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Original Article

Validation of parent and teacher versions of emotion regulation checklist in the Iranian setting: Factorial structure and associations with children's social-behavioral functioning

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Abstract

Introduction: The Emotion Regulation Checklist (ERC) is widely used to evaluate children's emotional development in terms of Emotion Regulation (ER) and Negativity/Lability (LN). It uses parents and/or teachers as informants. The purpose of this study was to validate the Iranian version of ERC among preschool and primary school-aged children, reported by parents and teachers.

Materials and Methods: The ERC was translated to Persian through a translation and back-translation procedure. Then, it was filled out by 549 mothers of children, aged 4 to 12 years (289 school-aged children and 260 preschool children), and 119 teachers of 295 preschool students aged 4 to 6 years. These participants were selected through convenience sampling from preschools and primary schools in different regions of Tehran and Karaj in 2019. To data analysis, descriptive statistics, correlation coefficients, exploratory and confirmatory factor analysis were used in SPSS-25 and AMOS-24.

Results: The results of exploratory factor analysis and confirmatory factor analysis confirmed the two-factor model of both parent and teacher versions of the Persian checklist with scales indicating satisfactory internal consistency. Also, the two subscales of ERC were associated, in the expected direction, with indices of behavioral, emotional, and social functioning of children. This finding provided further evidence for the validity of the ERC.

Conclusion: Results of this study provided evidence for the validity of both parent and teacher versions of ERC in the Iranian setting.

Keywords: Emotion regulation checklist, Parents, Teacher

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Introduction

Emotion regulation is defined as modulating one's emotional arousal to foster an optimal level of engagement with the environment. This ability is one of the most important components of healthy social, emotional, and cognitive development (1,2). Also, deficits in emotion regulation in various children's internalizing and externalizing disorders have been repeatedly emphasized in the theoretical and empirical literature (3,4).

Measurement is a major difficulty in studying children's emotion regulation (5,6) because observational and task-based methods are time-consuming and costly, and self-report measures are inappropriate for preschoolers and primary school students (especially younger ones).

The Emotion Regulation Checklist is a caregiver-report or teacher-report questionnaire that has overcome these limitations and has been widely used in research on emotion regulation in childhood. This instrument assesses emotion regulation in preschoolers and school-aged children through two dimensions: regulation and lability/negativity. The emotion regulation subscale (ER) comprises items that describe context-appropriate affective displays, empathy, and emotional self-awareness (9). Emotional lability/negativity can be described as children's rapidity in responding to emotion eliciting stimuli and simultaneous difficulty in recovering from adverse emotional reactions. The Lability/Negativity (LN) subscale comprises items that assess inflexibility, dysregulated negative affect, unpredictability, and suddenness of mood change (10).

ERC has been translated and successfully used in different languages. Its validity and reliability have been supported by some studies (10-12). This study aimed to examine the validity of ERC for preschool and primary school-aged children in an Iranian setting, reported by parents and teachers.

Materials and Methods

The participants for the parent version were 549 mothers of children aged 4-12 years old (7.32 ± 2.73 years, 49.2% girls); 289 of the children were school-aged, and 260 ones were preschoolers. For the teacher version, participants were 138 teachers who completed the questionnaires about children aged 4-6 years old (4.62 ± 0.77 years and, 49.3% girls). The sample size estimation was based on previous studies (9,10). All participants were recruited through the convenience sampling from preschools and primary schools in different regions of two cities in Iran, Tehran, and Karaj, in 2019. All participants had Iranian nationality. Mothers filled out all the parent questionnaires. In terms of mothers' education, 57.7% had higher education degrees. The teachers' educational level distribution was as follows: 15.9% had a two-year college education, 59.4% had a bachelor's degree, and 24.6% had a master's degree. An Iranian version of the ERC was developed through a translation/back-translation procedure. First, items of the ERC were independently translated from English to Persian by the first author and a bilingual translator. Then, the two translations were synthesized. Subsequently, another translator back-translated the Persian version to English. Afterward, a comparison of the back-translated English version and the original English Checklist was made, correcting translation discrepancies. In order to improve the clarity of the questions, it was first performed in a pilot sample.

Participants were recruited from several primary schools and kindergartens in different parts of Tehran and Karaj. After obtaining the consent of the schools' principals, questionnaires were given to the children in the schools, and they were asked to take the questionnaires home and hand them to their parents.

Then, the next day, the questionnaires were returned to the school by the children and collected by the researchers within a week. The questionnaires were provided directly to parents and teachers in kindergartens, who completed them the same day and returned them to the research assistants. It was emphasized that participation in the study was completely voluntary. Confidentiality was also ensured by anonymity and by replacing personal information with a numeric code, and participants could stop their participation in the study. The inclusion criteria included having at least one child aged 4 to 12 years, and exclusion criteria were incomplete or distorted questionnaires. The study was reviewed and approved by the Attachment and Interpersonal Studies Research Group of the University.

Research instruments

A) Emotion Regulation Checklist (ERC): The ERC consists of 24 items that measure the children's emotion regulation. Items can be reported by parents, teachers, or anyone who know the child well. The items are rated on a 4-point Likert scale (1= never to 4= always). This Checklist assesses two dimensions of emotion regulation: Lability/negativity (LN), including 16 items (α= 0.96), which measures mood lability, anger outbursts, and reactivity; and Emotion Regulation (ER), including eight items (α= 0.83), that assesses the social appropriateness of affective displays, containing emotional self-awareness and empathy (7,8).

B) Strengths and Difficulties Questionnaire (SDQ): The SDQ is a 25-item scale that measures the adjustment and psychopathology of children and adolescents. SDQ consists of five subscales: Conduct Problems (CP), Hyperactivity-Inattention (HI), Emotional Symptoms (ES), Peer Relationship Problems (PRP), and Pro-social Behaviors (PB). All subscales consist of five items scored on a 3-point Likert scale. Goodman reported the acceptable internal consistency (0.73) and test-retest reliability (4 to 6 months; r= 0.62) for the total difficulties score (13). The parent and teacher form of this scale have been validated in Iran (14,15).

C) Social Skills Rating System (SSRS): The parent version of the SSRS (SSRS-P) for preschoolers consists of 39 items about social skills. The tool consists of three subscales: Self-control, Cooperation, and Assertion. The total score of the Social Skills Scale is calculated by summing up the subscales scores. The SSRS-P items are rated using a three-point Likert rating scale. The teacher version of SSRS for preschoolers (SSRS-T) includes 30 items. This version also includes self-control, cooperation, and assertion subscales (16). In Iran, the reliability and validity of the preschool version of the SSRS for parent and teacher forms have been examined by Shahim (17).

D) Child Behavioral Checklist (CBCL): This checklist measures the emotional and behavioral problems of children aged 6-18 years (18). The parent form of the checklist consists of 113 items. Items are rated on a three-point scale. To evaluate the internalizing and externalizing symptoms, scores of five subscales of empirically-based syndrome scales (Withdrawn/Depressed, Somatic Complaints, Anxious/Depressed, Rule-Breaking Behavior, and Aggressive Behavior) are used. Minaee has standardized and validated this tool in Iran (19).

The parent-report sample was first divided randomly into two sub-samples. The first and second subsamples were used to examine the structure of the ERC with Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), respectively. The homogeneity of the two subgroups in terms of gender and mean age of children and mean age and educational level of parents were examined using T and $\chi 2$ tests. Using SPSS and AMOS software, the validity of the parent version of ERC was explored in three steps. First, generalized least squares EFA using the Quartimax rotation method (given the correlation between the factors) was employed to examine the underlying factor structure of the ERC. Second, to determine the suitability of the resulted model of the first step, CFA was used. To investigate the fitness of the model, the chi-squared test was used, which should be non-significant or have low values. Also, the ratio between the chi-squared and the degrees of freedom of the model ($\chi 2$/df) should have a value< 3 (20,21). As Chi-square is sensitive to sample size, model fit was also evaluated using two additional fit indices, Root Mean Square Error of Approximation (RMSEA) and Comparative Fix Index (CFI). Values greater than 0.95 for CFI and lower than 0.05 for RMSEA indicate good model fit (22,23). A RMSEA value between 0.05 and 0.08 indicates fair fit and between 0.08 and 0.10 indicates mediocre fit (23). After establishing the factor structure of the ERC, we estimated the reliability by computing Cronbach's alphas for individual ERC subscales. Alpha values above 0.70 were considered acceptable (24). Third, to provide further validity evidence, associations between the subscales of the ERC and indices of children's social-behavioral functioning reported by parents were examined. The validity of the teacher version of ERC was explored in two steps. First, CFA was used to examine the underlying factor structure, suggested in the first step of the parent version. Next, model fit indices were considered as it was then considered for the parent version. After establishing the factor structure of the ERC,

Cronbach's alphas for individual ERC subscales were computed. Second, to provide further validity evidence, associations between the subscales of the ERC and indices of children's social-behavioral functioning, reported by teachers, were examined.

Results

The dimensionality of the Parent Version of ERC First, EFA was applied on subsample 1. Six factors were extracted with Eigenvalues more than 1, but the two-factor solution was the most reasonable considering Cattell's scree plot and the clearness of the items' loadings. This two-factor solution explained 30.05 % of the variance.

The first factor explained 20.84% of the variance, while the second explained 9.22% of the variance.

There were some differences between the factor solution in this study and the original instrument (Table 1). Item 23, unexpectedly, exhibited positive loading on the LN factor. However, it was not significant (0.22). As a result, it was removed from the model. Item 16 (which seems sad or listless) was cross-loaded. Items 4 and 5 exhibited insignificant loadings on the expected factor (LN) and significant loading on the unexpected factor (ER). These suggested factor solutions were accepted whether they were theoretically supported.

Table 1. Factor solution for the parent and teacher versions of ERC

Summary of items		EFA Factor loadings		CFA Standardized factor loadings for parent version		CFA Standardized factor loadings for teacher version	
		LN	ER	LN	ER	LN	ER
2	Exhibits wide mood swings	0.57		0.48		0.56	
6	Is easily frustrated?	0.54		0.52		0.32	
8	Is prone to angry outbursts?	0.67		0.54		0.68	
9*	Is able to delay gratification?	0.47		0.43		0.65	
10	Takes pleasure in the distress of others	0.27		0.35		0.56	
11*	Can modulate excitement in emotionally arousing situations?	0.36		0.23		0.67	
12	Is whiny or clingy with adults?	0.65		0.54		0.40	
13	Is prone to disruptive outbursts of energy and exuberance?	0.72		0.65		0.80	
14	Responds angrily to limit-setting by adults	0.71		0.66		0.59	
17	Is overly exuberant when attempting to engage other in play?	0.52		0.44		0.49	
19	Responds negatively to neutral or friendly approaches by peers	0.49		0.52		0.51	
20	Is impulsive?	0.64		0.61		0.67	
22	Displays exuberance that others find intrusive or disruptive	0.64		0.64		0.74	
24	Displays negative emotions when attempting to engage others in play	0.56		0.57		0.69	
1	Is a cheerful child?		0.55		0.46		0.50
3	Responds positively to neutral or friendly approaches by adults		0.54		0.64		0.70
4	Transitions well from one activity to another		0.34		0.35		0.36
5	Can recover quickly from episodes of upset or distress?		0.45		0.44		0.57
7	Responds positively to neutral or friendly approaches by peers		0.60		0.51		0.71
15	Can say when s/he is feeling sad, angry or mad, fearful or afraid?		0.39		0.31		0.56
16*	Seems sad or listless	-0.34	0.37		0.30		0.50
18*	Displays flat affect		0.45		0.26		0.23
21	Is empathic towards others?		0.36		0.31		0.37
23ᵗ	Displays appropriate negative emotions						

Notes *Reverse items; ᵗRemoved item; EFA: Exploratory Factor Analysis; CFA: Confirmatory Factor Analysis; LN: Lability/Negativity; ER: Emotion Regulation

CFA was performed on the second sub-sample to test the suggested factor model in the previous step in the second step. CFA resulted in a model with a good fit: $\chi2$= 313.03; df= 193; $\chi2$/df= 1.62; RMSEA= 0.05; CFI= 0.91. All items had substantial loadings in the expected direction on their respective factors (Table 1). Cronbach's α coefficients for LN and ER were 0.70 and 0.86, respectively. These values indicate satisfactory internal consistency for research purposes (24).

Associations with Social and Behavioral Functioning for Parent Version Validity of the parent version of ERC was further supported by significant correlations, in the expected directions, between two subscales of ERC and indices of maladaptive psychological functioning of children, as measured by SDQ (for preschoolers) or CBCL (for school-aged children), and social skills of children as measured by SSRS (Table 2 and 3).

Table 2. Pearson correlations between ERC subscales and parents ratings of social and behavioral functioning (preschool)

	ES	PRP	CP	HI	PB	SS
LN	0.45**	0.31**	0.64**	0.48**	-0.32**	-0.47**
ER	-0.52**	-0.50**	-0.33**	-0.21*	0.52**	0.48**

Notes LN: Lability/Negativity; ER: Emotion Regulation; ES: Emotional Symptoms; PRP: Peer Relationship Problems; CP: Conduct Problems; HI: Hyperactivity–Inattention; PB: Prosocial Behavior; SS: Social Skills
**P< 0.01 *P< 0.05

Table 3. Pearson correlations between ERC subscales and parent ratings of behavioral functioning (school-aged)

	AD	WD	SC	RBB	AB	In	Ex
LN	0.37**	0.34**	0.28**	0.37**	0.55**	0.40**	0.53**
ER	-0.24**	-0.48**	-0.32**	-0.18**	-0.23**	-0.42*	-0.23**

Notes LN: Lability/Negativity; ER: Emotion Regulation; AD: Anxious/ Depressed; WD: Withdrawn/ Depressed; SC: Somatic Complaint; RBB: Rule-Breaking Behavior; AB: Aggressive Behavior; In: Internalizing; Ex: Externalizing
**P< 0.01 *P< 0.05

The dimensionality of the teacher version of ERC CFA on the teacher-report sample resulted in a model with a good fit: $\chi2$= 310; df= 187; $\chi2$/df= 1.61; RMSEA= 0.07; CFI= 0.91, supporting the two factor model, suggested by the EFA on parent version. Cronbach's α coefficients for LN and ER were 0.77 and 0.85, respectively.

Associations with social and behavioral functioning for the teacher version.The validity of the teacher version was further supported by associations, in the expected directions, between two subscales of ERC and indices of social-behavioral functioning of children on teacher reports SDQ and SSRS (Table 4).

Table 4. Pearson correlations between ERC subscales and teachers ratings of social and behavioral functioning (preschool)

	ES	PRP	CP	HI	PB	SS
LN	0.48**	0.30**	0.74**	0.63**	-0.59**	-0.62**
ER	-0.47**	-0.48**	-0.18*	-0.21*	0.44**	0.55**

Notes LN: Lability/Negativity; ER: Emotion Regulation; ES: Emotional Symptoms; PRP: Peer Relationship Problems; CP: Conduct Problems; HI: Hyperactivity–Inattention; PB: Prosocial Behavior; SS: Social Skills
**P< 0.01 *P< 0.05

Discussion

This study aimed to examine the dimensionality of the parent and teacher versions of ERC in the Iranian setting and provide further evidence for the validity of the Iranian/Persian ERC through investigating associations with students' social-behavioral functioning. The main findings are summarized below according to these research objectives. The EFA confirmed the proposed structure of the ERC.

However, the Iranian/Persian version differed from the original version. Item 23 (displays appropriate negative emotions) did not exhibit significant loading on factors. This finding is in line with the findings revealed from EFA in a Brazilian study (9) in which the ERC is answered by parents and teachers of children aged 3 to 12 and an Italian study (10) in which ERC is answered by parents of children aged 3 to 11 years. These findings together suggest confusion in the interpretation of this item. One can argue that the words "appropriate" and "negative" together make the item confusing for parents and teachers. Items 4 (transitions well from one activity to another) and 5 (can recover quickly from episodes of upset or distress?) were expected to load negatively on the first factor and loaded positively on the second factor. This finding is similar to the previously mentioned studies of the Brazilian and Italian versions (9,10). Further efforts are needed to deepen the problems with the item solution of the checklist.

The CFA showed that the two-factor structure fits the Persian version for both parent and teacher versions. In addition, internal consistency was satisfactory for both subscales, although ER subscale revealed less Cronbach's alpha which is comparable with the original study (8).

In line with an enriched body of theoretical and empirical literature, both LN and ER subscales for both parent and teacher reports revealed associations with behavioral, emotional, and social development indices of children. These findings can further support the validity of the Persian version. For example, in the Brazilian study (9), both LN and ER were correlated in the expected direction with children's social skills and problem behaviors for both parent and teacher reports. Also, in a study that aimed to validate the Turkish version of the ERC in a sample of preschool children, both the LN and ER were associated with the problem behaviors of children (12). Furthermore, in several correlational studies focused on the association of preschool and elementary school children's emotion regulation with their psychosocial functioning, ERC was shown to be correlated, in the expected directions, with behavior problems and school-related behaviors (25,26).

Limitations of the current study and suggestions for future research should be mentioned. First, our study may not warrant the generalizability of the findings since the convenience sampling method was followed. Research with representative samples could provide more information on the psychometric properties of the Iranian version of ERC. Second, our study is limited since, in examining the validity, it only used self-report measures. Future researchers are suggested to judge the validity of the Iranian version of the ERC by using other reports (e.g., using reports of parents on SDQ for examining the validity of the teacher version of ERC). Third, future researchers are suggested to examine the validity of the Iranian version of ERC in clinical samples.

Conclusion

In conclusion, this study provides evidence for the validity of the Persian version of Emotion Regulation Checklist (ERC) as a parent-report and teacher-report tool for measuring children's emotion regulation. Adaptation and validation of the ERC, which helps assess and monitor children's emotion regulation through reports of parents and teachers, would represent a step forward in the clinical practice and school-based mental health services.

It is also important for future research on children's emotion regulation in Iran. The findings of this study also add to the previous literature on the validation of ERC in different socio-cultural contexts. Finally, this study highlights the need for a more in-depth investigation of the item solution of the checklist.

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