Platania S, Abrams KB, Di Nuovo S, *et al*. Development and validation of the English version of the school burnout inventory for university students. *Health Psychology Research.* 2026;14(1):e81240035.
https://doi.org/10.14440/hpr.0108

Research Article

Development and Validation of the English Version of the School Burnout Inventory for University Students

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Keywords: Academic burnout, Validation, Clinical psychometric properties, Cross-cultural validity, Stress

Health Psychology Research

Vol. 14, 2026

Background

Academic burnout arises in response to prolonged stress related to university study demands. It is characterized by three main dimensions: Emotional exhaustion, cynicism, and reduced personal effectiveness. Chronic academic stress can lead to mental health issues, such as anxiety, depression, and insomnia. Early detection of burnout allows for intervention before more severe symptoms develop.

Objective

This study aimed to develop and assess the psychometric properties of the English version of the School Burnout Inventory (SBI) for University Students while providing further psychometric evidence for the pre-existing Italian version of the scale (SBI-U/I).

Methods

The study included 194 university students from the United States. The scale's factorial structure was examined, and the results were compared with the previously published Italian version. Cross-cultural validity was tested through an invariance analysis across gender and both scale versions. Convergent validity was assessed through bivariate correlation analysis.

Results

The findings confirmed that the three-factor structure was consistent with prior data. Confirmatory factor analysis of the American sample showed good model fit (χ^2 [24] = 51.991, comparative fit index [CFI] = 0.98, Tucker-Lewis index = 0.95, root mean square error of approximation [RMSEA] = 0.078). Reliability coefficients were acceptable (α = 0.77–0.88). Measurement invariance was supported across gender and country (ΔCFI $\leqslant$ 0.011, easurem$\leqslant$ 0.002), confirming cross-cultural validity. Convergent validity was evidenced by significant correlations with perceived stress (r = 0.19–0.32, p<0.01). The scale's validity was further supported by invariance analyses across gender and cultural contexts.

Conclusion

The study confirmed that both versions of the SBI-U scales are valid for assessing academic burnout and can be used for cross-cultural comparisons. This underscores the importance of early burnout detection in university students, facilitating targeted interventions to enhance their well-being.

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1. INTRODUCTION

Academic burnout is a profound emotional, mental, and physical exhaustion that affects those engaged in study or research.[1] It is a response to chronic and unmanaged stress, often stemming from the high expectations associated with academic work and (internal/external) pressures to achieve specific results. Unlike a normal period of fatigue or a dip in motivation, burnout tends to be more pervasive, negatively impacting academic performance and an individual's overall well-being.

Those experiencing this condition often feel a persistent sense of exhaustion that does not abate even with rest.[2] Every academic task seems insurmountable, and activities once regarded as interesting or stimulating become sources of anxiety and pressure. A detached or cynical attitude toward studies may develop, where courses, research, or projects become meaningless, almost as if they are an unnecessary burden. This mental state is accompanied by a sense of personal inefficacy, a feeling of being unable to meet goals, leading to a decline in self-esteem.

The causes of academic burnout are complex and interconnected. External factors include an excessive workload, tight deadlines, and a highly competitive environment.[3,4] In addition, personal factors may play a role, such as the inability to balance one's academic and personal life, perfectionism, or the tendency to undervalue one's achievements. The absence of adequate social support represents another critical factor, as feeling isolated or misunderstood in one's academic journey can amplify the sense of loneliness and pressure.

The consequences of this condition can be significant. It is not just about a decline in academic performance, such as lower grades or difficulties in meeting deadlines. Burnout can have consequences on physical and psychological health, such as insomnia, headaches, gastric issues, anxiety, and depression. On a social level, burnout can undermine self-confidence and lead to social withdrawal, impacting interpersonal relationships.[5]

To discuss academic burnout, it is essential to first address occupational burnout, the construct from which it derives, and on which the bulk of research is available. Occupational burnout syndrome was first identified in the 1970s among workers, particularly healthcare professionals.[6,7] Burnout has a longstanding tradition in workplace studies, and researchers have recently suggested that burnout is also growing among university students.[6]

1.1. ASSESSMENT OF ACADEMIC BURNOUT

Measuring academic burnout is crucial in understanding its impact and intervening effectively. This type of exhaustion is not merely a passing moment of fatigue or a temporary loss of motivation; it is a complex condition that, if left unrecognized, can have lasting consequences on students' well-being and ability to learn and achieve their goals. For this reason, understanding how and to what extent burnout affects individuals engaged in study or research is essential to providing them with the appropriate support.

Assessing burnout allows for more precise identification of those experiencing difficulties, and timely intervention can prevent the situation from worsening. Furthermore, collecting reliable data sheds light on individual cases and broader trends, such as features of the academic environment that may contribute to the problem, such as excessive workloads or overly competitive atmospheres.

Christina Maslach's definition of burnout refers to a prolonged and chronic syndrome related to stress in the workplace. She identified three specific dimensions: Emotional exhaustion, depersonalization, and reduced personal accomplishment. This conceptualization led to the development of the maslach burnout inventory (MBI), which became the gold standard for measuring burnout. The MBI was initially adapted for healthcare professionals and thereafter for other types of employees. A specific scale was also developed to assess burnout in students (MBI-Student Survey).

The academic literature contains many studies examining the relationship between academic burnout and individual and contextual variables. These variables include flexibility, self-esteem, self-efficacy, gender, school climate, social support, and academic performance.[8,9] In addition, research has highlighted how self-efficacy and self-esteem significantly influence burnout.[10-12]

However, several authors stressed the importance of developing a tool for specifically assessing academic burnout[13-15] and validated the English-language school burnout inventory (SBI) in university and non-university students.[15]

The SBI is a specific instrument designed to assess burnout syndrome among adolescents.[16] In a Spanish sample, the SBI was shown to be a valid means of assessing school burnout. Nonetheless, developing new scales has been deemed desirable for applying burnout measures in academic contexts and across cultures. The development of a measurement tool that is methodologically capable of being understood in the same way across different languages and countries is of paramount importance. A standardized and universally interpretable instrument ensures that the phenomenon being studied—such as academic burnout—can be assessed consistently, regardless of cultural or linguistic context. This consistency is crucial for producing reliable and comparable data, which are the foundation for advancing research and implementing effective interventions on a global scale.

A tool that is linguistically and culturally adaptable minimizes the risk of misinterpretation or bias that could arise from cultural differences in the perception of concepts, such as stress, exhaustion, or disengagement. For instance, what one culture perceives as a sign of burnout might be viewed differently in another due to differing social norms or academic expectations. A well-designed instrument addresses these variations by being carefully translated and validated in each language, ensuring that the meaning of its items remains intact.

Moreover, such a tool facilitates cross-national research, enabling scholars to identify patterns and differences in how academic burnout manifests in various educational systems or cultural contexts. This global perspective can reveal broader trends, highlight unique regional challenges, and inform the development of tailored strategies to combat burnout.

In addition to enhancing research, a universally interpretable instrument also promotes equity in addressing the issue. By ensuring that the tool is accessible and relevant to diverse populations, it becomes possible to provide all students with the support they need, regardless of where they live or study.

1.2. AIM OF THE RESEARCH

Recognizing the significance of stress among university students in predicting psychological outcomes, such as self-esteem and self-efficacy, our goal was to enhance

existing research by validating the SBI for University Students (SBI-U) scale in English using samples from Italy and the United States of America. We aimed to demonstrate that the SBI-U scale is a reliable, culturally adaptable tool for assessing academic burnout among students. Given the recent publication of the Italian version of the tool,[17] a comparison through invariance analysis was conducted to test the adaptability and validity of the scale across different cultural and linguistic contexts.

2. METHODS

2.1. PARTICIPANTS

The study included two samples of university students, one from the United States and one from Italy. The American sample comprised 194 students (mean age = 21.06 years, standard deviation = 3.51), with 53.2% identifying as female. Participants were recruited through an online questionnaire distributed through Google Forms, with recruitment strategies, including university mailing lists, academic social media groups, and direct outreach by faculty members. Similarly, the Italian sample consisted of 256 students (mean age = 23.98 years, standard deviation = 6.49), with 58.2% identifying as female. The Italian participants completed the same questionnaire advertised through social networks, university portals, and student associations. The average completion time for the questionnaire across both samples was approximately 10 min.

Participation in the study was voluntary and anonymous, and informed consent was obtained from all participants before data collection. The study adhered to ethical research guidelines, ensuring confidentiality, compliance with data protection regulations (e.g., the European Union's General Data Protection Regulation for the Italian sample), and the right to withdraw at any time.

2.2. THE SBI-UNIVERSITY SCALE

The SBI-U is a validated instrument designed to assess burnout in university students.[16] The scale consists of nine items, scored on a six-point Likert scale ranging from 1 (completely disagree) to 6 (completely agree). It measures three core dimensions of academic burnout:

(i) Emotional exhaustion: Feeling overwhelmed and physically/emotionally drained due to academic demands
(ii) Cynicism: A detached, indifferent, or negative attitude toward university studies
(iii) Inadequacy: A perceived lack of competence and achievement in academic activities.

A critical aspect of this study was the cross-cultural adaptation of the SBI-U scale. The original Italian version (SBI-U/I)[17] was translated into English SBI for University Students following an established translation-back-translation process. Two bilingual translators independently translated the instrument into English, after which a third expert conducted a back-translation into Italian. Any discrepancies were resolved through discussion to ensure semantic and conceptual equivalence between the two versions.

2.3. THE PERCEIVED STRESS SCALE

The Perceived Stress Scale[18] is a widely used tool to assess stress. The items were designed to capture how individuals perceive their lives as unpredictable, uncontrollable, and overloaded. The scale includes a series of direct questions on present perceived stress. The Perceived Stress Scale was designed for the general population with at least a middle school educational level. For each item, respondents were asked to indicate how often they have felt a certain way.

2.4. DATA ANALYSIS

The American and Italian samples were randomly divided into two equally sized groups for exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The EFA groups comprised 195 participants from the United States and 256 from Italy, as did the CFA group. The number of factors in the initial EFA was determined using the Hull method, a reliable approach for factor determination.[19] In addition, minimum rank factor analysis was conducted to test the scale's structure.

For CFA, we utilized the robust maximum likelihood estimator and considered several criteria for an acceptable fit based on past literature,[20,21] including (i) a non-significant chi-square (χ^2) statistic, (ii) a comparative fit index (CFI) and tucker-lewis index (TLI) exceeding 0.90, and (iii) a standardized root mean square residual (SRMR) lower than 0.10.

Subsequent analyses were performed on the entire sample, separately for each country. We evaluated the discrimination, difficulty, and informativeness of the scale using the multidimensional item response theory package,[22] specifically employing the graded response model due to the polytomous nature of the measure.[23]

Scale invariance across countries and sexes was tested through multigroup CFA (robust maximum likelihood method). Measurement invariance tests whether participants of different sexes and countries responded consistently, facilitating cross-cultural and cross-sex comparisons.[24,25] To establish invariance, the fit indices of a more restricted model must align closely with those of a less restricted model, with guidelines based on the established literature,[26,27] including a drop of at least ⩽0.01 change in CFI and ⩽0.03 change in SRMR.

Reliability and convergent validity of the Optimism Scale were evaluated using McDonald's omega (ω), Cronbach's alpha (α), and composite reliability (CR), with thresholds set above 0.70 for ω and α and above 0.50 for CR,[28,29] respectively. Convergent validity was examined by calculating Pearson bivariate correlations between optimism and the Big Five personality factors, separately for each country.

3. RESULTS

3.1. DESCRIPTIVE STATISTICS AND NORMALITY OF DISTRIBUTION OF THE TWO SAMPLES

Table 1 confirms the factorial structure; critical values that exceed +2.00 or are <−2.00 indicate statistically significant degrees of non-normality. Descriptive statistics in Table 1 show that the data were normally distributed, with acceptable skewness and kurtosis values. The results confirmed the goodness of the scale and the normality of the distribution.

As noted by Milfont and Fischer,[30] metric invariance enables meaningful comparisons of correlations between countries, while scalar invariance allows reliable comparisons of central tendency estimates, such as the mean, and correlation coefficients between groups.

Table 1. Descriptive statistics and normality of distribution of the two different samples

School Burnout Inventory-University	American sample				Italian sample			
	Mean	SD	Skewness	Kurtosis	Mean	SD	Skewness	Kurtosis
I feel overwhelmed by my university studies.	5.07	1.36	−0.676	0.159	5.60	1.10	−0.853	0.918
I lack motivation in my university studies and often think of dropping out.	4.05	1.76	−0.233	−1.001	5.06	1.06	−0.145	−0.128
I often feel inadequate in my university activities.	4.72	1.76	−0.587	−0.642	5.71	1.15	−0.847	0.625
I often have difficulty sleeping due to my university commitments.	4.79	1.87	−0.742	−0.684	5.69	1.05	−0.950	1.165
I am losing interest in my university studies.	4.09	1.93	−0.213	−1.174	4.95	1.46	−0.740	0.117
I am constantly wondering if my academic work is meaningful.	4.41	1.96	−0.421	−0.889	5.35	1.31	−0.473	−0.311
In my free time, my mind is pre-occupied by my university studies.	4.16	1.66	−0.368	−0.778	4.70	1.40	−0.540	0.008
I used to have higher expectations for my academic work than I do now.	5.05	1.69	−1.024	0.197	5.75	1.00	−0.734	0.161
The pressure from my university commitments causes problems in my personal relationships.	4.47	1.90	−0.491	−0.887	5.45	1.17	−0.588	−0.142

Abbreviation: SD: Standard deviation.

3.2. CFA OF THE AMERICAN SAMPLE

CFA was carried out exclusively on the American sample to examine whether the three first-order factor structure of the scale, as in the original English version and the Italian one, would be confirmed. A model composed of three first-order factors with covariances between them (Model 1) yielded the following fit indices: χ^2 (24) = 51.991, Chi-square minimum discrepancy (C_{min})/degrees of freedom (df) = 2.17, SRMR = 0.027, root mean square error of approximation (RMSEA) = 0.078, CFI = 0.98, TLI = 0.95, Akaike Information Criterion (AIC) = 93.991, and Bayesian Information Criterion (BIC) = 162.617. Subsequently, Model 1 was compared with an alternative structure comprising one second-order factor and three first-order factors (Model 2), resulting in: χ^2 (25) = 112.34, C_{min}/df = 4.49, SRMR = 0.045, RMSEA = 0.089, CFI = 0.95, TLI = 0.92, AIC = 192.303, and BIC = 284.358. Based on the fit indices, AIC, BIC, and the chi-square difference test ($\Delta\chi^2$ M2−M1[1] = 60.349), Model 1 demonstrated a better fit to the data than Model 2. Considering the possibility of a unidimensional solution for the nine items, Model 1 was compared with a single-factor model (Model 3), which appeared more appropriate than the three-factor structure. This comparison yielded: χ^2 (27) = 63.342, C_{min}/df = 2.38, SRMR = 0.032, RMSEA = 0.085, CFI = 0.97, TLI = 0.93, AIC = 100.342, and BIC = 159.163. Although Model 3 showed excellent reliability indices, Model 1 exhibited superior reliability and a better fit to the data ($\Delta\chi^2$ M3−M1[3] = 11.35). All factor loadings in Model 1 were statistically significant at p<0.001, ranging from 0.68 to 0.86, with a mean of 0.79 (Figure 1).

3.3. RELIABILITY OF THE AMERICAN SAMPLE

For the American sample, the first two indicators (cynicism and exhaustion) demonstrated strong internal consistency for all three factors. In addition, the CR and the average variance extracted significantly exceeded the 0.50 threshold[29] (Table 2).

3.4. MEASUREMENT INVARIANCE

Three models—configural, metric, and scalar—were used to examine the consistency of results across sex and country. The findings demonstrated that full invariance was achieved for both sex and countries, ensuring the validity of these comparisons. This highlights the instrument's cultural adaptability, showing that it is interpreted consistently even when used in different languages (Table 3).

3.5. CONVERGENT VALIDITY

Convergent validity was evaluated by examining the correlation between the SBI-U and the Perceived Stress Scale, which was analyzed separately for each country. The results showed high, significant, and positive relationships between perceived stress and the SBI-U factors in both samples (Table 4).

4. DISCUSSION

This study aimed to provide further psychometric support for using the SBI-U scale across different cultural and linguistic contexts, focusing on its application to samples from English-speaking country (the United States) and Italy. The primary objective was to assess the scale's reliability and validity in measuring academic burnout in cross-cultural settings, ensuring its adaptability to diverse educational environments.

The findings confirmed the reliability and validity of the SBI-U scale as a psychometric tool for analyzing academic burnout. The three-factor first-order structure, previously identified in earlier validations, both the original and the Italian versions, was corroborated. Furthermore, the scale's invariance across gender and cultural contexts reinforces its versatility for international use.

Significant positive correlations between the scale's factors and perceived stress levels further emphasized its convergent validity, confirming its effectiveness in measuring academic burnout.

Table 2. Reliabilities of the American sample

Factors	Cronbach's alpha	McDonald's omega	Composite reliability	Average variance extracted
Exhaustion	0.830	0.834	0.83	0.56
Cynicism	0.881	0.883	0.89	0.67
Inadequacy	0.770	0.770	0.77	0.63

Table 3. Measurement invariance of the school burnout inventory-university scale across gender and country

Characteristics	Models	CFI	RMSEA	ΔCFI	ΔRMSEA
Gender(*n*)	Configural	0.944	0.72(0.61–0.83)	-	-
Male=99	Metric	0.941	0.72(0.62–0.84)	0.001	0.000
Female=351	Scalar	0.930	0.73(0.63–0.84)	0.011	0.001
Country(*n*)	Configural	0.937	0.74(0.62–0.78)	-	-
Italy=256	Metric	0.933	0.74(0.62–0.78)	0.004	0.000
United States=194	Scalar	0.928	0.76(0.63–0.81)	0.005	0.002

Abbreviations: CFI: Comparative fit index; RMSEA: Root mean square error of approximation.

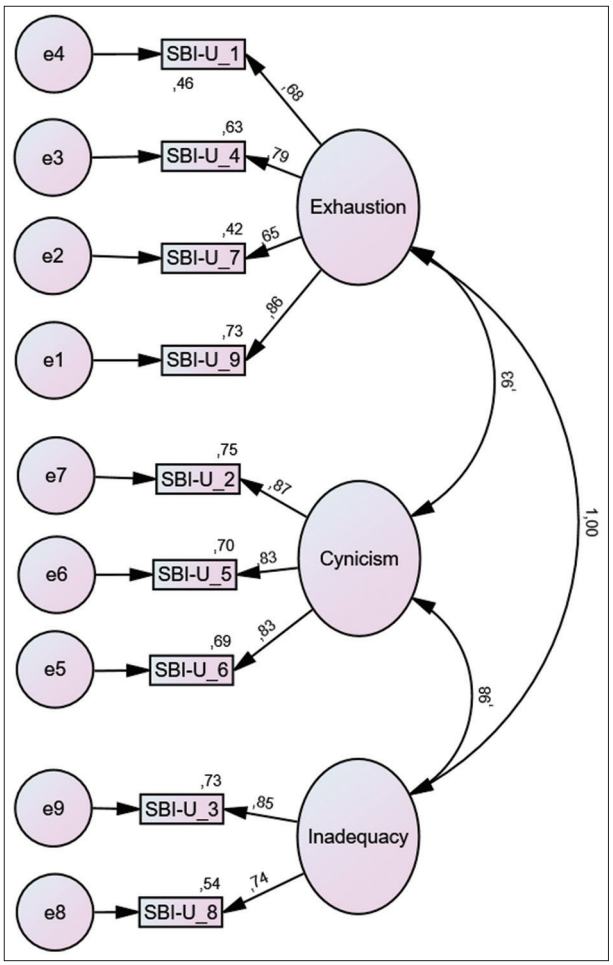

Figure 1. Factorial structure and factor loading of model 1 (American sample)
Abbreviation: SBI-U: School burnout inventory-university.

The comparative analysis between the English-speaking and Italian samples revealed significant differences in average scores: Italian students reported higher levels of emotional exhaustion and feelings of inadequacy than their English-speaking counterparts. These differences may be attributable to factors linked to educational systems and cultural expectations. In Italy, for instance, higher academic pressure, reduced flexibility in study pathways, and a more rigid assessment system could increase stress and feelings of inadequacy among students.

Academic burnout is one of the leading causes of university dropout, with substantial consequences at both individual and institutional levels. Tools, such as the SBI-U scale enable the early identification of at-risk students, providing a foundation for targeted interventions by academic institutions. Implementing psychological support programs, mentoring initiatives, and revising academic workloads can help mitigate burnout.

The scale's invariance across cultural contexts also highlights the potential for developing standard policies and interventions at the international level, while still accounting for local specificities.

Despite the promising findings, this study has several limitations that should be acknowledged. First, the sample size, although adequate for the analyses conducted, was limited to university students from the United States and Italy, which may restrict the generalizability of the results to students from other cultural and educational backgrounds. Future research should aim to validate the SBI-U scale across a more diverse range of countries and academic systems.

Second, the study employed a cross-sectional design, which prevents the ability to establish causal relationships between burnout and related psychological factors, such as perceived stress. Longitudinal studies are needed to track the progression of academic burnout over time and to assess the long-term impact of burnout on academic performance, mental health, and career outcomes.

In addition, while self-report measures provide valuable insights, they are subject to social desirability bias and response distortions. Including objective measures or multi-informant reports (e.g., faculty assessments or peer evaluations) could enhance the reliability of the findings.

Finally, although the study tested measurement invariance across gender and cultural contexts, it did not explore other potential moderating factors, such as socioeconomic status, personality traits, or social support, which could influence burnout levels. Addressing these aspects in future research would provide a more comprehensive understanding of the factors contributing to academic burnout and help refine intervention strategies.

Table 4. Descriptive statistics and intercorrelations in both samples

Factors	American sample		Italian sample		1	2	3	4
	Mean	Standard deviation	Mean	Standard deviation				
Exhaustion	4.62	1.39	3.89	0.98	-	[b]0.52**	[b]0.61**	[b]0.32**
Cynicism	4.18	1.69	3.71	0.83	[a]0.80**	-	[b]0.58**	[b]0.26**
Inadequacy	4.88	1.55	3.98	0.86	[a]0.82**	[a]0.80**	-	[b]0.21**
Perceived stress	2.22	0.49	2.25	0.62	[a]0.19**	[a]0.24**	[a]0.19**	-

Notes: [a]Correlations among the American sample; [b]Correlations among the Italian sample; **indicates statistical significance.

5. CONCLUSION

In summary, the SBI-U scale is confirmed as a valid and effective tool for measuring academic burnout in international contexts. The findings underscore the importance of early assessment of this phenomenon, which is crucial for improving student well-being and reducing university dropout rates. Future research should continue to explore the dynamics of academic burnout and develop increasingly targeted interventions to address it.

ACKNOWLEDGMENTS

Not applicable.

FUNDING

None.

CONFLICT OF INTEREST

As the Editor-in-Chief of this journal, Pasquale Caponnetto was not involved in the editorial and peer-review process conducted for this paper. Separately, other authors declared that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

AUTHOR CONTRIBUTIONS

Conceptualization: All authors
Formal analysis: All authors
Investigation: All authors
Methodology: All authors
Writing – original draft: All authors
Writing – review & editing: All authors

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was approved by the Ethics Committee of the Psychology Unit, Department of Education Sciences, University of Catania (Prot. n Ierb-Edunict-2023.01.16/3) and by the Ethics Committee of Carleton College (IRB 2022-23 1506 KABRAMS). Participants provided written informed consent before participation in the study. To ensure data protection and participant confidentiality, all data were collected and stored in compliance with the European Union's General Data Protection Regulation (GDPR).

CONSENT FOR PUBLICATION

All participants provided their written informed consent for participation and publication.

DATA OF AVAILABILITY STATEMENT

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Submitted: 24 April 2025; Revision received: 30 July 2025; Accepted: 31 July 2025; Published: 06 October 2025

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