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Psychometric properties of the Indonesian Version of Self-Critical Rumination Scale

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Abstract. The Self-Critical Rumination Scale (SCRS) measures maladaptive repetitive thinking focused on perceived flaws and failures. Limited research has examined its psychometric properties among engineering students. This study aimed to adapt and evaluate the Indonesian version of the SCRS. Participants were 181 engineering students from Diponegoro University (119 males, 62 females). The scale demonstrated good reliability. Confirmatory factor analysis supported a single-factor structure with acceptable loadings and satisfactory model fit. Convergent validity with the Emotion Reactivity Scale (ERS) showed a strong positive correlation, indicating higher self-critical rumination is associated with greater emotional reactivity. These findings indicate that the Indonesian SCRS is a reliable and valid instrument for assessing self-critical rumination in young adults.

Keywords: *self-critical rumination; emotion reactivity; psychometric validation; confirmatory factor analysis*

Introduction

Rumination, or the tendency to repeatedly think about negative experiences, has long been a central focus in clinical psychology research due to its role in maintaining and exacerbating emotional disorders such as depression and anxiety (Nolen-Hoeksema et al., 2008). One maladaptive form of rumination is self-critical rumination, which refers to a repetitive thinking process that focuses on personal shortcomings, mistakes, and failures without active efforts toward problem solving (Smart et al., 2015). In contrast to adaptive self-reflection, self-critical rumination tends to intensify negative emotions such as guilt, shame, and feelings of inadequacy, thereby increasing vulnerability to psychological disorders (Kolubinski et al., 2019; Milia et al., 2020).

Self-critical rumination is closely associated with emotional reactivity, defined as an individual's tendency to respond intensely to emotional experiences. Repetitive thoughts oriented toward self-criticism are known to amplify the intensity of emotional responses to failure

and reduce emotion regulation capacity (Nock et al., 2008). Over time, this pattern may contribute to decreased psychological well-being and increased emotional distress (Kolubinski et al., 2019).

The academic context of university students, particularly in engineering fields, involves high academic and social demands (Jensen and Cross, 2019). Heavy study loads, strict evaluation standards, and a competitive culture may foster maladaptive perfectionism and trigger ruminative thinking patterns in response to failure. If left unaddressed, these conditions have the potential to reduce students' psychological well-being and academic performance (Yamasaki et al., 2024). Therefore, an assessment tool that can accurately measure levels of self-critical rumination in engineering students is needed.

The Self-Critical Rumination Scale (SCRS) developed by Smart et al. (2015) is a unidimensional instrument consisting of 10 items designed to assess an individual's tendency to focus attention on personal shortcomings in the context of failure. This instrument has demonstrated high reliability ($\alpha = 0.89$) and convergent validity with measures of depression such as the Beck Depression Inventory (r = 0.65). Cross-cultural studies, such as that conducted by Martínez-Sanchis et al. (2021) in a Spanish-speaking population, also support a one-factor structure with good model fit indices (CFI = 0.95; RMSEA = 0.05). In Indonesia, prior research on rumination has primarily utilized the Ruminative Response Scale (RRS) adapted to Bahasa Indonesia, revealing a significant negative effect on academic achievement among 518 undergraduate students, particularly through brooding and depresive-related dimensions (Gauw & Kartasasmita, 2016). Self-criticism has also been explored using instruments like the Forms of Self-Criticizing/Attacking & Self-Reassuring Scale (FSCRS) in self-compassion interventions (Amita et al., 2024). However, research examining the validity and reliability of the SCRS within the Indonesian cultural context, particularly among engineering students, remains very limited.

Despite extensive searches across Indonesian academic databases and journals, no published studies were found validating the psychometric properties of the Self-Critical Rumination Scale (SCRS) in the Indonesian context, including no prior adaptations or validations among university students, let alone engineering populations. While related constructs like general rumination (Gauw & Kartasasmita, 2016) and self-criticism (Amita et al., 2016) have been

examined among Indonesian undergraduates, these do not address self-critical rumination specifically, highlighting a critical gap for a culturally adapted tool. This absence underscores the need for SCRS adaptation, as engineering students in Indonesia face unique stressors such as high academic pressure and perfectionism, that may elevate self-critical rumination risks yet lack validated measures for early identification and intervention. Thus, the present study aims to adapt and evaluate the psychometric properties of the Indonesian version of the SCRS, including internal consistency reliability, construct validity via Confirmatory Factor Analysis (CFA) to test its unidimensional structure, and convergent validity with the Emotion Reactivity Scale (ERS), which captures related emotional dysregulation tendencies.

Engineering students globally report elevated self-critical rumination due to perfectionistic demands, technical failures, and high-stakes academic pressure. In Indonesia, UNDIP Faculty of Engineering exemplifies this: a thesis found significant positive correlation between perfectionism and procrastination among UNDIP engineering students, indicating maladaptive self-criticism patterns (Agustin, 2017). Broader studies show engineering students face high dropout risks (Alwan et al., 2023; Talar & Gozaly, 2025) linked to stress, low self-confidence, and perfectionism. Local counseling trends highlight self-criticism in 26.8% of academic procrastination cases among Indonesian students. This context justifies targeting UNDIP engineering students for initial SCRS adaptation, representative of STEM pressures while enabling broader applicability.

Based on this gap, the present study aims to adapt and evaluate the psychometric properties of the Indonesian version of the SCRS, including reliability testing, construct validity through Confirmatory Factor Analysis (CFA), and convergent validity with the Emotion Reactivity Scale (ERS). This study is expected to provide a reliable and valid measurement tool to identify tendencies of self-critical rumination among engineering students in Indonesia.

Method

This study uses a quantitative research approach to examine the validity and reliability of the SCRS adaptation into Indonesian linguistic and cultural context. Data were collected via

online questionnaires from 181 engineering students at Diponegoro University (UNDIP), selected purposively due to their representation of high-stress STEM populations with documented perfectionism and procrastination phenomena (Agustin, 2017). Participants spanned four departments—Electrical Engineering (n = 52), Geological Engineering (n = 41), Mechanical Engineering (n = 48), and Civil Engineering (n=40) reflecting UNDIP's core engineering diversity. The sample comprised 119 males (65.7%) and 62 females (34.3%), aged 18-22 years (M = 18.5, SD = 0.79), primarily first/second-year students voluntarily recruited via departmental emails and lectures (response rate 82%). This population was chosen because UNDIP engineering students exhibit acute perfectionism correlating with procrastination (r significant), mirroring national STEM dropout trends (22.6%) driven by self-criticism, ideal for initial validation, though future multi-disciplinary studies will test generalizability. Purposive sampling ensured relevance while meeting CFA power requirements (≥10:1 item-to-sample ratio).

The instrument adapted in this study is the Self-Critical Rumination Scale (SCRS), which measures the tendency toward maladaptive repetitive thoughts focusing on an individual's perceived deficiencies and failures. The researchers adapted the SCRS scale to align with the Indonesian language and cultural context. The SCRS scale was originally developed by Smart et al. (2015). The SCRS is a unidimensional instrument consisting of 10 items questionnaire to measure self-critical rumination comprehensively. The reliability coefficient for this scale is .92 (Cronbach's alpha = .92). Participant response options on this instrument used a Likert scale model consisting of four answer options (1 = Tidak Sama Sekali, 2 = Sedikit, 3 = Cukup, 4 = Sangat). Participants were given instructions to rate how well each statement describes themselves.

The adaptation process of the Self-Critical Rumination Scale (SCRS) was carried out based on the instrument adaptation process guidelines developed by Beaton et al. (2000) to ensure conceptual, semantic, and cultural equivalence for the measurement tool. This adaptation process was carried out through five main stages by involving three English language expert and three Indonesian language expert. The first stage was the forward translation, where the original scale

in English was translated into Indonesian. The second stage was the translation synthesis stage. In this stage, the translation versions were compared and synthesized to produce a final accurate translation version. The third stage was backward translation, which ensures that the synthesized Indonesian translation does not change the meaning and remains consistent with the meaning of the original measurement tool. The fourth stage is the expert committee review involving three expert in psychology field, where experts review and assess the suitability of the entire translated version of the measurement instrument and identify inaccurate terms or potentially culturally biased terms.

The fifth stage is the field test, which consists of two parts: a small-scale field test and a primary field test. The first part of the field test was conducted on a small scale with 10 university students as participants. This small-scale field test aimed to evaluate the quality of the item statements or instructions in the adapted questionnaire. Furthermore, this field test was intended to identify errors or deficiencies in the items, as well as to identify items or instructions that were and were not understandable to the participants. In addition to collecting written feedback, researchers also conducted interviews with each participant to determine the duration of the completion process, feedback regarding the questionnaire, and assess the psychological responses or mental conditions of participants during and after completing the questionnaire. The second part, the primary field test, was administered to 181 participants who met the criteria to assess the psychometric properties of the items and the instrument structure. The purpose of this section is to determine the quality of the item and collect evidence regarding the validity and reliability of the instrument.

Data analysis in this study was conducted using JASP software version 0.18.3 (Intel). Confirmatory Factor Analysis (CFA) was used to test construct validity, aiming to test the measurement model and factor loadings of the measurement. The purpose of the measurement model test was to determine whether the SCRS tool as a unidimensional construct met the goodness of fit criteria. There are several acceptable fit index criteria, as follows: Chi-square; $p > .05$, Root Mean Square Error of Approximation (RMSEA) $< .08$, Goodness of Fit Index (GFI) $\geq$

.90, Comparative Fit Index (CFI) ≥ .90, Tucker-Lewis Index (TLI) ≥ .90, Normed Fit Index (NFI) ≥ .90. Confirmatory factor analysis was also used in analyzing factor loadings (λ) to determine whether the measured construct (latent variable) was represented by the items (observed variables). The results of the factor loading test determined whether a certain item should be retained or eliminated.

Result

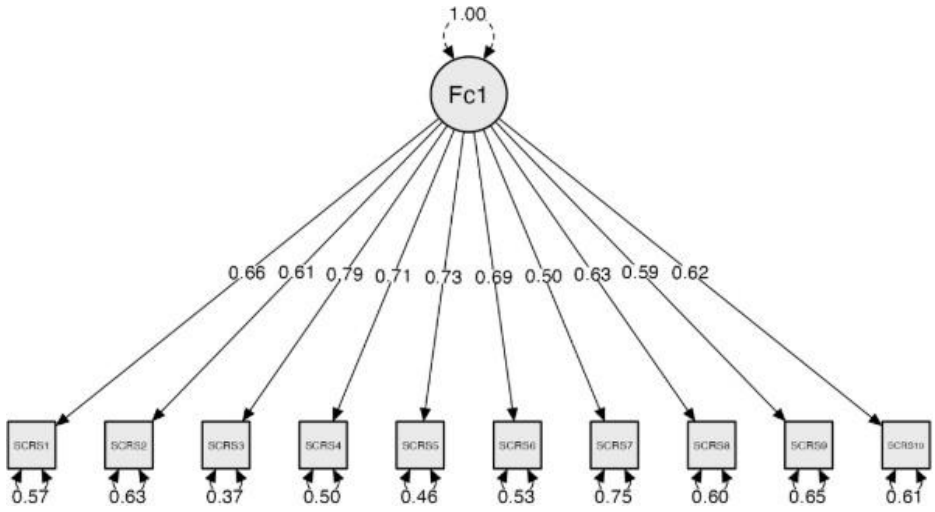
The results of the reliability test for the Indonesian version of the Self-Critical Rumination Scale (SCRS) showed a Cronbach's alpha coefficient value of .88 (> .7). This indicates that the reliability of the Indonesian version of SCRS instrument is acceptable, as the Cronbach's alpha value is more than .70, demonstrating its effectiveness in measuring self-critical rumination. According to Guilford's reliability coefficient criteria (Sugiyono, 2008), coefficients within the range of .7 – .9 are considered reliable. The results of the item-rest correlation analysis are presented in Table 1.

Table 1.
Table Frequentist Individual Item Reliability Statistics

Item	Item-rest correlation
SCRS1	0.617
SCRS2	0.559
SCRS3	0.735
SCRS4	0.649
SCRS5	0.682
SCRS6	0.637
SCRS7	0.468
SCRS8	0.599
SCRS9	0.561

The item-rest correlation values ranged from 0.468 to 0.735. All items exceeded the minimum threshold (≥ .30). Considering the rule of thumb for item-rest correlation values of .20, .30, or .40 (Zijlmans et al., 2018), the Indonesian version of the SCRS showed a minimum value of .468 (SCRS7) and a maximum value of .735 (SCRS3). Therefore, the items in this scale meet the criteria for reliability and do not require elimination. Thus, the Indonesian version of the SCRS can be considered consistent and stable in measuring a single construct, self-critical rumination.

Construct validity was tested using Confirmatory Factor Analysis (CFA) to evaluate the measurement model, including the factor loadings. This measurement model test aimed to determine whether the SCRS instrument met the goodness of fit criteria as a unidimensional construct. The Confirmatory Factor Analysis model demonstrated results that met the model fit index value criteria by following Hooper et al. (2008) recommendation. The Comparative Fit Index (CFI) values were .944 (fit), the Tucker-Lewis Index (TLI) value of .928 (fit), the NFI values were .899 (near acceptable fit), the Root Mean Square Error of Approximation (RMSEA) values were .006 (fit), and the Goodness of Fit Index (GFI) values were .968 (fit). The analysis results using JASP software indicated a good fit for the single-item factor structure of the items with factor loadings, as shown in Picture 1 and Picture 2.



Picture 1. Model Plot

						95% Confidence Interval		
Factor	Indicator	Estimate	Std. Error	z-value	p	Lower	Upper	Std. Est. (all)
Factor 1	SCRS1	0.630	0.061	10.272	< .001	0.510	0.750	0.660
	SCRS2	0.533	0.054	9.957	< .001	0.428	0.638	0.610
	SCRS3	0.744	0.049	15.306	< .001	0.649	0.839	0.792
	SCRS4	0.663	0.056	11.752	< .001	0.553	0.774	0.705
	SCRS5	0.682	0.054	12.671	< .001	0.576	0.787	0.733
	SCRS6	0.652	0.058	11.308	< .001	0.539	0.765	0.686
	SCRS7	0.468	0.075	6.213	< .001	0.320	0.615	0.504
	SCRS8	0.520	0.054	9.638	< .001	0.414	0.626	0.634
	SCRS9	0.606	0.066	9.132	< .001	0.476	0.736	0.593
	SCRS10	0.665	0.062	10.771	< .001	0.544	0.786	0.622

Picture 2. Factor Loading

As illustrated in Figure 1 and Table 2, the acceptable factor loadings range from .50 to .79, with z-values for the factor loadings of each item exceeding 1.96. Therefore, it can be concluded that all ten items are valid for measuring the existing factor. While the CFI, TLI, GFI, and RMSEA values met the required criteria, the NFI value was slightly below .90 but remains considered a near-acceptable fit.

Discussion

The Self-Critical Rumination Scale (SCRS) adapted into the Indonesian language is a valid and reliable instrument for comprehensively measuring self-critical rumination in early adulthood, specifically among individuals aged 18 to 22 years, with student samples, particularly engineering students. The SCRS is expected to be useful for future researchers who aim to examine self-critical rumination in a comprehensive manner among research populations such as university students or individuals in early adulthood.

This study is limited to a student sample. The student sample in this study also involved only engineering students from a single university and did not represent the broader student population.

For future research, it is recommended to expand sample diversity to examine the construct validity and reliability of the instrument across different populations. Increasing sample size and employing varied sampling methods should be considered to obtain more representative data. This study also did not examine correlations between self-critical rumination and related constructs. In addition, researchers may conduct further validity testing, such as convergent and discriminant validity, to strengthen the measurement evidence.

Conclusion

The results of the adaptation of the 10-item SCRS scale into the Indonesian version indicate that the scale has met the psychometric criteria as a valid and reliable measurement instrument. Validity testing of the Indonesian version of the SCRS demonstrates that all items in this instrument are unidimensional, where each item measures only one factor, namely self-critical rumination. Reliability testing showed good internal consistency based on Cronbach's alpha value of 0.88 (> 0.7). Consequently, the SCRS can be declared valid for comprehensively measuring the construct of self-critical rumination among the Indonesian university student population or emerging adults within the age range of 18–22 years.

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