Revision and validation of the Japanese-version cognitive emotion regulation questionnaire: psychometric properties and measurement invariance across gender

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Abstract: The Cognitive Emotion Regulation Questionnaire (CERQ) is a self-report scale measuring the use of nine types of cognitive emotion regulation strategies. The present study aimed to develop a revised version of the Japanese translated CERQ (CERQ-RJ). Specifically, we revised translations of the original Japanese version CERQ (CERQ-J), and examined its psychometric properties and measurement invariance across gender. We conducted two surveys 8 weeks apart; participants were recruited from a single Internet survey company in Japan. Results indicated that the CERQ-RJ showed better fit for the predicted nine-factor model than the CERQ-J, and acceptable reliability and validity; it also showed acceptable fit for both gender groups. Results also revealed scalar invariance of the CERQ-RJ across gender groups. Lastly, most strategies showed predicted associations with mental health outcomes in concurrent analyses. The newly translated scale may prove useful in future examinations of emotion regulation among Japanese participants.

Subjects: Psychological Science; Testing, Measurement and Assessment; Mental Health

Keywords: emotion regulation; cognitive emotion regulation questionnaire; validation; revision; measurement invariance

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PUBLIC INTEREST STATEMENT
Emotion regulation plays a vital role in maintaining our mental health. Prior studies on emotion regulation have mainly focused on cognitive strategies that people use to manage emotions. The Cognitive Emotion Regulation Questionnaire (CERQ) is a self-report scale measuring the use of nine types of cognitive emotion regulation strategies. The present study aimed to develop a revised version of the Japanese translated CERQ (CERQ-RJ). Specifically, we revised translations of the original Japanese version scale, and examined its psychometric properties. Results indicated that the CERQ-RJ showed acceptable reliability and validity; results also revealed that the new scale can examine gender differences. Lastly, most strategies showed significant associations with mental health outcomes in the predicted directions. The newly translated scale may prove useful in future examinations of emotion regulation among Japanese participants.
Emotion regulation can be defined as sets of processes that determine the offset of an emotional response, either deliberate and effortful or automatic and effortless (Koole, 2009). Prior studies have examined the former process, portraying emotion regulation as a process that occurs mostly inside people’s minds (Koole & Veenstra, 2015). Studies have investigated associations between cognitive emotion regulation strategies and mental health outcomes, indicating that there are “putatively” adaptive and maladaptive emotion regulation strategies (Aldao et al., 2010).

The Cognitive Emotion Regulation Questionnaire (CERQ)—developed by Garnefski et al. (2001)—is widely used to measure trait use of cognitive emotion regulation strategies. The scale consists of 36 items, 4 items each assessing the use of nine different cognitive strategies: self-blame, blaming others, rumination, catastrophizing, acceptance, positive reappraisal, positive refocusing, refocusing on planning, and putting into perspective. This scale was developed to measure the cognitive components of emotion regulation that have not been studied separately from other dimensions (Garnefski et al., 2001). In developing the scale, Garnefski et al. (2001) took a theory-based approach, defining and clarifying dimensions of cognitive emotion regulation based on existing coping measures. They assumed that the first four strategies were maladaptive, and the latter five strategies adaptive; studies that investigated the associations between CERQ and mental health outcomes have generally confirmed these theoretical assumptions (Garnefski et al., 2001; Sakakibara & Kitahara, 2016). CERQ has been translated into various languages in different cultures, such as European cultures (e.g., Jermann et al., 2006), Middle East cultures (e.g., Megreya et al., 2016), and Asian cultures (e.g., Zhu et al., 2008); the nine-factor structure has been confirmed across cultures, generally showing adequate psychometric properties.

Sakakibara (2015) developed the Japanese version of the CERQ (CERQ-J). CERQ-J is widely used among emotion regulation researchers in Japan (e.g., Kobayashi et al., 2020). However, there are several issues in the psychometric properties of the scale. First, results of confirmatory factor analysis in Sakakibara (2015) showed poor fit indices; one item from acceptance was extracted to improve overall fit. Poor fit of data may be due to several reasons. One possibility is that translations of items in the CERQ-J may have been inadequate; hence, revision of translations may help to improve model fit. Another possibility is that poor fit may be due to cultural differences in emotion regulation between Eastern and Western cultures (e.g., Nozaki, 2018). For instance, a study suggested that habitual use of suppression may not be associated with negative outcomes depending on culture (Soto et al., 2011); thus, even if revisions are made in translations of the CERQ-J, overall fit may not improve. Next, to the best of our knowledge, no study has examined the measurement invariance of the Japanese translated CERQ across socio-demographic variables. In developing a new scale, it is crucial to examine the comparability of scores among different socio-demographic groups; therefore, there is a need for evaluation of measurement invariances of the Japanese version CERQ.

To overcome issues regarding the CERQ-J (Sakakibara, 2015), the present study revised translations and examined its reliability and validity. Specifically, we examined the predictive validity of the revised CERQ-J for mental health. Furthermore, we examined measurement invariance across gender among Japanese adults. We especially focused on gender, because previous studies have shown sex differences in emotion regulation (e.g., Nolen-Hoeksema, 2012).
1. Methods

1.1. Participants and procedure

Before data collection, we preregistered all aspects of our study, except for longitudinal data collection and analysis, on the Open Science Framework [https://osf.io/2db3t].1 First, we revised translations of the CERQ-J (Sakakibara, 2015) and developed the revised Japanese-version scale (CERQ-RJ).2 All authors re-examined the Japanese translated items, and modified translations when needed. For example, the tense and auxiliary verbs were improperly translated in some items (e.g., items 2 and 12); several items were not necessarily capturing the nuance of the original items (e.g., items 12, 13, 27).3 Revised translations were then back-translated into English by an English and Japanese bilingual speaker with a PhD degree in clinical psychology. We then compared the original English version scale and back-translated items, and corrected translations when needed. Two surveys were conducted 8 weeks apart; participants were recruited from survey panels of a major Internet survey company in Japan. We aimed to collect data from approximately 700 participants at Time 1. This sample size was based on past studies on psychometric properties of CERQ (e.g., Garnefski & Kraaij, 2007; Garnefski et al., 2001) with approximately 600 participants. In accordance with our contract with the company, recruitment stopped when the expected number of participants answered the survey. A total of 5317 survey panels had access to the survey; data were collected from 722 participants. Data from one participant was excluded due to poor quality responses; we used data from 721 participants for concurrent analysis (all: $M_{\text{age}} = 46.27, SD = 11.71$; male: $n = 360$, $M_{\text{age}} = 49.92, SD = 11.69$; female: $n = 361$, $M_{\text{age}} = 42.64$, $SD = 11.28$). At Time 2, we aimed to collect data from approximately 300 participants; as did in Time 1, recruitment stopped when the expected number of participants answered the survey. Three hundred and ten people also participated at Time 2, although two participants were excluded due to poor quality responses; data from 308 participants were used for prospective analysis (all: $M_{\text{age}} = 47.45, SD = 11.49$; male: $n = 154$, $M_{\text{age}} = 51.37, SD = 9.86$; female: $n = 154$, $M_{\text{age}} = 43.54, SD = 11.69$). All participants responded to self-report measures over the Internet; informed consent was obtained online. This study was approved by the Ethics Review Committee of the Faculty of Economics, Law and Humanities, Kagoshima University (reference number: 20).

2. Measures

2.1. Revised version of the CERQ-J (CERQ-RJ)

The revised version of the CERQ-J (Garnefski et al., 2001; Sakakibara, 2015; CERQ-RJ) was used to measure cognitive emotion regulation strategies. Participants rated each item on a 5-point likert scale (1–5). We calculated item averages for each subscale. Higher scores indicate more strategy use.

2.2. Personality traits

Big five personality traits were measured using the Japanese version of the Ten Item Personality Inventory (TIPI-J; Gosling et al., 2003; Oshio et al., 2012). The TIPI-J consists of 10 items which measures the big five personality traits: namely, neuroticism, extraversion, openness, agreeableness, and conscientiousness. Participants rated each item on a 7-point scale (1–7); higher scores indicate that the individual shows higher levels of each trait. Big five personality traits were accounted for as covariates.

2.3. Mental health measures

Psychological distress was measured using the Japanese version of K6 (Furukawa et al., 2008; Kessler et al., 2002). Participants rated how much psychological distress they experienced in the last 30 days on a 5-point scale (1–5). Higher scores indicate greater distress. Next, well-being was measured using the Japanese adaptation of WHO Five Well-Being Index (WHO-5-J; Awata
et al., 2007). Each participant rated their well-being in the past two weeks on a 6-point scale (1–6). Higher scores indicate higher levels of well-being. In reference to results of a meta-analysis (Sakakibara & Kitahara, 2016), we hypothesized that rumination, self-blame, blaming others, catastrophizing, and acceptance would show positive associations, and positive reappraisal, positive refocusing, refocus on planning, putting into perspective would show negative associations with psychological distress. Conversely, we hypothesized that rumination, self-blame, blaming others, catastrophizing, and acceptance would show negative associations, and positive reappraisal, positive refocusing, refocus on planning, putting into perspective would show positive associations with well-being. We predicted that overall, strategies and mental health outcomes would show similar levels of effect size as Sakakibara (2015). Although acceptance was originally conceptualized as an adaptive strategy (Garnefski et al., 2001), studies robustly indicate positive associations between psychopathological outcomes (e.g., Garnefski & Kraaij, 2018; Sakakibara & Kitahara, 2016); in reference to these studies, we predicted that acceptance would show positive associations with distress, and negative associations with well-being.

3. Statistical analysis
We conducted all analyses using R 4.0.0 (R Core Team, 2020). First, the “psych” package (Revelle, 2020) was used to calculate descriptive statistics. To evaluate the internal consistency of the CERQ-RJ, we computed Cronbach’s alpha coefficients and omega coefficients. To examine test-retest reliability, we computed intra-class correlation coefficients using the “irr” package (Gamer et al., 2012). Next, we examined the fit indices for the nine-factor model using confirmatory factor analysis (CFA). In interpreting fit indices, we referred to cut-off values proposed by Hu and Bentler (1999); cut-off value close to .95 for TLI and CFI, .08 for SRMR, and .06 for RMSEA. We also tested measurement invariance of scale items across gender groups. Packages “lavaan” (Rosseel, 2012) and “semtools” (Jorgensen et al., 2021) were used to conduct CFAs. Pearson’s correlation coefficients were calculated to determine associations among strategies and other measures. Lastly, we conducted linear regression analyses to confirm associations among cognitive emotion regulation strategies and mental health outcomes. We conducted regression analyses using both cross-sectional and longitudinal data. In the concurrent analysis predicting mental health outcomes at Time 1, we included age, gender, and big five personality traits as covariates. In the longitudinal analysis predicting mental health outcomes at Time 2, we included age, gender, big five personality traits and outcomes at Time 1 as covariates. Variance inflation factors (VIF) were computed using the “car” package (Fox & Weisberg, 2011) to check for multicollinearity.

4. Results
Results of confirmatory factor analysis (CFA) are shown in Table 1. CFA using data from Times 1 and 2 both suggested adequate fit for the nine-factor model; although most fit indices showed values below cut-off points (Hu & Bentler, 1999), values of CFI, RMSEA, and SRMR all suggested better fit than the original CERQ-J (Sakakibara, 2015). Results of separate CFAs for each gender group also indicated that the nine-factor model was acceptable for both groups. Next, we tested the measurement invariance of the CERQ-RJ across gender groups; results revealed intercept invariance across gender.

Table 2 shows the factor loadings and descriptive statistics of the CERQ-RJ. All items showed acceptable factor loadings (.40), except for 2 items: “I think that I cannot change anything about it” (Acceptance; factor loading = .292) and “I want to understand why I feel the way I do about what I have experienced” (Rumination; factor loading = .390). Cronbach’s alpha coefficients suggested adequate internal consistency for most factors (α = .70-.86), except for “putting into perspective” (Time 1: α = .58, ω = .57; Time 2: α = .63, ω = .63). Intra-class correlation coefficients (ICC) indicated that the test-retest reliability between Times 1 and 2 were acceptable (ICC (2,1) = .408-.586).
Table 1. Confirmatory factor analysis of the CERQ-RJ

|               | $\chi^2$ | df  | $\Delta\chi^2$ | $\Delta$df | p   | AIC      | BIC      | CFI      | TLI      | RMSEA   | SRMR   |
|---------------|----------|-----|-----------------|------------|-----|----------|----------|----------|----------|---------|--------|
| Sakakibara    | 1743.04  | 558 |                 |            |     | .830     | .073     | .089     |          |         |        |
| (2015) a      |          |     |                 |            |     |          |          |          |          |         |        |
| (n = 400)     |          |     |                 |            |     |          |          |          |          |         |        |
| Time 1        | 4950.174 | 558 |                 |            |     | .871     | .855     | .059     | .087     |         |        |
| (n = 721)     |          |     |                 |            |     |          |          |          |          |         |        |
| Time 2        | 1195.671 | 558 |                 |            |     | .860     | .842     | .061     | .092     |         |        |
| (n = 308)     |          |     |                 |            |     |          |          |          |          |         |        |
| Male          | 1349.321 | 558 |                 |            |     | .862     | .844     | .063     | .091     |         |        |
| (n = 360)     |          |     |                 |            |     |          |          |          |          |         |        |
| Female        | 1357.929 | 558 |                 |            |     | .856     | .837     | .063     | .089     |         |        |
| (n = 361)     |          |     |                 |            |     |          |          |          |          |         |        |

Measurement invariance

|               | $\chi^2$ | df  | $\Delta\chi^2$ | $\Delta$df | p   | AIC      | BIC      | CFI      | TLI      | RMSEA   | SRMR   |
|---------------|----------|-----|-----------------|------------|-----|----------|----------|----------|----------|---------|--------|
| Configural    | 2707.250 | 1116|                 |            |     | 60,747   | 62,066   | .856     | .837     | .063    | .089   |
| invariance    |          |     |                 |            |     |          |          |          |          |         |        |
| Factor        | 2743.970 | 1143| 36.720          | 27         | .100| 60,730   | 61,925   | .855     | .840     | .062    | .091   |
| loading       |          |     |                 |            |     |          |          |          |          |         |        |
| invariance    | 2776.692 | 1170| 32.722          | 27         | .206| 60,708   | 61,780   | .854     | .843     | .062    | .092   |
| Intercept     | 2857.407 | 1206| 80.715          | 36         | .000| 60,717   | 61,624   | .850     | .844     | .062    | .092   |
| invariance    |          |     |                 |            |     |          |          |          |          |         |        |

Note. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion; CFI = Comparative Fit Index; TLI = Tucker Lewis Index; RMSEA = Root Mean Square of Error Approximation; SRMR = Standardized Root Mean Square Residual. For AIC, BIC, RMSEA and SRMR lower values indicate better model fit. For CFI and TLI, higher values indicate better model fit.

*aResults of CFA with 36 items.*
|               | Time 1 (n = 721) |                   | Time 2 (n = 308) |       |
|---------------|------------------|-------------------|------------------|-------|
|               | M    | SD    | α    | ω    | M    | SD    | α    | ω    | ICC  |
| **Self-blame**|      |       |      |      |      |       |      |      |      |
| Self-blame    | .676 | 2.632 | .906 | .81  | .622 | 2.578 | .77  | .77  | .449 |
| Acceptance    | .700 | 3.135 | .972 | .70  | .659 | 3.000 | .72  | .75  | .444 |
| Rumination    | .706 | 2.870 | .902 | .74  | .674 | 2.744 | .90  | .90  | .561 |
| Positive refocusing | .751 | 3.147 | .928 | .70  | .765 | 3.097 | .86  | .86  | .556 |
| Refocusing on planning | .705 | 3.239 | .889 | .70  | .730 | 3.234 | .88  | .88  | .570 |
|               |      |       |      |      |      |       |      |      |      |
| **Continued** |      |       |      |      |      |       |      |      |      |
|                      | Time 1 (n = 721) |                      | Time 2 (n = 308) |                      |
|----------------------|------------------|----------------------|------------------|----------------------|
|                      |                  |                      |                  |                      |
| Positive reappraisal| .714             | 3.166                | 0.913            | .677                 | 3.110                | 0.942 |
|                      | .775             | 3.398                | 0.924            | .840                 | 3.377                | 0.931 |
|                      | .737             | 3.071                | 0.953            | .698                 | 3.010                | 0.911 |
|                      | .731             | 2.875                | 0.989            | .660                 | 2.847                | 0.985 |
|                      | .717             | 2.900                | 0.939            | .717                 | 2.912                | 0.935 |
|                      | .732             | 2.885                | 0.960            | .746                 | 2.857                | 0.995 |
| Putting into perspective | .58             | .57                  | .63              | .63                  | .408                |       |
|                      | .554             | 2.890                | 0.946            | .571                 | 2.938                | 0.846 |
|                      | .510             | 2.664                | 0.898            | .577                 | 2.636                | 0.930 |
|                      | .495             | 2.778                | 0.866            | .532                 | 2.812                | 0.837 |
|                      | .460             | 2.678                | 1.046            | .520                 | 2.675                | 0.991 |
| Catastrophizing      | .603             | 2.409                | 0.930            | .557                 | 2.425                | 0.908 |
|                      | .773             | 2.755                | 0.931            | .749                 | 2.740                | 0.950 |
|                      | .608             | 2.331                | 0.905            | .535                 | 2.403                | 0.938 |
|                      | .696             | 2.843                | 0.970            | .714                 | 2.802                | 0.936 |
| Blaming others       | .781             | 2.587                | 0.860            | .791                 | 2.581                | 0.864 |
|                      | .759             | 2.463                | 0.888            | .694                 | 2.510                | 0.829 |
|                      | .513             | 2.725                | 0.853            | .545                 | 2.669                | 0.862 |
|                      | .760             | 2.467                | 0.859            | .765                 | 2.461                | 0.840 |
Table 3. Correlations among subscales of the CERQ-RJ (n = 721)

|   | 1       | 2       | 3       | 4      | 5      | 6      | 7      | 8      |
|---|---------|---------|---------|--------|--------|--------|--------|--------|
| 1 | Self-blame |         |         |        |        |        |        |        |
| 2 | Acceptance | .586 ** |         |        |        |        |        |        |
| 3 | Ruminaton  | .612 ** | .565 ** |        |        |        |        |        |
| 4 | Positive refocusing | .055 | .226 ** | .101 ** |        |        |        |        |
| 5 | Refocus on planning | .365 ** | .517 ** | .395 ** | .396 ** |        |        |        |
| 6 | Positive reappraisal | .223 ** | .341 ** | .236 ** | .578 ** | .581 ** |        |        |
| 7 | Putting into perspective | .366 ** | .507 ** | .377 ** | .378 ** | .425 ** | .456 ** |        |
| 8 | Catastrophizing | .490 ** | .412 ** | .599 ** | .035  | .132 ** | .079 * | .375 ** |
| 9 | Blaming others | .129 ** | .180 ** | .351 ** | .147 ** | .068  | .076 * | .309 ** | .465 ** |

** p < .01, * p < .05
Table 4. Correlations between strategies and other variables (n = 721)

|                      | Ext  | Agr  | Con  | Neu  | Ope  | K6   | WB   |
|----------------------|------|------|------|------|------|------|------|
| Self-blame          | -.159 ** | -0.058 | -0.186 ** | .351 ** | -0.160 ** | .341 ** | -.154 ** |
| Acceptance          | -.093 *  | .057  | -.127 ** | .205 ** | -.109 ** | .253 ** | -.033 |
| Ruminaton           | -.157 ** | -.092 *  | -.137 ** | .417 ** | -.059 | .408 ** | -.109 ** |
| Positive refocusing | .221 **  | .222 ** | .109 ** | -.231 ** | .274 ** | -.103 ** | .318 ** |
| Refocus on planning | .105 **  | .234 ** | .104 ** | -.092 *  | .165 ** | -.076 *  | .238 ** |
| Positive reappraisal| .214 **  | .279 ** | .216 ** | -.243 ** | .342 ** | -.099 ** | .331 ** |
| Putting into perspective | .047  | .060  | -.060 | .090 *  | .036  | .176 ** | .082 * |
| Catastrophizing     | -.149 ** | -.168 ** | -.105 ** | .381 ** | -.144 ** | .473 ** | -.234 ** |
| Blaming others      | .014  | -.155 ** | -.020 | .175 ** | .035  | .212 ** | -.050 |

Note. Ext = Extraversion; Agr = Agreeableness; Con = Conscientiousness; Neu = Neuroticism; Ope = Openness; K6 = Psychological Distress; WB = Well-Being. ** p < .01, * p < .05
Table 5. Associations between the CERQ-RJ and mental health outcomes

|                  | Psychological Distress |                          | Well-Being                  |
|------------------|------------------------|--------------------------|-----------------------------|
|                  | Time 1 (n = 721)       | Time 2 (n = 308)         | Time 1 (n = 721)            | Time 2 (n = 308) |
|                  | B                      | β                        | B                           | B               |
| Self-blame       | 0.039                  | 0.032                    | -0.052                      | -0.044          | -0.099         | -0.068        | -0.010        | -0.007        |
| Acceptance       | 0.103                  | 0.075                    | 0.141                       | 0.107           | -0.084         | -0.052        | -0.061        | -0.039        |
| Ruminating       | 0.166                  | 0.137 **                 | -0.005                      | -0.004          | 0.103          | 0.072         | -0.082        | -0.060        |
| Positive refocusing | 0.018                  | 0.015                    | -0.116                      | -0.100          | 0.152          | 0.107 **      | 0.015         | 0.011         |
| Refocus on planning | -0.201                | -0.172 **                | 0.000                       | 0.000           | 0.132          | 0.096 *       | 0.030         | 0.023         |
| Positive reappraisal | -0.017                | -0.014                   | -0.046                      | -0.041          | 0.145          | 0.106 *       | 0.069         | 0.052         |
| Putting into perspective | 0.100             | 0.070                    | 0.024                       | 0.017           | 0.034          | 0.020         | -0.009        | -0.006        |
| Catastrophizing  | 0.293                  | 0.234 **                 | 0.125                       | 0.103           | -0.216         | -0.146 **     | -0.088        | -0.061        |
| Blaming others   | -0.073                 | -0.055                   | -0.082                      | -0.064          | 0.053          | 0.034         | -0.011        | -0.007        |
| $R^2$            |                        |                          | 0.408                       | 0.587           |                | 0.295         | 0.456         |

Note. All regression models included age, sex, and big five personality traits at Time 1 as covariates. For prospective models (Time 2), we also entered Time 1 outcomes respectively. ** $p < .01$, * $p < .05$
Inter-correlations among variables at Time 1 are shown in Tables 3 and 4. Results showed similar associations with Sakakibara (2015): most cognitive strategies showed moderate inter-correlations, whereas putatively adaptive strategies (e.g., positive reappraisal, refocus on planning) and putatively maladaptive strategies (e.g., blaming others, catastrophizing) showed relatively weaker associations with each other. Also, all emotion regulation strategies showed predicted associations with depressive symptoms; associations between strategies and well-being were mostly in the predicted direction, although acceptance and blaming others showed non-significant associations. Next, results of regression analyses are presented in Table 5. VIFs for regression models were all below 3, indicating that multicollinearity was not a problem. Rumination, refocus on planning, and catastrophizing showed significant associations with Time 1 psychological distress. When Time 1 well-being was the dependent variable, positive refocusing, refocus on planning, positive reappraisal, and catastrophizing showed significant associations. When using longitudinal data, all strategies showed non-significant associations with mental health outcomes.

5. Discussion
In the present study, we developed the revised version of CERQ-J (CERQ-RJ), which measures use of nine cognitive emotion regulation strategies. Specifically, we re-examined the original Japanese translated items (Sakakibara, 2015), and modified translations. The CERQ-RJ showed better fit for the predicted nine-factor model than the originally translated CERQ-J, and acceptable reliability and validity; it also showed acceptable fit for both gender groups. Results also revealed scalar invariance of the CERQ-RJ across gender groups; this means that the nine-factor structure holds for both gender groups, and that mean differences between gender are not due to scale properties but gender differences. Lastly, most strategies showed predicted associations with mental health outcomes in concurrent analyses.

Results from the present study suggest that the CERQ-RJ is a useful scale to measure cognitive emotion regulation strategies among Japanese participants. However, a single item each from rumination and acceptance showed low factor loadings. Despite changes made in translations, similar results were shown in the original translation of the CERQ (CERQ-J): Sakakibara (2015) reported that “I want to understand why I feel the way I do about what I have experienced” showed factor loadings of .53, and “I think that I cannot change anything about it” showed factor loadings of .20. Hence, these results may not be due to the quality of translation, but to the lack of validity of items and factor structures in the original CERO. First, the item from rumination may have shown low factor loadings because it reflects the positive aspect of self-focus. Trapnell and Campbell (1999) differentiated between self-rumination and self-reflection, the former representing negative self-focus and the latter representing positive self-focus. The particular item from rumination in the CERQ-RJ may have reflected self-reflection and not rumination, which may have led to the low factor loading. Next, the item from acceptance may have shown low factor loadings because this item reflects passive acceptance, and not active acceptance (Garnesfski & Kraaij, 2006; Sakakibara & Kitahara, 2016). Garnesfski and Kraaij (2006) have pointed out that acceptance in the CERQ shows positive associations with depression scores, because it measures acceptance as a passive form of resignation, rather than acceptance as an active process of self-affirmation to negative experiences. Although it is hard to determine which items measure the passive or the active type, we could assume that the specific item rather reflects the passive form of acceptance (Sakakibara & Kitahara, 2016), which may have resulted in the low factor loadings.

Another possible explanation is that emotion regulation processes differ between Eastern and Western populations. A study showed that expressive suppression, which is commonly known as a putatively maladaptive strategy, was associated with negative outcomes only among European-American participants, while non-significant among Eastern Asian participants (Soto et al., 2011).
Another study found that trait emotional intelligence was negatively associated with expressive suppression among European-American participants, whereas positive associations were found among Japanese participants (Nazaki, 2018). These results indicate that the adaptiveness of emotion regulation strategies may differ across cultures. There may even be a possibility that the ways in which we regulate our emotions differ by cultures; for example, studies show that disengaging or resigning from an experience (“akiramenu” in Japanese) may have positive influences on mental health among Japanese people (e.g., Suganuma, 2013). These cultural differences may have led to poor factor loadings in the CERQ-RJ. Lastly, most strategies showed predicted associations with mental health measures concurrently; however, in the prospective analyses, all strategies showed non-significant results. Similar results were obtained in Garnefski and Kraaij (2007): when predicting anxiety symptoms at follow-up (one year after baseline), fewer strategies showed significant associations. This may mean that cognitive emotion regulation strategies and emotional health are inseparable constructs that affect each other concurrently, rather than prospectively predict one another.

6. Limitations
There were several limitations that need to be noted. First, the present study was conducted among participants from a single Internet survey company, which limits generalization of the findings. To increase generalizability, future studies should check whether results are replicable among diverse samples. Next, as noted above, we did not consider cultural differences in emotion regulation. Future research should re-examine differences in emotion regulation styles in the Eastern and Western countries, and develop new scales if needed. Lastly, although psychometric properties showed some improvements, several items still showed low factor loadings. Further scale validations should be conducted in future studies.

Despite these limitations, the present study developed a revised version of the CERQ-J, which showed better psychometric properties than the original Japanese version (Sakakibara, 2015). Newly developed scales are rarely re-tested for their psychometric properties; measures lacking in validity are often used without further scale validation (Haebara, 2011). However, in measuring psychological constructs, it is crucial that utilized measures are well validated; hence, more attempts should be made in improving scale validity of existing scales.

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Notes
1. We decided to collect longitudinal data after pre-registration on the Open Science Framework.
2. For re-translation, permission was obtained from the author of the original scale.
3. Revised items are shown as supplementary materials.
4. We conducted the same analyses using Time 2 data as well. Results are shown as supplementary materials.
Declaration statement
There is no conflict of interest regarding this manuscript.

Data availability statement
The data that support the findings of this study are available on the Open Science Framework (https://osf.io/ jzmpg).

Correction
This article has been corrected with minor changes. These changes do not impact the academic content of the article.

Supplemental data
Supplemental data for this article can be accessed here.

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