



# Psychometric Properties of the Persian Version of Co-Rumination Questionnaire

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## Abstract

**Background:** Although growing studies support features of co-rumination as a vulnerability factor in internalizing symptoms and positive factor in friendship, little attention has been paid to the psychometric properties of the Co-Rumination Questionnaire (CRQ).

**Objectives:** This study aimed to determine the psychometric properties of the Persian version of this questionnaire.

**Methods:** This research is a descriptive-exploratory study and 550 high school students who were selected by random cluster sampling from schools in Tehran. They completed CRQ, Beck depression inventory-II (BDI-II), and ruminative response scale (RRS) from winter 2014 to summer 2015. Construct validity, internal consistency reliability, and factor structure were investigated.

**Results:** The factor analysis identified two interpretable factors with the eigenvalue higher than 2. The results from concurrent validity measurement in the current study showed that co-rumination has a positive correlation with depression signs ( $P < 0.01$ ) and rumination response style ( $P < 0.01$ ). The CRQ validity was determined using the half-split method employing Spearman-Brown (0.82) and Guttman correlation test (0.81) and internal consistency (0.90). According to these values, this questionnaire has acceptable internal consistency reliability.

**Conclusions:** The Persian version of CRQ has reliability and validity for assessing co-rumination among adolescent participants. This study provides primary evidence on the applicability of the Persian version of the CRQ in the Iranian population.

**Keywords:** Co-Rumination, Psychometric Properties, Reliability, Validity

## 1. Background

Rose (1) indicated that co-rumination means discussing, revisiting, and speculating about problems and focus on negative feelings extensively. It has some common factors with rumination, such as negative thoughts or feelings, which is linked with poor problem-solving and depression (2). This concept has negative and positive effects, including social benefits in friendship (3, 4) and on the other hand, increasing the risk of internalizing symptoms, especially in female adolescents such as anxiety and depression (1, 5-7), externalizing symptoms (8), alcohol consumption (9), and stress (10).

There are two kinds of rumination, which are associated with internalizing symptoms in adolescents, including co-rumination with friends (1, 5, 6, 11) and mothers (12). It is hypothesized that co-rumination increases the tendency of ruminating the problems repeatedly and decreasing problem-solving about it, so it can intensify the risk of

internalizing disorders (1, 13, 14). Positive and negative effects of co-rumination are consequences of focusing on the negative effects of problems, which are associated with increasing the cortisol and salivary alpha-amylase (12).

Because co-rumination has different effects, it mandates further study, and finding an acceptable tool is essential for the assessment. The co-rumination questionnaire (CRQ) was developed by Rose (1) to measure co-rumination in adolescents. There is little attention to the psychometric properties of CRQ and none on the Persian version. At present, two studies were done on the psychometric properties of this questionnaire. The first one by Rose suggested that the scale has just one dimension in nature, but there are no details about analyses that were conducted (1). The second research revealed a 3-factor structure, including mulling, rehashing, and encouraging problem talk. Furthermore, it indicated adequate internal consistency and relation between CRQ, self-report measures of rumination, worry, attachment, and observational measures of co-

rumination (15). The current study describes the correlations between the CRQ and other constructs for determining test convergent and discriminate validity.

## 2. Objectives

This study aimed to determine the factorial structure and psychometric properties of the Persian version of the co-rumination questionnaire.

## 3. Methods

This research is a descriptive-exploratory study.

### 3.1. Sample and Procedure

In this study, 580 high school students who were selected by cluster random sampling from schools in Tehran. The sample size was calculated by Morgan table. Given that might be missing data, this study was considered a sample size of 580. Participants completed CRQ, Beck depression inventory-II (BDI-II), and ruminative response scale (RRS). Of 580 participants, 550 individuals completed the questionnaire completely. Thirty datasets were excluded due to skipped items or illegible handwriting. There were no significant demographic differences in terms of characteristics between respondents and non-respondents on the questionnaire. The sample included 223 males (40.54%), 327 females (59.45%), the mean of their age was 15 (SD = 2). Data were collected during eight months from winter 2014 to summer 2015. The inclusion criteria were being 12-19 years old, being high school students.

The comparability of the Persian and original CRQ has been validated by precise translation and back translation procedures. Two translators translated the questionnaire. Subsequently, two others translated the response categories, and a provisional version was provided. Then it was back-translated into English. After pilot testing of 50 students and correcting the deficiencies based on the findings, the translated CRQ was administered to a sample of students.

### 3.2. Scales

The co-rumination questionnaire has 27 items for assessing co-rumination (1). The Shortened Co-Rumination Questionnaire (CRQ-S; 5) includes 16 items. Each item is rated on a 5-point Likert scale ranging from 1 (not at all) to 5 (really true). Internal consistency of the questionnaire ranges from 0.90 to 0.97 (1, 2, 12, 16). Another study indicated adequate reliability (up to 0.84) and significant relation between total score of CRQ and observational measures of co-rumination and self-reports of depression, rumination, worry, and attachment (15).

BDI-II has 21 items and widely used for assessing the severity of depressive symptoms in normal and psychiatric patients. Each item consists of four statements rated from 0 to 3. BDI involves two factors: somatic and cognitive-affective depressive symptoms and has good internal consistency and concurrent validity (17). Persian BDI-II had high internal consistency (Cronbach's alpha = 0.91) and test-retest reliability ( $r = 0.94$ ) for a week interval (18).

Ruminative response scale involved 22 items and was used for the assessment of dispositional tendencies to ruminate. It assessed a sad mood (focused on self, symptoms, and possible consequences and causes of mood state) and behavioral responses to dysphoria. Each item of this scale rates from 1 to 4, and RRS has adequate inter-rater reliability (Cronbach's alpha = 0.90), test-retest correlation over two years, and validity (19-21). Lotfinia, who investigated RRS in Iran, reported alpha coefficient as 0.90 and test-retest coefficient as 0.82 for a 3-week interval (22).

### 3.3. Statistical Analyses

Data were analyzed in SPSS V. 23. The Pearson correlation coefficient was used to measure the validity of the test-retest and convergent validity of the questionnaire. In addition, exploratory factor analysis (EFA) was used to assess the factorial structure of the questionnaire. Cronbach's alpha was also used to measure the internal consistency of the questionnaire.

## 4. Results

This study was conducted on 550 students at the age of 12-19 in all-boys and all-girls schools across Tehran. The participants included 223 males (40.54%), 327 females (59.45%); the mean of their age was 15 (SD = 2). The mean scores of BDI-II, CRQ, and RRS were 27.92 (SD = 0.58), 32.82 (SD = 1.59), and 27.23 (SD = 0.85), respectively. Exploratory factor analysis based on the principal component analysis (PCA) was used to assess the factorial structure of the CRQ. To determine the applicability of this method for the 27 items of this questionnaire, the Kaiser-Meyer-Olkin was used (KMO = 0.88). Moreover, the results of Bartlett test were statistically significant ( $P < 0.001$ ) ( $\chi^2 = 5.7$ ). The Varimax Rotation was used for the given factor analysis. The lowest factor loading (0.03) was considered for the minimum acceptable correlation between each substance and its respective factor. The factor analysis identified two interpretable factors with the eigenvalues higher than 2. The contents of the first and second factors were consistent with the English version. As a result, "participant's problem rumination" and "friend's problem rumination" were used for naming the factors (5). Table 1 presents substance content, factor loading, and percentage of explained variance by these two factors.

**Table 1.** Exploratory Factor Analysis of Co-Rumination Questionnaire in the Iranian Sample

Factor		Factor Load	Explained Variance
<b>Participant's problems</b>			88.32
2	We talk for a long time trying to figure out all different reasons why the problem may happen	0.74	
8	We talk a lot about all of different bad things that may happen because of the problem	0.69	
4	We talk a lot about parts of the problem that do not make sense to us	0.67	
5	We spend a long time talking about how sad or mad the person with the problem feels	0.67	
13	We spend a lot of time talking about what bad things are going to happen because of the problem	0.66	
3	We try to figure out each bad thing that may happen because of the problem	0.65	
15	We spend a long time talking about how sad or mad the person with the problem feels	0.64	
7	We talk a lot about the problem in order to understand why it happened	0.62	
14	We try to figure out everything about the problem, even if there are parts we may never understand	0.6	
12	We talk about all unlikely reasons for that problem	0.6	
9	We spend a lot of time trying to figure out parts of the problem we cannot understand	0.57	
10	We talk for a long time about how upset it has made one of us with the problem	0.54	
6	We talk about every part of the problem over and over	0.50	
1	We keep talking even after we both know all of the details about what happened	0.48	
11	We usually talk about that problem every day even if nothing new has happened	0.38	
<b>Friend's problem</b>			7.49
8	After I have told my friend about a problem, my friend always tries to get me to talk more about it later	0.68	
7	When my friend has a problem, I always try to get my friend to tell me every detail about what happened	0.65	
11	After my friend tells me about a problem, I always try to get my friend to talk more about it later	0.61	
6	When we see each other, if one of us has a problem, we will talk about the problem even if we had planned to do something else together	0.61	
12	When I have a problem, my friend always tries to get me to tell every detail about what happened	0.60	
5	When one of us has a problem, we talk about it for a long time	0.59	
4	When I have a problem, my friend always tries really hard to keep me talking about it	0.56	
9	We spend most of our time together talking about problems that my friend or I have	0.55	
2	If one of us has a problem, we will talk about the problem rather than talking about something else or doing something else	0.54	
1	We talk about problems that my friend or I are having almost every time we see each other	0.49	
10	If one of us has a problem, we will spend our time together talking about it, no matter what else we could do instead	0.48	
3	When my friend has a problem, I always try really hard to keep my friend talking about it	0.43	

To assess the concurrent validity, total score correlation, and items of the CRQ were measured using the BDI and RRS. Table 2 presents the findings.

**Table 2.** Convergent Validity of CRQ

	RSQ	BDI
<b>CRQ</b>	0.64 <sup>a</sup>	0.77 <sup>a</sup>
<b>Participant's problems</b>	0.55 <sup>b</sup>	0.73 <sup>a</sup>
<b>Friend's problem</b>	0.68 <sup>a</sup>	0.80 <sup>a</sup>

<sup>a</sup>P < 0.01.

<sup>b</sup>P < 0.05.

The results of Pearson correlation coefficient showed

that the co-rumination, as well as “participant’s problem rumination” and “friend’s problem rumination” factors, had a direct significant correlation with BDI and RRS. As a result, people who adopt co-rumination strategy are more likely to suffer from depression signs and symptoms.

To assess the reliability of the questionnaire, two split-half methods, namely the Spearman-Brown coefficient and the Guttman split-half coefficient, as well as internal consistency, were used. Based on Cronbach’s alpha, the internal consistency for the entire questionnaire, participant’s problem rumination, and friend’s problem rumination was obtained as 0.90, 0.84, and 0.91, respectively. Table 3 summarizes the reliability coefficients of the CRQ and its factors.

**Table 3.** Reliability of Total Score and Subscales of CRQ

Reliability	Participant's problems	Friend's problem	CRQ
Spearman-Brown correlation coefficient	0.85	0.87	0.82
Guttman coefficient	0.84	0.87	0.81
Internal consistency	0.84	0.91	0.90

## 5. Discussion

This study investigated the factorial structure and psychometric properties of the Persian version of the CRQ. The factor analysis identified two interpretable factors with the eigenvalue higher than 2. The contents of the first and second factors were consistent with the English version of the Shortened Co-Rumination Questionnaire. As a result, "participant's problem rumination" and "friend's problem rumination" were used for naming the factors (5). Although the results of this study are consistent with several studies (12, 16), Davidson et al. used exploratory factor analysis in adult participants, college students. They showed that the 27-item CRQ has three main factors, including rehashing, mulling, and encouraging problem talk. Using confirmatory factor analysis (CFA), they also developed a three-factor model to conceptualize co-rumination more carefully (15). Rose performed another exploratory factor analysis in younger participants and showed one strong factor (all [factors] > 0.45) (1). These differences may be due to differences in sample procedures, especially comparing adult versus adolescent participants. Co-rumination is more likely to occur in friendship and romantic relationships than parent-child contacts. Adult participants would be dependent on parents, while adults may have transitioned to use friend networks and romantic partners for social support (23). Additionally, adult participants have higher co-rumination scores and depressive scores (10). In exploratory factor analysis, differences would be due to developmental transition. Another objective of this study was the reliability assessment of the CRQ. To this end, the CRQ reliability was determined using the half-split method employing Spearman-Brown and Guttman correlation test and internal consistency. According to these values, this questionnaire has acceptable internal consistency reliability. It is worth noting that studies have shown high internal consistency of the short-form CRQ (12, 16). Davidson introduced three factors, and Cronbach's alpha of these main factors are as follows: rehashing (0.94), mulling (0.85), and encouraging problem talk (0.85) (15). Moreover, Rose showed one strong factor, and Cronbach's alpha showed high internal consistency for all 27 items (1). The results from concurrent validity measurement in the current study showed that co-rumination has a positive correla-

tion with depression signs and rumination response style. As a result, patients who adopt co-rumination suffer from a greater degree of depression. These findings are consistent with the findings of previous studies (11, 12). On the other hand, since co-rumination refers to an excessive discussion of personal problems within a dyadic relationship and is characterized by the repeated description of problems, frequent discussion of problems, mutual encouragement of problem-focused talks, speculating about problems, and dwelling on negative feelings (1); there should be a reasonable correlation between co-rumination and response style. However, Davidson et al. showed that co-rumination was not associated with depression. It may be due to differences in sampling procedures. It may influence how participants respond to the questionnaire (15).

### 5.1. Conclusions

In general, the findings of this study indicate the desirable validity and reliability of the CRQ. This study provides primary evidence on the applicability of the Persian version of the CRQ in the Iranian population. However, we need further studies to assess the psychometric properties of the Persian version of CRQ in clinical settings. Also, CRQ is useful for identifying the severity of co-rumination. This concept is associated with depression, anxiety, and intimacy.

### 5.2. Limitations and Suggestions

The major limitation of the present study was the application of the student sample. It is recommended to replicate this factor structure in different populations, specifically those with depression and anxiety disorders. Meanwhile, the sensitivity to change CRQ should be explored. This property is of particular interest in the follow-up of patients in clinical practice. Also, this study did not evaluate divergent validity. Another limitation was that all measures were self-report instruments.

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## Footnotes

**Authors' Contribution:** Asma Aghebati, Sanaz Joekar, Hamze Alimoradi, and Shima Ataie designed the study. Sanaz Joekar and Hamze Alimoradi conducted the study and collected the clinical data. Shima Ataie performed the statistical analysis. Shima Ataie and Asma Aghebati drafted the manuscript. Asma Aghebati provided supervision and revised the manuscript for important intellectual content.

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## References

- Rose AJ. Co-rumination in the friendships of girls and boys. *Child Dev.* 2002;**73**(6):1830-43. doi: [10.1111/1467-8624.00509](https://doi.org/10.1111/1467-8624.00509). [PubMed: [12487497](https://pubmed.ncbi.nlm.nih.gov/12487497/)].
- Nolen-Hoeksema S, Wisco BE, Lyubomirsky S. Rethinking Rumination. *Perspect Psychol Sci.* 2008;**3**(5):400-24. doi: [10.1111/j.1745-6924.2008.00088.x](https://doi.org/10.1111/j.1745-6924.2008.00088.x). [PubMed: [26158958](https://pubmed.ncbi.nlm.nih.gov/26158958/)].
- Wei M, Russell DW, Zakalik RA. Adult Attachment, Social Self-Efficacy, Self-Disclosure, Loneliness, and Subsequent Depression for Freshman College Students: A Longitudinal Study. *Journal of Counseling Psychology.* 2005;**52**(4):602-14. doi: [10.1037/0022-0167.52.4.602](https://doi.org/10.1037/0022-0167.52.4.602).
- Rudiger JA, Winstead BA. Body talk and body-related co-rumination: associations with body image, eating attitudes, and psychological adjustment. *Body Image.* 2013;**10**(4):462-71. doi: [10.1016/j.bodyim.2013.07.010](https://doi.org/10.1016/j.bodyim.2013.07.010). [PubMed: [23999076](https://pubmed.ncbi.nlm.nih.gov/23999076/)].
- Rose AJ, Carlson W, Waller EM. Prospective associations of co-rumination with friendship and emotional adjustment: considering the socioemotional trade-offs of co-rumination. *Dev Psychol.* 2007;**43**(4):1019-31. doi: [10.1037/0012-1649.43.4.1019](https://doi.org/10.1037/0012-1649.43.4.1019). [PubMed: [17605532](https://pubmed.ncbi.nlm.nih.gov/17605532/)]. [PubMed Central: [PMC3382075](https://pubmed.ncbi.nlm.nih.gov/PMC3382075/)].
- Hankin BL, Stone L, Wright PA. Corumination, interpersonal stress generation, and internalizing symptoms: accumulating effects and transactional influences in a multiwave study of adolescents. *Dev Psychopathol.* 2010;**22**(1):217-35. doi: [10.1017/S0954579409990368](https://doi.org/10.1017/S0954579409990368). [PubMed: [20102657](https://pubmed.ncbi.nlm.nih.gov/20102657/)]. [PubMed Central: [PMC4031463](https://pubmed.ncbi.nlm.nih.gov/PMC4031463/)].
- Stone LB, Uhrlass DJ, Gibb BE. Co-rumination and lifetime history of depressive disorders in children. *J Clin Child Adolesc Psychol.* 2010;**39**(4):597-602. doi: [10.1080/15374416.2010.486323](https://doi.org/10.1080/15374416.2010.486323). [PubMed: [20589570](https://pubmed.ncbi.nlm.nih.gov/20589570/)]. [PubMed Central: [PMC2914792](https://pubmed.ncbi.nlm.nih.gov/PMC2914792/)].
- Tompkins TL, Hockett AR, Abraibesh N, Witt JL. A closer look at co-rumination: gender, coping, peer functioning and internalizing/externalizing problems. *J Adolesc.* 2011;**34**(5):801-11. doi: [10.1016/j.adolescence.2011.02.005](https://doi.org/10.1016/j.adolescence.2011.02.005). [PubMed: [21411134](https://pubmed.ncbi.nlm.nih.gov/21411134/)].
- Ciesla JA, Dickson KS, Anderson NL, Neal DJ. Negative Repetitive Thought and College Drinking: Angry Rumination, Depressive Rumination, Co-Rumination, and Worry. *Cognitive Therapy and Research.* 2011;**35**(2):142-50. doi: [10.1007/s10608-011-9355-1](https://doi.org/10.1007/s10608-011-9355-1).
- Byrd-Craven J, Geary DC, Rose AJ, Ponzi D. Co-ruminating increases stress hormone levels in women. *Horm Behav.* 2008;**53**(3):489-92. doi: [10.1016/j.yhbeh.2007.12.002](https://doi.org/10.1016/j.yhbeh.2007.12.002). [PubMed: [18206886](https://pubmed.ncbi.nlm.nih.gov/18206886/)].
- Starr LR, Davila J. Clarifying co-rumination: associations with internalizing symptoms and romantic involvement among adolescent girls. *J Adolesc.* 2009;**32**(1):19-37. doi: [10.1016/j.adolescence.2007.12.005](https://doi.org/10.1016/j.adolescence.2007.12.005). [PubMed: [18249194](https://pubmed.ncbi.nlm.nih.gov/18249194/)]. [PubMed Central: [PMC2652577](https://pubmed.ncbi.nlm.nih.gov/PMC2652577/)].
- Calmes CA, Roberts JE. Rumination in Interpersonal Relationships: Does Co-rumination Explain Gender Differences in Emotional Distress and Relationship Satisfaction Among College Students? *Cognitive Therapy and Research.* 2008;**32**(4):577-90. doi: [10.1007/s10608-008-9200-3](https://doi.org/10.1007/s10608-008-9200-3).
- Stone LB, Gibb BE. Brief report: preliminary evidence that co-rumination fosters adolescents' depression risk by increasing rumination. *J Adolesc.* 2015;**38**:1-4. doi: [10.1016/j.adolescence.2014.10.008](https://doi.org/10.1016/j.adolescence.2014.10.008). [PubMed: [25460674](https://pubmed.ncbi.nlm.nih.gov/25460674/)]. [PubMed Central: [PMC4268114](https://pubmed.ncbi.nlm.nih.gov/PMC4268114/)].
- Waller JM, Silk JS, Stone LB, Dahl RE. Co-rumination and co-problem solving in the daily lives of adolescents with major depressive disorder. *J Am Acad Child Adolesc Psychiatry.* 2014;**53**(8):869-78. doi: [10.1016/j.jaac.2014.05.004](https://doi.org/10.1016/j.jaac.2014.05.004). [PubMed: [25062594](https://pubmed.ncbi.nlm.nih.gov/25062594/)]. [PubMed Central: [PMC4129949](https://pubmed.ncbi.nlm.nih.gov/PMC4129949/)].
- Davidson CL, Grant DM, Byrd-Craven J, Mills AC, Judah MR, Lechner WV. Psychometric properties of the Co-Rumination Questionnaire. *Personality and Individual Differences.* 2014;**70**:171-5. doi: [10.1016/j.paid.2014.07.002](https://doi.org/10.1016/j.paid.2014.07.002).
- Waller MWJA. *Sexual orientation in adolescence and young adulthood: Measures, connectedness, and depression [dissertation]*. The University of North Carolina; 2005.
- Storch EA, Roberti JW, Roth DA. Factor structure, concurrent validity, and internal consistency of the Beck Depression Inventory-Second Edition in a sample of college students. *Depress Anxiety.* 2004;**19**(3):187-9. doi: [10.1002/da.20002](https://doi.org/10.1002/da.20002). [PubMed: [15129421](https://pubmed.ncbi.nlm.nih.gov/15129421/)].
- Fata L, Birashk B, Atefvahid MK, Dabson KS. [Meaning Assignment Structures/ Schema, Emotional States and Cognitive Processing of Emotional Information: Comparing Two Conceptual Frameworks]. *Iranian Journal of Psychiatry and Clinical Psychology.* 2005;**11**(3):312-26. Persian.
- Nolen-Hoeksema S, Morrow J. A prospective study of depression and posttraumatic stress symptoms after a natural disaster: the 1989 Loma Prieta Earthquake. *J Pers Soc Psychol.* 1991;**61**(1):115-21. doi: [10.1037//0022-3514.61.1.115](https://doi.org/10.1037//0022-3514.61.1.115). [PubMed: [1890582](https://pubmed.ncbi.nlm.nih.gov/1890582/)].
- Treynor W, Gonzalez R, Nolen-Hoeksema S. Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research.* 2003;**27**(3):247-59. doi: [10.1023/a:1023910315561](https://doi.org/10.1023/a:1023910315561).
- Nolen-Hoeksema S, Morrow J, Fredrickson BL. Response styles and the duration of episodes of depressed mood. *J Abnorm Psychol.* 1993;**102**(1):20-8. doi: [10.1037//0021-843x.102.1.20](https://doi.org/10.1037//0021-843x.102.1.20). [PubMed: [8436695](https://pubmed.ncbi.nlm.nih.gov/8436695/)].
- Lotfinia A. *Efficacy of problem solving therapy in depressed student with ruminative response style and distraction [dissertation]*. Tehran, Iran: Tehran psychiatric institute; 2007.
- La Greca AM, Prinstein MJ. Peer group. In: Silverman WK OT, editor. *Developmental issues in the clinical treatment of children*. Allyn & Bacon; 1999. p. 171-98.