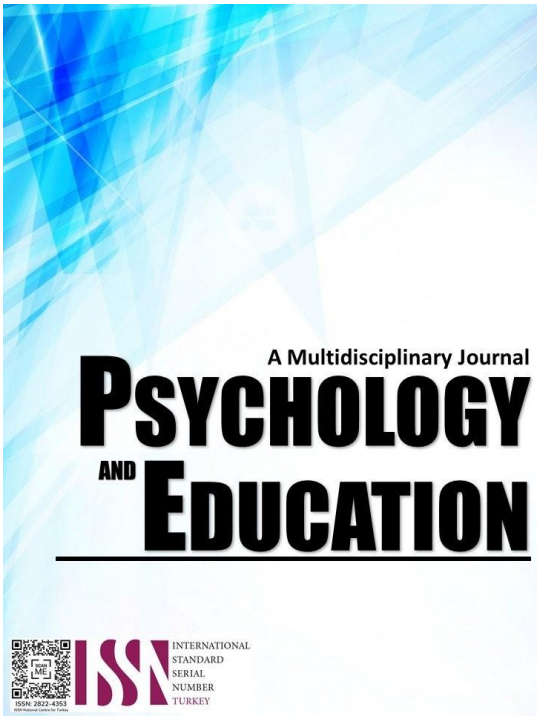
EXAMINING THE FACTORIAL STRUCTURE OF THE COPENHAGEN BURNOUT INVENTORY-STUDENT VERSION (CBI-S) AMONG COLLEGE STUDENTS: AN EXPLORATORY FACTOR ANALYSIS



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Research Article

Examining the Factorial Structure of the Copenhagen Burnout Inventory-Student Version (CBI-S) among College Students: An Exploratory Factor Analysis

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Abstract

Four decades have passed, and burnout is still commonly linked to professionals with extremely demanding roles. However, it is argued that burnout is not solely job-related since chronic stress, an apparent predictor of burnout, is not restricted to demanding jobs and work environments. For instance, students are susceptible to burnout and its corresponding psychological issues, given the nature and requirements fused into every student's academic journey. This rationale paved the way for the development of tests for students' burnout. The Copenhagen Burnout Inventory-Student version (CBI-S) is a standardized scale validated in various contexts as an alternative measurement that addresses the limitations of other well-established burnout measures. The present study aims to validate the English version of the CBI-S using exploratory factor analysis (EFA) in Filipino college students. This is to determine whether the initial four-factor structure established by previous scholars applies to the Filipino context. The data was gathered from 310 randomly selected college students. The findings support a three-factor solution for studies-related burnout (SRB), classmates-related burnout (CRB), and instructor-related burnout (IRB), which is different from the findings of previous studies since the present analysis integrated personal burnout (PB) and SRB as one factor pertinent to academic burnout. The results contribute significantly to the existing evidence about the CBI-S' psychometric and cross-cultural validity in the Filipino context, especially to the number of factors it has. These results can be used to improve further or develop a standardized scale that will precisely measure burnout among Filipino students using further research.

Keywords: *academic burnout, instructor-related burnout, exploratory factor analysis*

Introduction

The concept of "burnout" can be credited to the earlier works of the American psychologist Herbert Freudenberger in 1974, who started coining this term as a phenomenon that was distinctively prevalent among caring professionals (Schaufeli et al., 2008, as cited in Samra, 2018). Maslach and Leiter (2016) defined burnout as a psychological syndrome that originates from chronic exposure to stressors, which is initially partitioned into overwhelming exhaustion, cynicism, feelings of detachment from one's job, and feelings of ineffectiveness and lack of accomplishment. Four decades have passed, and burnout is still commonly linked to professionals with extremely demanding roles, such as those in the healthcare industry (Eisenstein, 2018).

Interestingly, Bianchi et al. (2014) argued that burnout is not solely job-related since chronic stress, an apparent predictor of burnout, is not restricted to demanding jobs and work environments. In this case, most research studies on burnout were primarily confined to working individuals, and only a small portion focused on students' burnout experiences (Norez, 2017).

Given the nature of and the requirements fused in every student's academic journey, it is sensible that they are also susceptible to the development of burnout accompanied by its corresponding psychological issues. In a study conducted in Oman, there were about 7.4% to 24.5% of medical students experienced burnout and symptoms of depression (Al-Alawi et al., 2019). About 28.8% or 872 students from 15 public schools in Sri Lanka had burnout (Wickramasinghe et al., 2018). In the Philippines, a survey revealed that about 54.7% of students have reported experiencing adverse physiological and psychological problems regarding their learning modality (Adonis, 2021).

In relation to this, Khani et al. (2018) emphasized the need to develop cross-culturally valid and reliable measurement of students' burnout. At present, the Maslach Burnout Inventory (MBI) is the most used measurement of burnout (Williamson et al., 2018). This particular scale is considered the "gold standard" for measuring this aspect of burnout, which consists of three factors: emotional exhaustion (i.e., feelings of exhaustion and getting emotionally overwhelmed from work), depersonalization (i.e., feelings of detachment and impersonal reactions or response to work), and personal accomplishment (i.e., feelings of incompetence to one's job) (Maslach et al., 1997; 2018, as cited in Forné, 2022). In a review, Schaufeli et al. (2020) stated that although the MBI is a widely accepted and utilized measurement of burnout, there are still identifiable conceptual, methodological, and practical limitations.

Hence, Kristensen et al. (2005) developed a new measurement for burnout, the Copenhagen Burnout Inventory, as an alternative to MBI that can address the potential limitation of this measurement. This new version was later adopted and modified by Campo et al. (2013) to make it a valid and reliable measurement of academic burnout in the context of students' experiences. Despite the conclusive evidence gathered from previous research about the Copenhagen Burnout Inventory-Student version (CBI-S) factor structure, it is still essential to conduct further studies to examine its cross-cultural validity and reliability to measure burnout in other countries, like the Philippines. In the local context, only one published study explicitly used the CBI-S to measure the burnout of English-speaking Filipino

students (Serafica & Muria, 2023), while the rest used the original CBI version.

Therefore, the present study aims to validate the English version of the CBI-S using exploratory factor analysis (EFA) in the sample of Filipino college students. Given that this particular sample was not the focus of the initial formulation and development of earlier burnout measures. Furthermore, the data above also exemplify that students experience psychological manifestations of burnout like anxiety, stress, and fatigue, including physiological consequences that could be in the form of disturbed sleeping and eating patterns, to cite a few. This prompted this study to determine the validity and reliability of CBI-S to measure students' burnout in the Filipino setting using EFA.

Moreover, this study seeks to investigate whether the four-factor structure initially established and validated by previous scholars applies to the sample of Filipino students. Existing data from 310 randomly selected college students in one institution will be reanalyzed using factor analysis. The results can contribute significantly to the existing evidence about the CBI-S' psychometric and cross-cultural validity in the Filipino context, especially to the number of factors it has. This can also help develop and establish a reliable measure of academic burnout among college students in the country to develop intervention strategies in line with the empirical evidence obtained from standardized tools.

Literature Review

Copenhagen Burnout Inventory (CBI)

Kristensen et al. (2005) stated that since the MBI was applied to more than 90% of burnout research worldwide, this shows how dominant its position is; thus, the consequences became: "burnout is what the MBI measures and the MBI measures what burnout is" (p. 193), which could mean that its measurement may be limited to what the scale is already intended to measure. Furthermore, they emphasized that some items of the MBI are limiting due to the earlier conceptualization of burnout, which originated from people working only in the health service sector. Hence, some items can only be answered by such a group of people. This prompts Kristensen et al. to develop a new measurement, the Copenhagen Burnout Inventory (CBI), that aims to address the previous limitations of the MBI.

The Development of Copenhagen Burnout Inventory-Student version (CBI-S)

Subsequently, Campo et al. (2013) adapted and modified the original CBI to measure students' burnout. This version became the 25-item Copenhagen Burnout Inventory-Student version (CBI-S), explored in the contexts of Portugal and Brazil. To ensure that this scale fits the context of the students, four factors were initially proposed: personal burnout (PB), studies-related burnout (SRB), colleagues-related burnout (CRB), and teachers-related burnout (TRB). The CBI-S was administered to 958 Brazilians and 556 Portuguese students, with a mean age of 23.1 (SD = 5.1) for the former and 23.1 (SD = 5.1) for the latter. The findings reveal empirical evidence supporting the validity and reliability of the CBI-S and its four-factor structure. However, despite the positive results of the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), it is worth noting that item 10, "Do you have enough energy for family and friends during leisure time?" was the only one that demonstrates a low negative factor loading which may be explained by its reverse formulation that is different from the item pool.

In another context, Bolatov et al. (2021) conducted psychometric validations of the CBI-S using 771 medical students at Astana Medical University, Kazakhstan. The results indicate that the CBI-S has good reliability ($\alpha = 0.94$; PB $\alpha = 0.896$; SRB $\alpha = 0.884$; CRB $\alpha = 0.874$; and TRB $\alpha = 0.926$). The EFA and CFA also show empirical evidence to support the four-factor burnout structure of Campo et al. (2013).

Despite the evidence about CBI-S' validity and reliability as a burnout measure, it is indisputable that it still needs further cultural validation. This is because the existing studies that tried to address such topics are all at the international level, and according to the researchers' initial review of the literature, there are no existing local studies that validated the CBI in the local context. It is important to conduct further instrument validation, such as this, to ensure that the adopted scale can quantify Filipino students' burnout experiences.

Methodology

Respondents

The data were initially gathered from randomly selected 310 English-speaking college students in Lipa City, Batangas, Philippines. The approved letter of invitation and Google form containing the survey instrument were submitted to the department secretaries and distributed to the respective group chats. Only those who voluntarily accepted the invitation were selected to be the study's respondents. There were 119 males and 191 females, comprising 107 psychology students, 23 nursing students, 19 tourism and hotel and restaurant management students, 21 education students, 122 criminology students, and 18 business and accountancy students. The age range is between 18 to 27 (M = 20.63, SD = 1.60).

Instruments

The 25-item Copenhagen Burnout Inventory-Student version by Campo et al. (2013) is a standardized questionnaire that can measure burnout among students. This scale is subdivided into four factors: personal burnout (PB), studies-related burnout (SRB), classmates-related burnout (CRB), and teachers-related [or instructor-related] burnout (TRB [IRB]). The responses and scoring are 1 = never (or 0% of the time), 2 = rarely (or 25% of the time), 3 = sometimes (or 50% of the time), 4 = frequently (or 75% of the time), and 5 = always (or 100% of the time), for all scales except for the fourth item of the SRB "Do you have enough energy for family and friends during leisure time", which will be reversed. The scores greater than 50 are indicative of high burnout.

Bolatov et al. (2021) stated that the CBI-S demonstrates good reliability with a Cronbach's alpha coefficient of $\alpha = 0.94$, while the subscales also demonstrate good reliability: PB $\alpha = 0.896$; SRB $\alpha = 0.884$; CRB $\alpha = 0.874$; and TRB $\alpha = 0.926$.

Meanwhile, the present study performed a reliability analysis to obtain Cronbach's alpha coefficient before proceeding with the exploratory factor analysis (EFA). This will ensure that the scale is valid, reliable, and meets the requirements of EFA. Based on the results, the CBI-S demonstrates very high reliability based on the overall $\alpha = .95$, whereas the subfactors also had good to very high reliability based on the following factors: PB $\alpha = .91$; SRB $\alpha = .85$; CRB $\alpha = .95$; and IRB $\alpha = .96$.

Procedure

The data used in this study were obtained and reanalyzed from previous research that examined academic burnout among college students. Before the data-gathering procedure, pertinent data such as letters and informed consent were prepared and submitted to the panel of examiners in the institution for approval. After the careful assessment and evaluations of the scale to be used, informed consent, and letters to be dispensed, data-gathering was approved. The prepared documents were submitted and approved by the Research and Development Office and the Office of the Vice-President for Academic Affairs of the institution. After that, the letter of invitation and the approved documents were submitted to the respective program chairs and deans for permission and approval to conduct the survey involving their students. After obtaining their approval, the Google form containing the informed consent, contact information of the researchers, and survey instrument were transmitted to their students by the department secretaries. There was a 97.8% response rate; 310 students voluntarily participated, while seven students, or 2.2%, declined the invitation.

Data Analysis

The data analyses were conducted using the Statistical Package for Social Sciences (SPSS) version 27 (IBM Corp, 2017), Jamovi version 2.4.8 (The Jamovi Project, 2024), and the O'Connor software program for determining the number of components and factors for parallel analysis (O'Connor, 2000). Bartlett's test of sphericity (Bartlett, 1950) was employed to check if the correlation matrix was not random. The Kaiser-Meyer-Olkin (KMO) was also used and set to > .50.

Prior to the correlation analysis and EFA, a test of normality using the Shapiro-Wilk test was employed to determine the distributional properties of data. Kurtosis and Skewness were also analyzed to ensure no values ≥ 2.0 for the former and ≥ 7.0 for the latter since those values can create problems with the EFA (Curran et al., 1996). In addition, Mahalanobis Distance (MD), a statistical analysis to detect outliers (Li et al., 2019), was also used to find any outliers in the data, which were then removed from the data set. The probability values obtained from the MD found to be less than 0.001 were considered outliers (Hair et al., 1998). There were 18 outliers identified and were discarded from the data set, leaving a total number of respondents of n = 292. Following the recommendations of previous EFA researchers that the sample size should be 5:1 or 10:1 (i.e., number of participants: number of variables) (Hair et al., 2010, as cited in Watkins, 2018), the remaining sample was still enough since EFA required a large number of sample (Norman & Streiner, 2014).

After analyzing the correlation matrix, the data were submitted for EFA. Since the study aims to determine a latent factor structure, Principal Axis Factoring (PAF) was selected instead of Principal Component Analysis (PCA), as suggested by Fabrigar et al. (1999). The PAF was preferred over the Maximum Likelihood (ML) and other procedures because it does not have any distributional assumptions (i.e., normal distribution), robust to unequal factor loadings, limited indicators per factor, and small sample size (Briggs & MacCallum, 2003; De Winter & Dodou, 2012; Fabrigar, 1999, as cited in Greider & Steiner, 2022).

Given that the study's objective is to find and validate the latent factor structure of the CBI-S, PAF was preferred rather than PCA. Since the former is also not sensitive to distributional assumptions or properties and was proven to be robust to deviation from normality, it was chosen rather than ML based on the recommendations of EFA researchers.

To determine the number of factors to retain, the present study adhered to the recommendations of previous EFA scholars, such as the use of parallel analysis and visual scree (Cattell, 1966; Horn, 1965; Velicer et al., 2000, as cited in Watkins, 2018). Furthermore, since it is hypothesized that the factors can correlate, oblimin rotation was used (Carroll, 1978; Child, 2006; Jennrich & Sampson, 1966; as cited in Watkins, 2018). The pattern coefficient is also examined to determine the weak pattern coefficient and to find a strong or salient pattern coefficient that can be strong enough to obtain scientific interpretation and exhibit practical value. Norman and Streiner (2014) suggested that for the significance level at 1% (i.e., the probability value of <.01), the formula 5.152N-2 can be used. In line with this, Bandalos and Gerstner (2016) and Hair et al. (2010) stated that pattern coefficients between .30 and .40 are deemed useful. Since there were n = 292 respondents for this study, and the significance level used is 1%, the computed pattern coefficient is 0.30, but for this

research, the coefficient will be set to .40.

Ethical Consideration

Prior to the involvement of the students in this research, a panel of examiners of the institution, comprising invited professors, deans, the director of the Research and Development Office, and the panel chair, who was the Vice President for Academic Affairs, examined all documents including the informed consent, letter of invitation, and research instrument. After obtaining their approval, the data-gathering procedure commenced. The respondents were cordially invited to communications transmitted by their respective department secretaries. Voluntary participation was emphasized, and the rights of the respondents were prioritized. The data obtained were carefully analyzed and stored in adherence to the research policies of the institution, the APA code of ethics for research, and the Data Privacy Act of the Philippines.

Results and Discussion

Table 1.1. *Frequency Distribution in terms of Sex and Program*

Program and Year Level	*Sex*	*N*	*Total*
Psychology	Male	16	101
	Female	85	
Nursing	Male	1	20
	Female	19	
Tourism and Hotel Restaurant Management	Male	5	17
	Female	12	
Education	Male	8	20
	Female	12	
Criminology	Male	73	116
	Female	43	
Business and Accountancy	Male	4	18
	Female	14	
Total			292

Table 1 presents the frequency distribution table of the respondents. The majority of the students came from the criminology programs (n = 101; male = 16, female = 85), followed by psychology, then nursing (n = 20; male = 1, female = 19) and education (n = 20; male = 8, female = 12) with an equal number of students, then business and accountancy (n = 18; male = 4, female = 14), and lastly, tourism and hotel restaurant management (n = 17; male = 5, female = 12).

Table 1.2 presents the level of burnout along with its subfactors, including PB = Personal Burnout, SRB = Studies-related Burnout, CRB = Classmates=related Burnout, and IRB = Instructor-related Burnout. Based on the data, PB and SRB are higher in females (PB: M = 64.14, SD = 18.33; SRB: M =55.73, SD = 18.82) than males (PB: M = 58.80, SD = 20.64, SRB: M = 53.17, SD = 18.70). On the other hand, CRB and IRB are higher than males (CRB: M = 45.25, SD = 26.95; IRB: M = 40.38, SD = 28.24) than females (CRB: M = 37.68; SD = 24.31; IRB: M = 29.98, SD = 24.41).

Table 1.2. *Level of Academic Burnout in terms of Sex and Program*

	Sex				*Program*											
	Male		*Female*		*Psych*		*Nur*		*THRM*		*Educ*		*Crim*		*Bus & Acc*	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
PB	58.80	20.64	64.14	18.33	64.40	18.82	63.54	17.83	61.52	18.07	69.38	17.22	58.58	20.48	64.12	17.51
SRB	53.17	18.82	55.73	18.70	56.79	18.29	54.46	16.26	48.95	23.03	63.39	16.87	51.17	18.70	63.29	14.94
CRB	45.25	26.95	37.68	24.31	41.58	24.75	38.33	22.81	25.74	30.87	55.42	22.46	39.91	25.59	37.27	23.85
IRB	40.38	28.24	29.98	24.41	28.14	23.65	37.71	26.44	24.02	25.24	53.96	24.12	36.39	27.94	31.25	20.42
CBI	49.55	20.44	47.24	17.31	48.09	16.87	48.75	16.98	40.41	21.95	60.65	14.82	46.70	19.88	49.56	15.52

M = Mean SD = Standard Deviation Psych = Psychology Program Educ = Education Program
Crim = Criminology Program Bus & Acc = Business and Accountancy Program

In terms of programs, education students have the highest level of burnout in terms of PB (M = 69.38, SD = 17.22), SRB (M = 63.39 SD = 16.87), CRB (M = 55.42, SD = 24.46), and IRB (M = 53.96, SD = 24.12). Meanwhile, criminology students have the lowest PB (M = 58.58, SD = 20.48), while tourism and hotel and restaurant management students have the lowest levels of burnout in terms of SRB (M = 48.95, SD = 23.03), CRB (M = 25.74, SD = 30.87), and IRB (M = 24.02, SD = 25.24).

Table 1.3. *Descriptive Statistics of the Copenhagen Burnout Inventory-Student Version*

Variables	*M*	*SD*	*Skewness*		*Kurtosis*	*Shapiro-Wilk*	
			Statistics	*Std. Error*	*Statistics*	*Std. Error*	*p-value*
PB1	69.86	20.50	-.357	.143	.066	.284	<.001
PB2	66.78	20.33	-.179	.143	-.054	.284	<.001
PB3	67.98	21.59	-.230	.143	-.283	.284	<.001
PB4	57.11	26.60	-.174	.143	-.545	.284	<.001
PB5	58.05	23.98	-.048	.143	-.395	.284	<.001
PB6	53.34	26.13	-.179	.143	-.500	.284	<.001
PB Average	62.19	19.35	-.189	.143	.005	.284	<.001
SRB1	63.18	24.03	-.242	.143	-.326	.284	<.001
SRB2	57.02	26.66	-.221	.143	-.541	.284	<.001
SRB3	55.22	27.74	-.208	.143	-.621	.284	<.001
SRB4	34.85	23.98	.411	.143	-.198	.284	<.001
SRB5	59.33	25.73	-.322	.143	-.378	.284	<.001
SRB6	56.16	24.45	-.134	.143	-.264	.284	<.001
SRB7	57.79	26.24	-.274	.143	-.542	.284	<.001
SRB Average	54.80	18.76	-.283	.143	-.216	.284	.007
CRB1	44.26	27.09	.157	.143	-.646	.284	<.001
CRB2	41.18	27.60	.116	.143	-.723	.284	<.001
CRB3	39.13	28.11	.246	.143	-.759	.284	<.001
CRB4	45.46	27.94	-.008	.143	-.659	.284	<.001
CRB5	34.76	30.02	.434	.143	-.846	.284	<.001
CRB6	37.93	29.78	.229	.143	-.948	.284	<.001
CRB Average	40.45	25.52	.276	.143	-.789	.284	<.001
IRB1	38.36	28.14	.278	.143	-.732	.284	<.001
IRB2	35.27	27.68	.296	.143	-.870	.284	<.001
IRB3	33.39	28.31	.485	.143	-.630	.284	<.001
IRB4	33.82	28.52	.395	.143	-.825	.284	<.001
IRB5	28.94	28.75	.712	.143	-.468	.284	<.001
IRB6	32.96	28.55	.467	.143	-.771	.284	<.001
IRB Average	33.79	26.31	.497	.143	-.631	.284	<.001
N = 292	48.09	18.52	0.094	.143	-.534	.284	.125

Table 1.3 presents the distributional properties, kurtosis, and skewness of the CBI-S per item. Based on the data, there are significant deviations from the normal distribution in all items, as attested by the Shapiro-Wilk probability values of less than (<) .05. Moreover, no issues were found on the skewness and kurtosis. According to Curran et al. (1996), kurtosis values greater than or equal to 2.0 and skewness values greater than or equal to 7.0 are considered problematic in EFA. Given the distributional properties, Spearman correlation will be utilized in the correlation coefficient matrix.

Table 2. *Differences in Burnout in terms of Sex and Programs*

Variables	*U Test (Sex)* *P-value*	*H Test (Program)* *P-value*
Personal Burnout	.069	.389
School-Related Burnout	.286	.005**
Classmates-Related Burnout	.018*	.011*
Instructor-Related Burnout	.004**	.002**
Copenhagen Burnout Inventory Student Version	.265	.010*

U-Test = Mann-Whitney U Test *p < .05 = significant** *p < .001 = highly significant****
H-Test = Kruskal-Wallis H Test *p < .01 = very significant***

Table 2 presents the significant differences among the subfactors of CBI-S regarding sex and program. Since there are violations of the parametric assumptions of independent samples t-test and one-way ANOVA, non-parametric counterparts, such as the Mann-Whitney U test and Kruskal-Wallis H test, were considered based on the suggestions of the literature (Derrick et al., 2020; Kim & Park, 2019; Najmi et al., 2021). Based on the findings, there are significant differences in classmates-related burnout (p = .018) and a very significant difference in instructor-related burnout (p = .004) among the respondents when grouped according to their sexes.

Meanwhile, there were very significant differences in school-related burnout (p = .005) and instructor-related burnout (p = .004), and significant differences in classmates-related burnout (p = .011) and the overall Copenhagen burnout inventory -student version (p = .01), when the respondents were grouped according to their programs.

Table 3. *Correlation Matrix*

	PB 1	PB 2	PB 3	PB 4	PB 5	PB 6	SRB 1	SRB 2	SRB 3	SRB 4	SRB 5	SRB 6	SRB 7	CRB 1	CRB 2	CRB 3	CRB 4	CRB 5	CRB 6	IRB 1	IRB 2	IRB 3	IRB 4	IRB 5
PB2	.738**																							
PB3	.690**	.705**																						
PB4	.591**	.557**	.618**																					
PB5	.626**	.625**	.620**	.796**																				
PB6	.493**	.509**	.510**	.677**	.752**																			
SRB1	.600**	.601**	.564**	.639**	.665**	.593**																		
SRB2	.561**	.519**	.530**	.665**	.681**	.583**	.717**																	
SRB3	.519**	.495**	.513**	.616**	.631**	.572**	.592**	.743**																
SRB4	-.032	-.058	-.003	.025	.022	-.032	-.036	-.004	-.058															
SRB5	.539**	.533**	.551**	.612**	.623**	.605**	.641**	.649**	.711**	-.149*														
SRB6	.526**	.483**	.534**	.576**	.600**	.556**	.545**	.609**	.652**	-.122*	.755**													
SRB7	.518**	.523**	.522**	.567**	.613**	.563**	.548**	.578**	.634**	-.156**	.760**	.842**												
CRB1	.198**	.289**	.269**	.301**	.333**	.340**	.298**	.419**	.423**	-.019	.391**	.404**	.401**											
CRB2	.250**	.334**	.274**	.375**	.409**	.381**	.341**	.408**	.431**	-.076	.370**	.428**	.460**	.785**										
CRB3	.246**	.294**	.231**	.377**	.388**	.368**	.353**	.429**	.453**	-.108	.408**	.464**	.479**	.815**	.884**									
CRB4	.248**	.278**	.289**	.361**	.414**	.365**	.339**	.438**	.424**	-.093	.427**	.447**	.479**	.686**	.717**	.747**								
CRB5	.235**	.304**	.219**	.362**	.395**	.347**	.283**	.437**	.405**	-.080	.363**	.418**	.424**	.737**	.853**	.837**	.716**							
CRB6	.208**	.240**	.219**	.342**	.398**	.331**	.325**	.448**	.402**	-.092	.375**	.374**	.379**	.673**	.764**	.772**	.685**	.836**						
IRB1	.283**	.320**	.250**	.369**	.432**	.453**	.361**	.473**	.384**	-.100	.429**	.448**	.464**	.560**	.575**	.632**	.547**	.631**	.588**					
IRB2	.309**	.361**	.315**	.417**	.464**	.496**	.380**	.504**	.422**	-.127*	.447**	.493**	.504**	.597**	.628**	.677**	.597**	.673**	.625**	.852**				
IRB3	.293**	.344**	.272**	.383**	.441**	.461**	.348**	.477**	.398**	-.128*	.411**	.465**	.464**	.629**	.645**	.704**	.591**	.697**	.635**	.824**	.890**			
IRB4	.247**	.296**	.258**	.336**	.414**	.433**	.319**	.441**	.371**	-.143*	.400**	.405**	.442**	.547**	.560**	.616**	.565**	.624**	.611**	.776**	.834**	.847**		
IRB5	.253**	.313**	.273**	.410**	.452**	.483**	.335**	.460**	.397**	-.125*	.421**	.470**	.455**	.564**	.618**	.654**	.552**	.702**	.645**	.771**	.845**	.888**	.843**	
IRB6	.298**	.313**	.293**	.415**	.455**	.460**	.347**	.471**	.408**	-.077	.404**	.468**	.462**	.565**	.617**	.636**	.544**	.676**	.664**	.760**	.842**	.850**	.829**	.886**

*Correlation is significant at the .05 level (p = < .05) **
*Correlation is significant at the .01 level (p = < .01) **

Table 3 presents the correlation matrix using Spearman Rho. The findings suggest that, except for SRB 4, all items have significant correlations. Some items also have R values greater than .80. It is notable that SRB4, albeit with little to negligible correlation with other items during this phase, has not yet been deleted or removed from the item pool. The reverse scoring may also explain this, as argued by previous developers (Campo et al., 2013)

Table 4. *KMO and Bartlett's Test*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		*.949**
Bartlett's Test of Sphericity	Approx. Chi-Square	7493.727
	df	300
	Sig.	.000**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy
*.90s = Marvelous**
.80s = Meritorious
.70s = Middling
.60s = Mediocre
.50s = Miserable
<.50s = Unacceptable

Bartlett's Test of Sphericity
*p < .05 = significant***

Table 4 presents the results of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy, which garnered a value of .949 and was interpreted as "marvelous." In addition, the p-value of Bartlett's Test of Sphericity resulted in .000, which is less than .05, which means that the relationship among the variables is not random. Therefore, such results indicate that the data can be submitted for factor analysis.

Table 5. *Reproduced Correlation*

	PB1	PB2	PB3	PB4	PB5	PB6	SRB1	SRB2	SRB3	SRB4	SRB5	SRB6	SRB7	CRB 1	CRB 2	CRB 3	CRB 4	CRB 5	CRB 6	IRB1	IRB2	IRB3	IRB4	IRB5
PB1	.589[a]																							
PB2		.547[a]																						
PB3			.575[a]																					
PB4				.656[a]																				
PB5					.725[a]																			
PB6						.580[a]																		
SRB1							.617[a]																	
SRB2								.649[a]																
SRB3									.619[a]															
SRB4										.016[a]														
SRB5											.659[a]													
SRB6												.613[a]												
SRB7													.617[a]											
CRB1														.705[a]										
CRB2															.850[a]									
CRB3																.886[a]								
CRB4																	.642[a]							
CRB5																		.837[a]						
CRB6																			.716[a]					
IRB1																				.743[a]				
IRB2																					.875[a]			
IRB3																						.894[a]		
IRB4																							.815[a]	
IRB5																								.870[a]
IRB6																								

Table 5 presents the reproduced correlations of the items. Since the objective of EFA is to reproduce the correlation matrix, residuals with a value greater than or equal to .10 may suggest that more factors remain to be extracted (Cudeck, 2000; Pett et al., 2003). The table found that the reproduced correlation of SRB4, which is .016a, is too low and violates the rule.

Table 6. *Total Variance Explained*

Initial Eigenvalues				*Extraction Sums of Squared Loadings*			*Rotation Sums of Squared Loadings*
Factor	*Total*	*% of Variance*	*Cumulative %*	*Total*	*% of Variance*	*Cumulative %*	*Total*
1	12.806	51.223	51.223	12.536	50.143	50.143	9.779
2	3.737	14.949	66.172	3.436	13.745	63.887	9.676
3	1.356	5.424	71.596	1.154	4.617	68.505	9.372
4	1.113	4.453	76.049				
5	.869	3.478	79.527				
6	.688	2.672	82.199				
7	.547	2.189	84.388				
8	.417	1.669	86.057				
9	.382	1.529	87.586				
10	.370	1.482	89.068				
11	.321	1.282	90.350				
12	.301	1.204	91.554				
13	.256	1.024	92.578				
14	.250	1.001	93.579				
15	.238	.952	94.531				
16	.213	.851	95.381				
17	.192	.768	96.150				
18	.164	.657	96.807				
19	.148	.593	97.400				
20	.139	.554	97.954				
21	.127	.509	98.463				
22	.115	.461	98.924				
23	.106	.423	99.346				
24	.086	.345	99.692				
25	.077	.308	100.000				

Extraction Method: Principal Axis Factoring

Table 6 shows a summary of the factors that are extracted before and after rotation. It is important to remember that the eigenvalue linked to a specific component indicates the extent to which the original variables (items) are explained by that particular component, summarizing the amount of variation accounted for. The components before rotation are on the leftmost side of the table, under the "Initial Eigenvalues." The first component accounts for as much variation as 12.806 of the original measured variables (items). The % can be computed by dividing the eigenvalue by the total number of items, which is 25: 12.806/25 = .5123 (or 51.23%). The second component accounts for as much variation as 3.737 of the original items; when computed into percentages, it is 66.17% of the variation. The third component accounts for as much variation as 1.356; when computed into %, it is 71.60%. From the 4th until the 25th component, it is seen that they have fewer variations than a single measured variable.

Under the "Extraction Sums of Squared Loadings," the eigenvalues are based on the final iterated Principal Axis Factoring. It is shown that Factor 1 accounts for as much variation as 12.536 of the original items, or when computed to %, it is 50.14%. Factor 2 accounts for as much variation as 3.436 of the original items or 63.89%. Lastly, Factor 3 accounts for as much variation as 1.154 of the original items or 68.51%.

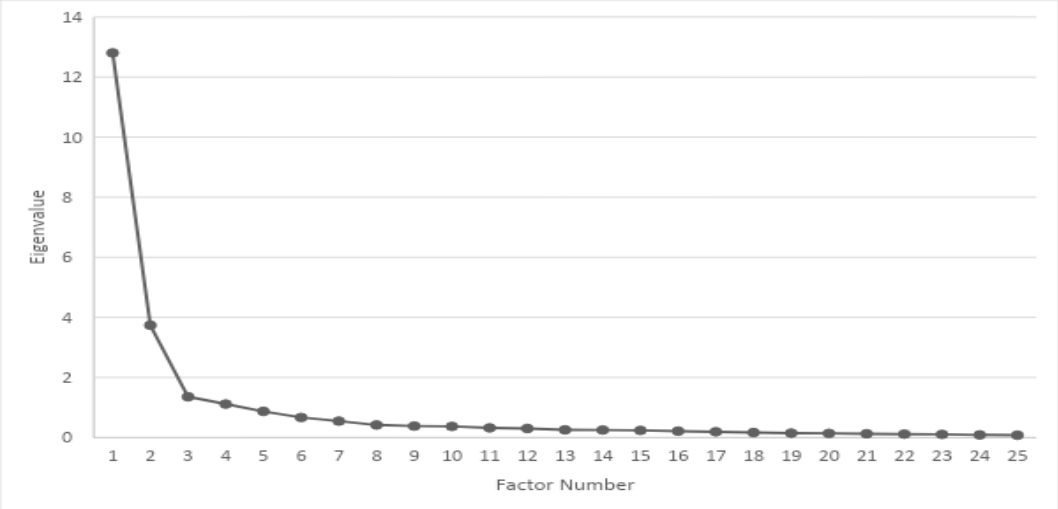

Figure 1. *Scree Plot*

In the scree plot, it is seen that three (3) factors have been retained based on the eigenvalue. The scree plot aims to identify trivial error factors by detecting an "elbow" or a distinct change in the slope, indicating the separation of true factors from error. According to Gorsuch (1983), the technique is subjective and could lead to potential disagreements among researchers regarding its interpretation (Child, 2006; Norman & Streiner, 2014). Thus, the syntax from O'Connor (2000) was used to perform the parallel analysis. In the results generated, it was found that there were four (4) factors; however, the researchers opted to stick with three (3) because the fourth factor only encompasses one item from the student-related burnout (SRB), specifically item four, "Do you have enough energy for family and friends during leisure time?", thus, retaining this factor will lead to over factoring.

Table 7. *Pattern Matrix*

	Factor		
	1	*2*	*3*
IRB4 - Do you feel that you give more than you get back when you work with your instructors?	.924		
IRB5 - Are you tired of working with your instructors?	.917		
IRB3 - Do you find it frustrating to work with your instructors?	.895		
IRB2 - Does it drain your energy to work with your instructors?	.882		
IRB6 - Do you sometimes wonder how long you will be able to continue working with your instructors?	.871		
IRB1 - Do you find it hard to work with your instructors?	.804		
SRB4 - *Do you have enough energy for family and friends during leisure time?* *			
PB1 - How often do you feel tired?		.828	
PB5 - How often do you feel worn out?		.816	
PB3 - How often are you emotionally exhausted?		.815	
PB4 - How often do you think "I can't take it anymore"?		.801	
SRB1 - Do you feel worn out at the end of the day?		.797	
SRB5 - Are your studies emotionally exhausting?		.766	
PB2 - How often are you physically exhausted?		.763	
SRB3 - Do you feel that every waking hour is tiring for you?		.717	
SRB2 - Are you exhausted in the morning at the thought of another day of class?		.713	
SRB6 - Do your studies frustrate you?		.681	
PB6 - How often do you feel weak and susceptible to illness?		.673	
SRB7 - Do you feel burnt out because of your studies?		.673	
CRB2 - Does it drain your energy to work with your classmates?			.953
CRB3 - Do you find it frustrating to work with your classmates?			.924
CRB5 - Are you tired of working with your classmates?			.838
CRB1 - Do you find it hard to work with your classmates?			.837
CRB6 - Do you sometimes wonder how long you will be able to continue working with your classmates?			.747
CRB4 - Do you feel that you give more than you get back when you work with your classmates?			.735

Extraction Method: Principal Axis Factoring.
Rotation Method: Oblimin with Kaiser Normalization. [a]

Table 7 presents the results of the pattern matrix using Principal Axis Factoring with Oblimin rotation. The matrix shows each extracted

factor's pattern coefficient per variable while controlling for the over variables. In the present study, the accepted pattern coefficient was set to >.40 since this is empirically supported as a useful coefficient in EFA (Bandalos & Gerstner, 2016; Hair et al., 2010).
The analysis reveals an appropriate three-factor structure in the Copenhagen Burnout Inventory-Student version. This is initially confirmed using the scree plot and parallel analysis. In this case, a four-factor solution is not feasible since the structure will be prone to over-factoring, given that when a four-factor structure is tested, only SRB 4 is correlated with the fourth factor.

Furthermore, factor one includes IRB 1 to IRB 6, which constitutes Instructor-related burnout, or the burnout experiences of students that originate from the teachers. The second factor consists of PB1 to PB6 and SRB 1 to SRB7 [excluding SRB 4], emphasizing that the two can be integrated to reflect on the student's academic burnout instead of separating personal burnout from studies-related burnout. Given that the scale aims to measure academic burnout and not other unrelated factors, it only justifies the integration between PB and SRB.

In addition, looking at and analyzing the items in personal burnout, these items are related in general. For instance, the statements: PB1, how often do you feel tired? PB2, how often do you feel exhausted? Moreover, PB4, how often do you think "I can't take it anymore"? These are items that may reflect studies-related burnout already. Meanwhile, in this three-factor structure of the CBI-S, SRB 4 will be deleted. Hence, the data will support a 24-item, three-factor model of the Copenhagen Burnout Inventory-Student version. The factors are Studies-related Burnout (SRB), Classmates-Related Burnout (CRB), and Instructor-Related Burnout (IRB).

Table 9. *Factor Correlation Matrix*

Factor	*1*	*2*	*3*
1	1.000	.488	.730
2	.488	.1000	.463
3	.730	.463	1.000

Extraction Method: Principal Axis Factoring.
Rotation Method: Oblimin with Kaiser Normalization.

Table 9 presents the correlations among the rotated factors. Factor 1 shows a moderately positive correlation (r = .488) with Factor 2. In addition, Factor 1 exhibited a strong positive correlation (r = .730) with Factor 3. Then, factor 2 also shows a moderately positive correlation (r = .463) with Factor 3.

Conclusion

The present study validated the 25-item Copenhagen Burnout Inventory-Student version, or CBI-S, in the 292 Filipino college students sample. The reliability analysis revealed promising results; the CBI has an overall α = .95, and its subfactors, namely PB α = .91, SRB = α 85, CRB α .95, and IRB α = .96. The scree plot and parallel analysis both supported a three-factor structure or model of the CBI-S. The KMO yielded a "marvelous" result (.949), together with the sphericity test of .000 or less than .001, both meeting the requirements of EFA. It is also important to note that the correlation matrices (including the reproduced correlation matrix) reveal a poor correlation coefficient in SRB-4, "Do you have enough energy for family and friends during leisure time?" It is also important to note that some items yielded correlation coefficients in the range of .80 to .90 (or above).

Nevertheless, the extracted three factors explain 68.51% of the variance, while the new factors are named Studies-Related Burnout (SRB), Classmates-Related Burnout (CRB), and Instructor-Related Burnout (IRB). Personal Burnout (PB) was integrated under SRB, as attested by the results of the pattern matrix. The integration can be justified by the highly interrelated items between PB and SRB, constituting the totality of students' burnout experiences. The integration also avoids potential over-factoring in the measurement. Hence, the results of the exploratory factor analysis for the CBI-S were different from the results of Campo et al. (2013) and other previously cited scholars.

The present findings are evidence supporting cultural differences among test-takers. It is also important to consider the present study's limitations, such as the limited number of students from one institution. This makes the generalizability of the results somewhat dubious. Therefore, it is recommended that future researchers spearhead another exploratory factor analysis using a Filipino-translated CBI-S that will be administered among college students from both private and public institutions. This method can be further elaborated when tied with confirmatory factor analysis to investigate the validity of the factor model that can be extracted from the EFA. Cross-cultural validation of this instrument is also deemed necessary, given that various cultures and contexts have different experiences and academic pedagogies being applied in education. Future research can also include testing intervention techniques that may be employed to help manage the students' burnout and improve their holistic mental health.

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