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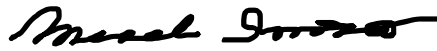
2019-2020 Honors Thesis

**Out of Mind: Undergraduate Predictors of
Generalized Anxiety Disorder Symptoms**

Michael S. Lanzaro

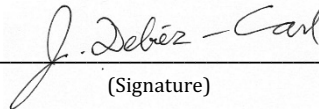
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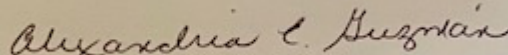
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Out of Mind: Undergraduate Predictors of Anxiety Symptoms

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Abstract

Demographic factors associated with anxiety have been studied extensively and are often characterized by interconnected relationships. These associations between variables provide insight into the predictive ability of anxiety in undergraduate populations. However, few studies if any have investigated the relationships between class level, sex, honors status, and undergraduate specialization as predictors of anxiety among an undergraduate American university sample. The results of this study provide key insight into the psychopathological development of undergraduate students and anxiety levels as it pertains to academic and demographic variables. By using a multiple linear regression analysis, demographic variables of American undergraduate students are compared to Penn State Worry Questionnaire (PSWQ) scores. Participants have been selected at a medium sized university through the usage of emails containing a survey questionnaire. Once completed, the participant's responses to class level and sex are compared to PSWQ scores, allowing associations to be quantified. Findings suggest that female students experience higher levels of anxiety symptoms; class rank, major, and honors status are not significant predictors of symptom presentation in the sample.

Keywords: Anxiety, Undergraduates, Penn State Worry Questionnaire.

Introduction

Researchers investigating the effects of anxiety in university students frequently associate symptom presentation to variables such as age, sex, and other personal characteristics. This practice conceptualizes anxiety as a barrier to academic success rather than a byproduct of educational or background environments (Heller & Cassady, 2017). As colloquial understanding of anxiety pathology evolves, a growing number of scholars seek to expand their use of demographics as predicting variables in higher education. Variables such as class level, biological sex, and undergraduate major have steadily grown in popularity. Yet, few studies consider the complex integration of these variables and how they collectively predict anxiety symptoms; this scholarly neglect is particularly true for undergraduate populations. Therefore, it is important to note this study does not provide diagnoses for anxiety related disorders, rather, it provides insight into the presentation of symptoms.

One such model, multiple linear regression, allows for accurate insight into the accountability of demographics variables in predicting anxiety. It is very likely that several variables or more might be needed to predict symptoms of anxiety. Moreover, an abundance of previous studies rely primarily on analysis of variance or qualitative methodology for similar variables (Pisarik et al., 2017). Therefore, these variables often fail to capture the true extent of the predictive capabilities of demographic variables. Moreover, each study investigating these variables have relied on samples in nations other than the US. Socio-cultural expectations, educational structure, economic wealth, and geographical environments differ from country-to-country. Resultantly, this limits the generalizability of previous findings and suitability of demographic variables to domestic university populations in the continental US.

By use of multiple linear regression modeling, this study examines the effects of honors status, class level, sex, and undergraduate major on anxiety symptoms, while controlling for each predictor simultaneously. Thus, expanding our understanding anxiety risk factors in an American undergraduate sample.

Literature Review

Anxiety and contributing factors among undergraduate students are often poorly understood. Moreover, anxiety is a very broad term for excessive worry which can present in many different forms and subtypes. Anxiety is defined as excessive worry which occurs for the majority of days for at least 6 months (American Psychiatric Association, 2013). Symptoms of anxiety include restlessness, irritability, difficulty concentrating, and sleep disturbances. Such symptoms have been linked to impairment to academic performance (American Psychiatric Association, 2013). With regards to the prevalence of anxiety, recent research studies conducted on college campuses have found that 15.6% of undergraduate students are experiencing any type of diagnosable anxiety on a daily basis, and these rates are rising steadily (Eisenberg, 2010). However, little is known regarding the demographic make-up of American undergraduate students experiencing symptoms of anxiety. If undergraduate students are at-risk for diagnosable anxiety levels, early preventative interventions may be able to mitigate an increase in morbidity rates. Conversely, student demographics such as college enrollment status have been found to be poor indicators of anxiety (Blanco et al., 2008). Therefore, understanding demographic variables associated with anxiety is crucial to ensure accessibility of psychological services among undergraduate students.

Many other socio-demographic factors have been associated with the progression of anxiety symptoms; undergraduate major, academic support, and career uncertainties are notable

variables that have been posited by previous researchers (Lanzaro, 2019; Pisarik et al., 2017). However, few researchers have considered implementing similar factors such as sex or class level as potential mediating variables within these circumstances. Considering class level may encompass various sub-factors such as age and exposure to aforementioned stressors, it is likely this may be a factor associated with anxiety related outcomes.

Moreover, the relationship between class level and psychological distress (PD) in a nation-wide first-year French undergraduate sample has been investigated. Implications of the study reveal PD levels among first-year studies is moderately high, consistent across studies in other countries, and differed within gender or academic expectations (Verger et al., 2009). Similarly, studies investigating demographic and psychosocial development among Australian students - across all class levels - support the claims that first-year students experience higher levels of anxiety symptoms (Farrer et al., 2016). Therefore, it is likely class level differences may be present within an American undergraduate sample. Furthermore, a longitudinal study investigating anxiety in a Japanese student sample revealed surprising results regarding autonomy and symptom reduction. Although indirectly related to class level, results suggest that as students become more independent anxiety symptoms decrease (Takebayashi, 2018). That being said, undergraduate students develop more autonomy over time as they gain more exposure to: internships, entry-level employment, independent living, and academic content. Nonetheless, upper-class levels and anxiety-specific related measures with an American-based sample remain inconclusive.

Variance between biological sexes has also been identified as factors associated with anxiety related disorders. Statistical data suggests that the most common disorders experienced by college-age adults are anxiety-related disorders. Notably, females are approximately twice as

likely to be diagnosed with anxiety compared to men (Anxiety and Depression Association of America, 2020). Although, the unique stressors disproportionately affecting undergraduate females remain somewhat inconclusive, a few emerging trends have been identified. Studies utilizing Islamic and Arabic undergraduate samples suggest anxiety rates are significantly higher among females (Abdel-Khalek & Alansari, 2004; Alansari, 2006). Similarly, investigators utilizing an Italian undergraduate population found that females experience higher levels of worry, show a lower adjustment to college life, and experience higher rates of anxiety symptom presentation compared to men (Bottesi et al., 2018). Furthermore, the current state of the field conceptualizes anxiety disorders as a predominantly uniaxial outcome across genders; a growing body of evidence suggests that unique factors such as familial expectations, cultural expectations, and ethnicity contribute to colloquial understanding of gender-unique stressors (Ai et al., 2014). According to recent studies in the field of higher education, minority female attendance rates are growing, thereby characterizing a changing landscape of socio-cultural needs and potential risk-factors linked to anxiety and biological sex (Tajalli & Ortiz, 2017; Zvolensky, 2016). Therefore, it can be expected that female participants are more likely to experience anxiety symptoms and dynamic cultural factors may influence the prevalence rates on college campuses.

Honors program membership, a form of academic enrichment, is likely a predictor of anxiety symptoms. Researchers investigating a case study of several honors students as they progressed through their undergraduate careers identified a significant relationship with anxiety (Hébert & McBee, 2007). Moreover, these findings may be attributed to greater symptoms of worry, social isolation from peers, and maintenance of intellectually stimulating environments. These findings were found to be consistent with Isaacson and colleagues (1964) longitudinal

study of honors student's mental health. It had been posited that students in honors programs self-select courses based on test anxiety levels and perceived academic success (Isaacson et al., 1964). However, the latter had only been a significant predictor of anxiety with female participants (Isaacson, 1964). Both of these studies suggest that honors status would be a significant predictor of anxiety. However, there are a few limitations in the supportive literature surrounding honors program membership and anxiety. The latter study focused on test anxiety rather than anxiety, and relied on diagnostic criterion from an earlier model of the Diagnostic and Statistical Manual of Mental Disorders (DSM). Therefore, this study seeks to expand previous knowledge by investigating honors status alongside other demographic variables in a larger undergraduate sample. Findings provide greater insight in the role of academic enrichment programs in anxiety symptoms.

With regards to undergraduate major as a predictor of anxiety symptoms, there is an abundance of literature suggesting suitability. For example, many scholars have posited that mathematics content plays a role. According to a study of undergraduate students in Canada, students were more likely to choose a major with less mathematical content in order to combat mathematics anxiety. This was based on perceived mathematical skill and negative attitudes towards mathematics (LeFevre et al, 1993). Similarly, a study that interviewed students suggests that mathematics anxiety is highly prevalent on college campuses and negatively correlates with academic achievement (Monge et al, 2017). Both would suggest that those studying in fields rooted in mathematics - such as STEM - may experience elevated PSWQ scores.

Furthermore, undergraduate students specializing in the field of music and fine arts may be at risk for anxiety. A survey study conducted on both undergraduate and graduate music students across 6 public Brazilian universities concluded that nearly all participants enrolled as music

majors had measurable anxiety levels compared to non-majors (Ray et al., 2016). This would support the claim that music majors could have elevated anxiety symptoms. Moreover, a similar study found that art majors experience clinically high levels of anxiety, and this outcome may be linked to personality traits (Shelton & Harris, 1979). It has been speculated by that performance anxiety may attribute to higher levels of anxiety in music and fine arts majors, although further investigation must be conducted. Therefore, undergraduate major is likely to be a significant predictor of anxiety symptoms. This study also provided greater insight into the role of undergraduate major in the U.S. by using a larger sample size and multiple linear regression modeling.

Summary and Hypotheses

According to the findings of supporting literature, demographic and academic variables are likely suitable predictors of anxiety. Revisiting the literature, it is likely females experience greater symptoms of anxiety than men. Secondly, honors students are more likely than non-honors students to experience symptoms of anxiety because of a diverse range of education needs to satisfy mental wellbeing. Moreover, students in higher class levels are less likely to experience symptoms of anxiety than lower classmen; a theory supported by various studies that investigated the concepts of autonomy and academic experience. Finally, undergraduate major is likely to predict anxiety with STEM, music, and arts fields experiencing significant differences (Lanzaro, 2019). These results should remain consistent with previous studies investigating differences in anxiety and personality traits within art and music majors. Therefore, gathering and comparing academic and demographic variables to anxiety scores are likely to reveal notable associations. The purpose of this study is to expand the scientific knowledge of anxiety in

college students by identifying demographic-academic predictors. Thus, allowing higher educational institutions to identify at-risk populations. Early identification and psychological support may promote student retention and academic success.

H₁: Females will experience higher levels of anxiety symptoms than males.

H₂: Students in a lower-class level will experience greater anxiety than higher classes.

H₃: Honors students will experience greater symptoms of anxiety than non-honors students

H₄: STEM, music, and fine arts students will experience higher symptoms of anxiety than those specializing in other fields

Methods

Participants

Undergraduate student participants ($N = 347$) were selected from a medium-sized private institution located in a New England urban setting. In the 2019 school year, the University had approximately 4912 undergraduate students, sex breakdown is 47% male and 53% female. Approximately 24.4 percent of students belonged to an underrepresented minority group (University of New Haven, 2019). Participants were recruited through mass e-mail in the university system. Participants completed a survey that contained a demographic form and the PSWQ – please refer to Appendix A to view survey materials. Those who agreed to partake in the survey-based study were offered the chance of winning one of three pre-paid gift cards as compensation. Participant responses were excluded based on the following criteria: patterned responses, responses containing obscenities, younger than 18 years of age, attendance to a different institution, incomplete survey submission, or student was not of undergraduate status. Inappropriate responses were identified by investigators if they included inappropriate open-ended responses or abnormal patterns as if randomly selected.

Design

A multiple linear regression design was used during this study. Symptoms of anxiety were operationalized through the utility of the self-report PSWQ, which measures symptoms on a continuum. Linear regression modeling was utilized during this investigation for its ability to determine multivariate correlations between anxiety scores and demographic variables while controlling for all measurements simultaneously (Shakil, 2006). Predictor variables were honors status, sex, undergraduate major, and class level. Honors status, sex, and class level were operationalized by asking participants what their class status were and assigning a number 1-4 in ascending rank; undergraduate major was measured by asking participants for their undergraduate major, sorting them into several broader categories, then assigning a number for each category.

Anxiety scores were measured by asking participants to complete the Penn State Worry questionnaire. The PSWQ is a 16 question self-report measure of anxiety with high internal consistency and construct validity (Fresco et al., 2003). Responses follow a Likert type format from “1” (not at all typical of me), to “5” (very typical of me). The assessment measures anxiety containing questions such as “My worries overwhelm me” and “I am always worrying about something”. Scores measure anxiety on a scale ranging from 16-80 between groups - with three different categories of severity: low worry (16-39), moderate worry (40-59), high worry (60-80). Please refer to Appendix B to view the PSWQ questionnaire. Three hundred and forty-seven participants completed the survey based PSWQ ($M = 57.75$, $SD = 13.35$).

Undergraduate major was measured by asking participants to type their primary college major. Approximately 348 responses were measured in this question. Undergraduate responses were grouped in one of several categories as follows: engineering, mathematics, & technology,

business, law & policy, communication & writing, hard/applied sciences, psychology, and music & fine arts - see Table 2 for major categorizations. Nine participants were removed from analysis due to low response rate for the following majors: fire science, history, undecided, and other.

For the variable “Honors Status” participants were asked whether or not they belonged to the University honors program. Responses ranged from 0-1 – with the value of “0” representing those who were not members of the honors program and “1” for who were members. Of the total number of respondents ($N = 347$), 25.1% ($n = 87$) of students were members of the honors program, and 74.9% ($n = 260$) were not. Therefore, most participants were not honors program members.

Sex was measured by asking participants which status they identified with. Responses ranged from 1-4. Response values were as follows: male “1”, female “2”, prefer not to answer “3”, and other “4”. Of the total number of participant responses ($N = 347$), approximately 23.3% were male ($n = 81$), 74.6% were female ($n = 259$), 1.2% preferred not to answer ($n = 4$), and .9% identified as other ($n = 3$). Only male and female responses were used during the analysis of findings due to the low representation of other groups. Non-binary responses were excluded to prevent error of measurement during data analysis.

The variable “Class level” was measured by asking respondents which grade level they belonged to. Possible responses ranged from 1-5. The categorization of values are as follows: freshman “1”, sophomore “2”, junior “3”, senior “4”, and 5th year or more “5”. Of all participant responses ($N = 347$), approximately 27.4% were freshman ($n = 95$), 24.8% sophomore ($n = 86$), 23.3% junior ($n = 81$), 22.5% senior ($n = 78$), and 2% 5th year or more ($n = 7$). Those who identified as 5th year or more were excluded during analysis for lack of representation and measurement error prevention.

Procedure

Respondents were asked to answer demographic, academic, and PSWQ questions. After completion of the survey, anxiety scores were then calculated by gathering the summation of all scores for each question. Finally, academic and demographic variables were compared to PSWQ scores using multiple linear regression modeling (ordinary least squares) to analyze findings.

Results

An ordinary least squares multiple linear regression model was conducted to determine significant findings at the .001 alpha level. Overall, the multiple linear regression model was statistically significant, suggesting that one or more demographic variables was successful in predicting symptoms of anxiety ($F(11, 335) = 7.553, p < .001, .446$). Please refer to table 1 to view the multiple linear regression analysis between sex, honors status, class level, and undergraduate major. Further analysis of the individual parameters revealed that sex was the only statistically significant demographic variable. Shared variance between remained somewhat reasonable ($R^2 = .199$). This suggests that roughly 19.99% of the Penn State Worry Questionnaire Scores can be explained by biological sex or other variables used in the model. The associative relationship between sex and anxiety appear moderately strong and positive.

Biological sex and other variables were investigated further regarding the extent by which they predicted symptoms of anxiety. Results indicate that males appear to be roughly 13.25 points less anxious than their female counterparts. These findings reveal that females are more anxious than males by a moderate degree, even when controlling for other variables. Therefore, it can be inferred that biological sex is causing a difference in anxiety scores rather than the presence of men and women in undergraduate majors or honors programs. In contrast,

variables such as class level, honors program status, and undergraduate major are poor predictors of anxiety symptoms in this study.

Table 1. Multiple linear regression analysis of sex, class level, undergraduate major, and honors status

Variables	B	Std. Error	B	T	P	Df	R	adj. R ²
Dependent Variables								
Penn State Worry questionnaire Score	59.731	2.314		25.811	.000			
Independent Variables								
<i>Class Rank</i>								
Sophomores	2.359	1.833	.076	1.287	.199			
Juniors	.913	1.862	.029	.490	.624			
Seniors	3.114	1.915	.098	1.626	.105			
<i>Undergraduate Major</i>								
Psychology majors	-.558	2.399	-.017	-.233	.816			
Communications and writing majors	-.722	2.974	-.015	-.243	.808			
Law and policy majors	-4.343	2.681	-.110	-1.620	.106			
Business majors	-2.750	3.221	-.049	-.854	.394			
Hard or applied science majors	-.884	2.353	-.029	-.376	.707			

Music, fine arts, and theater majors	4.245	2.705	.102	1.569	.118			
<i>Honors Status</i>								
Honors members	1.089	1.593	.035	.683	.495			
<i>Sex</i>								
Males only	-13.247	1.672	-.420	-7.925	.000**			
Overall model						346	.446	.172

N=347

Notes: Multiple linear regression model was conducted at the .05 alpha level. *** Indicates statistical significance at the .001 level. Omitted reference groups for dummy variables are as follows: freshman in class rank, Engineering, mathematics, and technology for undergraduate major, females in gender, and non-honors members for honors status.

Table 2. Categorical breakdown of undergraduate majors.

Major Participants	Engineering, Mathematics & Technology	Business	Law & Policy	Communications & Writing	Hard or Applied Sciences	Psychology	Music & Fine Arts
	Chemical	Sports Management	Legal Studies	TV/Video Production	Biology	General Psychology	Music and Sound Recording
	Civil	Business Management	Criminal Justice	Communications	Bio pre-med/vet	Forensic	Music Industry
	Computer	Accounting	International Diplomacy and Development	Journalism	Genetics and Biotechnology	Clinical	Theater
	Industrial	International Business	Marine Affairs	English	Marine Biology		Graphic Design
	Electrical	Business	Political Science		Environmental Science		Interior Design
	Computer Science Cybersecurity	Marketing Finance	National Security		Biochemistry		
	Mathematics	Economics			Cellular and Molecular Biology Health Sciences Dental Hygiene Nutrition and Dietetics Forensic Biology Chemistry		
PSWQ x N = 339	52.64 39	53.29 21	55.37 46	57.71 28	59.09 89	59.13 76	61.83 40

Discussion

This study provides insight into the academic and demographic variables contributing to anxiety. The results were consistent with only one of the proposed hypotheses: females will experience higher levels of anxiety symptoms than males. Other data did not support variables such as class level, honors status, and undergraduate major.

Class level, although supported by previous literature, was not found to be a significant predictor of anxiety. These findings may be explained by the structural differences between international institutions. For example, French and Australian researchers identified a significant relationship between freshman and anxiety in domestic samples (Verger et al., 2009; Farrer et al., 2016). It appears that these findings did not generalize to an American sample. This phenomenon could be investigated further by encompassing a diverse range of samples from different countries, in order to identify socio-cultural predictors of anxiety.

Additionally, participant involvement in the honors program was not found to be a significant predictor of anxiety. There are a few speculative theories as to why this outcome may have been reached. Perhaps, students participating in the University honors program experience the same degree of difficulty despite taking more challenging courses. This would suggest that honors students, although more competitive than non-honors program students, may experience similar academic challenges because of their learning ability. In other words, non-honors students are just as challenged by regular coursework, than their honors student counterparts are with more intensive courses. On the other hand, coursework found in the honors program may be no more difficult than non-honors courses. Although honors programs vary between universities, future studies may consider comparing the rigor of academic enrichment programs to symptoms of anxiety.

The undergraduate major variable was not significant in predicting anxiety symptoms. Despite previous studies supporting the association between undergraduate major and anxiety symptoms, this outcome remains open to speculation. A previous study, using the same data set, revealed a positive relationship exists between music & fine arts majors and Science, Technology & mathematics majors (Lanzaro, 2019). Multiple linear regression modeling may also be more substantiated with a larger sample size for each major category. As a result, the difference in anxiety scores between majors appears to be accounted for by other variables, more specifically biological sex. Therefore, future studies should consider gathering a larger sample size, measuring undergraduate majors in a different manner, and implementing a more diverse range of demographic variables.

Finally, sex was found to be a statistically significant predictor of anxiety symptoms. On average, females were found to be more anxious than male counterparts. This outcome may be explained by similar studies which identified factors such as family expectations, role strain, and other cultural expectations among the variables that contribute to anxiety among females (Abdel-Khalek & Alansari, 2004; Alansari, 2006; Ai et al., 2014). Moreover, a study using an Italian student sample identified that females felt less prepared, and more anxious in academic environments than their male counterparts (Bottessi et al., 2018). As sex was found to be a significant predictor of anxiety in undergraduate students across a diverse range of nations including this study, further investigation is warranted to provide insight into this phenomenon. Perhaps, researchers should consider conducting qualitative studies that interview females regarding anxiety symptoms in academic environments. Based on the overall results, it can be inferred that biological sex is causing a difference in anxiety scores rather than the presence of men and women in undergraduate majors or honors programs. It is also important to note that

males were underrepresented in this study and accounted for only 23.3% of response.

Resultantly, this may have altered the presentation of symptoms in males.

Limitations

Some limitations of the investigation should be noted. Limitations include a small sample size, poor generalizability across university populations, low representation of undergraduate majors, and survey-based concerns. First, the effects of the multiple linear regression model estimate that many assumptions are met such as multivariate normality, homoscedasticity, and an absence of multicollinearity. The latter would suggest that each independent variable in this study may cause a shift in the unit change of the others. Therefore, it may be difficult for the model to estimate the relationship between each independent variable as they each change in unison. Furthermore, multicollinearity may result in failure to adequately partition variance between the selected predictors if they are related (Tonidandel & LeBreton, 2011). Future studies should take these issues into account, as they are not unique to multiple linear regression modeling

Secondly, the sample gathered from the university can only be generalized to similar medium-sized universities. The sample was relatively small and response rates were relatively low. Moreover, this sample does not represent the population of every national or international institution. The surveyed university does not contain all possible majors and depth of study varies between universities. Gathering larger samples from multiple universities may reveal more veritable results for further investigations.

Finally, greater restrictions are present in survey-based designs such as: limited response options, assumptions of prior knowledge in symptom pathology, and dishonest responses (Starr, 2002). Most notably, self-selection bias may have reduced the external validity of these findings.

This concept posits that convenience sampling with survey-based studies may not represent the entire population, as the sample consists of only those who chose to complete the survey (Kennedy & Vargus, 2001). Future studies may consider in-person experimental methods which may mitigate the negative effects of survey-based formatting by gathering in-depth clinical measurements.

Conclusion

Although this study provides insight into the accuracy of many demographic and academic predictors of anxiety, the most important contribution may be that it raises more intriguing questions for future studies. If demographic and academic variables can help predict anxiety symptoms, then it is crucial for more expansive research to occur. Therefore, it would be gainful to build on this study by identifying other variables that may be suitable for investigation. Moreover, the association between anxiety and females in undergraduate environments could be further elaborated. By broadening our knowledge on these variables, the role of undergraduate environments on mental wellbeing can become more apparent. This ongoing trend can only be understood through the use of ongoing research studies devoted to improving student mental health.

References

- Abdel-Khalek, A. M., & Alansari, B. M. (2004). Gender differences in anxiety among undergraduates from ten Arab countries. *Social Behavior & Personality: An International Journal*, 32(7), 649–656. <https://doi-org.unh-proxy01.newhaven.edu/10.2224/sbp.2004.32.7.649>
- Ai, A. L., Weiss, S. I., & Fincham, F. D. (2014). Family factors contribute to general anxiety disorder and suicidal ideation among latina Americans. *Women's Health Issues*, 24(3), 345-352. doi:10.1016/j.whi.2014.02.008
- Alansari, B. M. (2006). Gender differences in anxiety among undergraduates from sixteen islamic countries. *Social Behavior & Personality: An International Journal*, 34(6), 651–659. <https://doi-org.unh-proxy01.newhaven.edu/10.2224/sbp.2006.34.6.651>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing
- Blanco, C., Okuda, M., Wright, C., Hasin, D. S., Grant, B. F., Liu, S. M., & Olfson, M. (2008). Mental health of college students and their non-college-attending peers: results from the National Epidemiologic Study on Alcohol and Related Conditions. *Archives of general psychiatry*, 65(12), 1429–1437. <https://doi.org/10.1001/archpsyc.65.12.1429>
- Bottesi, G., Martignon, A., Cerea, S., & Ghisi, M. (2018). Worry and associated cognitive features in Italian university students: Does gender make a difference? *Personality and Individual Differences*, 126, 38–43. <https://doi-org.unh-proxy01.newhaven.edu/10.1016/j.paid.2018.01.016>

- Brown, T. A., Antony, M. M., & Barlow, D. H. (1992). Psychometric properties of the Penn state worry questionnaire in a clinical anxiety disorders sample. *Behaviour Research and Therapy*, 30(1), 33-37. doi:10.1016/0005-7967(92)90093-v
- Di Blasi, M., Muccioli, P., Alagna, M., Torres, D., Duca, I., & Tosto, C. (2018). Self-image and psychological distress in treatment-seeking adolescents. *Child and Adolescent Mental Health*, 23(3), 258–265. <https://doi.org/10.1111/camh.12255>
- Eisenberg, D., Gollust, S. E., Golberstein, E., & Hefner, J. L. (2007). Prevalence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry*, 77(4), 534–542. doi: 10.1037/0002-9432.77.4.534
- Farrer LM, Gulliver A, Bennett K, Fassnacht DB, Griffiths KM. Demographic and psychosocial predictors of major depression and generalised anxiety disorder in Australian university students. *BMC Psychiatry*. 2016;16:241. Published 2016 Jul 15. doi:10.1186/s12888-016-0961-z
- Fresco, D.M., et. al. (2003) Using the Penn State Worry Questionnaire to identify individuals with generalized anxiety disorder: a receiver operating characteristic analysis. *Journal of Behavior Therapy and Experimental Psychiatry*. 34, 283-291.
- Hébert, T. P., & McBee, M. T. (2007). The Impact of an undergraduate honors program on gifted university students. *Gifted Child Quarterly*, 51(2), 136–151. <https://doi.org/10.1177/0016986207299471>
- Heller, M. L., & Cassady, J. C. (2017). The impact of perceived barriers, academic anxiety, and resource management strategies on achievement in first-year community college students. *Journal of The First-Year Experience & Students in Transition*, 29(1), 9-32.

- Kennedy, J. M., & Vargus, B. (2001). Challenges in survey research and their implications for philanthropic studies research. *Nonprofit and Voluntary Sector Quarterly*, 30(3), 483-494.
- Lanzaro, M. S.(2019) *Undergraduate Major as a Predictor of Generalized Anxiety Disorder Symptoms*. Unpublished manuscript, University of New Haven, West Haven, CT
- Lefevre, J., Kulak, A. G., & Heymans, S. L. (1992). Factors influencing the selection of university majors varying in mathematical content. *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement*, 24(3), 1st ser., 276-289. doi:10.1037/h0078742
- Monge, I. C., Gonzáles, J. E., & Castro, J. F. (2017). Ansiedad matemática en estudiantes universitarios de Costa Rica y su relación con el rendimientos académico y variables sociodemográficas. *Propósitos Y Representaciones*,5(1), 1st ser., 275. doi:10.20511/pyr2017.v5n1.148
- Pisarik, C. T., Rowell, P. C., & Thompson, L. K. (2017). A Phenomenological Study of Career Anxiety Among College Students. *The Career Development Quarterly*, 65(4), 339-352. doi:10.1002/cdq.12112
- Ray, Sonia et al.(2016). Exploratory Study on the Impact of Information on Performance Psychology on Stress and Anxiety Levels of Brazilian Music Performers. *Opus*, 22(2), 303–323. doi: 10.20504/opus2016b2212
- Shakil, M. (2006). A multiple linear regression model to predict the student’s final grade in a mathematics class. *Sam Houston State University*.
- Shelton, J., & Harris, T. L. (1979). Personality characteristics of art students. *Psychological Reports*, 44(3), 949-950.

- Starr S. (2012). Survey research: we can do better. *Journal of the Medical Library Association: JMLA*, 100(1), 1–2. <https://doi.org/10.3163/1536-5050.100.1.001>
- Tajalli, H., & Ortiz, M. (2017). An examination of Hispanic college enrollment and graduation: Has the Texas Closing the Gaps plan been successful? *Journal of Latinos and Education*, 17(4), 330-343. doi:10.1080/15348431.2017.1348301
- Takebayashi, Y., Tanaka, K., Sugiura, Y., & Sugiura, T. (2018). Well-being and generalized anxiety in Japanese undergraduates: A prospective cohort study. *Journal of Happiness Studies*, 19(3), 917–937. <https://doi-org.unh-proxy01.newhaven.edu/10.1007/s10902-017-9852-3>
- Tonidandel, S., LeBreton, J.M. Relative importance analysis: A useful supplement to regression analysis. *J Bus Psychol* 26, 1–9 (2011). <https://doi.org/10.1007/s10869-010-9204-3>
- (n.d.). *Fast Facts - University of New Haven*. Retrieved September 16, 2020, from <https://www.newhaven.edu/about/facts-figures.php>
- Verger, P., Combes, J.-B., Kovess-Masfety, V., Choquet, M., Guagliardo, V., Rouillon, F., & Peretti-Wattel, P. (2009). Psychological distress in first year university students: Socioeconomic and academic stressors, mastery and social support in young men and women. *Social Psychiatry and Psychiatric Epidemiology: The International Journal for Research in Social and Genetic Epidemiology and Mental Health Services*, 44(8), 643–650. <https://doi-org.unh-proxy01.newhaven.edu/10.1007/s00127-008-0486-y>
- Zvolensky, M. J., Jardin, C., Garey, L., Robles, Z., & Sharp, C. (2016). Acculturative stress and experiential avoidance: Relations to depression, suicide, and anxiety symptoms among minority college students. *Cognitive Behaviour Therapy*, 45(6), 501-517. doi:10.1080/16506073.2016.120565

Appendix A**Anxiety in the Collegiate Environment Survey**

1. How old are you?
2. What is your sex?
 - a. Male
 - b. Female
 - c. Prefer not to answer
 - d. Other (please specify)
3. What is your class standing?
 - a. Freshman
 - b. Sophomore
 - c. Junior
 - d. Senior
 - e. 5th year or more
4. What is your current academic major?
5. Are you a member of the University's Honors Program?
 - a. Yes
 - b. No
6. *Penn State Worry Questionnaire Task*
7. To what extent do you agree with the following statements? Please respond from “1” strongly agree to “5” strongly disagree.
 - a. My choice of major plays a significant role in stress levels
 - b. I would experience less stress if I majored in something else
 - c. I feel more stressed than not
 - d. I believe my academic department provides adequate support for my success as a student
8. University Email address (Optional)

Appendix B**The Penn State Worry Questionnaire (PSWQ)**

Instructions: Rate each of the following statements on a scale of 1 (“not at all typical of me”) to 5 (“very typical of me”). Please do not leave any items blank.

1. If I do not have enough time to do everything, I do not worry about it.
1 2 3 4 5
2. My worries overwhelm me.
1 2 3 4 5
3. I do not tend to worry about things.
1 2 3 4 5
4. Many situations make me worry.
1 2 3 4 5
5. I know I should not worry about things, but I just cannot help it.
1 2 3 4 5
6. When I am under pressure I worry a lot.
1 2 3 4 5
7. I am always worrying about something.
1 2 3 4 5
8. I find it easy to dismiss worrisome thoughts.
1 2 3 4 5
9. As soon as I finish one task, I start to worry about everything else I have to do.
1 2 3 4 5
10. I never worry about anything.
1 2 3 4 5
11. When there is nothing more I can do about a concern, I do not worry about it anymore.
1 2 3 4 5
12. I have been a worrier all my life.
1 2 3 4 5
13. I notice that I have been worrying about things.
1 2 3 4 5
14. Once I start worrying, I cannot stop.
1 2 3 4 5
15. I worry all the time.
1 2 3 4 5
16. I worry about projects until they are all done.
1 2 3 4 5

In scoring the PSWQ, a value of 1, 2, 3, 4, and 5 is assigned to a response depending upon whether the item is worded positively or negatively. The total score of the scale ranges from 16 to 80.

Items 1, 3, 8, 10, 11 are reverse scored as follows:

- Very typical of me = 1 (circled 5 on the sheet)
- Circled 4 on the sheet = 2
- Circled 3 on the sheet = 3
- Circled 2 on the sheet = 4
- Not at all typical of me = 5 (circled 1 on the sheet)

For items 2, 4, 5, 6, 7, 9, 12, 13, 14, 15, 16 the scoring is:

- Not at all typical of me = 1
- Ratings of 2, 3, and 4 are not transformed
- Very typical of me = 5