

University of Rhode Island

DigitalCommons@URI

---

Open Access Master's Theses

---

2019

## CORRELATIONS OF THE FEAR OF MISSING OUT & INTERPERSONAL STRESS WITH FEMALE COLLEGE STUDENTS' SLEEP

Victoria Elizabeth Russo

University of Rhode Island, toriia\_russo@uri.edu

Follow this and additional works at: <https://digitalcommons.uri.edu/theses>

---

### Recommended Citation

Russo, Victoria Elizabeth, "CORRELATIONS OF THE FEAR OF MISSING OUT & INTERPERSONAL STRESS WITH FEMALE COLLEGE STUDENTS' SLEEP" (2019). *Open Access Master's Theses*. Paper 1450.  
<https://digitalcommons.uri.edu/theses/1450>

This Thesis is brought to you for free and open access by DigitalCommons@URI. It has been accepted for inclusion in Open Access Master's Theses by an authorized administrator of DigitalCommons@URI. For more information, please contact [digitalcommons@etal.uri.edu](mailto:digitalcommons@etal.uri.edu).

CORRELATIONS OF THE FEAR OF MISSING OUT &  
INTERPERSONAL STRESS WITH FEMALE COLLEGE  
STUDENTS' SLEEP

BY

VICTORIA ELIZABETH RUSSO

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE  
REQUIREMENTS FOR THE DEGREE OF  
MASTER OF SCIENCE IN HUMAN DEVELOPMENT AND FAMILY STUDIES  
DEVELOPMENTAL SCIENCE

UNIVERSITY OF RHODE ISLAND

2019

MASTER OF SCIENCE THESIS  
OF  
VICTORIA ELIZABETH RUSSO

APPROVED:

Thesis Committee:

Major Professor      Sue Adams

Melanie Brasher

W. Grant Willis

Nasser H. Zawia  
DEAN OF THE GRADUATE SCHOOL

UNIVERSITY OF RHODE ISLAND  
2019

## **ABSTRACT**

Insomnia has been correlated with several negative mental and physical health outcomes in female undergraduate students, a population with increasing interest when considering those suffering with insomnia. Considering the increased vulnerability reported by college students, and the poor outcomes of insomnia, it is important to determine correlates of insomnia and which factors differentially impact college students' development of insomnia. This study examined whether interpersonal stress or the fear of missing out (i.e. FoMO) was more highly correlated with insomnia in a population of female undergraduate students at the University of Rhode Island. This study also examined whether levels of interpersonal stress, FoMO, and insomnia varied across students in different class years. Variables examined included levels of insomnia, FoMO, interpersonal stress, year in school, race, and age. An examination of the data using correlations and ANOVAs was utilized to determine if there were differences in students among the four class years in college and the correlations of insomnia with interpersonal stress and FoMO.

It was hypothesized that FoMO would be more highly correlated to insomnia than interpersonal stress would be correlated to insomnia. It was also hypothesized that all three measures would be significantly higher for first year students and seniors than for juniors and sophomores. No significant differences were found in students on any measure among the four class years. It was found that interpersonal stress was more highly correlated with insomnia than FoMO was correlated with insomnia. However, both interpersonal stress and FoMO were more highly correlated with each other than either was to insomnia. Each of these correlation analyses showed statistical

significance. Therefore, neither hypothesis proposed by the researcher was supported. This study contributes to the literature showing that interpersonal stress and FoMO are related and that this relationship should be studied further in order to help students identify healthy coping strategies to deal with each and have successful college careers.

## ACKNOWLEDGMENTS

I would like to acknowledge a number of individuals for contributing to and guiding the success of the current study. Each of these individuals has supported my personal growth over the course of my Master's degree as well as the growth of this thesis from the original proposal to the final manuscript.

First, I would like to thank my major professor, Dr. Sue Adams, for her direction, time, and patience. She continually supported my efforts to contribute to a body of literature that I was unaware of at the beginning of this project as well as keeping me focused on a timeline that would allow me to accomplish my academic goals. Without her guidance I likely would have had a much more difficult time in all aspects of the thesis process and may not have met my deadlines on time. I am forever grateful for the relationship we've developed.

I would also like to thank my committee members, Dr. Melanie Brasher and Dr. W. Grant Willis. I would like to thank Dr. Brasher for her input on all aspects of my thesis, and specifically for her suggestions regarding the original and ongoing statistical analyses plans in order to contribute to the literature in a meaningful way. I would like to thank Dr. Willis for his support also relating to the original statistical analysis plan and consistent review of the manuscript. His perspective as an outside committee member helped me to include areas of literature I wouldn't have otherwise. I would also like to thank my chair, Dr. Steven Cohen, for agreeing to mediate my defense to create a supportive environment in which to finalize this important milestone of the thesis research.

Finally, I'd like to recognize the Developmental Science Master's program and its faculty. Over the past two years, I have been supported to find a niche and career path for my future goals that is consistent with my values and allows me to help children and families in a way that both meets my passions and their needs. The University of Rhode Island has been a place I've been honored to call my home for the past six years and I am proud to be a double alumnus with the accomplishment of this thesis defense and the granting of my Master's degree. Thank you to the Developmental Science faculty and other HDF and URI faculty who supported me throughout my undergraduate and graduate careers. I will use the tools I've learned to support diverse populations of children and their families within all the communities I find myself throughout the course of my life.

## TABLE OF CONTENTS

<b>ABSTRACT</b> .....	ii
<b>ACKNOWLEDGMENTS</b> .....	iv
<b>TABLE OF CONTENTS</b> .....	vi
<b>LIST OF TABLES</b> .....	vii
<b>CHAPTER 1</b> .....	<b>1</b>
INTRODUCTION .....	1
<b>CHAPTER 2</b> .....	<b>4</b>
REVIEW OF LITERATURE .....	4
<b>CHAPTER 3</b> .....	<b>22</b>
METHODOLOGY.....	22
<b>CHAPTER 4</b> .....	<b>29</b>
FINDINGS .....	29
<b>CHAPTER 5</b> .....	<b>32</b>
CONCLUSION .....	32
<b>BIBLIOGRAPHY</b> .....	<b>41</b>



## LIST OF TABLES

TABLE	PAGE
Table 1. Descriptive Statistics of Dependent, Independent, and Control Variables ...	24
Table 2. Correlations of Independent and Dependent Variables .....	30
Table 3. Means and Standard Deviations of Each Dependent Variable Across Class Years .....	31
Table 4. Means of Current Sample Compared to Previous Samples on Focus Variables .....	31

# CHAPTER 1

## INTRODUCTION

Considering the increased vulnerability reported by college students, and the poor outcomes of insomnia, it is important to determine correlates of insomnia and which factors differentially impact college students' development of insomnia (Bresslau et al., 1996; Cernovsky, 1984; Galambos et al., 2013). College students in particular are exposed to a variety of new life circumstances that lead them to make choices that may have negative consequences, and must navigate this newfound autonomy to learn greater independence and less reliance on the opinions of others. This time of change and newfound autonomy leads students to make choices that impact their social and academic lives. These choices ultimately have impacts on students' well-being, including the potential to develop insomnia.

Many factors contribute to a college student developing insomnia, defined as the inability or difficulty of falling asleep or remaining asleep, including the fear of missing out (i.e. FoMO) and interpersonal stress (Adams et al., 2016). The experiences that students face throughout their college years have varying impacts on these constructs (Galambos et al., 2013). FoMO is described as the all-consuming feeling that others are having more rewarding experiences without you (Przybylski et al., 2013). This is considered a psychological factor of one's development. FoMO has dimensions relating to sense of self, social interactions, and social anxiety. FoMO is a reality that is increasingly occurring in college students. The daunting feeling of trying

to fit in and managing relationships with many new individuals affects the student's daily decision making in terms of choosing between academic and social responsibilities (Alt, 2015; Przybylski et al., 2013; Riodian et al., 2015).

Interpersonal stress is described as stress that arises from conflict with others. This is considered a social factor to one's development. College student stress has been related to many changes in the lives of students when first arriving to a college campus. These changes include decreased communication with friends and family from home, living in a new environment, decreased academic supervision and increased academic demands, managing increased autonomy, and opportunities for students to experience novel situations (Adams et al., 2016). While the prevalence of students experiencing negative outcomes due to stress has been widely studied and supported, and great efforts have been made to make services available and known to students, many students do not reach out for help (Coiro et al., 2017).

Reflecting impacts of the biopsychosocial model (Engel, 1977) (used in this study as insomnia being biological, FoMO being psychological, and interpersonal stress being social), negative outcomes associated with these issues include poor academic performance, increased college dropout, immune system deficits and higher frequency of illness, increased suicidal thoughts, decreased stress management, and substantial decrements in the quality of life (Adams et al., 2016; Lund et al., 2010; Wallace et al., 2017; Wilson et al., 2017). Previous research on college students has shown differences in men and women's responses to these stressors, including women being more likely to report stress and use maladaptive coping strategies (Hudd et al., 2000; Dyson & Renk, 2006; Piercall & Keim, 2007). Also, insomnia has been correlated

with several negative health outcomes in female undergraduate students (Breslau et al., 1996; Cernovsky, 1984; Galambos et al., 2013).

The current study researches the impact of FoMO and interpersonal stress on insomnia for a population of female college students who attended the University of Rhode Island in 2014, using a cross-sectional study design. Modified versions of previously established measures were used to measure these constructs in a quantitative study at the University of Rhode Island conducted by Dr. Sue Adams and colleagues. The dataset was accessed with Dr. Adams' permission. The current study uses SPSS software to conduct correlation and ANOVA analyses to determine if FoMO or interpersonal stress has a higher correlation with insomnia levels for female students and how those differ across their college career. The findings of the study indicate that interpersonal stress was more highly correlated to insomnia than was FoMO, and also that both FoMO and interpersonal stress were more highly correlated with each other than either was correlated to insomnia. All of these correlation analyses were statistically significant. Also, the findings indicate that there were no differences in levels of FoMO, interpersonal stress, or insomnia across students in different years in their college careers. Future research should utilize a broader population of students in order to increase generalizability of results, consider other correlates of FoMO and interpersonal stress, and implement a longitudinal study design in order to determine causality and directionality of how FoMO, interpersonal stress, and insomnia interact with one another.

## CHAPTER 2

### REVIEW OF LITERATURE

Insomnia has been correlated with several negative mental and physical health outcomes in female undergraduate students, a population with increasing interest when considering those suffering with insomnia (Breslau et al., 1996; Cernovsky, 1984, Galambos et al., 2013). Many factors contribute to a college student developing insomnia, including the fear of missing out (i.e. FoMO) and interpersonal stress (Adams et al., 2016). The experiences that students face throughout their college years have varying impacts on these constructs (Galambos et al., 2013).

#### **Insomnia**

Considering the increased vulnerability reported by college students, and the poor outcomes of insomnia, defined as the inability or difficulty of falling asleep or remaining asleep, it is important to determine correlates of insomnia and which factors differentially impact college students' development of insomnia (Breslau et al., 1996; Cernovsky, 1984; Galambos et al., 2013). College students in particular are exposed to a variety of new life circumstance that lead them to make choices that may have negative consequences, and must navigate this newfound autonomy to learn greater independence and less reliance on the opinions of others. One health issue that has been shown in previous literature to affect students is insomnia (Katz & McHorney, 2002). Insomnia is not only an individual concern, but has major implications for public health, with studies showing that driving sleepy is equally as dangerous as

driving under the influence of alcohol, which would also increase traffic and work-related accidents (Katz & McHorney, 2002). Insomnia has many poor health outcomes, including greater fatigue, irritability, anxiety, depression, difficulty completing tasks, impairment in cognitive functioning, work absenteeism, poor quality of life, developing substance abuse, impaired immune functioning, and development of cardiovascular disease (Taylor et al., 2013). Taylor and colleagues (2013), using self-reported sleep data of college students, found a prevalence of 9.5% of students with insomnia using the more stringent DSM-5 criteria. However, they found a prevalence of 27% of students showing symptoms of insomnia without complaint (part of the DSM-5 criteria), meaning that these students do not consider their sleep deficits a problem, but still would be able to be diagnosed with insomnia if they did have complaints about it. Therefore, while insomnia has been extensively studied in this population and the negative consequences of it are well known, this study demonstrates that students continue to experience insomnia while believing it to be part of the normal college experience.

In another study conducted by Nardoff and colleagues (2010), insomnia was reported to be significantly associated with suicidal ideation, even after controlling for mental health disorders containing insomnia as a diagnostic criterion. In this study of an undergraduate student population, both insomnia and nightmares were related to suicide ideation independent of one another. When controlling for symptoms of depression, anxiety, and PTSD, only nightmares, and not insomnia, was related to suicidal ideation. Therefore, insomnia is both a symptom and a risk factor for onset and recurrence for mental health issues and should be considered with nightmares

when researching suicide, which has been reported as one of the leading causes of death for the college student age population (Nadorff, Nazem, & Fiske, 2010).

Buboltz and colleagues (2001) conducted a study of sleep patterns and habits in college students. They found that while 73% of their students reported occasional sleep problems, only 15% met the criteria to be considered to have low sleep quality. Women reported sleep difficulty more often than men, especially in the areas of maintaining sleep, more morning tiredness, and more daytime napping. The students in this study believed they were getting less sleep than they actually reported during the week, and wished they had gotten more sleep on the weekends. This in turn makes them feel more tired than they actually are. In addition, college students have been found to suffer decreased sleep quality compared to the non-student adult population (Buboltz, Brown, & Soper, 2001). When students shift their sleep-wake times by 2 hours while maintaining the same amount of sleep, they experience feelings of depression, reduced affability, and difficulty concentrating. When they sleep later on the weekends than during the week, they develop chronic psychomotor slowing and concentration problems, irritability, and depression (Buboltz, Brown, & Soper, 2001). Previous studies have shown that the rapid eye movement (REM) stage of sleep is associated with learning integration (De Koninck et al., 1989). Therefore, when sleep is interrupted and students do not get to enter into REM sleep, integration of new learning is limited.

### **Interpersonal Stress**

The stress that undergraduate students experience has been associated with numerous negative outcomes. Interpersonal stress is the stress that is associated with

conflict with others. This is particularly important for college students, as they are in a period of identity development and trying to find social groups in which they fit in (Torres et al., 2009). This type of stress is often related to trait anxiety, which is one's general disposition to become anxious and typical levels of anxiety (Alt, 2015). Previous research suggests that anxiety is best understood by distinguishing its trait and state factors (Endler & Kocovski, 2001; Kocovski et al., 2004; Rapee & Medro, 1994; Ree, 2008; Reiss, 1997; Spielberger, 1985). Trait anxiety is defined as a stable tendency to perceive threat and become anxious.

It has been reported that between 20-50% of undergraduates have either reported a current or previous diagnosis of depression or symptoms of depression, anxiety, and low levels of mood and life satisfaction (Gress-Smith et al., 2015; Oberst, et al., 2017; Wallace et al., 2017; Wilson et al., 2014). Negative outcomes associated with these mental health issues include poor academic performance, increased college dropout, immune system deficits and higher frequency of illness, increased suicidal thoughts, more impaired memory, decreased stress management, increased levels of obesity and substantial decrements in the quality of life (Adams et al., 2016; Lund et al., 2010; Wallace et al., 2017; Wilson et al., 2017). College student stress has been related to many changes in the lives of students when first arriving to a college campus. These changes include decreased communication with friends and family from home, living in a new environment, decreased academic supervision and increased academic demands, managing increased autonomy, and opportunities for students to experience novel situations (Adams et al., 2016). While the prevalence of students experiencing negative outcomes due to stress has been widely studied and supported, and great



efforts have been made to make services available and known to students, many students do not reach out for help (Corrio et al., 2017).

Coping strategies may differ by culture or generation. The current study sample included millennial students, defined as those born from 1981-1997 (Fry, 2016). Bland and colleagues (2012) discuss the specific characteristics of millennial college students that make them more susceptible to stress in the college years. For example, the millennial generation is larger than any since the Boomers. Millennials have habits of teamwork, achievement, modesty, and good conduct. They also are more diverse, better educated, more affluent, and have had more parental support throughout their upbringing than any generation before. This parental support has often led to millennials being over scheduled, heavily monitored, and pressured to excel academically. They have high achievement needs; going to college is now the norm, often an expectation, and academic standards are higher than ever before. Technology advancements in their lifetimes have made millennials constantly connected to one another and to the outside world in real time, including extensive trauma and mass casualties. Millennial students have generally very active “helicopter” parents on whom they rely for social support, even when these parents create stress for academic achievement (Bland et al., 2012). One study showed that the two greatest worries of current young adults are college acceptance and grades, compared to AIDS and violent crime in the early 2000s, and nuclear war in the 1980s (Howe & Strauss, 2000). When these students do move on to college, they are removed from their current support networks on which they relied for coping with all these stressors. In the Bland study (2012), levels of stress tolerance of college students were compared to types of coping

strategies they utilized. Only one coping strategy was associated with high stress tolerance: social support, an approach-oriented strategy. On the other hand, low stress tolerance was associated with avoidance coping strategies, including cleaning their room, going on social media, and using substances. While college students are developing autonomy, a purpose, and their identity, many are unable to cope with stressors in the absence of their original support network. This research shows it is important to encourage students to find a good social support system in school and develop autonomy in creating that network while relying less on parents to solve problems for them, as many are used to with “helicopter” parenting (Bland et al., 2012). Cohen also found that social support buffers the negative effects from stress (Cohen, 2004).

More importantly, stress and insomnia are very difficult to separate. Researchers examining this topic have supported the idea that there is a bidirectional relationship between stress (depression and anxiety) and insomnia. While stress could lead to having difficulty falling asleep or staying asleep, these experiences could also cause further stress within the individual. Most of the previous literature has been cross sectional on this topic, so it is impossible to determine causality in these constructs.

Taylor and colleagues (2011) discuss this difficulty in their study of undergraduate students, stating it is often difficult to determine symptoms and comorbidities of insomnia as studies use varying degrees of specificity when defining insomnia and insomnia is a diagnostic criterion for many mental health disorders. Using a very strict definition of insomnia, they were able to determine that those with insomnia showed more obsessive-compulsive symptoms, but no other mental health symptoms. They

also could not determine if insomnia symptoms resulted in increased mental health symptoms or if mental health symptoms lead to insomnia symptoms (Taylor et al., 2011). Etindele Sosso reports, “Insomnia is a consequence of slight damage of brain structure or a symptom indicating the necessity to evaluate mental health,” (Etindele Sosso, 2017, p. 32). Even at the brain chemistry level, these ideas are intertwined. The current study adds to the literature by studying insomnia, FoMO, and interpersonal stress separately in an attempt to separate them.

Amaral and colleagues (2018) examined stress in college students related to insomnia and differences in men and women students. In their study, they discuss the difficulty in the transition to college resulting in increased stress to undergraduates. Sleep deprivation, homesickness, and stress all negatively impact academic success (Amaral et al., 2018). They report that women tend to report more sleep problems and more emotional distress, more rumination and repetitive negative thinking, and more depressive symptoms than men, all of which are related to more sleep problems. Using an 80% female undergraduate sample, they found that the women reported more sleep problems, negative affect, perceived stress, and repetitive negative thinking than the men. Pre-sleep rumination and repetitive negative thinking in “individuals with insomnia is excessive, uncontrollable, negatively toned, and covers a broad range of topics,” (Amaral et al., 2018, p. 336). This impact of stress on sleep is mediated by the amount of repetitive negative thinking and negative affect prior to sleep onset; this means stress itself does not necessarily cause sleep problems if not obsessively thought about prior to falling asleep (Amaral et al., 2018). The current study adds to the previous literature by focusing on the women student population in order to further

understand their needs and characteristics, which have been shown to be different than those of men.

Additionally, Brougham and colleagues (2009) aimed to find differences in stressors and coping mechanisms between men and women in an undergraduate student population, citing significance of transition to college leaving students vulnerable to stress when exploring identity. Common stressors included academics, social relationships, finances, daily hassles, and family relationships. Previous research has shown differences in men and women's responses to these stressors (Hudd et al., 2000; Dyson & Renk, 2006; Pierceall & Keim, 2007). This study (Brougham et al., 2009) found that women experienced more stress from family relationships, finances, daily hassles, and social relationships at school than men. Social relationships were the most significant stressor for women. Women were also found to use more self-help, approach, and self-punishment coping strategies than men. These findings support women's overall greater reports of stress and greater use of emotion focused strategies (Brougham et al., 2009). The men in this sample were found to use both maladaptive and adaptive emotion focused coping while women used only maladaptive emotion focused coping along with adaptive problem focused coping. Both men and women used emotion focused coping more than problem focused coping (Brougham et al., 2009).

Another study focusing on stress in college students (Hirsch & Barton, 2011) reports a significant factor of the transition to college is the loneliness from the loss of traditional support systems, such as family and friends from home. There is additional stress placed on students to create new support systems and pressure to make new

friends. In this situation, interpersonal conflict with these new friends, roommates, and neighbors can be a significant challenge for students. Resulting negative life events, hopelessness, and depression is significantly associated with suicide in college age population. Hirsch and Barton (2011) conducted a study on undergraduate students in which they measured suicidal thoughts and behaviors and compared these to the amount of social support and negative social experiences of students. Emotional, informational, and tangible support were correlated with less suicidal thoughts and behaviors and negative social experiences correlated with more suicidal thought and behaviors. However, only tangible social support and negative social experiences were significant predictors of suicidal outcomes when controlled for all types of social experiences. It is important to support these students through positive social experiences and tangible social support in order to combat feelings of inadequacy, distress, isolation, and hopelessness that can arise during the difficult processes of identity and role development without their traditional support systems (Hirsch & Barton, 2011).

### **Fear of Missing Out (i.e. FoMO)**

Both FoMO and interpersonal stress have been shown to cause stress and worry in the college student population, which can have detrimental effects on their sleep health. Although there is still very little literature available on the construct of FoMO, or the fear of missing out, it has been shown to be widely experienced by students of this population and the effects it has on them have been documented, especially in relation to social media usage (Przybylski et al., 2013; Riodian et al., 2015). FoMO is defined as the all-consuming sense that others are having rewarding experiences that

the individual is not a part of. FoMO has roots in self-determination theory (SDT), which states that “effective self-regulation and psychological health are based on the satisfaction of three basic psychological needs: competence – the capacity to effectively act on the world, autonomy – self-authorship or personal initiative, and relatedness – closeness or connectedness with others,” (Przybylski et al., 2013, p. 1841). FoMO is often referred to as a trait anxiety, similarly to interpersonal stress. It has dimensions relating to sense of self, social interactions, and social anxiety (Alt, 2015).

FoMO is a reality that is increasingly occurring in college students. These students are navigating the newfound autonomy of the college experience. The daunting feeling of trying to fit in and managing relationships with many new individuals affects the student’s daily decision making in terms of choosing between academic and social responsibilities (Oberst et al., 2017; Riordan et al., 2015). Feeling as if you are missing out on activities or social engagement with peers due to easy access to social media may increase feelings of interpersonal stress. Those high in FoMO have been found to be more likely to engage in social media during risky times, such as while driving or during a lecture (Riordan et al., 2015). FoMO has been determined to be a mediating factor in the use of social media engagement and the negative effects it has on individuals with existing mental health issues and low self-esteem (Oberst et al., 2017). It also has been correlated with a decline in subjective wellbeing, both in how people feel moment to moment and how satisfied they are with life overall.

The simple access to others’ social lives via technology and social media has increased feelings of irritability, anxiety, and inadequacy (Alt, 2015). This has been

particularly seen in younger students and in women. For example, Beyens, Frison, and Eggermont (2016) examined levels of FoMO in an adolescent population and found that FoMO related to unhealthy eating patterns, such as skipping a meal or eating too quickly in order not to miss out on peer interaction on Facebook. Additionally, they found FoMO increased perceived stress due to not belonging to their peers on Facebook and not being popular among their peers on Facebook (Beyens, Frison, & Eggermont, 2016). Research has shown a high prevalence of insomnia, sleep difficulties, and fewer hours of sleep among women (Buboltz, Brown, & Soper, 2001; Buysse et al., 2008; Galambos, Howard, & Maggs, 2011; Tsai & Li, 2004). Students high in FoMO are likely to engage in social media use to find out what their peers are doing, satisfying the need to engage with others, while simultaneously realizing just how many experiences they are not participating in while they watch through a screen. Social media inherently forces individuals to choose which experiences to engage in and which ones to leave behind.

Several studies have examined both FoMO and insomnia in college students including technology and social media use. Rosen et al. (2016) conducted a study of undergraduate students that did not explicitly measure FoMO, but examined executive functioning and anxiety impacts on technology usage, multitasking, nighttime phone placement, and nighttime awakening from the phone. Their research showed that more technology use during the day, more social media use during the day, and more nighttime media use all predicted higher insomnia levels. Also, they found pre-sleep worry about phone usage reduced sleep duration and quality. These poor sleepers showed lower levels of executive functioning and more anxiety about missing out on

technology and social media use (i.e. FoMO). Citing a recommendation from the National Sleep Foundation (Gradisar et al., 2013), this study (Rosen et al, 2016) also measured students' response to placing the phone away from the bed while sleeping. This recommendation comes from research showing that blue light emitted by devices, such as laptops, smart phones, and tablet, limits the production of melatonin, which delays sleep onset. Blue light also increases cortisol, which interferes with falling asleep. However, Rosen and colleagues found that placing the phone away from the bed at sleep onset predicted more sleep problems, leading to anxiety about missing out on phone calls, messages, and notifications (i.e. FoMO) (Rosen et al., 2016).

Another study (Alt, 2015) assessed FoMO related to social media use during class time and its correlates with learning motivations. While she hypothesized that college students who are extrinsically motivated or do not have motivation to learn would be more likely to use social media in the classroom, it was actually found that FoMO is more directly related to social media use in the classroom regardless of motivation type (Alt, 2015).

Ko and colleagues (2008) report on the topic of risky behaviors in their study of Chinese college students in which they tested decision making characteristics of college students with internet addiction, which has been seen in those experiencing high levels of FoMO. In this study, extreme uses of the internet were seen to change brain structure, producing lesions on the amygdala. This impacted the students' decision making, novelty seeking, and risk taking behaviors (Ko et al., 2008).



Another study by Stead and Bibby (2017) found that FoMO is both a variable that heightens social media use and a factor in unhealthy obsessive behaviors. FoMO was also negatively correlated with subjective wellbeing in their study. This means that those higher in FoMO were less likely to report their own wellbeing as being healthy. Stead and Bibby claim that these are the result of feelings of social envy and social exclusion with heightened social media use, as well as believing other people's lives are better than their own. Those high in FoMO tend to overestimate the positive emotional experiences and underestimate the negative emotional experiences of others seen on social media.

An additional study that considers the use of late night social media use and sleep was conducted by Scott and Woods (2018). In this study, they evaluated a model in which FoMO predicts nighttime social media use through behavioral and cognitive means which should affect sleep. Their research shows that those high in FoMO were more likely to engage in more social media behavior at night and feel more alert in the bed. They reported that 95% of the sample reports social media usage at night, suggesting a high prevalence of pre-sleep cognitive arousal that stems not just from social media behavior itself, but from the fear of missing out. Therefore, both pre-sleep cognitive arousal and nighttime social media use were shown to be the path by which FoMO predicts shortened sleep duration. (Scott & Woods, 2018). This relates to decreased levels of melatonin and increased levels of cortisol induced by blue light emitted by electronic devices, suggesting an increased flight or fight response when lying in bed by those engaging in social media or other device usage (Gradisar et al.,

2013). This appears to be the mechanism by which FoMO affects biological processes of the body impacting sleep.

One study in particular investigated the relationship between FoMO and college student sleep behaviors, noting that many would rather delay onset of sleep for simply the possibility of friends deciding to spend time together in the dorm or of going out with friends late at night (Adams et al., 2016). This is related to the idea that those high in FoMO are more likely to participate in risky behaviors, as many of the students in this study reported delaying the onset of sleep created a cycle of restlessness, waking late, napping in the afternoon, and trying to find time to prioritize both socializing and academic responsibilities. Socializing for the undergraduate is a very important responsibility in order to participate in the full college experience. This can also be a source for stress on these students, as many put off academic duties and self-care tasks in order to engage with peers.

However, it is again difficult to separate these two constructs, as interpersonal stress is interwoven throughout the literature regarding FoMO. Those high in FoMO would tend to be those who are more affected by the feeling of not fitting in, use of maladaptive strategies for coping with interpersonal stress, and have a diminished sense of self-worth, which further triggers the rumination and guilt leading to feelings of FoMO. This is why it is hypothesized that FoMO will more strongly predict insomnia rather than interpersonal stress. Again, a bidirectional relationship was identified between interpersonal stress and FoMO, which also has a bidirectional relationship with insomnia (Oberst et al., 2017).

### **Biopsychosocial Model and Developmental Perspective**

The biopsychosocial conceptual framework, developed by Engel (1977), proposes that health and development of an individual must be considered within the context of biological, psychological, and social factors (Doherty & Campbell, 1988). Therefore, this theory infers that new social experiences in the lives of college students have lasting impacts on their mental and physical health as well as their continuing development (Adams et al., 2016). The biopsychosocial theory switched clinical view of the patient from a linear way of thinking to a holistic approach that included the context and environment in which the individual is interpreting their reality (Borrell-Carrió et al., 2004). One important piece of this theory was to build a bridge between the mind-body divide, in which clinicians consider the mind and body separate from one another as if neither had an impact on the other. Borrell-Carrió et al. (2004) argue that the mind-body divide is a socially created construct and should not have been separated to begin with. Engel's (1997) research supported this idea by showing that, "fear, rage, neglect, and attachment had physiological and developmental effects on the whole organism." (Borrell-Carrió et al., 2004, p. 577). In this theory, the biological, psychological, and social aspects of a person are considered equal. Thus, in any individual, any of those may play more significant roles at any given time for any given context. All three work together in each person in each of their experiences. Therefore, in following this model, research must consider the whole person in all of their contexts, including their subjective narrative of their experience, in order to draw any conclusions (Borrell-Carrió et al., 2004). The current study acknowledges this by examining psychological and social aspects of college students' lives and how those affect their biological process of sleep.

In addition to the biopsychosocial model, developmental perspectives are considered due to the specific population of college students. The transition to college is known to be a particularly stressful, challenging, and exploratory time for young adults (Adams et al., 2016; Alt, 2015; Brougham et al., 2009; Torres et al., 2009). Specifically, in college student development, Torres and colleagues (2009) discuss the importance of identity development within the college environment. Identity is an individual's personal beliefs about the self in relation to social groups. Identity is socially constructed based on interpersonal interactions with those in the same social groups as the individual as well as with those in different social groups (Torres et al., 2009). Additionally, identity is socially constructed through interactions with both institutions and systems of power and inequality (Torres et al., 2009). Young adults begin this identity exploration in the transition to college by first accepting simple definitions of themselves based on external factors. Then young adult identity development moves towards more complex understandings of themselves within their environment. During this time, college students are able to determine who they are and all the possible selves they can become (Torres et al., 2009).

Previous studies have linked emerging adulthood with increased vulnerability to stress during identity exploration due to new environments, new responsibilities and expectations, modification of existing identities and roles, and adapting new roles (Brougham et al., 2009). Reconstruction of identity is consistent throughout the college experience, especially during the beginning of enrollment. This is due to exposure to new college experiences and increasingly diverse campus communities (Torres et al., 2009). Torres and colleagues (2009) discuss the importance of identities

being fluid, flexible, and multidimensional. Identities also need to be recognized within the greater societal contexts of race, gender, class, and systems of power that marginalize certain identities.

Healthy identity development promotes self-esteem and a sense of belonging, which both contribute to wellbeing. On the other hand, feelings of inadequacy and stress related to not finding a peer group are related to poor health behaviors, such as poor eating habits, excessive time on social media, and decreased sleep quality (Beyens, Frison, & Eggermont, 2016; Nardorff, Nazem, & Fiske, 2010). Current college students have more opportunities than ever before to explore their identities, due to both increasingly diverse campus communities for face to face exploration and online communities (Torres et al., 2009).

While identity is constructed and reconstructed throughout the college years and the lifespan, times of transition leave college students most vulnerable to the biological, psychological, and social impacts the process can have on their development. According to Etindele Sosso (2017), the brain is influenced by social and psychological interactions of the body and its environment throughout the lifespan. These interactions particularly affect the central nervous system, where the majority of brain and mood disorders originate. Changes to these systems increase the risk of developing neurodegenerative diseases, mood disorders, and insomnia. This makes college age students most susceptible to these changes and developing these disorders, especially for those under 30 years old (Etindele Sosso, 2017).

The current study aims to evaluate levels of interpersonal stress (social), FoMO (psychological), and insomnia (biological) in a sample of female university

students who attended the University of Rhode Island in 2014. Specifically, it is hypothesized that FoMO will be more highly correlated to insomnia than interpersonal stress will be for this population. Also, it is hypothesized that the women who are first year students and seniors will experience higher levels of FoMO, interpersonal stress, and insomnia than the sophomore and junior women.

## CHAPTER 3

### METHODOLOGY

The current study aims to determine if FoMO or interpersonal stress has a higher correlation with insomnia levels for female undergraduate students and how those may differ throughout the college years for a sample of college students. Data were collected at the University of Rhode Island through a quantitative design based on the biopsychosocial model. The dataset being used is a secondary dataset collected by Dr. Sue Adams and colleagues through The University of Rhode Island Technology Use and Health Study in 2014. The participants included currently enrolled students at URI, both male and female, of any racial or ethnic group. The students are of traditional college age (18-22), but some ages varied. Both full time and part time undergraduate students were invited to participate. Participants completed an online survey, administered through Qualtrics, independently and anonymously at a time, place, and computer that was convenient to them. The survey took about 20-30 minutes to complete. Participants were recruited by providing the survey link to as many professors as possible in health related fields, and most survey responses came from students enrolled in psychology and human development and family studies courses.

The survey focused on collecting data to examine links between cellphone use and health and well-being in emerging adults and included modified versions of several previously established measures. The current study aims to focus on the

responses relating to FoMO, interpersonal stress, and insomnia. A sample of 253 students were chosen from the original study, which contained 291 participants. Participants with missing data on any of the independent, dependent, and control variables ( $N = 8$ ), as well as all male ( $N = 29$ ) participants, were excluded. This choice was made by the researcher due to the focus area of the study being concerned with female levels of insomnia, FoMO, and interpersonal stress and the ways these constructs affect women specifically. Finally, one participant was excluded from the finale sample due to being outside the age range of interest (50 years old) and was determined to be an outlier. Gender (1: male, 2: female, 3: transgender, 4: other) and biological sex (1: male, 2: female) were both recorded in the dataset. Biological sex was used for the purposes of this study. Chronological age (in years) and year in school (1: first year, 2: sophomore, 3: junior, 4: senior) were both recorded in the dataset. Year in school was used for the purposes of this study in order to consider a developmental perspective of age and how FoMO, interpersonal stress, and their effects on insomnia may change over the years as a female student progresses through college. See Table 1 for a demographic summary of the participants.



Table 1

<i>Descriptive Statistics of Dependent, Independent, and Control Variables (N = 253)</i>				
	<i>N</i>	<i>%</i>	<i>Mean</i>	<i>SD</i>
Age			21.39	4.16
Class Year				
First year students	25	9.9		
Sophomore	85	33.6		
Junior	82	32.4		
Senior	61	24.1		
Race/Ethnicity				
White	222	87.7		
Hispanic	9	3.6		
African American or Black	16	6.3		
American Indian or Alaskan Native	0	0		
Asian	5	2.0		
Native Hawaiian or Pacific Islander	0	0		
Insomnia Severity Index			17.73	5.73
FoMO Scale Score			29.51	11.01
Interpersonal Stress Score			60.93	18.83

*Note.* Data adapted from The University of Rhode Island Technology Use and Healthy Study, 2014.

The sample consisted of 253 participants. Approximately 10% were first year students ( $N = 25$ ), 34% were sophomores ( $N = 85$ ), 33% were juniors ( $N = 82$ ), and 24% were seniors ( $N = 61$ ). The mean age of participants was 21.39 ( $SD = 4.16$ ). The majority of the sample, 88%, was White ( $N = 222$ ), while others were Hispanic ( $N = 9$ ), African American or Black ( $N = 16$ ), or Asian ( $N = 5$ ). No participants identified as Alaskan Native/American Indian or Native Hawaiian/Pacific Islander.

*Study Measures.*

The Fear of Missing Out (FoMO), the pervasive apprehension that others might be having rewarding experiences from which one is absent, was measured in this survey by using a modified version of the ten item Fear of Missing Out scale developed by Przybylski et al. (2013). When administered to a large, nationally representative sample, young adults, especially young men, were found to have the highest reported levels of FoMO, and FoMO was negatively associated with general positive mood and overall life satisfaction. Additionally, first-year university students high in FoMO were more likely to use their cellphones at inopportune times, such as using Facebook during meals and within 15 minutes of waking up, which could have impacts on their level of insomnia and sleep quality. The Fear of Missing Out scale developed by Przybylski and colleagues (2013) is a 10 item questionnaire to which participants respond on a 7-point scale ranging from “not at all true of me” to “extremely true of me” and has demonstrated internal consistencies from .87-.90 in previous studies (Przybylski et al., 2013). The instructions state: “Below is a collection of statements about your everyday experience. Using the scale provided, please indicate how true each statement is of your general experiences.” The present study used a modified 14 item version with additional items. The original FoMO scale has the following items: “I feel others are having more rewarding experiences than me,” “I get anxious when I don’t know what my friends are up to,” “Sometimes I wonder if I spend too much time keeping up with what is going on,” “When I miss out on a planned get together, it bothers me,” “It is important that I understand my friends’ inside jokes,” “When I go on vacation I continue to keep tabs on what my friends are

doing,” “I fear my friends have more rewarding experiences than me,” “I get worried when I find out my friends are having fun without me,” “It bothers me when I miss an opportunity to meet up with friends,” and, “When I have a good time it is important for me to share the details online. The additional four items used were: “It is important for me to keep up to date with what others are doing, via social media,” “When I am driving, I continue to keep tabs on what my friends are doing via cellphone,” “When I am studying, I continue to keep tabs on what my friends are doing via cellphone,” and, “It bothers me when I see on my friends' status updates that they have been having a good time without me.”.

Interpersonal stress, defined as stressors experienced from social situations or societal norms, was measured using a modified version of the Social Stress Inventory (SSQ; Connor-Smith & Compas, 2002). The SSQ assesses the number and stressfulness of interpersonal stressors experienced during the past month in a 25 item questionnaire aimed at college students. For each experience that is endorsed, participants responded on a 4-point scale to rate the stressfulness of the situation as “not at all” to “very.” The items on the SSQ are as follows: “Being around other people who are inconsiderate or offensive,” “Having problems with a friend,” “Not having as many friends of your gender as you would like,” “Having problems with people you live with,” “Being rejected by an organization for a leadership position,” “Seeking friendship or romantic relationship with someone who isn’t interested,” “Turbulence in a romantic relationship,” “Feeling pressured by others to do something that makes you uncomfortable,” “Not having a significant other,” “Not having as many friends of the opposite sex as you would like,” “Feeling pressured to live up to

friends' or family members' expectations," "Not having time to maintain friendships," "Having issues with an authority figure (e.g. professor, coach, advisor, administrator, etc.)," "Having different drinking or partying patterns than your friends," "Being concerned about the behavior of a friend but not knowing how best to help," "Feeling like you are different from everyone else or you can't identify with anyone else," "Not having a date to a date function," "Balancing contact with your parents," "Feeling left out of social gatherings," "Worrying about the wellbeing of a friend or family member," "Stresses, tensions, or changes in your family," "Feeling disconnected or isolated from others," "Dealing with demandingness on the part of a family member or friend," "Feeling like you are putting a strain on your family," and, "Awkwardness in face to face interactions with a friend or acquaintance with whom you have been communicating with electronically."

Insomnia, the inability or difficulty of falling asleep or remaining asleep, was measured using the Insomnia Severity Index (ISI). This is a 7 item, self-report questionnaire to assess the nature, severity, and impact of insomnia over the past month. The ISI evaluates severity of sleep onset, sleep maintenance, and early morning awakening problems, sleep dissatisfaction, interference of sleep, difficulties with daytime functioning, noticeability of sleep problems by others, and distress caused by sleep difficulties. The total score on the ISI ranges from 0-28, and scores greater than 14 are suggestive of moderate to severe insomnia. This measure has demonstrated excellent internal consistency in multiple samples ( $\alpha=.90, .91$ ) (Bastien, Vallières, & Morin, 2001). The items on the ISI are as follows: "Please rate the current (i.e., last 2 weeks) SEVERITY of your insomnia problems(s): difficulty falling asleep,

difficulty staying asleep, and problem waking too early,” “How SATISFIED/dissatisfied are you with your current sleep pattern?” “To what extent do you consider your sleep problem to INTERFERE with your daily functioning (e.g. daytime fatigue, ability to function at work/daily chores, concentration, memory, mood, etc.),” “How NOTICEABLE to others do you think your sleeping problem is in terms of impairing the quality of your life?” and “How WORRIED/distressed are you about your current sleep problem?” Each of these items is rated on a five-point Likert scale (0 = not at all, 4 = extremely) (Bastien, Vallières, & Morin, 2001).

As previously stated, the data has already been collected on these measures with no identifying information about participants. Data analysis was conducted using IBM SPSS Statistics 24 to run descriptive univariate and bivariate analysis. Correlation analyses were used to test the hypothesis that FoMO will be more strongly correlated with higher levels of insomnia, rather than interpersonal stress. ANOVA tests were used in order to determine if levels of interpersonal stress, FoMO, and insomnia vary across the years in college. It is hypothesized that women will show higher levels on all three measures of insomnia, interpersonal stress, and FoMO in their first and fourth years of college than their second and third years of college, due to the onset or impending onset of new life experiences and transitions.

## CHAPTER 4

### FINDINGS

Internal consistency estimates of reliability were computed for each of the three measures used in the current study expressed as Cronbach's coefficient alphas, and each indicated satisfactory reliability. The alpha for the modified FoMO scale created for this study was determined to be ( $\alpha=.918$ ). The alpha for the SSQ used in this study was determined to be ( $\alpha=.937$ ). Finally, the alpha for the ISI measure used in this study was determined to be ( $\alpha=.885$ ).

Pearson correlation coefficients were computed among the three focus variables of study (Insomnia, FoMO, and Interpersonal Stress). Using the Bonferroni approach to control for Type I error across the three non-redundant correlations, a  $p$  value of less than .008 ( $.05/6 = .008$ ) was required for significance. The results of the correlational analyses presented in Table 1 show that all correlations were statistically significant. The correlation of Insomnia with Interpersonal stress (.413) was higher than the correlation of Insomnia with FoMO (.341), which was counter to the original hypothesis. However, these correlations are very close together, both showing moderate to weak strength. The reliability of the strengths of the correlations was not tested. The results also show that FoMO and Interpersonal stress were more highly correlated with each other (.597) than either was with insomnia. See Table 2 for the correlations discussed here.

Table 2  
*Correlations of Independent and Dependent Variables (N = 253)*

	FoMO	Interpersonal Stress
FoMO	--	--
Interpersonal Stress	.597*	--
Insomnia	.341*	.413*

*Note.* \*  $p < .008$

Three one-way analyses of variance tests were conducted to evaluate the hypothesis that women will experience more insomnia, FoMO, and interpersonal stress in their first ( $N = 25$ ) and fourth years of college ( $N = 61$ ) than their second and third years of college ( $N = 167$ ), due to the onset or impending onset of new life experiences and transitions. The independent variable, class year, included three levels: first year students, seniors, and sophomores/juniors. The group of sophomores and juniors was combined because of the idea that these students are not undergoing new life transitions or expecting them as they are settled into their college careers. The dependent variables were Insomnia Index level, FoMO score, and Interpersonal Stress score, each tested through individual ANOVAs. The ANOVA for insomnia was not significant at the .05 level,  $F(2, 249) = 1.56, p = .21$ . The ANOVA for the FoMO score also was not significant at the .05 level,  $F(2, 250) = .313, p = .73$ . The ANOVA for the Interpersonal Stress score again was not significant at the .05 level,  $F(2, 250) = 2.41, p = .09$ . Therefore, the null hypothesis that students would not have any differences in insomnia, FoMO, or interpersonal stress throughout the college years could not be rejected. See Table 3 for the means of each measure across class years of this sample.

With more varied samples of young adults, the means of these measures have shown to be as follows: ISI (measure for insomnia)  $M = 19.7$ , SSQ (measure for interpersonal stress)  $M = 8.9$ , and FoMOs (measure for FoMO)  $M = 25.6$  (Bastien, et al., 2001; Connor-Smith & Compas, 2002; Przybylski et al., 2013). For this sample, the means were as follows: ISI  $M = 17.73$ , SSQ  $M = 60.93$ , and FoMOs  $M = 29.51$ . While the means for insomnia and FoMO scores are similar to previously recorded samples, the mean for interpersonal stress for this sample is larger than the mean of previous samples. See Table 4 to compare the means of this sample to previous samples.

Table 3

*Means and Standard Deviations of Each Dependent Variable Across Class Years (N = 253)*

	Sample Size <i>N</i>	Insomnia Severity Index		FoMO Score		Interpersonal Stress Score	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
First Years	25	19.60	5.87	30.72	10.74	67.52	22.48
Sophomore/Juniors	167	17.43	5.50	29.61	11.09	59.33	18.22
Senior	61	17.75	6.24	28.72	11.00	62.62	18.46
Total	253	17.73	5.73	29.51	11.01	60.93	18.83

Table 4

*Means of Current Sample Compared to Previous Samples on Focus Variables (N = 253)*

	Current Sample <i>M</i>	Previous Samples <i>M</i>
Insomnia (ISI)	17.73	19.7
Interpersonal Stress (SSQ)	60.93	8.9
FoMO (FoMOS)	29.51	25.6



## CHAPTER 5

### CONCLUSION

The current study aims to determine if FoMO or interpersonal stress is more highly correlated to insomnia in a population of female college students, as well as to see if any of those measures vary for students at different points in their college careers. This study was conducted on a sample of 253 female college students at the University of Rhode Island in 2014. Specifically, it was hypothesized that FoMO would be more highly correlated to insomnia than interpersonal stress would be correlated to insomnia, and that all three measures would be higher for first year students and seniors than they would be for juniors and sophomores. Analyses did not allow the null hypothesis for either research question to be rejected.

Correlation analyses showed that interpersonal stress was more highly correlated to insomnia than FoMO was correlated to insomnia; however, both interpersonal stress and FoMO were more highly correlated with each other than either was to insomnia. This finding supports previous literature reporting that stress and insomnia are highly related for the young adult population (Bernert et al., 2007; Brisette & Cohen, 2002; Hall et al., 2000; Hicks et al., 2001; Sadeh et al., 2004). These studies show that, for young adults, conflict and stress within relationships both at home and in social circles can lead to a higher risk of showing symptoms of insomnia. Often, healthy coping skills act as a moderator for students not to suffer from insomnia (Sadeh et al., 2004). Since both interpersonal stress and FoMO are

defined as types of trait anxiety (Alt, 2015), the results of this study extend the literature showing that each has a pervasive effect on one's well-being measured by insomnia symptoms. Williams and colleagues (1988) describe how state and trait anxiety differ: state anxiety increases the value of a threat assigned to a specific stimulus or situation, while trait anxiety creates a tendency to constantly direct attention to the source of a threat (Pacheco-Unguetti et al., 2010; Williams et al., 1988). That is, suffering from each interpersonal stress or FoMO is more likely to have a more disruptive effect on one's life because they are related to one's general disposition to become anxious and their typical levels of anxiety.

The high correlation between FoMO and interpersonal stress shown by the results means that there is multicollinearity between these two constructs, due to the overlap in predictability of each other (Grewal, 2004). While it was originally believed that interpersonal stress and FoMO were measuring two different ideas, there seems to be more overlap than expected. For example, several of the items from the SSQ measure for interpersonal stress are similar to the items on the FoMO measure and similar to the concept of FoMO. The SSQ asked participants to rate how stressful a statement is on a scale from 1-5 ranging from not at all stressful to very stressful. Items of interest include, "feeling pressured to live up to friends' or family members' expectations, not having as many friends of your gender as you would like, not having as many friends of the opposite gender as you would like, feeling left out of social gatherings, feeling like you are different from everyone else, feeling disconnected or isolated from others, awkwardness in face to face interactions with a friend or acquaintance with whom you have been communicating with electronically." Each of

these questions from the SSQ relate to the idea of the fear of missing out on experiences and stress from negative thoughts of what others think of you. Although FoMO and interpersonal stress may be more related than originally expected, the significance of all correlations in this study shows that social stressors (measured by both variables) do predict sleep problems.

Another aspect of this hypothesis to consider is the fact that FoMO is a relatively new construct, with very little literature available thus far. Most of the research concerning FoMO also includes the use of cell phones and social media. While this study adds to the current body of literature as another lens to view FoMO, it is important to consider FoMO as an appropriate construct for individual study. Is FoMO its own concept, or is it more related to anxiety and stress, as shown in these correlation analyses? Is it applicable to only the college student population, or is it increasing across age groups with the rise of simple access to technology and information about each other's lives? Future research should consider ways to break down the idea of FoMO to determine if there are better ways to measure this or if it is worth being measured at all on its own.

Additionally, no differences were found on any of the measures of insomnia, FoMO, and interpersonal stress among any of the students of varying years in college. ANOVA analyses on these variables were conducted showing no differences across the four class years. This finding is not supported in previous literature. Research shows that the many different and new experiences of students throughout their college careers creates significant changes in their identities (Torres et al., 2009) as well as their continued development (Adams et al, 2016; Galambos et al., 2013). Sleep

patterns and insomnia symptoms have been shown to differ for first year students than other grades (Tsai & Li, 2004), and students report similarly high levels of stress in their first year students and senior years compared to their sophomore and junior years (Kreig, 2013).

Due to the frequently cited differences of students across the college years, it is most probable that differences were not seen in this study due to the limited sample size. The first year students sample ( $N = 25$ ) was smaller than any other class size, while the other class sizes were very similar (Sophomores:  $N = 85$ , Juniors:  $N = 82$ , Seniors:  $N = 61$ ). Other characteristics of the sample, including race, gender, and age, were all very similar across the four class years. Almost all participants were white and within the 18-22-year-old age range. All participants were women. Since the survey was distributed as a link provided to as many professors as possible in health-related fields, most survey responses came from students enrolled in psychology and human development and family studies courses. While their majors were not asked as part of the study, it can be assumed that the majority of the sample belonged to these and similar majors. Most research examining differences across the four class years includes a more varied sample of participants. While the means for insomnia and FoMO scores are similar to previously recorded samples, the mean for interpersonal stress for this sample is much larger than the mean on previous samples. It is possible that when the SSQ was first developed by Connor-Smith & Compas (2002) levels of interpersonal stress were not as high for students in 2002 as they were seen to be with this sample, in 2014. This could be due to a variety of factors, including helicopter parenting, increased technology and social media use, and the increased pressure for

millennial students to succeed compared to previous generations (Bland et al., 2012). Sample characteristics continue to be a limitation in this study, discussed below.

The results of the current study should be interpreted in light of its limitations. First, the characteristics of the sample must be considered, due to its impact on the generalizability of the findings. The study sample included mostly white, typical college-age women. While the interest of the researcher lied in women specifically, it does limit the ability to generalize the results to include men or women of other races. Race was not even considered in this study due to the small amount of non-white participants. Also, original study participants falling outside the typical college age range were excluded from the study. These individuals' answers could have provided insight into the college experience for older students as well. Finally, participants with any missing data on any independent or dependent variables were excluded from the study. Those individuals could have impacted the results of the study as well. Second, the number of first year students in the study compared to other class years was much smaller ( $N = 25$ ) compared to the other class years. The results of the study would have been better supported if each class year had similar, if not exactly the same, numbers of students in each group. Future research should focus on a broader range of college students, including those outside of the traditional student age population, men, and individuals of varying races, abilities, and SES. This research should also consider other factors that may impact student stress, such as the number of credits they are enrolled in, employment, scholarship offerings, etc.

The study design poses a second limitation in which the results should be interpreted. The literature on these topics consistently uses cross-sectional study

design to learn more about FoMO, interpersonal stress, and insomnia in the college student population. The current study also utilized a cross-sectional study design, which limits the ability of the researcher to determine causality or directionality of the results. Future research should consider longitudinal studies of college students in which their levels of insomnia, interpersonal stress, and FoMO can be measured throughout the college career. Also, this research should attempt to determine the pathways in which interpersonal stress and FoMO interact with insomnia and with one another. All of these considerations may better help students learn how to combat each interpersonal stress, FoMO, and insomnia in order to have a more successful college career.

The final limitation to consider is the use of insomnia as a measure for the college student population. Taylor and colleagues (2013), using self-reported sleep data of students, found a prevalence of 9.5% of students with insomnia using the more stringent DSM-5 criteria. However, they found a prevalence of 27% of students showing symptoms of insomnia without complaint (part of the DSM-5 criteria), meaning that these students do not consider their sleep deficits a problem, but still would be able to be diagnosed with insomnia if they did have complaints about it. So the question arises: is insomnia the most appropriate measure for college students? In a study conducted by Pilcher and colleagues (1997), they found that sleep quality was more predictive of measures of health, wellbeing, and sleepiness than sleep quantity for college students. Using several established measures of sleep quality, they found that questions relating to daytime sleepiness, which has been shown to relate to severity of sleep disturbance, was better at predicting measures of subjective

wellbeing than questions relating to times falling asleep, hours spent asleep, and nighttime awakenings (Pilcher et al., 1997). In a similar study, Lund and colleagues (2010) found that measurements of daytime sleepiness and sleep quality were more predictive of sleep problems than measures of bedtimes and rise times. However, they also found that perceived stress was the most predictive of poor sleep when compared to sleep schedule regularity, alcohol or drug use, exercise frequency, or electronics usage (Lund et al., 2010). With so many students unable to be caught by insomnia diagnostic criteria, and research showing other more appropriate measures of sleep for college students, it is a limitation of the current study that insomnia was used as a measure as opposed to measures of daytime sleepiness and sleep quality. This does lead to a strength of the study, however, that social stressors were also considered along with insomnia. If insomnia is not the best measure to use, then this is another area in which the study did not fully incorporate the biopsychosocial model: the biological marker of wellbeing was misinterpreted.

The implications of this research lie in directions for future research as well as practice within the college environment. Future research should look deeper into social media and other device usage around sleep in attempt to explain causality of how FoMO or interpersonal stress impacts the biological processes impacting sleep, such as the study conducted by Scott and Woods (2018) that both pre-sleep cognitive arousal and nighttime social media use were shown to be the path by which FoMO predicts shortened sleep duration. This relates to decreased levels of melatonin and increased levels of cortisol induced by blue light emitted by electronic devices, suggesting an increased flight or fight response when lying in bed by those engaging

in social media or other device usage (Gradisar et al., 2013). This appears to be the mechanism by which FoMO affects biological processes of the body impacting sleep. Causality could not be determined through the current study design, but doing so would have implications in practice with college student populations.

Much research still needs to be done in order to determine the ways that FoMO and interpersonal stress work together, are related, and are different. Also, more research considering sleep problems in college students should be directed at sleep quality instead of the measure of insomnia, as it does not catch the breadth of the issue within the college student population. Both of these points relate to the use of the biopsychosocial theoretical model in this field of study. While the biopsychosocial model continues to be relevant in helping individuals embrace holistic views of themselves, and in helping researchers embrace holistic views of their subjects, it only works if all three aspects are actually observed, in some way, in the research.

The biological marker of wellbeing chosen for this study was insomnia, though some studies show that might not have been the best choice. The social marker chosen was interpersonal stress, and the psychological marker chosen was FoMO. These were shown to be highly correlated and may not expand the range of both psychological or social characteristics. When thinking about the biopsychosocial model, it appears that both FoMO and interpersonal stress have impacts on the psychological and social aspects of one's life. Originally it was believed that FoMO would be more psychological while interpersonal stress would be more social. Perhaps there is an argument to be made that both are more one or the other, instead of stating that both



are psychological and social. More research will need to be done to make this determination.

While the current study has limitations, the results of will lead further research and intervention development to help college students cope better with these stressors, create healthy sleep and self-care habits, and know when and how to reach out for help when needed (Coiro et al., 2017). With so many students exhibiting sleep problems and social stressors, it is most important to direct policies and programs towards helping students cope with social stressors, which should in turn improve their sleep quality.

## BIBLIOGRAPHY

- Adams, S.K., Williford, D.N., Vaccaro, A., Kisler, T.S., Francis, A., & Newman, B. (2016). The young and the restless: Socializing trumps sleep, fear of missing out, and technological distractions in first-year college students. *International Journal of Adolescence and Youth*, 1-12.
- Amaral, A.P., Soares, M.J., Pinto, A.M., Pereira, A.T., Madiera, N., Carvalho Bos, S., Marques, M. Roque, C., & Macedo, A. (2018). Sleep difficulties in college students: The role of stress, affect, and cognitive processes. *Psychiatry Research*, 260, 331-337.
- Alt, D. (2015). College students' academic motivation, media engagement, and fear of missing out. *Computers in Human Behavior*, 49, 111-119.
- Bastien, C. H., Vallieres, A., Morin, C.M. (2001). Validation of the insomnia severity index as an outcome measure for insomnia research. *Sleep Medicine Reviews*, 2, 297-307.
- Bernert, R.A., Merrill, K.A., Braithwaite, S.R., Van Orden, K.A., & Joiner, T.E. (2007). Family life stress and insomnia symptoms in a prospective evaluation of young adults. *Journal of Family Psychology*, 21(1), 58-66.
- Beyens, I., Frison, E., & Eggermont, S. (2016). "I don't want to miss a thing": Adolescents' fear of missing out and its relationship to adolescents' social needs, Facebook use, and Facebook related stress. *Computers in Human Behavior*, 64, 1-8.

- Bland, H.Q., Melton, B.F., Welle, P., & Bigham, L. (2012). Stress tolerance: New challenges for millennial college students. *College Student Journal, 46*(2), 32-375.
- Borrell-Carrió, F., Suchman, A.L., & Epstein, R.M. (2004). The biopsychosocial model 25 years later: Principles, practice, and scientific inquiry. *Annals of Family Medicine, 2*(6), 576-582.
- Breslau, N., Roth, T., Rosenthan, L., & Andreski, P. (1996). Sleep disturbance and psychiatric disorders: A longitudinal epidemiological study of young adults. *Biological Psychology, 39*, 411-418.
- Brisette, I., & Cohen, S. (2002) The contribution of individual differences in hostility to the associations between daily interpersonal conflict, affect, and sleep. *Personality and Social Psychology Bulletin, 28*(9), 1265- 1274.
- Brougham, R.R., Zail, C.M., Mendoze, C.M., & Miller, J.R. (2009). Stress, sex differences, and coping strategies among college students. *Current Psychology, 85*, 85-97.
- Buboltz, W.C., Brown, F., & Soper, B. (2001). Sleep habits and patterns of college students: A preliminary study. *Journal of American College Health, 50*, 131-135.
- Buyse, D.J., Angst, J., Gamma, A., Ajdacic, V., Eitch, D., & Rossler, W. (2008). Prevalence, course, and comorbidity of insomnia and depression in young adults. *Sleep, 31*, 473-480.
- Cernovsky, Z.Z. (1984). Life stress measures and reported frequency of sleep disorders. *Perceptual and Motor Skills, 58*, 39-49.

- Cohen, S. (2004). Social relationships and health. *American Psychologist*, 59, 676-684.
- Coiro, M. J., Bettis, A. H., & Compas, B. E. (2017). College students coping with interpersonal stress: Examining a control-based model of coping. *Journal of American College Health*, 65(3), 177-186.
- Connor-Smith, J. K., Compas, B.E. (2002). Vulnerability to social stress: Coping as a mediator or moderator of sociotropy and symptoms of anxiety and depression. *Cognitive Therapy and Research*, 26(1), 39-55.
- De Koninck, J., Lorrain, D., Christ, G., Proulx, G., & Coulombe, D. (1989). Intensive language learning and increases in rapid eye movement sleep: evidence of a performance factor. *International Journal of Psychophysiology*, 8(1), 43-47.
- Doherty, W.J., & Campbell, T.L. (1988). *Family studies text series* (Vol. 10). Thousand Oaks, CA: Sage.
- Dyson, R., & Renk, K. (2006). First year students adaptation to university life: Depressive symptoms, stress, and coping. *Journal of Clinical Psychology*, 62(10), 1231-1244.
- Endler, N.S. & Kocovski, N.L. (2001). State and trait anxiety revisited. *Journal of Anxiety Disorders*. 15, 231–345.
- Engel G. (1977) The need for a new medical model: A challenge for biomedicine. *Science*, 196(4286), 129-136.
- Etindele Sosso, F.A. (2017). Sleep disorders and insomnia: Effects on a young population. *EC Psychology and Psychiatry*, 2(1), 26-32.

- Fry, R. (2016). Millennials overtake Baby Boomers as America's largest generation. *Pew Research Center*, 25.
- Galambos, N.L., Howard, A.L., & Maggs, J.L. (2011). Rise and fall of sleep quantity and quality with student experiences across the first year of university. *Journal of Research on Adolescence*, 21, 342-349.
- Galambos, N.L., Vargas Lascano, D.I., Howard, A.L., & Maggs, J.L. (2013). Who sleeps best? Longitudinal patterns and covariates of change in sleep quantity, quality, and timing across four university years. *Behavioral Sleep Medicine*, 11(1), 8-22. DOI: 10.1080/15402002.2011.596234
- Gradisar, M., Wolfson, A.R., Harvey, A.G., Hale, L., & Rosenberg, R. (2013). The sleep and technology use of Americans: Findings from the National Sleep Foundation's 2011 Sleep in America Poll. *Journal of Clinical Sleep Medicine*, 15(2), 1291-1299.
- Gress-Smith, J.L., Roubinov, D.S., Andreotti, C., Compas, B.E., & Luecken, L.J. (2015). Prevalence, severity, and risk factors for depressive symptoms and insomnia in college undergraduates. *Stress & Health*, 31, 63-70.
- Grewal, R., Cote, J.A., & Baumgartner, H. (2004). Multicollinearity and measurement error in structural equation models: Implications for theory testing. *Marketing Science*, 23(4), 519-529.
- Hall, M., Buysse, D.J., Nowell, P.D., Nofzinger, E.A., Houck, P., Reynolds, C.F., & Kupfer, D.J. (2000). Symptoms of stress and depression as correlates of sleep in primary insomnia. *Journal of Psychosomatic Medicine*, 62, 227-230.

- Hicks, R.A., Fernandez, C., & Pellegrini, R.J. (2001). Striking changes in sleep satisfaction of university students over the last two decades. *Perceptual and Motor Skills, 93*, 660.
- Hirsch, J.K. & Barton, A.L. (2011). Positive social support, negative social exchanges, and suicidal behavior in college students. *Journal of American College Health, 59*(5), 393-938.
- Howe, N. & Strauss, W. (2000). *Millennials rising: The next generation*. New York: Vintage Books.
- Hudd, S., Dumlao, J., Erdmann-Sager, D., Murray, D., Phan, E., Soukas, N., et al. (2000). Stress at college: Effects on health habits, health status, and self-esteem. *College Student Journal, 34*(2), 217-227.
- Katz, D.A. & McHorney, C.A. (2002). The relationship between insomnia and health-related quality of life in patients with chronic illness. *Journal of Family Practice, 51*(3), 229-235.
- Kreig, D.B. (2013). High expectations for higher education? Perceptions of college and experiences of stress prior to and through the college career. *College Student Journal, 47*(4), 635-643.
- Ko, C., Hsiao, S., Liu, G., Yen, J., Yang, M., & Yen, C. (2008). The characteristics of decision making, potential to take risks, and personality of college students with internet addiction. *Psychiatry Research, 175*, 121-125.
- Kocovski, N.L., Endler, N.S., Cox, B.J., & Swinson, R.P. (2004). The differential assessment of state-trait anxiety and depression in a clinically anxious sample. *Journal of Psychopathology and Behavioral Assessment, 26*, 165.

- Lund, H. G., Reider, B. D., Whiting, A. B., & Prichard, J. R. (2010). Sleep patterns and predictors of disturbed sleep in a large population of college students. *Journal of Adolescent Health, 46*(2), 124-132.
- Nadorff, M.R., Nazem, S., & Fiske, A. (2010). Insomnia symptoms, nightmares, and suicidal ideation in a college student sample. *Sleep, 34*(1), 93-98.
- Oberst, U., Wegmann, E., Stodt, B., Brand, M., & Chamarro, A. (2017). Negative consequences from heavy social networking in adolescents: The mediating role of fear of missing out. *Journal of Adolescence, 55*, 51-60.
- Pacheco-Unguetti, A.P., Acosta, A., Callejas, A., & Lupiáñez, J. (2010). Attention and anxiety: Different attentional functioning under state and trait anxiety. *Psychological Science, 21*(2), 298-304.
- Pierceall, E.A. & Keim, M.C. (2007). Stress and coping strategies among community college students. *Community College Journal of Research and Practice, 31*(9), 703-712.
- Pilcher, J.J., Ginter, D.R., & Sadowsky, B. (1997). Sleep quality versus sleep quantity: Relationships between sleep and measures of health, well-being, and sleepiness in college students. *Journal of Psychosomatic Research, 42*(6), 583-596.
- Przybylski, A. K., Murayama, K., DeHaan, C.R., Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior, 29*(4), 1841-1848. doi: 10.1016/j.chb.2013.02.014
- Rapee, R.M. & Medro, L. (1994). Fear of physical sensations and trait anxiety as mediators of the response to hyperventilation in nonclinical subjects. *Journal of Abnormal Psychology, 103*, 693-699.

- Ree, M.J. (2008). Distinguishing cognitive and somatic dimensions of state and trait anxiety: Development and validation of the State-Trait Inventory for Cognitive and Somatic Anxiety (STICSA). *Behavioural and Cognitive Psychotherapy*, 36, 313-332.
- Reiss, S. (1997). Trait anxiety: it's not what you think it is. *Journal of Anxiety Disorders*, 11, 201-214.
- Riordan, B. C., Flett, J.A., Hunter, J.A., Scarf, D., & Conner, T.S. (2015). Fear of missing out (FoMO): The relationship between FoMO, alcohol use, and alcohol-related consequences in college students. *Annals of Neuroscience and Psychology*, 2(7).
- Rosen, L., Carrier, L.M., Miller, A., Rokkum, J., & Ruiz, A. (2016). Sleeping with technology: cognitive, affective, and technology usage predictors of sleep problems among college students. *Journal of the National Sleep Foundation*, 2, 49-56.
- Sadeh, A., Keinan, G., & Daon, K. (2004). Effects of stress on sleep: The moderating role of coping style. *Health Psychology*, 23, 542-545.
- Scott, H. & Woods, H.C. (2018). Fear of missing out and sleep: Cognitive behavioural factors in adolescents' nighttime social media use. *Journal of Adolescence*, 68, 61-65.
- Spielberger, C.D. (1985). Assessment of state and trait anxiety: conceptual and methodological issues. *Southern Psychologist*, 2, 6-16.



- Stead, H., & Bibby, P.A. (2017). Personality, fear of missing out and problematic internet use and their relationship to subjective well-being. *Computers in Human Behavior, 76*, 534-540.
- Taylor, D. J., Bramoweth, A. D., Grieser, E. A., Tatum, J. I., & Roane, B. M. (2013). Epidemiology of insomnia in college students: relationship with mental health, quality of life, and substance use difficulties. *Behavior Therapy, 44*(3), 339-348. doi: 10.1016/j.beth.2012.12.001
- Taylor, D.J., Gardner, C.E., Bramoweth, A.D., Williams, J.M. Roane, B.M., Grieser, E.A., & Tatum, J.I. (2011). Insomnia and mental health in college students. *Behavioral Sleep Medicine, 9*(2), 107-116.
- Torres, V. Jones, S.R., & Renn, K.A. (2009). Identity development theories in student affairs: Origins, current status, and new approaches. *Journal of College Student Development, 50*(6), 577-596.
- Tsai, L.-L., & Li, S.-P. (2004). Sleep patterns in college students: Gender and grade differences. *Journal of Psychosomatic Research, 56*, 231-327.
- Wallace, D. D., Boynton, M.H., Lytle, A.L. (2017). Multilevel analysis exploring the links between stress, depression, and sleep problems among two-year college students. *Journal of American College Health, 65*(3), 187-196. doi: 10.1080/07448481.2016.1269111
- Williams, J.M.G., Watts, F.N., MacLeod, C., & Matthews, A. (1988). *Cognitive psychology and emotional disorders*. Chinchester, England: Wiley.
- Wilson, K. T., Bohnert, A.E., Ambrose, A., Davis, D.Y., Jones, D.M., Magee, M.J. (2014). Social, behavioral, and sleep characteristics associated with depression

symptoms among undergraduate students at a women's college: A cross-sectional depression survey, 2012. *BMC Women's Health*, 14(8).