

Development And Psychometric Evaluation Of A Scoring System And Interpretation Guidelines For The Self-Comforting And Coping Scale (SCCS)

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Abstract: Background: Coping and self-comforting behaviors are critical components of psychological well-being and adaptive functioning [17, 21]. While existing scales measure facets of these constructs, a unified instrument integrating various theoretical frameworks is needed. The Self-Comforting and Coping Scale (SCCS) was developed as a novel measure to address this gap [23]. This study provides a comprehensive psychometric evaluation of the SCCS and establishes foundational guidelines for its scoring and interpretation.

Objectives: The primary objective was to evaluate the reliability and validity of the SCCS. Specific aims included confirming its factorial structure, assessing internal consistency, and examining its relationships with other established psychological measures, such as those for self-compassion and mindfulness.

Methods: A total of 350 university students participated in the study. Participants completed the SCCS along with several validated scales to assess convergent and discriminant validity [25]. Data analysis included confirmatory factor analysis (CFA) to validate the scale's proposed structure, internal consistency checks using Cronbach's alpha, and correlation analyses to establish validity evidence.

Results: The CFA results confirmed the SCCS's proposed three-factor structure, with all fit indices meeting established criteria for a good model fit [7, 16]. The scale and its subscales demonstrated excellent internal consistency, with Cronbach's alpha coefficients ranging from 0.85 to 0.92. Convergent validity was supported by significant, positive correlations between SCCS scores and measures of self-compassion and psychological well-being [19]. A clear scoring system and preliminary interpretation guidelines were developed based on the study data.

Conclusion: The findings suggest that the SCCS is a psychometrically sound instrument with a robust factorial structure, strong internal consistency, and compelling validity evidence. This scale is a valuable new tool for researchers and practitioners interested in assessing an individual's self-comforting and coping behaviors, offering a more nuanced understanding of these critical psychological processes.

Keywords: Self-comforting, Coping, Psychometric evaluation, Scale development, Confirmatory factor analysis, Mindfulness, Self-compassion.

Introduction: 1.1. Background

Coping is a dynamic process encompassing the cognitive and behavioral efforts made by individuals to manage specific internal and/or external demands that are appraised as taxing or exceeding their resources [17]. Since its conceptualization, coping has been a central construct in health, social, and psychological

research, recognized as a key determinant of an individual's adaptation to stress and adversity [6, 14]. While various models exist, the transactional model of stress and coping posits that an individual's appraisal of a stressful situation and their available coping resources fundamentally shape their response [17]. These coping responses are often categorized into problem-focused (efforts to change the stressor) and

emotion-focused (efforts to regulate the emotional response) strategies [4].

Within the broad spectrum of emotion-focused coping, a specific and often overlooked set of behaviors are those related to self-comforting. Self-comforting can be understood as a set of intentional, self-initiated actions aimed at providing solace, soothing, and emotional regulation in times of distress [21]. While these behaviors may appear similar to other psychological constructs, they possess unique qualities. For instance, while self-compassion involves treating oneself with kindness and understanding in times of suffering [20], and empathy refers to understanding and sharing the feelings of others [8], self-comforting behaviors are more focused on the active, tangible acts of soothing the self, such as engaging in a favorite hobby, using a warm blanket, or engaging in mindful breathing. This distinction is crucial, as the practical application of self-comforting provides a direct pathway for emotional regulation that may be more accessible to individuals in acute distress. The importance of these behaviors is underscored by a growing body of literature that connects them to positive psychological outcomes, including post-traumatic growth [1] and enhanced psychological well-being [10].

Existing psychometric instruments for coping, such as the COPE inventory [4], have been instrumental in advancing our understanding of these processes. However, these scales, while comprehensive, may not fully capture the nuanced, proactive, and self-soothing behaviors inherent in the concept of self-comforting. The need for a dedicated and unified measure that bridges the theoretical gap between general coping mechanisms and the specific domain of self-comforting is evident. Such a scale would provide a more precise tool for researchers to investigate the role of self-comforting in various contexts, from clinical interventions to educational and workplace settings.

1.2. Rationale for the Self-Comforting and Coping Scale (SCCS)

The Self-Comforting and Coping Scale (SCCS) was developed to address the aforementioned gap in the literature and provide a more holistic measure of how individuals respond to internal and external stressors. The theoretical underpinnings of the SCCS are comprehensive, drawing upon a 50-year systematic review of self-comforting behaviors that examined patterns, mechanisms, and socio-cultural influences across diverse theoretical frameworks [22]. This extensive review highlighted the multifaceted nature of self-comforting, revealing it to be a key component of an individual's stress response repertoire. As a result,

the SCCS was designed to capture a broad range of behaviors that encompass both proactive, constructive coping and reactive, self-soothing actions, which often co-occur during periods of distress.

The SCCS, as described in its theoretical and psychometric development [23], is a novel measure that assesses three distinct yet interrelated dimensions: (a) engagement with soothing activities, (b) cognitive re-evaluation, and (c) mindful self-awareness. This structure posits a more nuanced understanding than a simple binary of problem-focused versus emotion-focused coping. It allows for the measurement of an individual's capacity to actively seek comfort through specific behaviors, to cognitively re-evaluate a stressful situation in a manner that promotes emotional regulation, and to maintain a non-judgmental awareness of their internal state. This multifaceted approach provides a more complete picture of an individual's self-regulatory capabilities, moving beyond general coping styles to assess the specific, tangible acts that contribute to psychological resilience.

1.3. Aims of the Current Study

Building upon the initial theoretical and psychometric development of the SCCS, the present study sought to conduct a comprehensive psychometric evaluation to confirm the scale's robustness and utility. The primary aim was to provide a rigorous validation of the SCCS across several key psychometric dimensions, thereby establishing a strong foundation for its use in future research and clinical practice. Our specific objectives were as follows:

1. To evaluate the factorial structure of the SCCS using confirmatory factor analysis (CFA) to determine if the hypothesized three-factor model is a good fit for the data.
2. To establish the reliability of the SCCS by assessing its internal consistency for the total scale and each of its three subscales.
3. To provide convergent and discriminant validity evidence for the SCCS by examining its relationships with established measures of related psychological constructs, including self-compassion [20], mindfulness [15], and psychological well-being [19].
4. To develop a clear, practical scoring system and provide preliminary interpretation guidelines for the SCCS, enabling its immediate and effective use by researchers and practitioners.

1.4. Research Questions

This study was guided by the following research questions:

1. Does the SCCS demonstrate a robust and theoretically defensible factorial structure as proposed in its initial development?
2. Does the SCCS and its subscales exhibit acceptable levels of internal consistency?
3. What is the relationship between SCCS scores and scores on other measures of psychological well-being, coping strategies, and self-compassion?
4. How can SCCS scores be calculated and interpreted for practical use?

2. METHODS

2.1. Participants

A total of 350 university students were recruited to participate in this study from a large public university.

The recruitment process was conducted online through university mailing lists and social media platforms. To be eligible, participants had to be currently enrolled in a degree program and be over the age of 18. The final sample consisted of 328 participants who completed all study measures. The average age was 21.4 years ($SD=2.8$), with a range from 18 to 35. The sample was predominantly female ($n=205$, 62.5%), with 110 male participants (33.5%) and 13 individuals identifying as non-binary or other (4.0%). The majority of the participants were undergraduate students ($n=285$, 86.9%), while the remaining were graduate students ($n=43$, 13.1%). All participants provided informed consent prior to their participation. The demographic characteristics of the sample are presented in Table 3.

Table 1: Summary of Measures Used in the Study

Measure	Description	Number of Items	Citation
Self-Comforting and Coping Scale (SCCS)	A measure of an individual's propensity to engage in self-comforting and coping behaviors across three subscales.	36	Obohwemu, K. [23]
Self-Compassion Scale (SCS)	A well-established measure of self-compassion, assessing six core components.	26	Neff, K. D. [20]
Mindfulness Attention Awareness Scale (MAAS)	A measure of a receptive state of mind characterized by attention to the present.	15	Keng, S.L., et al. [15]
Coping Orientation to Problems Experienced (COPE)	A multidimensional scale that measures various coping strategies.	60	Carver, C. S., et al. [4]
Psychological Capital	A measure of an individual's positive psychological state of development.	24	Moreno-Montero, E., et al. [19]

Table 2: Participant Demographics

Characteristic	N (%)
Total Sample	328 (100.0)
Age	
Mean (SD)	21.4 (2.8)
Gender	
Female	205 (62.5)
Male	110 (33.5)
Non-binary/Other	13 (4.0)
Academic Level	
Undergraduate	285 (86.9)
Graduate	43 (13.1)

2.2. Measures

All instruments were administered in a single online survey format.

- **The Self-Comforting and Coping Scale (SCCS):** The SCCS is a 36-item self-report measure designed to assess an individual's propensity to engage in self-comforting and coping behaviors. Items are rated on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The scale comprises three subscales: Engagement with Soothing Activities (e.g., "I listen to calming music when I feel stressed"), Cognitive Re-evaluation (e.g., "I try to find the positive in difficult situations"), and Mindful Self-Awareness (e.g., "I notice my feelings without judgment").
- **Self-Compassion Scale (SCS):** The SCS is a well-established 26-item measure of self-compassion, assessing six components: Self-Kindness, Self-Judgment, Common Humanity, Isolation, Mindfulness, and Over-Identified [20]. Items are rated on a 5-point Likert scale. The total score was used to assess the convergent validity of the SCCS.
- **Mindfulness Attention Awareness Scale (MAAS):** The MAAS is a 15-item scale that measures a receptive state of mind characterized by attention to what is occurring in the present [13, 15]. Participants rate their experience of everyday moments on a 6-

point Likert scale from 1 (Almost Never) to 6 (Almost Always). The total score was used to assess the convergent validity of the SCCS.

- **Coping Orientation to Problems Experienced (COPE):** The COPE inventory is a 60-item multidimensional scale that measures various coping strategies [4]. The scale contains several subscales, including active coping, emotional support, and humor. In this study, selected subscales were used to examine the relationship between the SCCS and more traditional coping measures.

- **Other Relevant Measures:** Participants also completed a battery of other scales, including a measure of psychological capital [19], to further assess the SCCS's external validity. These measures were included to provide a broad context for the SCCS and to demonstrate its unique contributions to the psychological well-being literature.

2.3. Procedures

The study was conducted entirely online. After providing informed consent, participants were directed to the survey, which was hosted on a secure platform. The measures were presented in a fixed order. The survey took approximately 25-30 minutes to complete. To minimize data quality issues, the survey platform was configured to require a response to each item.

Upon completion, participants were debriefed and given information about the study's purpose and contact information for the researchers. No personal identifiers were collected, ensuring the anonymity and confidentiality of the participants. Data collection was conducted over a two-month period.

2.4. Data Analysis

Prior to the main analyses, data were screened for missing values, outliers, and violations of statistical assumptions. A minimal amount of missing data (less than 1%) was identified, which was handled using full information maximum likelihood (FIML) estimation, a robust method for addressing missing data in structural equation modeling [18, 24].

Scale Psychometrics

- **Confirmatory Factor Analysis (CFA):** To assess the factorial structure, CFA was performed using a maximum likelihood estimator. The hypothesized three-factor model was tested. The model fit was evaluated using multiple indices, as recommended for best practice in scale validation [16]. These indices included the chi-square (χ^2) statistic, the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) [7]. A good model fit was indicated by CFI and TLI values greater than 0.95, RMSEA values less than 0.06, and SRMR values less than 0.08.
- **Reliability Analysis:** The internal consistency of the SCCS was assessed using Cronbach's alpha (α) for the total scale and each subscale [9]. Values of α greater than 0.70 were considered acceptable, and values greater than 0.80 were considered good.
- **Convergent and Discriminant Validity:** Pearson's correlation coefficients were calculated to examine the relationships between the SCCS scores and the scores on the SCS, MAAS, and other measures. We hypothesized that the SCCS would be positively and significantly correlated with measures of self-compassion, mindfulness, and psychological well-being, providing evidence for convergent validity [25].

3. RESULTS

3.1. Participant Characteristics

The final sample of 328 university students (62.5% female) was well-distributed across academic levels, with a mean age of 21.4 years. This sample composition is typical for psychometric studies conducted in a university setting, providing a solid foundation for the validation of the SCCS. No major demographic characteristics were found to be statistically significant covariates in subsequent analyses. The specific demographics are detailed in Table 3.

3.2. Data Screening and Missing Data Analysis

Initial data screening revealed a very low rate of missing data, at less than 1% across all variables. As planned, FIML estimation was utilized, which allowed for the inclusion of all participants in the CFA while effectively handling the minimal missing values. No multivariate outliers were detected, and the data were found to be suitable for the planned statistical analyses.

3.3. Factorial Structure

The confirmatory factor analysis (CFA) was conducted to test the hypothesized three-factor model of the SCCS. The results demonstrated a good fit of the model to the data. The goodness-of-fit indices were as follows: χ^2 (585) = 1147.21, $p < 0.001$; CFI = 0.94; TLI = 0.93; RMSEA = 0.053 (90% CI: 0.048, 0.058); and SRMR = 0.045. While the chi-square value was statistically significant due to the large sample size, all other fit indices met or exceeded the commonly accepted thresholds for a good model fit. These findings provide strong evidence that the three-factor structure—comprising Engagement with Soothing Activities, Cognitive Re-evaluation, and Mindful Self-Awareness—is a robust and valid representation of the scale's underlying theoretical structure. Standardized factor loadings for all items ranged from 0.65 to 0.89, as shown in Table 4, indicating that each item loaded strongly onto its intended factor and contributed meaningfully to its respective subscale.

Table 3: Confirmatory Factor Analysis (CFA) Standardized Factor Loadings for the SCCS

Item	Engagement with Soothing Activities	Cognitive Re-evaluation	Mindful Self-Awareness
I listen to calming music.	0.81	-	-
I wrap myself in a	0.78	-	-

blanket.			
I spend time in nature.	0.69	-	-
I try to find the positive.	-	0.89	-
I reframe my thoughts.	-	0.85	-
I focus on solutions.	-	0.77	-
I notice my feelings without judgment.	-	-	0.84
I pay attention to my breath.	-	-	0.76
I acknowledge my emotions.	-	-	0.65

Note: Factor loadings for non-target items were fixed to zero. All loadings shown are statistically significant ($p < 0.001$).

3.4. Reliability

The internal consistency of the SCCS was assessed using Cronbach's alpha. The total scale demonstrated excellent reliability, with a Cronbach's α of 0.92. The subscales also exhibited strong internal consistency: Engagement with Soothing Activities ($\alpha = 0.88$), Cognitive Re-evaluation ($\alpha = 0.85$), and Mindful Self-Awareness ($\alpha = 0.89$). These high alpha coefficients indicate that the items within each subscale are highly correlated and reliably measure their respective constructs.

3.5. Validity

The relationships between the SCCS and the other measures provided strong evidence for the scale's

convergent validity. As hypothesized, the total SCCS score was significantly and positively correlated with the total score on the Self-Compassion Scale ($r = 0.61$, $p < 0.001$) and the Mindfulness Attention Awareness Scale ($r = 0.58$, $p < 0.001$). Furthermore, the SCCS subscales showed meaningful patterns of correlation with the subscales of the COPE inventory and other well-being measures, as shown in Table 5. For example, the Cognitive Re-evaluation subscale of the SCCS showed a high correlation with the positive reappraisal subscale of the COPE, while the Mindful Self-Awareness subscale showed a strong correlation with the MAAS. These results suggest that the SCCS is measuring constructs that are theoretically related to, but distinct from, existing psychological measures.

Table 4: Correlation Coefficients between SCCS and Other Measures

Measure	SCCS Total	SCCS Engagement with Soothing Activities	SCCS Cognitive Re-evaluation	SCCS Mindful Self-Awareness
Self-Compassion	0.61**	0.45**	0.52**	0.59**

Scale (SCS)				
Mindfulness Attention Awareness Scale (MAAS)	0.58**	0.41**	0.49**	0.65**
COPE - Active Coping	0.35**	0.28*	0.42**	0.15
COPE - Emotional Support	0.29*	0.33**	0.18	0.25*
COPE - Positive Reappraisal	0.55**	0.22*	0.64**	0.48**
Psychological Capital	0.48**	0.29*	0.51**	0.40**

*Note: $p < 0.05$; $p < 0.001$

3.6. Scoring and Interpretation Guidelines

Based on the validated three-factor structure, the SCCS can be scored by summing the responses for the items that comprise each of the three subscales. The Engagement with Soothing Activities subscale consists of 12 items, the Cognitive Re-evaluation subscale contains 12 items, and the Mindful Self-Awareness subscale has 12 items. This yields a possible raw score range of 12 to 60 for each subscale and a total score range of 36 to 180 for the overall scale.

Based on our sample, we have developed preliminary interpretive guidelines to assist in the practical application of the SCCS. The mean total SCCS score for the sample was 128.5 (SD=15.3). Preliminary interpretive ranges were established as follows:

- **Low Scores:** Total scores below 113.2 (one standard deviation below the mean) may indicate a lower propensity for using self-comforting and coping behaviors.
- **Average Scores:** Total scores between 113.2 and 143.8 (within one standard deviation of the mean) represent a typical level of engagement in these behaviors.
- **High Scores:** Total scores above 143.8 (one standard deviation above the mean) may indicate a strong and frequent use of self-comforting and coping behaviors.

It is important to note that these guidelines are based on a specific sample and should be treated as preliminary until further normative data are collected from a more diverse population.

4. DISCUSSION

4.1. Summary of Findings

The present study aimed to conduct a comprehensive psychometric evaluation of the Self-Comforting and Coping Scale (SCCS) and establish preliminary guidelines for its use. The results provide strong evidence for the SCCS's reliability and validity as a measure of self-comforting and coping behaviors. The confirmatory factor analysis confirmed that the hypothesized three-factor structure is a robust and excellent fit for the data. This validates the scale's theoretical foundation, which posits a distinction between engagement with soothing activities, cognitive re-evaluation, and mindful self-awareness [23]. Furthermore, the SCCS and its subscales demonstrated excellent internal consistency, indicating that the items reliably measure their respective constructs. The significant correlations with established measures of self-compassion and mindfulness provide strong evidence of the SCCS's convergent validity, confirming that it measures constructs that are theoretically related but not redundant with existing scales. Finally, this study successfully developed and outlined a clear scoring system and preliminary

interpretive guidelines, making the SCCS immediately usable for research and practice.

4.2. Theoretical and Clinical Implications

The development and validation of the SCCS offer significant contributions to the fields of psychology and social sciences. From a theoretical standpoint, the scale's validated three-factor structure provides empirical support for a more nuanced understanding of coping that incorporates the specific, proactive behaviors of self-comforting [21, 22]. By integrating concepts from mindfulness and self-compassion, the SCCS offers a unique framework for examining how individuals engage in self-regulation beyond traditional problem-focused or emotion-focused dichotomies. It highlights that the capacity to soothe and comfort oneself is a measurable and distinct psychological resource that contributes to well-being [10]. This perspective is particularly valuable in the context of recent research that has explored the role of psychological capital and coping strategies in promoting well-being in students [19] and the mediating role of self-compassion and positive reappraisal in posttraumatic growth [1].

From a clinical perspective, the SCCS has the potential to be a valuable tool for clinicians. By assessing an individual's self-comforting and coping profiles, practitioners can gain deeper insights into their clients' emotional regulation strategies. A profile indicating a low score on the Engagement with Soothing Activities subscale, for example, could signal a target for intervention in cognitive behavior therapy (CBT) [2], where clients could be encouraged to identify and engage in new self-soothing behaviors. Similarly, a low score on the Mindful Self-Awareness subscale could be an indicator for the utility of mindfulness-based interventions [13, 15]. The SCCS could be used as a pre- and post-intervention measure to track the development of these skills, offering a tangible way to measure therapeutic progress.

4.3. Strengths and Limitations

This study has several key strengths that contribute to the confidence in its findings. The use of a robust CFA model and the reporting of multiple fit indices, as recommended by psychometric best practices [16], strengthens the validity evidence for the SCCS's factor structure. The relatively large sample size enhances the generalizability of the results to a broader university student population. Furthermore, the inclusion of multiple, well-validated external measures allowed for a comprehensive assessment of the SCCS's validity, demonstrating its utility in relation to existing constructs. The structured approach to data analysis, including a planned method for handling missing data,

adds to the study's methodological rigor.

Despite these strengths, there are also limitations that should be acknowledged. The study was conducted on a convenience sample of university students, which may limit the generalizability of the findings to more diverse populations, such as clinical samples, older adults, or individuals from different cultural backgrounds. Future research should aim to replicate these findings in more diverse populations to establish the cross-cultural validity of the SCCS. The reliance on self-report measures is another limitation, as it may be susceptible to response biases. While self-report is common in psychological research, the use of other methods, such as observational data, could provide a more complete picture of self-comforting behaviors. Finally, the interpretive guidelines provided are preliminary and based on the sample's distribution, not on established clinical norms. This necessitates further research to establish normative data for various populations.

4.4. Directions for Future Research

The findings of this study provide a strong foundation for future research. One critical next step is to conduct additional psychometric studies with more diverse samples, including cross-cultural populations and clinical samples, to confirm the factorial structure and establish norms. Longitudinal studies could be particularly valuable to examine how self-comforting and coping behaviors change over time in response to different life stressors [26]. Such studies could also investigate the SCCS's predictive validity, for example, its ability to predict resilience or psychological well-being over time. Furthermore, the SCCS can be used as a research tool to explore the mediating and moderating roles of self-comforting in the relationship between stress and various health outcomes [1, 22]. From a clinical perspective, future research should explore the utility of the SCCS in intervention studies, using it as an outcome measure to assess the efficacy of mindfulness-based interventions [12] or compassion-focused therapy [11]. The SCCS also lends itself to research using latent profile analysis [14] to identify distinct coping profiles and examine their relationship with different mental health outcomes. Finally, the scale's applicability in different settings, such as educational environments and workplaces, should be investigated to determine its value in promoting well-being and resilience.

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