Original Paper

College Stress: Testing the Unidimensionality of a Standardized Stress Measuring Inventory Designed to Assess Stress among College Students

Avdi S. Avdija[1*]

[1] Department of Criminology and Criminal Justice, Indiana State University, USA

[*] Avdi S. Avdija, Department of Criminology and Criminal Justice, Indiana State University, USA

Abstract

Stress is a very common and unavoidable emotional strain among college students. The full domain of college stress has multiple dimensions, each with a unique perspective. The current study examines the unidimensionality and reliability of a 48-items standardized scale designed to measure perceived college stress among students. This Perceived Stress Inventory (PSI) consists of five subscales; each measuring a unique aspect of college stress. To test of unidimensionality and reliability of PSI, factor analysis and psychometric properties were examined. The analyses are based on the data that were collected from 302 college students. The results of this study show that the all five subscales of the Perceived Stress Inventory (PSI) are reliable and each of them is unidimensional.

Keywords

college stress, financial stress, academic stress, social stress, time management, family stress

1. Introduction

Stress is a natural part of life. Everyone experiences stress at some point in time or another. One particular time that many people experience stress is throughout their college experience. It is something that can determine their future, where they will meet lifelong friends, meet potential spouses and make memories that will last forever. College is also a time when students can obtain mountains of debt, struggling to obtain good grades, and other stressors. In the life of the typical college student, there are a plethora of factors that may prove difficult for students who find themselves engaged in the new and exciting environment that is college. While movies depict this time in life as nothing but a party, many students find out the hard way that stress plays a massive role in the life of a young

collegiate. In many cases, students face a combined number of stressors that include all different areas of their lives. Academia, finances, time management, social, and familial stressors are among those. This literature review focuses on these factors and how they impact college students and their stress levels.

1.1 Academic Stressors

Academic stressors are very common among students. As one progresses in academia, presumably, the material which one is studying will increase in difficulty. However, many believe that the academic stressors facing college students today are relatable to that of symptoms of Post-Traumatic Stress Disorder or PTSD (Woolman, Becker, & Klanecky, 2015). PTSD is commonly associated to life instances of intense stress which may cause and individual to develop coping mechanisms in order to deal with these symptoms. Research shows that, in such instances of female college students who reported they had been exposed to some sort of trauma, including instance of academic trauma, a large percentage of these women turned to coping with alcohol in order to subside their symptoms. A number of these female students report that their low academic performance is directly related to their coping strategies which are maladaptive in nature (Woolman et al., 2015).

Given that sufferers of PTSD include individuals who have fought in wars and seen things that are unimaginable to the average person, including female college students on the list of those sufferers of PTSD based off of negative academic performances appears to raise red flags. Nonetheless, stress is manifested in different forms. One instance would be the inability of students to properly concentrate, absorb information, or the idea that students may lack the interest in the topic of study may increase a student's risk of symptomatic academic stress (Bhujade, 2017). While a simple solution may be to encourage students to engage in coursework that appeals to them, many students may find their academic path shifting as they navigate the curriculum on their campus. Despite the ability for students to add and drop courses, grades may negatively be impacted as well as the timeline of a traditional undergraduate student timeline. Students who choose to change their major while enrolled in a different program may have to find extra time and money to stay on campus for a longer amount of time which can then create additional stressors. According to recent research, the most frequently reported stressor within academic is grades and competition (Lee, Kang, &Yum, 2005). Nevertheless, college stress is a multifaceted emotional strain.

1.2 Financial Stressors

Students often times worry about debt loads and other financial responsibilities that negatively affect their well-being. This type of worry is even worse for those with financial difficulties, including low-income families, and those first generation college students. Not only is there financial strain on a majority of college students, but those who are first generation college students may experience a higher influx of stress when determining how and where they will attend a four-year college. In this

regard, stress starts even before starting college. In fact, for some perspective students, financial stressors can determine if they ever attend or start college and drop out before completing it. Research shows that, in comparison to their non-low income counterparts, only about 10% of students in low-income areas will obtain a college degree by the age of 25 (Adams, Meyers, & Beidas, 2016). Adams et al. (2016), in their study addressed the relationship between the financial strain and several outcome variables, including the psychological symptoms, academic, and social integration of students using a cross-sectional survey, all amongst first-generation college students. This shows that one type of stress, in this case, financial stress, can play the role of a mediating factor, in a negative way, affecting other factors such as physiological and psychological well-being.

Along this line, White and Perrone-McGovern's (2017) study shows that those students who experience high financial stress would have lower levels of career decisions and academic self-efficacy. Thus, financial stress has an effect on future choices that students make. Furthermore, financial stress can also affect academic performance and retention. According to Trombitas (2012), about one third of students admitted that financial stress negatively affected their academic performance. Among the highest stress-producing factors were the need to repay loans, the cost of education, borrowing money for college, etc. (Trombitas, 2012). Students with higher amounts of student loans are less likely to continue college, and likely that they never graduate. Britt, Ammerman, Barrett, and Jone's (2017) study confirm this hypothesis in their resent research, indicating that students who discontinued college had higher student loans compared to those who successfully completed or continued college (Britt et al., 2017).

1.3 Time Management Stressors

Students in college often struggled with time management. Many students find it difficult to balance outside life and school. Students who have multiple classes and/or jobs to financially care for themselves, find themselves multitasking quite frequently. They tend to struggle with time management often because of the responsibility they have placed upon themselves with other things. Although school may come first in a student's life, jobs tend to be equally important factors as well. Not only does a student have to excel in school, but at work as well, that is if they want to keep a good work history. Many jobs in college towns are willing to work with college students to make their schedule a little less hectic; nevertheless that is not always the case. Students must utilize time management wisely and prioritize activities accordingly. Thus, time is another aspect of the life of a collegiate may find difficult to manage while attempting to go to school and to have a social life at the same time. Macan and Shahni (1990) study shows that those who reported they have good time management skills are those students who show success in their GPA and academic performance (Macan & Shahni, 1990). After studying a group of over 100 undergraduate students, they found that there were many correlations between time management and those who reported stress or performance issues.

70

Similarly, Misra and McKean (2000) looked at ways to increase time management skills among young people looking at goal-setting, making lists of priorities, organizing their work space, and how those undergraduate students perceived their control of time. In this study, a significant finding was the differences between gender roles, indicating that females experience stress at a higher level than their male counterparts. However, this finding contradicts the findings of a more recently published research article by Khatib (2014). According to Khatib, females reported a higher time managements compared to males, and higher time management was negatively associated with stress (Khatib, 2014). This means, that individuals with higher time management experienced lower stress level.

1.4 Social Stressors

On top of schooling, working, and other aspects of life, students must find time to engage friendships and relationships outside of those activities. One of the great aspects of the college experience is meeting new people. By meeting new people, individuals are able to possibly meet people that may be culturally different and build long lasting relationships with such people. Once these relationships are built, students find it hard to maintain these relationships due to the fact they find themselves busy with other aspects of the college life. Looking at it from another point of view, students also feel that they are not the only ones busy, so are their friends. Whether their friends are on campus with them, or different university, or back in their hometown, often times students struggle trying to stay connected or reconnecting with their friends.

Students must find time out of their busy schedules to do things for themselves socially. As mentioned above, making time to have a social life in college can cause stress when one is trying to remain social, but also focus on school and perhaps work. Many scholars connect stress, which may be social in nature, to drug use among college students. Coleman and Trunzo look at over 200 undergraduate and graduate students that aged 18-24 in order to determine minor drug use (alcohol and marijuana) and more serious drug use (narcotics). By using self-report tools, researchers were able to gather information concerning stress levels and drug use. Their study found that social stress and neuroticism, which was found to be a common trait of drug users, in combination, were largely able to predict total drug use (Coleman & Trunzo, 2015). So, in addition to dealing with social stressors that face college students, those who display neurotic tendencies are more likely to engage in these risky behaviors while in college, further contributing to failures in college.

1.5 Family Stressors

After examining those stressors that are determined to be financial concerning, the ability of parents to be able to send their children to a university while not breaking the budget, this can also be an applied family stressor to college students. Perhaps students feel guilty for using what little money their parents have in order to send them to school. This can create a stressor amongst the family unit whether or not it actually exists.

71

In addition to these notions, students may feel that their families have higher expectations than what a student may feel he/she is able to realistically achieve. Katz and Nelson (2007) tested a hypothesis regarding those students who feel as though their needs in regards to parental care have not been met while pursuing their undergraduate degrees. These additional familial stressors may induce a greater amount of self-criticism on behalf of the student (Katz & Nelson, 2007). After gathering information from undergraduate students using the self-reporting *Levels of Self-Criticism Scale*, they found that there was a correlation between family stress and self-criticism, which may then affect a student's likelihood of being successful in the secondary education ventures. Moreovver, family stress can also be manifested in a form of a broken quality of relationship between the family and the student, which correlates with stress (Yazedjian, Toews, & Navarro, 2009; Putwain, Woods, & Symes, 2010). In other words, a good quality relationship between the family and the student acts as a stress-reducing factor (Anders, 2011).

2. Summary

College can be a very stressful time for students and families alike. Academic stressor, financial stressors, time management stressors, social stressors, and family stressors can create additional challenges for those students attempting to be successful while working towards their academic and career goals. As all of these studies show, perceived stress, regardless of what type of stress it may be, can have a negative impact on college students and their abilities to maintain a positive self-image. These stressors may cause college students to engage in risky behaviors, such as drug use, which can create additional issues for students, can lead to problems with retention, etc. All in all, stressors, whether they are real or perceived, can create additional issues for students who are attempting to have a successful secondary educational experience.

3. The Present Study

As stated in the abstract, the primary objective of this research study is to determine whether the subscales of a 48-item Perceived Stress Inventory (PSI) designed to measure stress among college students are unidimensional or not. The second objective is to measure the reliability of the survey instrument. The first objective will be achieved by examining the results of factor analysis and the second objective by examining the psychometric properties of subscales. Building on previous studies, the measuring inventory that is tested in this study has been refined and re-constructed to broaden the domain of the perceived stress inventory (Note 1). The primary base of this inventory is the 1999's Student Stress Survey (SSS) (Ross, Niebling, & Heckert, 1999), as well as Insel and Roth's 1995 stress inventory. However, the current measure (PSI) is reorganized and more complete.

4. Methods

4.1 The Data and Participants

The data were collected from a sample of 302 college students. Of which, 6.6% were freshmen, 28.8% were sophomores, 39.1% juniors, and 25.5% seniors. The majority of them were between the ages of 18 and 22 years old (89.7%, M = 21.2, SD = 3.03). In terms of gender, 44.7% were females and 55.3% were males. The racial composition of the sample is a good representation of the university from which the data were collected. The descriptive statistics show that 70.2% of the participants were whites, 15.9% African Americans, 4% Hispanic/Latinos, 2.3% Asians, and the rest were other races.

4.2 The Data Analysis

Since the primary objective of this research study was to determine whether or not the subscales of perceived stress among college students are unidimensional, the analyses focused primarily on looking at the factor analysis, including the Scree Plots for the subscales. However, the first step in this process was to determine the reliability of the composite measures for each scale. The reliability of the perceived stress subscales were measured by looking at the internal consistency and stability of scores within each subscale equated with Cronbach's alpha (DeVellis, 1991). The next step included factor analysis. This analysis also include the Kaiser-Meyer-Olkin (KMO) measure of the sampling adequacy (Kaiser, 1974), and Bartlett's Test of Sphericity to determine that the correlation between items within each subscale is statistically different from zero. The last step that contributed significantly to the main objective of this study was the Scree Plot for each subscale. The reason for including Scree Plots was to show a visual display of the dimensionality of each subscale. The "elbow" on the Scree Plot shows whether or not the subscales are one-factor solutions or multiple-factor solutions.

5. Results

The Perceived Stress Instrument (PSI) that was designed to measure stress among college students has 48 items total. This inventory is designed to measure stressors in five different areas: financial stressors (7 items), time management stressors (9 items), social stressors (12 items), academic stressors (13 items), and family stressors (7 items). In terms of content validity of this inventory, these five dimensions describe the full domain of perceived college stress among students. Each item on these scales is measured on a 10-point Lickert scale, ranging from 0 (no stress) to 10 (high stress). See Appendix A for a complete list of items.

5.1 Reliability Analysis

Reliability of a measuring instrument refers to the consistency of that measuring instrument when it's used on repeated trials (Carmines & Zellrn, 1979). It is the first step in assessing the validity of the measuring instrument, which is not assessed in this study. In other words, reliability is the prerequisite for validity of a measuring instrument. In this study, the purpose of testing the reliability of subscales

was to see the relationship between individual items within each subscale. That way, the subscales consistently reflect the constructs that are measured. The reliability of subscales was assessed by looking at the Crombach's Alpha levels, which is widely known as the test of internal consistency of scales. Crombach's Alpha tests the average correlation of items in the measuring instrument (Santos, 1999).

Crombach's Alpha values range from 0 to 1, and values that approach 1 have a higher internal consistency, which are desirable for every measuring instrument. Since stress is a psychological construct, a 0.70 would be the cut-off value of internal consistency measure (Kline, 1999; DeVellis, 2003). Based on this cut-off value as a base measure for assessing the reliability, the Crombach's Alpha level for each subscale, as shown in Table 1, is adequate. In fact, most subscales show an internal consistency value of 0.08 or above. This means that the measuring instrument is expected to produce reliable results when used in repeated trials. Furthermore, even if these subscales are used independent of one another (i.e., some researchers may consider using them selectively to measure a particular dimension of college stress), they still produce reliable results.

Table 1. Cronbach's Alpha for Each Subscale in the Perceived Stress Inventory (PSI)

Subscales	Crombach's Alpha	Number of Items
Financial stress	.891	7 items
Time management stress	.871	9 items
Social stress	.820	12 items
Academic stress	.906	13 items
Family stress	.739	7 items

5.2 Factor Analysis

The purpose of using factor analysis in this study was to uncover the underlying structure (Norris & Lecavalier, 2010) of this stress measuring inventory designed to specifically measure college stress among students. To put it another way, factor analysis is a statistical technique that helps identify whether the subscales of this inventory are one-factor solution or multi-factor solution. It is one of the techniques used to determine whether the subscales are unidimensional or not. A unidimensional scale is one that measures only one thing/dimension. If a scale or subscale measures only one dimension of stress, then it is considered a one-factor solution scale/subscale, which is a desirable outcome for research purposes.

Before looking at the eigenvalues on Table 3, it is important to review the results of Kaiser-Meyer-Olkin Measure of sampling adequacy (KMO) and Bartlett's Test of Sphericity, both sets

74

of results are presented in Table 2 below. As stated in the "Data Analysis" section above, the KMO is considered a test of sampling adequacy, and the Bartlett's Test of Sphericity measures whether the variables in the composite measure are correlated statistically different than zero. For the BTS test, the correlation matrix of variables should be statistically significant compared to the identity matrix. The significance level of Bartlett's Test of Sphericity should be less than .05 to be considered adequate.

The KMO values range from 0 to 1. Higher values, typically those that approach 1, are desirable because they indicate that using factor analysis would be an adequate statistical technique to explore the data. The cut-off value of KMO is 0.50 (Field, 2009). Some researchers argue that the cut-off value should be 0.60 (Tabachnick & Fidell, 2014).

Based on the above parameters for the KMO and BTS, the data in Table 2 show that all subscales have adequate scores. The KMO for each subscale is way above the cut-off value of .05/.60, and the BTS is statistically significant at p < .000, indicating the correlation between items in subscales is statistically significant and different from zero.

Table 2. Kaiser-Meyer-Olkin Measure of Sampling Adequacy and Bartlett's Test of Sphericity

Subscales	KMO	BTS Chi-Square	BTS Sig.	BTS df
Financial stress	.879	1230.52	.000	21
Time management stress	.832	1323.18	.000	36
Social stress	.833	931.87	.000	66
Academic stress	.901	2249.86	.000	78
Family stress	.776	423.54	.000	21

Table 3 below shows the eigenvalues for the first three components of each subscale. Ideally, a scale/subscale with only one eigenvalue above 1 is considered unidimensional. However, even if there are more than one eigenvalue with the value of 1 or above, the first component with the highest eigenvalue should explain a significantly larger portion of the variance compared to other components with eighenvelues 1 or above. The factor analysis in Table 3 show that the financial stress subscale has only one eigenvalue of 4.292 (above 1), explaining a significantly larger portion of the variance (61.31%). The time management stress subscale had two eigenvalues above 1. The first eighenvalue (4.493) explained 49.92% of the variance, whereas the second eigenvalue explained 12.60% of the variance. The social stress subscale has two eigenvalues above 1. The first explains 34.41% of the variance, and the second explains 11.35% of the variance. The academic stress subscale has two eigenvalues above 1 also. The first explains 48.47% of the variance and the second explains 13.03%.

The family stress subscale has two eigenvalues above 1, with the first one explaining 39.74% of the variance and the second one explaining 13.03% of the variance. Overall, the first eigenvalue of each subscale is significantly larger than the second one, which is a convincing piece of empirical evidence to conclude that these subscales are a one-factor solution scales.

Table 3. Factor Analysis for All Subscales

	Eigenvalues for the First Three components			% of Variance for the First Three eigenvalues		
Subscales	1	2	3	1	2	3
Financial stress	4.292	.815	.583	61.31%	11.64%	8.32%
Time management stress	4.493	1.134	.978	49.92%	12.60%	10.87%
Social stress	4.129	1.136	.910	34.41%	11.35%	9.01%
Academic stress	6.301	1.695	.848	48.47%	13.03%	6.52%
Family stress	2.782	1.208	.831	39.74%	17.25%	11.87%

Note. Extraction Method: Principle Component Analysis with varimax rotation.

The Scree Plots presented in Figure 1 show a visual display of computed eigenvalues that are presented in Table 3. Even though this statistical technique is considered somewhat not a clear decision-making model in research (see Courtney, 2013), it is one of the best visual displays that can be used to determine the unidimensionality of a measuring instrument. Based on the Scree Plot display of eigenvalues, the subscales are considered a one-factor solution (e.g., unidimensional). The "elbow" on the Scree Plot represents a sharp change on the eighenvalues with the first component significantly different than other components. If there is only one component above the elbow, then the scale/subscale is considered unidimensional, measuring only one dimension of, in this case, college stress. The Scree Plots in Figure 1, coupled with the percent of variance for the first eigenvalue of each subscale in Table 3, clearly show that, for most subscales, the number of components above the elbow is only one, which is a good indication of unidimensionality of subscales.
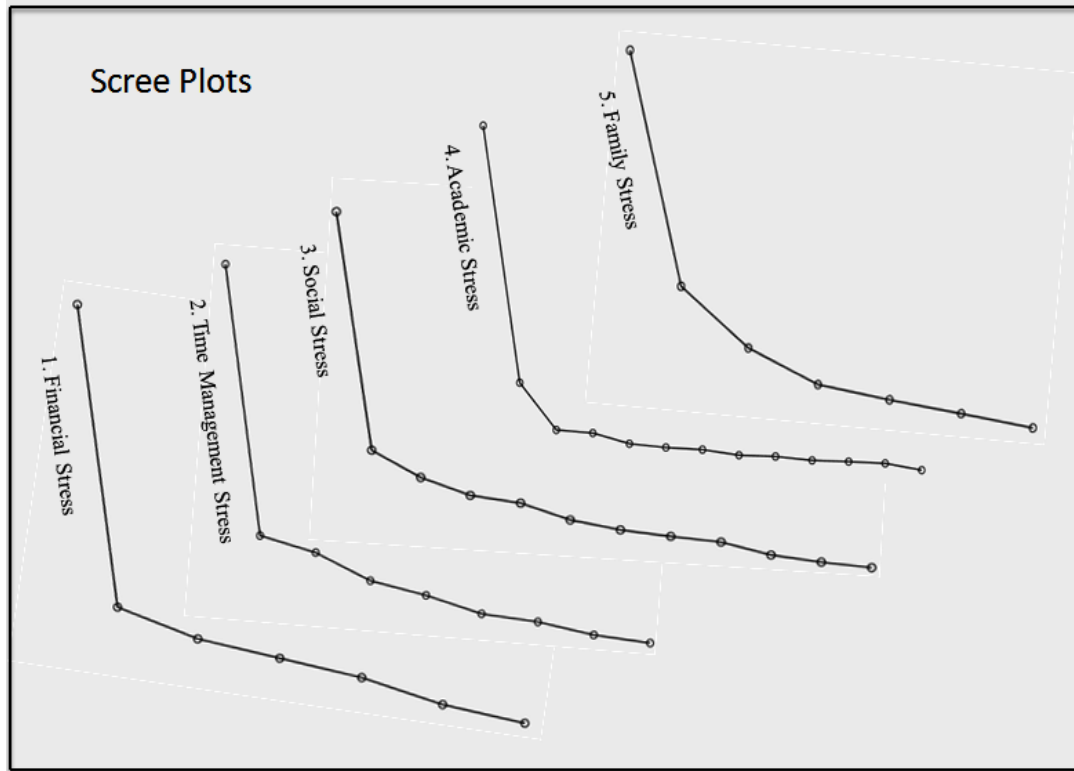
Figure 1. Scree Plot Showing Eigenvalues for Each Components of Subscales, in Factor Extraction of the Data from 302 Subjects

6. Discussion

There are many scales that have been developed to measure college stress, but not all of them are as complete as the PSI inventory that's tested in this study. Some of them have 14 items designed to measure college stress (Civitici, 2015). Brown and Blankson (2013), for example, used an 18-item inventory to measure college stress, but their scale focused on specific race; particularly focusing on colleges students stress for black women. Oh, Blondin, Cochran, and Williams (2011) tested an 11-item College Student Stress Scale inventory developed by Feldt (2008). However, one inherited weakness of that scale is that it does not include the full domain of college stress. Thus, it lacks content validity. Other researchers have developed and used stress inventories, but again most of them are area-focused inventories with one or two dimensions of stress (i.e., measuring only academic stress, college life stress, a combination of two different dimensions, etc.). Such scales were used by Struthers, Perry, and Menec (2000) focusing on academic stress, Rocha-Singh's (1994) GSI-R inventory focusing on environmental, academic, and family dimensions of stressors; Burge's (2009) 22-items scale focusing on three dimensions of stress: academic stress, time-related stress, and social-environmental stress, etc.

The perceived stress inventory that is tested in this study has 48 items, measuring five unique domains of college stress (see Appendix A). This PSI inventory measures financial stress, academic stress, social stress, time management stress, and family stress. It has a very broad domain, thus contributing to an advanced content validity of this stress inventory. The analyses in this study show that the 48-items Perceived Stress Inventory (PSI) designed to measure college stress is a reliable measure. More importantly, what comes out of this current study is that all five subscales are unidimensional. They can be used individually to measure a specific segment of college stress, a combination of two or more, or all together to measure the full domain of college stress.

References

Adams, D. R., Meyers, S. A., & Beidas, R. S. (2016). The relationship between financial strain, perceived stress, psychological symptoms, and academic and social integration in undergraduate students. *Journal of American College Health*, *64*(5), 362-370. https://doi.org/10.1080/07448481.2016.1154559

Anders, K. (2011). *Stress and Family Relationships among College Students*. Poster presented at the 39th Annual Western Pennsylvania Undergraduate Psychology Conference, New Wilmington, PA.

Bhujade, V. M. (2017). Depression, anxiety and academic stress among college students: A brief review. *Indian Associate of Health, Research and Welfare*, *8*(7), 748-751.

Britt, S. I., Ammerman, D. A., Barrett, S. F., & Jone, S. (2017). Student loans, financial stress, and college student retention. *Journal of Student Financial Aid*, *47*(1), 24-37.

Brown, A. I., & Blankson, N. (2013). Developing the college student stress inventory for black women (CSSI-BW). *Interdisciplinary Journal of Undergraduate Research*, *2*, 1-15.

Burge, J. (2009). *Coping Frequency, Coping Effectiveness, and Personality Factors in University Students* (Unpublished thesis). University of Canberra, Australia.

Carmines, E. G., & Zellrn, R. A. (1979). *Reliability and Validity Assessment*. Beverly Hills, CA: SAGE Publishing, Inc. https://doi.org/10.4135/9781412985642

Civitci, A. (2015). Perceived stress and life satisfaction in college students: Belonging and extracurricular participation as moderators. *Procedia—Social and Behavioral Sciences*, *205*, 171-181. https://doi.org/10.1016/j.sbspro.2015.09.077

Coleman, J., & Trunzo, J. (2015). Personality, social stress, and drug use among college students. *Psi Chi Journal of Psychological Research*, *20*(1), 52-58. https://doi.org/10.24839/2164-8204.JN20.1.52

Courtney, M. G. R. (2013). Determining the number of factors to retain in EFA: Using the SPSS R-Menu v2.0 to make more judicious estimations. *Practical Assessment, Research and Evaluation*, *18*(8), 1-14.

DeVellis, R. F. (1991). *Scale Development: Theory and Application*. Newbury Park, CA: SAGE Publications, Inc.

DeVellis, R. F. (2003). *Scale Development: Theory and Application* (2nd ed.). Thousand Oaks, CA: SAGE Publications, Inc.

Feldt, R. C. (2008). Development of a brief measure of college stress: The college student stress scale. *Psychological Reports*, *102*, 855-860. https://doi.org/10.2466/pr0.102.3.855-860

Field, A. (2009). *Discovering Statistics Using SPSS* (3rd ed.). London: SAGE Publications, inc.

Insel, P. M., & Roth, W. T. (1985). *Core Concepts in Health*. Palo Alto, CA: Mayfield.

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, *39*, 31-39. https://doi.org/10.1007/BF02291575

Katz, J., & Nelson, R. (2007). Family experiences and self-criticism in college students: Testing a model of family stress, past unfairness, and self-esteem. *The American Journal of Family Therapy*, *35*, 447-457. https://doi.org/10.1080/01926180601057630

Kline, P. (1999). *A Handbook of Psychological Testing* (2nd ed.). London: Routledge Publishing, Inc.

Lee, D. H., Kang, S., & Yum, S. (2005). A Qualitative assessment of personal and academic stressors among Korean college students: An exploratory study. *College Student Journal*, *39*(3), 442-448.

Maca, T. H., & Shahani, C. (1990). College students' time management: Correlations with academic performance and stress. *Journal of Educational Psychology*, *82*(4), 760-768. https://doi.org/10.1037/0022-0663.82.4.760

Misra, R., & McKean, M. (2000). College student's academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Studies*, *16*(1), 41-52.

Norris, & Lecavalier. (2010). Evaluating the use of exploratory factor analysis in developmental disability psychological research. *Journal of Autism and Developmental Disorders*, *40*(1), 8-20. https://doi.org/10.1007/s10803-009-0816-2

Oh, E. J., Blondin, C. A., Cochran, J., & Williams, R. L. (2011). Perceived stressors among college students in an American and Korean University. *Korean Social Science Journal*, *38*(2), 81-113.

Putwain, D. W., Woods, K. A., & Symes, W. (2010). Personal and situationsl predictors of test anxiety of students in post compulsory education. *British Journal of Educational Psychology*, *80*, 137-160. https://doi.org/10.1348/000709909X466082

Rocha-Singh, I. A. (1994). Perceived stress among graduate students: Development and validation of graduate stress inventory. *Educational and Psychological Measure*, *54*(3), 714-727. https://doi.org/10.1177/0013164494054003018

Ross, S. E., Niebling, B. C., & Heckert, T. M. (1999). Sources of stress among college students. *College Student Journal*, *33*(2), 312-318.

Santos, R. A. (1999). Cronbach's Alpha: A tool for assessing the reliability of scales. *Journal of Extension*, *37*(2). Retrieved from http://www.joe.org/joe/1999april/tt3.php

Struthers, P., & Menec. (2000). An examination of the relationships among academic stress, coping, motivation, and performance in college. *Research in Higher Education*, *41*(5), 581-592. https://doi.org/10.1023/A:1007094931292

Tabachnick, & Fidell. (2014). *Using Multivariate Statistics* (6th ed.). Boston, MA: Pearson.

Trombitas, K. (2012). *Financial Stress: An Everyday Reality for College Students*. Retrieved from https://www.universitybusiness.com/sites/default/files/Inceptia_FinancialStress_whitepaper.pdf

White, A. V., & Perrone-McGovern, K. (2017). Influence of generational status and financial stress on academic and career self-efficacy. *Journal of Employment Counseling*, *54*, 38-48. https://doi.org/10.1002/joec.12049

Woolman, E. O., Becker, M. M., & Klanecky, A. K. (2015). PTSD symptoms mediate academic stress and drinking to cope in college students. *Journal of Drug Education: Substance Abuse Research and Prevention*, *45*(2), 96-112. https://doi.org/10.1177/0047237915607282

Yazedjian, A., Toews, M. L., & Navarro, A. (2009). Exploring parental factors, adjustment, and academic achievement among white and Hispanic college students. *Journal of College Student Development*, *50*, 458-467. https://doi.org/10.1353/csd.0.0080

Note

Note 1. This current study does not test the construct validity of this stress-measuring inventory. It only tests the reliability and unidimensionality of subscales within the 48-item inventory designed to measure stress among college students.

Appendix A

Perceived Stress Scale (PSI)

This inventory contains statements dealing with student-life stressors. Read it carefully and respond to each statement as it relates to you as a student.

Use the 10-point scale to rank the level of stress each college stressor brings to your life experience as a student. Circle only ONE answer for each statement.

Financial Stressors	**No Stress** **Moderate** **High Stress**
1. Worried about financial responsibilities	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
2. Borrowing money for college	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
3. The need to repay loans	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
4. The cost of tuition	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
5. The cost of textbooks	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
6. Loss of financial support from college	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
7. The need to find a job after school	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
Time Management Stressors	**No Stress** **Moderate** **High Stress**
8. Difficulties managing both school and work at the same time	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
9. Difficulties finding time to study	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
10. I'm unable to control the time I spend	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
11. Hard time getting papers done on time	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
12. Missed too many classes	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
13. Not getting enough time to sleep	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
14. Sleeping too much	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
15. Change in eating habits	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
16. Change in sleeping habits	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
Social Stressors	**No Stress** **Moderate** **High Stress**
17. Being on one's own in a new environment – with new responsibilities	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
18. Awareness of one's sexual identity and orientation	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
19. New love interest	0----1-----2-----3-----4-----5-----6-----7----8-----9----10

20. Hard time making friends at school	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
21. Problems with boyfriend / girlfriend	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
22. Change in social activities	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
23. Making decisions, on a higher level than one is used to	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
24. Substance abuse	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
25. Minor violations of the law (e.g. traffic ticket)	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
26. First term in college	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
27. Exposure to new people, ideas, and temptations	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
28. Problems with roommate	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
Academic Stressors	**No Stress**　　　　　　　　　　**Moderate** **High Stress**
29. Greater academic demands	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
30. Failing grade in an important or required class	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
31. Change in college (transfer)	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
32. Not being able to take good notes in classes	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
33. Academic probation (or fear of being placed)	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
34. Serious conflict with instructor	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
35. Lower than expected grades	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
36. Change in major	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
37. Increased workload from college	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
38. Course load	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
39. Preparing for exams	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
40. Writing term papers	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
41. Keeping up with the required readings	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
Family Stressors	**No Stress**　　　　　　　　　　**Moderate** **High Stress**
42. I don't get enough support from my family	0----1-----2-----3-----4-----5-----6-----7----8-----9----10

82

43. Being away from home, often for the first time	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
44. Parental issues (child care issues)	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
45. Preparing for life after graduation	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
46. My parents' expectation of my grades	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
47. Serious argument with significant other	0----1-----2-----3-----4-----5-----6-----7----8-----9----10
48. Parental alcoholism and family dysfunctions	0----1-----2-----3-----4-----5-----6-----7----8-----9----10

83