Original Article

Psychometric Properties of the Persian Version of the Mentalizing Emotions Questionnaire

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Abstract

Objective: The Mentalizing Emotions Questionnaire (MEQ) assesses individuals' capacity to perceive, understand, and communicate emotional states across three dimensions: Self, Communicating, and Other. This study aimed to evaluate the psychometric properties of the Persian version of the MEQ.

Method: Two independent samples of Iranian adults participated in this research (total N = 785; 71% female). Study 1 (N = 307) conducted an exploratory factor analysis (EFA) to examine the underlying structure of the scale. Study 2 (N = 478) performed a confirmatory factor analysis (CFA) to test the three-factor model. Internal consistency, test–retest reliability, convergent validity, and divergent validity were also assessed using established measures of mentalization, empathy, alexithymia, emotional beliefs, personality functioning, and emotion regulation.

Results: The original three-factor structure (Self, Communicating, Other) was supported. Model fit indices indicated adequate-to-good fit (CFI = 0.92, RMSEA = 0.07, SRMR = 0.05, CMIN/df = 3.74). The Persian MEQ demonstrated strong internal consistency (α = 0.82–0.90) and excellent test–retest reliability (ICC = 0.89). Convergent validity was supported by positive correlations with mentalization and empathy measures (r = 0.20–0.35). Divergent validity was evidenced by negative correlations with alexithymia (r = −0.39), maladaptive emotional beliefs (r = −0.34), and personality functioning impairments (r = −0.31). Difficulty Describing Feelings showed a strong negative association with the Communicating dimension (r = −0.43). Cognitive reappraisal demonstrated a negative association with emotional mentalizing (r = −0.29).

Conclusion: The Persian version of the MEQ demonstrates strong reliability and validity for assessing the mentalizing emotions in nonclinical Iranian populations. The findings also suggest potential cultural variations in the relationship between cognitive reappraisal and mentalizing emotions warranting further cross-cultural investigation.

Key words: *Assessment; Emotions; Mentalization; Psychometrics; Psychology*

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Emotions constitute a fundamental determinant of behavior, decision-making, and social interactions (1). The capacity to regulate these emotions is vital for maintaining mental health, with emotion regulation defined as the processes employed to influence which emotions are experienced, their timing, and their expression (2–4). An essential capacity that facilitates adaptive emotion regulation is mentalizing: the imaginative ability to perceive and interpret one's own and others' behaviors in terms of intentional mental states (e.g., thoughts, feelings, emotions) (5–7).

Mentalizing develops within early caregiving relationships, where mirroring fosters epistemic trust, the openness to receiving social information as relevant and personally significant, which in turn supports social learning, adaptation, and the co-regulation of emotional states by the caregiver, playing a central role in the development of self-regulation (5,7–10). Trauma or suboptimal caregiving can impair this process, resulting in mentalizing deficits that underlie various psychopathologies (9–12).

Although mentalizing and emotion regulation are interconnected, they are distinct constructs: mentalizing offers a means for identifying, understanding, and communicating emotions, whereas emotion regulation pertains to their subsequent modulation (5, 6). Prior literature has attempted to differentiate mentalizing from related constructs such as empathy, theory of mind, emotional intelligence, and mindfulness; however, many self-report measures blur these distinctions by emphasizing only cognitive inference, emotional resonance, or broad socio-emotional skills (7). These limitations highlight the need for an instrument that captures the integrated and bidirectional nature of mentalizing emotions.

The Mentalizing Emotions Questionnaire (MEQ) was developed to address the limitations of existing self-report measures by conceptualizing the mentalizing of emotions as a distinct capacity, separate from emotion regulation (13, 14). Based on the Reflective Functioning Scale (RFS) (15, 16), the gold standard interview-based assessment of mentalizing (17, 18), the MEQ (14) operationalizes three core processes: (I) identifying emotions, (II) processing emotions, and (III) communicating emotions. It consists of 16 items across three subscales (Self, Communicating, Other), each capturing interest, acceptance, multi-perspective reasoning, and a developmental perspective. Notably, the Communicating subscale uniquely addresses the interpersonal expression of emotions, a dimension largely absents from other instruments (13).

To situate the MEQ within the broader landscape of self-report measures, Supplementary 1 summarizes tools assessing mentalization and emotion-related constructs (19-29). Many existing measures either emphasize impairments (e.g., RFQ, MZQ) (19, 20), focus on related but narrower constructs (e.g., MentS, epistemic trust)

(21, 25), or conflate mentalizing with emotion regulation (22, 23, 30, 31). By differentiating self- and other-oriented mentalizing and incorporating communication as a core social dimension, the MEQ provides a conceptually clear and comprehensive assessment of emotional mentalizing, supporting its adaptation and validation in diverse cultural contexts (13).

A growing body of research demonstrates that emotional processes and mentalization capacities are shaped by cultural contexts (32, 33). While cross-cultural studies often contrast East Asian emotional restraint with Western expressiveness (34–37), these broad comparisons do not fully capture the sociocultural dynamics of Middle Eastern, collectivistic, and Islamic-influenced societies such as Iran. Iranian cultural norms are characterized by an emphasis on relational interdependence, restrained emotional expression, and gendered expectations in emotional communication. Recent Iranian studies (38, 39) highlight culturally specific patterns in mentalization and emotion-related constructs, suggesting that emotional awareness and interpersonal communication may operate differently than in Western samples. These cultural characteristics underscore the need for a localized validation of the MEQ, as Western-developed measures may not adequately reflect how emotional mentalizing is shaped, expressed, and communicated within Persian cultural contexts.

Despite the growing interest in mentalization research in Iran, validated instruments specifically designed to assess mentalized emotions remain scarce. Addressing this gap, the present study evaluates the psychometric properties of the Persian version of the Mentalizing Emotions Questionnaire (MEQ) in a representative adult Iranian sample. Drawing on the original validation study and the theoretical framework underlying the MEQ, three hypotheses were proposed. We expected the Persian MEQ to reproduce the original three-factor structure (Self, Communicating, and Other emotions), demonstrate strong internal consistency (α and ω > 0.80), and exhibit meaningful associations with established measures of mentalization, emotion-related constructs, and psychopathology, thereby supporting its convergent and divergent validity.

Materials and Methods

This psychometric validation study employed a two-phase, cross-sectional design. Study 1 focused on the cultural adaptation of the MEQ and an exploratory factor analysis (EFA) to examine its underlying structure within an Iranian sample. Building upon this, Study 2 aimed to confirm the factor structure via confirmatory factor analysis (CFA) and to evaluate the scale's construct validity by examining its relationships with established measures of mentalization (MZQ, ETMCQ), emotion-related constructs (ERQ, EQ, EBQ), and psychopathology (LPFS-BF, TAS). Reliability was assessed through internal consistency (Cronbach's α,

McDonald's ω) in both phases, with additional test-retest and split-half reliability evaluated in Study 2.

Sampling and Power Considerations

For Study 1 (EFA), a sample of 307 participants was recruited. This sample size meets and exceeds the common recommendation of a minimum of 10-20 participants per questionnaire item for stable factor solutions exceeding the commonly recommended minimum of 300 cases for obtaining stable and reliable factor solutions (40). For Study 2 (CFA), a post hoc power analysis conducted using G*Power 3.1 (41) indicated that the sample of 478 participants provided more than 99% statistical power to test the hypothesized model (df = 99, α = 0.05, RMSEA = 0.07 vs. 0.05).

The test–retest reliability analysis was conducted on a subsample of 30 participants, which was considered adequate for estimating an Intraclass Correlation Coefficient (ICC) greater than .70, in line with standard methodological recommendations. Because data collection involved both online and paper-based formats, potential mode effects were examined to ensure equivalence across subsamples. Preliminary analyses revealed no significant differences between online and paper respondents in terms of age, gender distribution, or mean MEQ scores in either study phase (all P-values > 0.10).

Together, these findings reduce concerns regarding selection bias and support the representativeness and comparability of the combined samples. Effective sample sizes after applying exclusion criteria are reported consistently for both study phases.

Participants and Recruitment Procedures

Participants were recruited between August and December 2024 using a mixed-method approach to enhance diversity. Online recruitment involved distributing the survey link via popular Iranian social media apps. Concurrently, paper questionnaires were distributed in person at public locations in Isfahan. To ensure data integrity in the online arm, the Porsline survey platform (https://porsline.ir/) was configured to prevent duplicate submissions by restricting to one response per IP and email address.

In Study 1, 319 unique online visits yielded 192 complete responses (60.2 % response rate), supplemented by 115 paper questionnaires, resulting in a final sample of N = 307 after excluding five incomplete entries. For Study 2, 1,050 online visits produced 350 completions, combined with 128 paper questionnaires from 200 distributed (64.0 % response rate), yielding a final N = 478 after excluding 16 incomplete entries. A subset of 30 participants from Study 2 voluntarily completed the MEQ twice via the same secured platform with a one-month interval to assess test-retest reliability. Demographic details for all samples are presented in Table1.

Table 1. Demographic Characteristics of the Samples

Characteristic	Study 1		Study 2		Re-test	
	M	SD	M	SD	M	SD
Age	24.12	6.47	25.57	8.04	26.30	7.73
Gender	n (307)	%	n (478)	%	n (30)	%
Male	135	44.0	117	24.5	5	16.7
Female	172	56.0	361	75.5	25	83.3
Education level						
Diploma	57	18.6	81	16.9	7	23.3
Associate degree	9	2.9	25	5.2	1	3.3
BSc	154	50.2	228	47.7	11	36.7
MSc	72	23.5	120	25.1	11	36.7
Ph.D.	15	4.9	24	5.0	0	0
Marital status						
Single	253	82.4	359	75.1	1	3.3
Couple	51	16.6	114	23.8	24	80.0
Divorced	3	1.0	5	1.0	5	16.7
Work status						
Employee	54	17.6	113	23.6	24	80.0
Unemployed	202	65.8	280	58.6	5	16.7
Part-time job	51	16.6	85	17.8	1	3.3

Note. *N* = sample size; *M* = arithmetic mean; *SD* = standard deviation.

Translation and Cultural Adaptation

The adaptation of the MEQ followed established cross-cultural guidelines to ensure conceptual and semantic equivalence (42). The process involved: (1) independent forward translation by two bilingual experts; (2) synthesis by a committee of translators and psychologists; (3) back-translation by two independent translators blind to the original; (4) expert review by a panel of three native Persian-speaking psychologists; and (5) a pilot study (N = 24) which demonstrated acceptable internal consistency (Cronbach's alpha = 0.76). Consistent with the recommendations of Bujang *et al.* (43), this minimum sample is considered sufficient for pilot studies aimed at evaluating questionnaire reliability. The final Persian version of the scale was approved by the original developer (LK) and is provided in Supplementary 2.

Instruments

Mentalizing Emotions Questionnaire (MEQ)

Developed by Kasper *et al.* (14), this 16-item instrument assesses mentalizing emotions with items rated on a Likert scale ranging from never (1) to always (7). It comprises three subscales: Self (e.g., "I am interested in my emotions"), Communicating (e.g., "I find it exciting to talk about my emotions with others"), and Other (e.g., "I find it exciting to think about where others' emotions come from"). In a German-speaking general population, the MEQ demonstrated high internal consistency (Cronbach's $\alpha = 0.95$ for the overall scale; Self: $\alpha = 0.94$, Communicating: $\alpha = 0.92$, Other: $\alpha = 0.94$) (14). In the current study, the internal consistency of the Persian MEQ in Study 1 was assessed using (α) and (ω). The overall scale yielded $\alpha = 0.88$ and $\omega = 0.89$, with subscale reliabilities as follows: Self ($\alpha = 0.79$, $\omega = 0.79$), Communicating ($\alpha = 0.86$, $\omega = 0.86$), and Other ($\alpha = 0.85$, $\omega = 0.85$). These results confirm robust reliability across the MEQ's three subscales, and Study 2 yielded $\alpha = 0.90$ and $\omega = 90$ for the total scale, Self ($\alpha = 0.82$, $\omega = 0.83$), Communicating ($\alpha = 0.87$, $\omega = 0.87$), and Other ($\alpha = 0.87$, $\omega = 0.88$).

Mentalization Questionnaire (MZQ)

Developed by Hausberg *et al.* (20), with 15 items designed to assess impairments in mentalizing. It focuses on four subscales: emotional awareness, affective regulation, psychic equivalence, and avoidance of self-reflection. MZQ is answered through a 5-point Likert scale, ranging from (1) no agreement at all to (5) total agreement. Hausberg *et al.* (20) re-coded all items such that higher overall scores reflect a more sophisticated mentalizing capacity. Previous research conducted with non-clinical samples has supported a unidimensional structure for the MZQ (15). In this present study, the Persian form of Asgarizadeh *et al.* (44) was used. In the current sample, the internal consistency with Cronbach's α was 0.80.

Epistemic Trust, Mistrust, and Credulity Questionnaire (ETMCQ)

Developed by Campbell *et al.* (25), this is a 15-item self-report measure. Scores vary between (1) strongly disagree and (7) strongly agree. In this study, the Persian version by Asgarizadeh and Ghanbari (39) was used. In the present sample, internal consistency reliability coefficients were as follows: Trust: $\alpha = 0.70$; Mistrust: $\alpha = 0.58$; Credulity: $\alpha = 0.60$.

Emotion Beliefs Questionnaire (EBQ)

Developed by Becerra *et al.* (24) with 16 items to assess emotional beliefs. Scores range from (1) not true at all to (7) completely true. In this study, the Persian form by Ranjbar *et al.* (45) was utilized. In the current research, internal consistency reliability coefficients were as follows: Controllability: $\alpha = 0.95$; Usefulness: $\alpha = 0.80$; overall scale: $\alpha = 0.87$.

Emotion Regulation Questionnaire (ERQ)

Developed by Gross and John (29), this 10-item measure assesses two emotion regulation strategies: cognitive reappraisal and expressive suppression. Responses are rated on a 7-point Likert scale ranging from (1) not true at all to (7) completely true. In the present study, the Persian version demonstrated acceptable reliability coefficients for each subscale (Suppression: $\alpha = 0.78$; Reappraisal: $\alpha = 0.80$).

Empathy Quotient (EQ)

Developed by Baron-Cohen and Wheelwright (28), this is a self-report measure. The Persian version, adapted by Abolghasemi (46), includes 26 items across three subscales: Cognitive Empathy, Social Skills, and Emotional Reactivity. Scores vary between (1) strongly disagree and (4) strongly agree. In the present study, internal consistency was (overall scale: $\alpha = 0.77$; Cognitive Empathy: $\alpha = 0.70$; Social Skills: $\alpha = 0.70$; Emotional Reactivity: $\alpha = 0.59$).

Toronto Alexithymia Scale (TAS-20)

Developed by Parker *et al.* (27), this is a 20-item measure of alexithymia with three subscales: Difficulty Identifying Feelings (DIF), Difficulty Describing Feelings (DDF), and Externally Oriented Thinking (EOT). Items are rated on a 5-point Likert scale, with responses ranging from (1) strongly disagree to 5 (strongly agree. In the present study, internal consistency was (overall scale: $\alpha = 0.86$; DIF: $\alpha = 0.86$; DDF: $\alpha = 0.72$; EOT: $\alpha = 0.61$).

Level of Personality Functioning Scale-Brief Form (LPFS-BF)

Developed by Morey (26), this is a 12-item scale with two subscales: Self and Interpersonal. Responses are rated on a 4-point Likert scale ranging from (1) completely false to (4) completely true. In the current study, the Persian version demonstrated high internal consistency (overall scale: $\alpha = 0.95$; Self: $\alpha = 0.88$; Interpersonal: $\alpha = 0.77$).

Data analysis

Statistical analyses were conducted using IBM SPSS Statistics (version 27.0; IBM Corp., Armonk, NY, USA), IBM SPSS AMOS (version 23.0; IBM Corp., Armonk, NY, USA), and JASP (version 0.19.3.0; JASP Team, Amsterdam, The Netherlands).

Study 1

Exploratory factor analysis (EFA) was conducted using Principal Axis Factoring (PAF). Although preliminary analyses revealed moderate correlations among factors, inspection of the intercorrelation matrix indicated that the factors were sufficiently distinct to justify an orthogonal rotation. Accordingly, a Varimax rotation was applied to enhance interpretability while remaining conceptually consistent with the original MEQ structure. The number of factors to retain was determined based on eigenvalues greater than 1, in conjunction with theoretical expectations derived from the original model. Sampling adequacy for factor analysis was evaluated using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity. Following the guidelines of Tabachnick and Fidell (47), KMO values above 0.70 were considered indicative of excellent suitability for factor analysis, values between 0.50 and 0.70 were interpreted with caution, and values below 0.50 were deemed unacceptable. A significant Bartlett's test (p < 0.05) was required to confirm the appropriateness of the correlation matrix for factor extraction.

To ensure transparency and replicability, all analytic decisions were specified a priori. Items with factor loadings below 0.30 or cross-loadings exceeding 0.30 were flagged for review. Item quality was further evaluated using item difficulty and item discrimination indices, following the criteria proposed by Bortz and Döring (48), whereby acceptable item difficulty values ranged from 0.20 to 0.80 and item discrimination values of .30 or higher were considered adequate. Item means (M) and standard deviations (SD) were calculated based on a 7-point Likert scale (1 = Never, 7 = Always).

CFA was subsequently performed using the maximum likelihood estimator. Model fit was evaluated using conventional fit indices. Modification indices were inspected, and only theoretically justified modifications were applied to improve model fit, ensuring conceptual coherence and methodological rigor.

In Study 1, the internal consistency of the MEQ total scale and its subscales was assessed using Cronbach's alpha and McDonald's omega. Finally, one-way analyses of variance (ANOVA) were conducted to examine differences in MEQ total scores across demographic variables, including age, gender, education level, employment status, and marital status, with frequency distributions reported accordingly.

Study 2

Model fit was evaluated using the following indices: CMIN/df, GFI, CFI, IFI, RMSEA, and SRMR. Acceptable fit was indicated by CMIN/df < 3, GFI/CFI/IFI > 0.90, RMSEA < 0.08, and SRMR < 0.08 (49, 50). Internal consistency was assessed using Cronbach's alpha, McDonald's omega (ω), the Spearman-Brown coefficient, and test-retest reliability via Pearson correlation. Structural coherence was confirmed by analyzing the alignment between MEQ subscales (Self, Communicating, Other) and the total score. Convergent and divergent validity were examined using Pearson correlations with measures of mentalization (MZQ, ETMCQ), emotion (EBQ, EQ, EPQ), and psychopathology (LPFS-BF, TAS). Reliability was interpreted based on standard thresholds: α > 0.90 (excellent), 0.80–0.90 (good), 0.70–0.80 (acceptable), and so forth (51). Both Cronbach's alpha and McDonald's omega range from 0 to 1, with internal consistency typically considered acceptable at coefficients ≥ 0.70 (52). Correlation strengths were classified according to Cohen's (53) guidelines: small (r = 0.10), medium (r = 0.30), and large (r ≥ 0.50).

Results

Study 1

The mean (M) and standard deviation (SD) values for all 16 items are presented in Table 2. Item difficulty indices ranged from 0.58 (Item 9) to 0.79 (Item 4), indicating acceptable range for the difficulty level of the items. Item discrimination indices ranged from 0.39 (Item 1) to 0.63 (Item 12). No substantial deviations from normality were observed in the distributions of most items, with coefficients of absolute skewness > 2 and absolute kurtosis > 7 serving as reference values for samples with more than 300 participants (54). An independent samples t-test was conducted to examine gender differences. The results showed no significant difference between men and women on MEQ scores (P > 0.05).

Table 2. Descriptive Statistics and Exploratory Factor Loadings for Individual Items of the Mentalizing Emotions Questionnaire in the Iranian Adult Sample

Item No.	Descriptive statistics				Normality of Items	
	M	SD	Difficulty	Discrimination	Skewness	Kurtosis
1	5.16	1.21	0.73	0.39	-0.44	-0.05
2	5.53	1.23	0.79	0.54	-0.84	0.68
3	5.33	1.22	0.76	0.53	-0.58	0.09
4	5.58	1.34	0.79	0.50	-1.01	0.94

Item No.	Descriptive statistics				Normality of Items	
	M	SD	Difficulty	Discrimination	Skewness	Kurtosis
5	4.63	1.28	0.66	0.43	-0.41	-0.07
6	4.37	1.69	0.62	0.53	-0.21	-0.85
7	4.44	1.55	0.63	0.61	-0.20	-0.76
8	4.49	1.56	0.64	0.60	-0.34	-0.62
9	4.07	1.50	0.58	0.59	-0.05	-0.80
10	4.55	1.53	0.65	0.60	-0.41	-0.46
11	4.77	1.45	0.68	0.56	-0.41	-0.48
12	4.95	1.49	0.70	0.63	-0.47	-0.46
13	5.11	1.29	0.73	0.50	-0.45	-0.31
14	4.77	1.50	0.68	0.59	-0.45	-0.45
15	5.24	1.13	0.74	0.48	-0.57	0.61
16	4.81	1.54	0.68	0.51	-0.47	-0.46

Note. *M* = arithmetic mean; *SD* = standard deviation; *EFA* = Exploratory Factor Analysis.

Exploratory Factor Analysis

To strengthen factor retention decisions, multiple criteria were applied. In addition to eigenvalues > 1, the scree plot showed a clear inflection after the third factor, supporting a three-factor solution. Parallel analysis was also conducted and confirmed that only the first three eigenvalues exceeded those generated from random data, further substantiating the retention of three factors. The exploratory factor analysis (EFA) revealed three main factors that comprehensively covered the structure of the questionnaire. The MEQ consists of 16 items measuring three sub-factors: Self, Communicating, and Other. Only factor loadings > 0.30 are presented, with smaller loadings suppressed for clarity. Factor 1 (5 items; eigenvalue = 2.87) explained 17.9 % of the variance, Factor 2 (4 items; eigenvalue = 3.02) explained 18.9 %, and Factor 3 (7 items; eigenvalue = 3.71) explained 23.2 %, accounting for a total of approximately 60 % of the variance. All items demonstrated factor loadings greater than 0.50. The full pattern matrix, communalities, and percentage of variance explained for each factor are presented in Table 3.

Table 3. Items, Pattern Matrix with loadings > 0.30, Communalities, % Variance Per Factor
Persian Version of the Mentalizing Emotions Questionnaire

Item No.	Item	EFA		
		Factor 1	Factor 2	Factor 3
1	I am interested in my feelings.	0.68		
2	I am interested in understanding my feelings.	0.79		
3	I try to understand the different reasons for my feelings.	0.78		
4	I think it is helpful to understand the causes of my feelings.	0.62		0.36
5	With some distance, I can understand my feelings in a new way.	0.62		
6	I think it is exciting to talk with others about my feelings.		0.80	
7	I can explain my different feelings to others.		0.82	
8	I think it is useful to talk about my feelings.		0.76	
9	I can talk to others about how my feelings change.		0.80	
10	I am interested in the feelings of others.	0.34		0.56
11	I can perceive conflicting feelings in others.			0.54
12	I think it is enriching to recognize feelings in others.			0.76
13	I try to see situations through the other person's eyes.			0.63
14	I find it helpful to think about the reasons for others' feelings.			0.83
15	Through time, I can better understand the feelings of others.			0.70
16	I think it is exciting to think about where others' feelings come from.			0.77
Eigenvalues for factors after rotation		3.82	2.96	2.82
Extraction Sums of Squared Loadings % of Variance (0.60)		23.90	18.51	17.65

The Kaiser-Meyer-Olkin (KMO) measure was reported as 0.87, which is highly satisfactory. Bartlett's test of sphericity yielded significant results (χ^2 = 2217.999, df = 120, P < 0.01), confirming the adequacy of the data for factor extraction. These findings collectively support the validity of the exploratory model. Internal consistency was assessed using both Cronbach's alpha (α) and McDonald's omega (ω). The total scale demonstrated excellent reliability (α = 0.88, ω = 0.89). Subscale reliabilities were also satisfactory: Self (α = 0.79, ω = 0.79), Communicating (α = 0.86, ω = 0.86), and Other (α = 0.85, ω = 0.85).

Before examining the reliability and validity of the scale, demographic subgroup analyses were conducted to ensure the robustness of the results. The correlation between age and total MEQ scores was -0.04, which was not significant (P > 0.05). Additionally, ANOVA results indicated no significant differences in MEQ scores based on marital status (single, married, divorced) or employment status (P > 0.05). However, significant differences were observed among participants with different educational levels (P < 0.01). Post-hoc

Bonferroni tests revealed that individuals with doctoral degrees scored significantly higher on the MEQ compared to those with high school diplomas, associate degrees, bachelor's degrees, and master's degrees. No significant differences were found among other educational levels. In Study 1, we tested which factor structure the items of the original German MEQ would assume in an Iranian sample. The factor structure of the Iranian MEQ matched the structure of the German questionnaire.

Study 2

Based on the findings of Kasper *et al.* (28), the three-subfactor structure of the MEQ had been previously validated. To confirm this structure in an Iranian population, a confirmatory factor analysis (CFA) was conducted. Subsequently, the results supported the proposed three-factor model, comprising:

*   Factor 1 (Items 1 to 5)
*   Factor 2 (Items 6 to 9)
*   Factor 3 (Items 10 to 16)

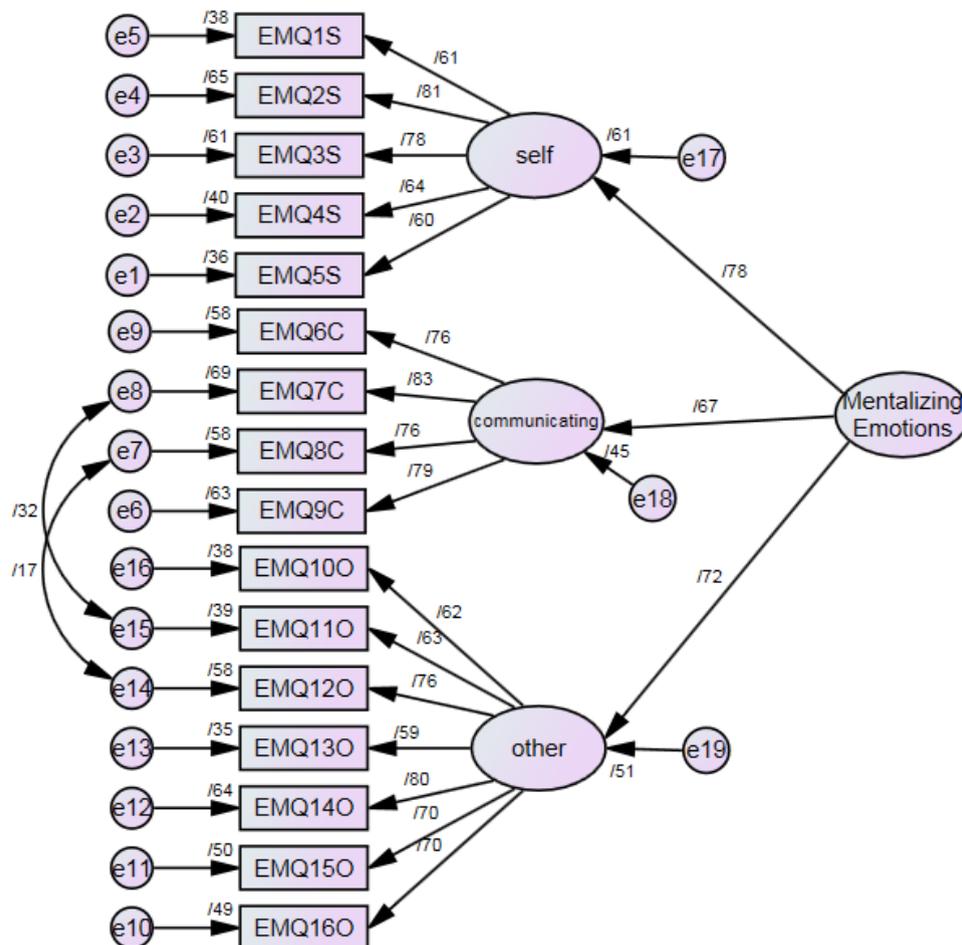This structure was successfully validated (Figure 1).

Figure 1. Second-Order Confirmatory Factor Model of the Persian Version of the Mentalizing Emotions Questionnaire in an Iranian Adult Sample

Table 4. Model Fit Indices for the First-Order and Second-Order Factor Models of the Persian Version of the Mentalizing Emotions Questionnaire in an Iranian Adult Sample

Number Model	Scale	CFI	GFI	TLI	RMSEA	CMIN/DF	PCLOSE
1	Self	0.91	0.94	0.91	0.07	2.51	0.13
2	Communicating	0.98	0.98	0.94	0.03	1.28	0.16
3	Other	0.96	0.96	0.94	0.03	2.75	0.15
4	Overall Scale MEQ (First-Order Model)	0.91	0.90	0.90	0.08	4.23	0.11
7	Overall Scale MEQ (Second-Order Model)	0.92	0.91	0.92	0.07	3.74	0.12

The model fit indices were calculated as follows: Comparative Fit Index (CFI) = 0.92, Goodness-of-Fit Index (GFI) = 0.91, Incremental Fit Index (IFI) = 0.92, Standardized Root Mean Square Residual (SRMR) = 0.05, Chi-square Mean Error (CMIN/df) = 3.74, Root Mean Square Error of Approximation (RMSEA) = 0.07 with a 90% confidence interval of 0.05–0.09, and PCLOSE = 0.12, indicating adequate fit (see Table 4).. While the CMIN/df value exceeded the ideal threshold of < 3, which is not uncommon for complex psychological models in large samples, the other indices (CFI, RMSEA, SRMR) collectively indicated an adequate and acceptable model fit. The model chi-square was χ^2 = 370.647, df = 99, P < 0.001. Comparative analyses with a one-factor model showed inferior fit (CFI = 0.81, RMSEA = 0.10), confirming the superiority of the three-factor structure. All indices fell within an acceptable range, confirming the structural validity of the proposed model.

The distribution of scale scores was assessed using skewness and kurtosis values. Specifically, skewness for the total MEQ score and its subscales ranged from −0.20 to −0.59, and kurtosis ranged from −0.25 to 0.49. Since all values were within the acceptable range (i.e., skewness < 2 and absolute kurtosis < 7), the normality of the score distribution was confirmed (55). To assess reliability, Cronbach's α, Spearman Brown coefficient, McDonald's ω, and test-retest correlations were calculated (Table 5). The total scale showed strong internal consistency (α = 0.90, ω = 0.90; SB = 0.80) and good temporal stability. Subscale reliabilities ranged from 0.82 to 0.87 for α, and ω ranged from 0.83 to 0.88, indicating very good internal consistency.

Table 5. Internal Consistency and Test–Retest Reliability of the Persian Version of the Mentalizing Emotions Questionnaire and Its Subscales (Self, Communicating, and Other) in the Iranian Adult Sample

Scale	Cronbach's α	McDonald's ω	Spearman-Brown Coefficient	Test – retest	ICC	95% Confidence Interval
MEQ	0.90	90	0.80	0.58	0.89	0.87 – 0.91
Self	0.82	83	0.79	0.61	0.76	0.73 – 0.79
Communicating	0.87	87	0.87	0.51	0.85	0.83 – 0.87
Other	0.87	88	0.86	0.51	0.85	0.83 – 0.87

The Self factor, with five items, assesses the mentalizing of self-emotions and showed strong internal consistency (α = 0.82). The Communicating factor, comprising four items, measures the expression of emotions to others and demonstrated high reliability (α = 0.87). The Other factor, including seven items, focuses on understanding others' emotions and demonstrated excellent consistency (α = 0.87). Confirmatory factor analysis (CFA) supported the MEQ's factorial structure and the validity of its subscales within the Iranian population, followed by an assessment of criterion validity.

Test-retest

A subsample of 30 participants from the original sample (N = 478) completed the MEQ again in Study 2 (Tables 1, 5). Test–retest reliability was evaluated using a two-way mixed-effects intraclass correlation coefficient for absolute agreement (ICC (3,1)), with 95% confidence intervals. The MEQ total score demonstrated excellent temporal stability (ICC = 0.89, 95% CI [0.87, 0.91]), closely comparable to the test–retest coefficients reported for the original German version (ICCs ≈ 0.85–0.90; ΔICC < 0.05). At the subscale level, Communicating (ICC = .85, 95% CI [0.83, 0.87]) and Other (ICC = 0.85, 95% CI [0.83, 0.87]) showed good-to-excellent stability, whereas Self demonstrated a comparatively lower, yet acceptable, level of stability (ICC = 0.76, 95% CI [0.73, 0.79]). Given the absence of prior evidence specifically addressing differential stability across MEQ subscales, this pattern should be interpreted cautiously and considered exploratory rather than conclusive.

The MEQ's psychometric properties and construct validity were examined across four key domains:

1. MEQ Internal Structure (Part 1): Internal consistency and subscale intercorrelations.
2. Mentalization-related constructs (Part 2): Relationships with mentalization measures (MZQ, ETMCQ).
3. Emotion-related constructs (Part 3): Associations with emotion-related tools (EBQ, EQ, ERQ).
4. Psychopathology-related constructs (Part 4): Links to personality functioning and symptom severity (LPFS-BF).

The mean (standard deviation) for the overall MEQ scale was 77.40 (14.72). For the subscales, the means (standard deviations) were: Self = 25.97 (4.93), Communicating = 17.73 (5.29), and Other = 33.69 (7.58). No evidence of ceiling or floor effects was observed. In Part 1, strong correlations were found between the overall MEQ and its subscales: Self (r = 0.79), Communicating (r = 0.77), and Other (r = 0.88), indicating high internal consistency. In Part 2, which explored associations between the MEQ and mentalization-related constructs, the MEQ total score also demonstrated a statistically significant, small positive correlation with the MZQ total score (r = 0.29, P < 0.01). At the subscale level, small positive correlations were found between the MZQ and the MEQ Self (r = 0.20, P < 0.01), Communicating (r = 0.26, P < 0.01), and Other (r = 0.24, P < 0.01) subscales.

Table 6 presents the intercorrelations between the MEQ total score and subscales with external measures, allowing for the identification of convergent and divergent validity patterns. Overall, the MEQ demonstrated the strongest convergent validity with measures of emotional trust and emotional reactivity, and the strongest divergent validity with alexithymia, particularly difficulties describing feelings (TAS-DDF). Within the emotional domain, the MEQ total score showed consistent negative associations with EBQ indices, including the EBQ total score, Controllability, and Usefulness (rs = –0.24 to –0.34), indicating small-to-moderate effect sizes across MEQ subscales. A similar pattern emerged for emotion regulation, where Reappraisal was negatively associated with the MEQ, most prominently for the Communicating subscale (r = –0.40), while Suppression showed no meaningful associations

Table 6. Means, Standard Deviations, and Correlations of the Persian Version of the Mentalizing Emotions Questionnaire and Related Psychological Measures

Context	Variable	M	SD	MEQ	Self	Communicating	Other
MEQ (part 1)	MEQ overall scale	77.40	14.72				
	MEQ self	25.97	4.93	0.79**			
	MEQ communicating	17.73	5.29	0.77**	0.48**		
	MEQ other	33.69	7.58	0.88**	0.55**	0.49**	
	MZQ	46.28	9.43	0.29**	0.20**	0.26**	0.24**
	ETMCQ Trust	26.24	4.22	0.29**	0.26**	0.25**	0.21**
	ETMCQ Mistrust	18.78	3.75	-0.16**	-0.09*	-0.20**	-0.10*
	ETMCQ Credulity	18.50	6.18	-0.13**	-0.10*	-0.03	-0.16**
Emotional (part 3)	EBQ total	40.23	16.63	-0.34**	-0.26**	-0.24**	-0.32**
	EBQ controllability	21.34	8.48	-0.31**	-0.24**	-0.22**	-0.30**
	EBQ usefulness	18.89	9.15	-0.32**	-0.25**	-0.22**	-0.31**
	EQ total	83.89	8.85	0.20**	0.15**	0.06	0.24**
	EQ cognitive empathy	19.93	2.99	0.16**	0.09*	0.09	0.20**
	EQ social skills	25.23	3.94	-0.19**	-0.13**	-0.19**	-0.16**
	EQ emotion reactivity	31.37	4.41	0.35**	0.28**	0.17**	0.39**
	ERQ reappraisal	15.81	4.98	-0.29**	-0.22**	-0.40**	-0.13**
	ERQ suppression	26.73	5.34	0.05	0.04	-0.04	0.01
Psychopathological (part 4)	LPFS-BF total score	14.09	7.02	-0.31**	-0.26**	-0.24**	-0.26**
	LPFS-BF self	6.65	3.44	-0.36**	-0.28**	-0.25**	-0.34**
	LPFS-BF interpersonal	7.44	4.22	-0.22**	-0.21**	-0.20**	-0.15**

Context	Variable	M	SD	MEQ	Self	Communicating	Other
	TAS Total	50.65	11.59	-0.39**	-0.33**	-0.33**	-0.31**
	TAS DIF	17.99	6.09	-0.24**	-0.23**	-0.20**	-0.18**
	TAS DDF	13.59	3.95	-0.38**	-0.28**	-0.43**	-0.24**
	TAS EOT	19.06	4.14	-0.37**	-0.31**	-0.20**	-0.37**

Note. *M* and *SD* are used to represent mean and standard deviation, respectively. * indicates *P* < 0.05, ** indicates *P* < 0.01; *MEQ* = Mentalizing Emotions Questionnaire; *MZQ* = Mentalization Questionnaire; *ETMCQ* = Epistemic Trust, Mistrust, and Credulity Questionnaire; *EBQ* = Emotional Beliefs Questionnaire; *EQ* = Empathy Quotient; *ERQ* = Emotion Regulation Questionnaire; *LPFS-BF* = Level of Personality Functioning Scale–Brief Form; *TAS* = Toronto Alexithymia Scale. It should be noted that correlations involving measures with lower internal consistency (e.g., ETMCQ Mistrust/Credulity, EQ Emotional Reactivity) may be attenuated due to measurement error, and should be interpreted with caution

Regarding empathy-related constructs, the MEQ displayed moderate positive associations with Emotion Reactivity, particularly for the Other subscale (r = 0.39), whereas relations with Cognitive Empathy were smaller and inconsistent. Social Skills showed small but systematic negative correlations with the MEQ dimensions. In the psychopathological domain, alexithymia exhibited the strongest and most consistent negative associations with the MEQ, especially for TAS-DDF (rs = –0.24 to –0.43), with the largest effect observed for the Communicating subscale. Additionally, impairments in personality functioning (LPFS-BF) were moderately negatively correlated with the MEQ total score and subscales (rs ≈ –0.24 to –0.31), supporting the criterion validity of the Persian MEQ.

Discussion

Mentalization is widely recognized as a key factor in mental health, and the MEQ (14) provides a reliable self-report measure of mentalizing emotions. The present study validates the Persian version in an Iranian community sample, confirming the original three-factor structure (Self, Communicating, Others) with strong psychometric properties. As the first comprehensive validation of the MEQ in a Middle Eastern collectivist culture, these findings highlight its robustness among Iranian adults.

Convergent validity was supported by positive correlations with related mentalization and emotions measures: MZQ, ETMCQ-Trust, EQ total, and particularly EQ emotion reactivity. Divergent validity was evidenced by negative correlations with constructs reflecting emotional difficulties: alexithymia (TAS total and subscales), maladaptive emotional beliefs (EBQ total and subscales), personality functioning impairments (LPFS-BF total, self, and interpersonal), ETMCQ-Mistrust, ETMCQ-Credulity, and EQ social skills.

A distinctive cultural pattern emerged: MEQ total scores were negatively correlated with ERQ cognitive reappraisal while showing no association with suppression. This contrasts with typical Western findings (14) but aligns with local research linking reappraisal to reduced emotional expression (38). While collectivism provides a broad explanatory framework,

more specific Iranian sociocultural mechanisms may also contribute. This finding can be contextualized within specific dimensions of collectivism salient in Iranian culture, such as the prioritization of relational harmony (*solh*) and context-dependent communication. The explicit, cognitive reappraisal of personal emotions may be perceived as less necessary or even disruptive to implicit, shared understanding within close relationships. This is particularly relevant for the *Communicating* subscale, where expressing emotions is already governed by nuanced norms (*ta'arof*). Thus, high emotional mentalizing in this context may align with intuitive, relationally-attuned understanding rather than explicit cognitive restructuring.

Iranian children frequently suppress emotions (55), and cultural norms favor contextual, intuitive understanding among close others rather than explicit disclosure (56). These tendencies may partially explain why higher mentalized affectivity is associated with reduced reliance on conscious reappraisal; however, this explanation remains exploratory. Cross-cultural evidence supports individualism–collectivism as a moderator of reappraisal use and outcomes (57–60), suggesting that future studies should directly measure these cultural dimensions rather than infer them indirectly. Women reported greater emotional expressivity, consistent with socialization effects (38); however, the female-majority sample in both the current study and Jafarpoor *et al.* (38) necessitates cautious interpretation.

Limitation

The present study has several limitations that should be acknowledged. First, the use of a nonclinical convenience sample recruited via online snowball sampling may have restricted variability in psychopathology-related constructs, potentially attenuating associations with alexithymia, personality functioning, and maladaptive emotional beliefs. In addition, the substantial overrepresentation of female participants may have inflated correlations with empathy-related measures or emotional expressivity, given well-documented gender differences in these domains. Future studies should employ stratified or probability-based sampling strategies to ensure more

balanced demographic representation and to enhance the generalizability of findings.

Furthermore, the comparatively lower test-retest stability of the Self subscale suggests that mentalizing one's own emotions may be more context-sensitive or susceptible to short-term fluctuations in mood or self-focus compared to the more interpersonal Communicating and Other dimensions. This differential stability warrants investigation in future longitudinal studies. Measurement invariance across gender, age, and cultural subgroups within Iran should be examined to clarify whether the MEQ functions equivalently across demographic strata. Moreover, incremental validity studies comparing the MEQ with existing Persian mentalization-related instruments are needed to establish its unique contribution. Additional priorities include evaluating sensitivity to therapeutic change, examining incremental validity using multi-method approaches (e.g., behavioral tasks and physiological indicators), and assessing the predictive utility of the MEQ in mentalization-based interventions. The internal consistency of the Mistrust and Emotional Reactivity subscales was below the conventional threshold, which may have attenuated the magnitude of their associations with other constructs. Accordingly, findings involving these subscales should be interpreted with caution.

Conclusion

This study confirms the psychometric validity and cultural adaptability of the Persian MEQ in an Iranian sample, supporting its three-factor structure, strong reliability, and both convergent and divergent validity. Beyond establishing its general utility, the present findings address a specific gap in Persian-language assessment tools: the MEQ is currently the only validated instrument that distinctly captures self-focused, other-focused, and communicative dimensions of emotional mentalizing. This tripartite structure offers a more differentiated profile of mentalized affectivity (31) than existing Persian measures, which typically emphasize impairments or narrower components of mentalization. Despite sampling limitations, the MEQ emerges as a valuable and uniquely informative tool for assessing emotional mentalizing in Persian-speaking populations, with clear potential for both research and clinical applications. By advancing cross-cultural validation, these findings broaden emotional mentalization research in non-Western contexts and highlight the need for future studies applying the Persian MEQ in clinical settings, intervention studies, and longitudinal designs to further establish its practical and diagnostic utility.

The validated three-factor structure provides clinicians with a differentiated profile—distinguishing self-focused, communicative, and other-focused mentalizing emotions which can inform targeted interventions in Persian-speaking therapeutic contexts.

Conflict of Interest
None.

Author's Contributions
A.R.H. led the study design, data collection, and manuscript writing. M.R.A. and M.R.M.A. contributed to conceptualization, study design, supervision, and manuscript editing. A.N. handled data analysis and contributed to data interpretation. L.A.K. reviewed, edited, and provided overall supervision. Z.A reviewed, edited. All authors reviewed and approved the final version of the manuscript for publication.

References

1. van Kleef GA, Côté S. The Social Effects of Emotions. Annu Rev Psychol. 2022;73:629–58.
2. Gross JJ. Handbook of emotion regulation: Guilford publications; 2013.
3. Lincoln TM, Schulze L, Renneberg B. The role of emotion regulation in the characterization, development and treatment of psychopathology. Nat Rev Psychol. 2022;1(5):272–86.
4. Zitzmann J, Rombold-George L, Rosenbach C, Renneberg B. Emotion Regulation, Parenting, and Psychopathology: A Systematic Review. Clin Child Fam Psychol Rev. 2024;27(1):1–22.
5. Schwarzer N-H, Nolte T, Fonagy P, Gingelmaier S, editors. Mentalizing and emotion regulation: Evidence from a nonclinical sample. International forum of psychoanalysis; 2021: Taylor & Francis.
6. Fonagy P, Steele M, Steele H, Moran GS, Higgitt AC. The capacity for understanding mental states: The reflective self in parent and child and its significance for security of attachment. Infant Ment Health J. 1991;12(3):201–18.
7. Fonagy P, Gergely G, Jurist EL. Affect regulation, mentalization and the development of the self: Routledge; 2018.
8. Fonagy P, Allison E. The role of mentalizing and epistemic trust in the therapeutic relationship. Psychotherapy (Chic). 2014;51(3):372–80.
9. Brüne M, Walden S, Edel MA, Dimaggio G. Mentalization of complex emotions in borderline personality disorder: The impact of parenting and exposure to trauma on the performance in a

novel cartoon-based task. Compr Psychiatry. 2016;64:29–37.

10. Fowler S. The relationship between traumatic events and psychological symptomatology and the moderating role of mentalization. 2016.

11. Rosso AM, Viterbori P, Scopesi AM. Are maternal reflective functioning and attachment security associated with preadolescent mentalization? Front Psychol. 2015;6:1134.

12. Fonagy P, Luyten P, Bateman A, Gergely G, Strathearn L, Target M, et al. Attachment and personality pathology. Psychodynamic psychotherapy for personality disorders: A clinical handbook. 2010;1:37–88.

13. Kasper LA. Mentalisieren in der Psychotherapie 2024.

14. Kasper LA, Hauschild S, Berning A, Holl J, Taubner S. Development and validation of the Mentalizing Emotions Questionnaire: A self-report measure for mentalizing emotions of the self and other. PLoS One. 2024;19(5):e0300984.

15. Taubner S, Hörz S, Fischer-Kern M, Doering S, Buchheim A, Zimmermann J. Internal structure of the Reflective Functioning Scale. Psychol Assess. 2013;25(1):127–35.

16. Fonagy P, Target M, Steele H, Steele M. Reflective-functioning manual version 5 for application to adult attachment interviews. 1998.

17. George C, West M. The adult attachment projective picture system: integrating attachment into clinical assessment. Journal of personality assessment. 2011 Sep 1;93(5):407-16.

18. Slade A, Aber J, Bresgi I, Berger B, Kaplan M. The parent development interview–revised. Unpublished protocol. 2004.

19. Fonagy P, Luyten P, Moulton-Perkins A, Lee YW, Warren F, Howard S, et al. Development and Validation of a Self-Report Measure of Mentalizing: The Reflective Functioning Questionnaire. PLoS One. 2016;11(7):e0158678.

20. Hausberg MC, Schulz H, Piegler T, Happach CG, Klöpper M, Brütt AL, et al. Is a self-rated instrument appropriate to assess mentalization in patients with mental disorders? Development and first validation of the mentalization questionnaire (MZQ). Psychother Res. 2012;22(6):699–709.

21. Dimitrijević A, Hanak N, Altaras Dimitrijević A, Jolić Marjanović Z. The Mentalization Scale (MentS): A Self-Report Measure for the Assessment of Mentalizing Capacity. J Pers Assess. 2018;100(3):268–80.

22. Greenberg DM, Kolasi J, Hegsted CP, Berkowitz Y, Jurist EL. Mentalized affectivity: A new model and assessment of emotion regulation. PLoS One. 2017;12(10):e0185264.

23. Greenberg DM, Rudenstine S, Alaluf R, Jurist EL. Development and validation of the Brief-Mentalized Affectivity Scale: Evidence from cross-sectional online data and an urban community-based mental health clinic. J Clin Psychol. 2021;77(11):2638–52.

24. Becerra R, Preece DA, Gross JJ. Assessing beliefs about emotions: Development and validation of the Emotion Beliefs Questionnaire. PLoS One. 2020;15(4):e0231395.

25. Campbell C, Tanzer M, Saunders R, Booker T, Allison E, Li E, et al. Development and validation of a self-report measure of epistemic trust. PLoS One. 2021;16(4):e0250264.

26. Morey LC. Development and initial evaluation of a self-report form of the DSM-5 Level of Personality Functioning Scale. Psychol Assess. 2017;29(10):1302–8.

27. Parker JD, Taylor GJ, Bagby RM. The 20-Item Toronto Alexithymia Scale. III. Reliability and factorial validity in a community population. J Psychosom Res. 2003;55(3):269–75.

28. Baron-Cohen S, Wheelwright S. The empathy quotient: an investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. J Autism Dev Disord. 2004;34(2):163–75.

29. Gross JJ, John OP. Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. J Pers Soc Psychol. 2003;85(2):348–62.

30. Jurist E. Minding emotions: Cultivating mentalization in psychotherapy: Guilford Publications; 2018.

31. Jurist EL. Mentalized affectivity. Psychoanalytic psychology. 2005;22(3):426.

32. Aival-Naveh E, Rothschild-Yakar L, Kurman J. Keeping culture in mind: A systematic review and initial conceptualization of mentalizing from a cross-cultural perspective. Clinical Psychology: Science and Practice. 2019;26(4):e12300.

33. Butler EA, Lee TL, Gross JJ. Emotion regulation and culture: are the social consequences of emotion suppression culture-specific? Emotion. 2007;7(1):30–48.

34. Kitayama S, Mesquita B, Karasawa M. Cultural affordances and emotional experience: socially engaging and disengaging emotions in Japan and the United States. J Pers Soc Psychol. 2006;91(5):890–903.

35. Mauss IB, Gross JJ. Emotion suppression and cardiovascular. Emotional expression and health: Advances in theory, assessment and clinical applications. 2004;60.

36. Murata A, Moser JS, Kitayama S. Culture shapes electrocortical responses during emotion suppression. Soc Cogn Affect Neurosci. 2013;8(5):595–601.

37. Ma X, Tamir M, Miyamoto Y. A socio-cultural instrumental approach to emotion regulation: Culture and the regulation of positive emotions. Emotion. 2018;18(1):138–52.

38. Jafarpoor F, Shayegh E, Haghjoo P, Ghanbari S. Persian Mentalized Affectivity Scale (MAS): Reliability, Validity, and Cultural Considerations. Brain Behav. 2025;15(9):e70880.

39. Asgarizadeh A, Ghanbari S. Iranian adaptation of the Epistemic Trust, Mistrust, and Credulity Questionnaire (ETMCQ): Validity, reliability,

discriminant ability, and sex invariance. Brain Behav. 2024;14(3):e3455.

40. Bollen KA. Structural equations with latent variables: John Wiley & Sons; 1989.

41. Farahani H, RoshanChesli R. Calculation and justification of sample size in researches of psychological sciences: Application of G* Power software. Clinical Psychology and Personality. 2023;20(2):221–34.

42. Borsa JC, Damásio BF, Bandeira DR. Cross-cultural adaptation and validation of psychological instruments: Some considerations. Paidéia (Ribeirão Preto). 2012;22:423–32.

43. Bujang MA, Omar ED, Foo DHP, Hon YK. Sample size determination for conducting a pilot study to assess reliability of a questionnaire. Restor Dent Endod. 2024;49(1):e3.

44. Asgarizadeh A, Sharp C, Ghanbari S. Shame-coping clusters: comparisons regarding attachment insecurities, mentalizing deficits, and personality pathology, controlling for general emotion dysregulation. Borderline Personal Disord Emot Dysregul. 2023;10(1):25.

45. Ranjbar S, Mazidi M, Gross JJ, Preece D, Zarei M, Azizi A, et al. Examining the cross cultural validity and measurement invariance of the Emotion Beliefs Questionnaire (EBQ) in Iran and the USA. J Psychopathol Behav Assess. 2023;45(3):755–66.

46. Abou Alghasemi A. HE RELIABILITY AND VALIDATION OF THE EMPATHY QUOTIENT SCALE FOR HIGH SCHOOL STUDENTS. 2010.

47. Tabachnick BG, Fidell LS, Ullman JB. Using multivariate statistics: pearson Boston, MA; 2007.

48. Bortz J, Döring N. Forschungsmethoden und evaluation: für human-und sozialwissenschaftler: Springer-Verlag; 2013.

49. Meyers LS, Gamst G, Guarino AJ. Applied multivariate research: Design and interpretation: Sage publications; 2016.

50. Awang Z. A handbook on structural equation modeling using AMOS. Universiti Technologi MARA Press, Malaysia. 2012:83–102.

51. Cronbach LJ. Coefficient alpha and the internal structure of tests. Psychometrika. 1951;16(3):297-334.

52. McNeish D. Thanks coefficient alpha, we'll take it from here. Psychol Methods. 2018;23(3):412–33.

53. Cohen J. Set correlation and contingency tables. Applied psychological measurement. 1988;12(4):425–34.

54. West SG, Finch JF, Curran PJ. Structural equation models with nonnormal variables: Problems and remedies. 1995.

55. Dadkhah A, Shirinbayan P. EMOTION REGULATION CHARACTERISTICS DEVELOPMENT IN IRANIAN PRIMARY SCHOOL PUPILS1. 2014.

56. Jurist E, Sosa MP. Commentary on mentalization and culture. 2019.

57. Song H, Chan JS, Ryan C. Differences and similarities in the use of nine emotion regulation strategies in Western and East-Asian cultures: Systematic review and meta-analysis. Journal of Cross-Cultural Psychology. 2024;55(8):865–85.

58. Klein ND, Bravo AJ, Conway CC, Keough MT, Pilatti A, Mezquita L. Individualism, collectivism, and emotion regulation: A cross-cultural examination among young adults from seven countries. Curr Psychol. 2024;43(31):26007–18.

59. Matsumoto D, Yoo SH, Nakagawa S. Culture, emotion regulation, and adjustment. J Pers Soc Psychol. 2008;94(6):925–37.

60. Ramzan N, Amjad N. Cross cultural variation in emotion regulation: A systematic review. Annals of King Edward Medical University. 2017;23(1).

Supplementary 1. Summary of Measures Related to Mentalization and Emotions

Tool Name (Reference)	Sample Description	Factor Structure	Reliability	Main Limitations
Reflective Functioning Questionnaire (RFQ) (19)	Study 1: 108 patients with BPD/eating disorders and 295 non-clinical controls. Subsequent studies: other clinical and non-clinical samples.	Two-factor: Certainty and Uncertainty about Mental States.	α = 0.63-0.84 (Internal Consistency). r = 0.75-.84 (Test-retest, 3 weeks).	Focuses on cognition and non-mentalized emotions; lacks distinction between self/other; no explicit focus on the processes of identifying, processing, and communicating emotions.
Mentalization Questionnaire (MZQ)(20)	434 inpatients assessed at admission, discharge, and 6-month follow-up.	Four-factor: Refusing self-reflection, Emotional awareness, Psychic equivalence, Regulation of affect.	α = .81 (Internal Consistency). r = 0.76 (Test-retest).	Assesses maladaptive features; emphasizes inability; lacks a dedicated subscale for "communicating"; does not differentiate between self and other.

Tool Name (Reference)	Sample Description	Factor Structure	Reliability	Main Limitations
Mentalization Scale (MentS) (21)	Study 1: 566 employed adults/students. Study 2: 62 BPD patients and 62 matched controls.	Three-factor: Self-Related Mentalization, Other-Related Mentalization, Motivation to Mentalize.	α = 0.75-0.84 (Internal Consistency).	Lacks dedicated subscales for emotional components (identifying, processing, expressing); while it distinguishes self/other, it is not emotion-specific.
Mentalized Affectivity Scale (MAS/B-MAS) (22,23)	MAS: 2,840 online adults. B-MAS: Two studies with 978 and 100 participants.	Three-factor: Identifying, Processing, and Expressing Emotions.	α > 0.70 (Internal Consistency, good).	Focuses on emotion regulation; unclear differentiation between stages of emotional mentalizing; does not distinguish between one's own and others' emotions.
Emotion Beliefs Questionnaire (EBQ) (24)	161 Australian adults (representative sample).	Three-factor: General Controllability, Usefulness of Negative Emotions, Usefulness of Positive Emotions.	α = 0.70-0.88 (Internal Consistency).	Measures general beliefs, not actual mentalizing capacity; no direct reference to self/other.
Epistemic Trust, Mistrust, and Credulity Questionnaire (ETMCQ) (25)	Two studies with 500 and 705 UK adults (representative samples).	Three-factor: Trust, Mistrust, Credulity.	α = 0.65-0.81 (Internal Consistency). r = 0.70-0.85 (Test-retest).	Does not assess emotional mentalizing processes; focuses on epistemic constructs.
Level of Personality Functioning Scale–Brief Form (LPFS-BF) (26)	240 personality disorder patients; norms: 2,002 Danish adults.	Two-factor: Self Functioning, Interpersonal Functioning.	α > 0.70 (Internal Consistency). Convergent validity supported.	Assesses general personality functioning, not the mentalizing process or its emotion-specific components.
Toronto Alexithymia Scale (TAS) (27)	1933 adults (880 men, 1053 women) from a community population in Ontario, Canada.	Three-factor: Difficulty Identifying Feelings, Difficulty Describing Feelings, Externally Oriented Thinking.	Total scale: α = 0.85-0.86.	Exclusively focuses on deficits (alexithymia); does not cover the full mentalizing process or other-oriented dimensions.
Empathy Quotient (EQ) (28)	Two studies with 90 and 197 adults.	Typically three-factor: Cognitive Empathy, Social Skills and Emotional Reactivity.	α = 0.92 (Internal Consistency). r = 0.97 (Test-retest, 12 months).	Does not comprehensively assess understanding others' mental states; misses a core aspect of mentalization.
Emotion Regulation Questionnaire (ERQ) (29)	Approximately 1,840 participants total.	Two-factor: Cognitive Reappraisal, Expressive Suppression.	α = 0.75-0.82 (Reappraisal) and 0.68-0.76 (Suppression). r = 0.69 (Test-retest, 3 months).	Measures emotion regulation strategies, not the foundational capacity to mentalize emotions.

Note. α: Cronbach's alpha coefficient for internal consistency reliability; r: Correlation coefficient for test-retest reliability.

Supplementary 2. The Persian, German and English Versions of the Mentalizing Emotions Questionnaire (MEQ)

#	German	English	Persian
1	Ich interessiere mich für meine Gefühle.	I am interested in my emotions.	.به هیجاناتم علاقه مندم
2	Ich bin daran interessiert, meine Gefühle zu verstehen.	I am interested in understanding my emotions.	.به درک هیجاناتم علاقه مندم
3	Ich versuche die verschiedenen Gründe meiner Gefühle zu verstehen.	I try to understand the different reasons for my emotions.	سعی می‌کنم دلایل مختلف هیجانات خود را درک کنم.
4	Ich finde es hilfreich, die Ursachen meiner Gefühle zu verstehen.	I think it is helpful to understand the reasons of my emotions.	فکر می‌کنم درک دلایل هیجاناتم برایم مفید است.
5	Mit etwas Abstand kann ich meine Gefühle neu verstehen.	With some distance, I can understand my emotions in a new way.	با کمی فاصله می‌توانم هیجاناتم را به روش جدیدی درک کنم.
6	Ich finde es spannend, mich mit anderen über meine Gefühle auszutauschen.	I find it exciting to talk about my emotions with others.	برایم شورانگیز است که درباره هیجاناتم با دیگران صحبت کنم.
7	Ich kann meine unterschiedlichen Gefühle anderen erklären.	I can explain my different emotions to others.	می‌توانم هیجانات متفاوتم را برای دیگران توضیح دهم.
8	Ich finde es nützlich, über meine Gefühle zu sprechen.	I think it is useful to talk about my emotions.	فکر می‌کنم صحبت کردن درباره هیجاناتم مفید است.
9	Ich kann mit anderen über die Veränderung meiner Gefühle sprechen.	I can talk to others about how my emotions change.	می‌توانم درمورد اینکه چگونه هیجاناتم تغییر می‌کند با دیگران صحبت کنم.
10	Ich interessiere mich für die Gefühle anderer.	I am interested in the emotions of others.	.به هیجانات دیگران علاقه مندم
11	Ich kann widersprüchliche Gefühle bei anderen wahrnehmen.	I can perceive conflicting emotions in others.	می‌توانم هیجانات متناقض را در دیگران درک کنم.
12	Ich finde es bereichernd, Gefühle bei anderen zu erkennen.	I think it is enriching to recognize emotions in others.	فکر می‌کنم تشخیص هیجانات دیگران به غنی شدن کمک می‌کند.
13	Ich versuche Situationen durch die Augen des anderen zu sehen.	I try to see situations through the other person's eyes.	سعی می‌کنم موقعیت‌ها را از دید طرف مقابل ببینم.
14	Ich finde es hilfreich, über die Gründe der Gefühle anderer nachzudenken.	I find it helpful to think about the reasons for others' emotions.	فکر کردن به دلایل هیجانات دیگران را مفید می‌دانم.
15	Über die Zeit kann ich die Gefühle anderer besser verstehen.	Over time, I can better understand the emotions of others.	با گذشت زمان می‌توانم هیجانات دیگران را بهتر درک کنم.
16	Ich finde es spannend, darüber nachzudenken, woher die Gefühle anderer kommen.	I find it exciting to think about where others' emotions come from.	فکر کردن به اینکه هیجانات دیگران از کجا سرچشمه می‌گیرد شورانگیز است.