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Multivariate Relationships of Binge Watching-Drinking-Eating With Depression, Anxiety, and Stress in College Students

Katina Letrice Clarke
Walden University

Walden University

College of Social and Behavioral Sciences

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Katina L. Clarke

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Review Committee
Dr. Charles Diebold, Committee Chairperson, Psychology Faculty
Dr. Amy Sickel, Committee Member, Psychology Faculty
Dr. Gary Burkholder, University Reviewer, Psychology Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

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MA, Bowie State University, 2005

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Social Psychology

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Abstract

Binge eating and drinking have been studied with respect to stress, anxiety, and depression, but little is known about the emerging phenomenon of binge watching television programming. Guided by escape theory and the uses and gratification theory, this cross-sectional, correlational study addressed multivariate relations of binge drinking, binge eating, and binge watching with depression, anxiety, and stress among 102 college students ages 18 to 24. Multivariate canonical correlation results revealed that participants with low anxiety scores tended to have low scores on binge eating and drinking but high scores on binge watching. Participants with low stress scores and high anxiety scores tended to have low scores on binge watching and eating. In a regression model, anxiety, stress, and gender were important predictors of binge eating. Binge drinking was influenced by where a student lived, fraternity/sorority status, athletic participation, depression, and stress. Binge watching was best predicted by a model including stress, anxiety, athletic participation, and whether binge episodes were planned or unplanned. More binge watching occurred among participants not involved in athletics to pass time but not for information. Results may provide college mental health student services centers with empirical data to create programs to identify maladaptive binge behaviors among students and help them more effectively cope with stress, anxiety, and depression.

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Dedication

This work is dedicated to my husband, Dr. Brian Clarke, who has supported me throughout this journey. It is also dedicated to my nieces, Kayla Pierce, Kyra Pierce, and Sydney Clarke, and my nephew, Cameron Clarke. This work is also dedicated to my former and future students. You all have motivated me to reach my fullest academic potential and to provide you with a positive example to follow.

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Chapter 1: Introduction to the Study

Entering college can be an exciting and daunting experience. College students often express initial excitement when leaving home about the prospect of living on a college campus. In addition to new accommodations, they also experience a newfound freedom from parental control. The collegiate atmosphere provides opportunities for new friendships and the space for self-exploration. This newfound freedom comes not only with an increased academic workload but also responsibilities such as learning how to manage time more effectively and maintaining intimate and social relationships. At some point, these new experiences and responsibilities may also become sources of stress for the college student.

Although college students and noncollege students ages 18 to 24 experience stress related to developmental and interpersonal transitions, the stress experienced by college students is unique in that college students must also adjust to the academic institution they attend (Mackinnon, Sherry, Pratt, & Smith, 2014). Stress is experienced when individuals feel they lack the resources to manage or adjust to changes in the environment (Lazarus & Folkman, 1984). When a person is unable to properly manage stress, he or she may also experience anxiety as a reaction to the stress (Anxiety and Depression Association of America, 2017).

Anxiety is the leading mental health complaint of college students (American College Health Association, 2014). Types of anxiety experienced by college students include academic and test anxiety (Spielberger, Anton, & Bedell, 2015), social anxiety (Anxiety and Depression Association of America, 2017), and fear of missing out, which

is a subtype of social anxiety (Chandley, Luebbe, Messman-Moore, & Ward, 2014). Anxiety in college students negatively impacts their academic performance (American College Health Association, 2014) and is also linked to stress and depression (Beiter et al., 2015).

Following anxiety, depression is the second most common mental health complaint among college students (Center for Collegiate Mental Health, 2017). Depressive symptoms are common among college students but more common among nonheterosexual students (Woodford, Han, Craig, Lim, & Matney, 2014) and Black and Latino/a students (Smith, Chesin, & Jeglic, 2014). Depression among college students is linked to low academic performance and the student's ability to succeed and persist to graduation (Auerbach et al., 2016; Boyraz, Horne, Owens, & Armstrong, 2016).

Depression, stress, and anxiety are the top three psychological factors experienced by college students (American College Health Association, 2014). Not all college students seek help in dealing with their mental health but instead use maladaptive coping methods to mediate the affects. Some of these maladaptive coping methods include binge drinking, binge eating, and a new type of binge behavior called binge watching. Instead of relieving symptoms associated with depression, stress, and anxiety, engaging in binge behaviors often exacerbates negative emotions (Heatherton & Baumeister, 1991; Hyman & Sinha, 2009) and contributes to poor academic performance (Petersen, 2016). Research shows that engaging in binge behaviors negatively impacts college students' academic performance and overall mental health (Petersen, 2016).

College students are engaging in binge eating, binge drinking, and binge watching. Although an abundance of research exists relating binge eating and binge drinking to psychological factors among college students, there is little empirical research relating binge watching to psychological factors, which include depression, stress, and anxiety. Binge behaviors share commonalities in that they are all behaviors of overindulgence (de Feijter et al., 2016) and involve consuming an excessive amount of a substance within a short period of time (Heatherton & Baumeister, 1991). Binge drinking and binge eating are sometimes used as maladaptive coping mechanisms to alleviate negative emotions associated with depression, stress, and anxiety (Pedersen, 2017; Sulkowski, Dempsey, & Dempsey, 2011).

Few researchers related binge watching to psychological factors. The few studies that have been done showed a relationship between binge watching and depression (Ahmed, 2017; Wheeler, 2015), while others revealed motivations for binge watching (Panda & Pandey, 2017a; Sung, Kang, & Lee, 2015). Ahmed (2017) examined the relationship between binge watching and depression and loneliness in Arab residents living in the United Arab Emirates and found a positive correlation between binge watching and depression and loneliness. Similarly, Wheeler (2015) explored emotional motivations for college students to engage in binge watching and found a positive relationship between binge watching and depression and attachment anxiety. With respect to motivations for binge watching, Sung et al. (2015) identified seven motivations for binge watching (social interaction, entertainment, passing time, relaxation, escape, information, and habit) and three motivations that predicted binge watching behaviors

(passing time, entertainment, and social interaction). Panda and Pandey (2017a) researched motivations and gratifications of college students' binge watching behavior and found that those who spent more time binge watching were motivated by the ability to escape from reality. Although these studies differed in variables addressed, they shared commonalities in their identification of relationships between binge watching, psychological factors, and the well-being of college students. However, none of these studies addressed binge watching, anxiety, and stress.

College mental health centers have seen a 30% increase in students seeking mental health treatment, yet the student population has increased by only 5% (Center for Collegiate Mental Health, 2017). Most of the students seeking mental health services at college counseling centers identify depression, stress, and anxiety as their presenting problem (American College Health Association, 2014). Findings from the current study may provide college student services with empirical data to use to create programs to identify maladaptive binge behaviors among students and help them more effectively cope with stress, anxiety, and depression.

In Chapter 1, I summarize the literature related to binge drinking, binge eating, and binge watching. Furthermore, I provide an overview of the literature on the relationship between depression, stress, and anxiety and binge behaviors in college students. The problem statement indicates the gap in the literature related to relationships within and between psychological variables (i.e., binge drinking, binge eating, and binge watching) and behavioral variables (i.e., depression, anxiety, and stress). I present a

comprehensive examination of factors relating to binge behaviors and how these behaviors relate to depression, anxiety, and stress in college students.

Background

College students are reporting depression, stress, and anxiety at alarming rates (Center for Collegiate Mental Health, 2017). The American College Health Association (2014) reported that among the students who received mental health services on college campuses, 33.2% identified depression as their presenting problem, 45% reported stress, and 61% noted anxiety. If not properly resolved, emotions associated with stress, depression, and anxiety can negatively impact students' academic success, well-being, and enrollment (Harris, Campbell-Casey, Westbury, & Florida-James, 2015). To mitigate negative emotions associated with depression, stress, and anxiety, some college students use maladaptive methods. Some of these maladaptive methods include engaging in binge behaviors. Studies showed that college students are engaging in binge eating and binge drinking at high rates. Between 37.9 % (Pedersen, 2017) and 50% (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2015) of college students reported engaging in binge drinking. A 2012 study revealed that 30% of college students reported binge eating within the previous week (Kelley-Weeder, Jennings, & Wolfe, 2012). A similar study showed that 59.4% of full-time college students consumed alcohol, and among those who consumed alcohol, 39% also admitted to binge drinking (U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health, 2013).

Binge behavior is defined as a compulsive act of repeatedly overindulging in an activity, without control, and with disregard for negative consequences that may follow (de Feijter, Khan, & van Gisbergen, 2016). A new binge behavior, binge watching, was born out of technological advances that streams movie and television shows ondemand to an array of personal electronic devices. College students are binge watching at rates higher than binge eating and binge drinking. Kutner (2015) reported that 75% of college students are engaging in binge watching behavior. Furthermore, as many as 80% of subscribers to media subscriptions (e.g., HULU and Netflix) engage in binge watching ("Binging Is the New Viewing," 2013).

Binge behaviors are associated with depression, stress, and anxiety. In one study, participants associated feelings of depression or pessimism with binge watching (de Feijter et al., 2016). Ahmed (2017) noted associations between depression and binge watching. Similarly, researchers who investigated college students noted associations between depression and binge watching (Sung et al., 2015; Wheeler, 2015). Researchers have also identified relationships between binge drinking and stress (Kenney, Lac, LaBrie, Hummer, & Pham, 2013; Newton et al., 2014), depression (Martin, Usdan, Cremeens, & Vail-Smith, 2013), and anxiety (Martin et al., 2013; Stewart, Zvolensky, & Eifert, 2001). In addition, binge eating has been related to depression (American Psychiatric Association, 2013; Araujo et al., 2010; Azarbad et al., 2010) and stress (Sulkowski et al., 2011). In Chapter 2, I furnish a more comprehensive explanation of these studies.

When examining theories to help understand binge behaviors, I found that some theories were applied to multiple binge behaviors. For example, the empirical literature revealed that the escape theory (Baumeister, 1991) was used to explain binge drinking motives while the theory of planned behavior (Ajzen, 1991) was used to explain binge drinking behaviors and intentions. In addition, escape theory was applied to binge eating (Higgins Neyland & Bardon-Cone, 2016). The use of binge watching as a form of escape has been suggested in empirical literature (Pena, 2015), but it does not appear that escape theory was applied in any empirical literature. Similarly, I could not find any published empirical studies in which researchers applied escape theory to binge watching, and I found only one study in which gratifications theory was applied to binge watching (Pittman & Sheehan, 2015). Because binge watching shares the hallmark of overindulgence found in other binge behaviors, Jenner (2016) suggested that binge watching should be studied with other binge behaviors. Although binge watching is similar in nature to binge eating and binge drinking, it is possible that the application of escape theory may reveal binge watching motives. In addition, studies revealed relationships between binge eating and binge drinking and negative emotions (Pedersen, 2013; Vickers et al., 2004; Wolff, Crosby, Roberts, & Wittrock, 2000), so it is possible that relationships between binge watching and depression, stress, and anxiety also exist.

Studies on binge behaviors in college students focused on binge eating and binge drinking. Motivations and intentions of binge drinking and binge eating have been extensively researched (Chen & Feeley, 2015; Rhodes & Clinkinbeard, 2013; Ross & Jackson, 2013). Depression, stress, and anxiety have also been associated with binge

eating (Han & Lee, 2017; Han & Pistole, 2014; Sulkowski et al., 2011) and binge drinking (Beiter et al., 2015; Martin et al., 2013; Newton et al., 2014). The nascent empirical literature on binge watching is mainly derived from media and marketing journals. No studies addressed the relationship between binge watching and psychological or health factors specifically in college students. The current study was designed to fill the gap in the literature addressing the relationship between binge behaviors and psychological factors among college students.

Problem Statement

Binge eating and binge drinking share commonalities in that both are compulsive behaviors, both are associated with depression and anxiety, and both are used to escape reality (Rush, Becker, & Curry, 2009). Although little empirical research addressed binge watching and psychological factors (i.e., depression, stress, and anxiety), researchers have studied the relationships between binge eating and binge drinking and psychological factors (Han & Lee, 2017; Martin et al., 2013; Newton et al., 2014). Studies have shown evidence of binge watching among college students (Kutner, 2015; Matrix, 2014); however, the relationship between binge eating, binge drinking, and binge watching and depression, anxiety, and stress was unclear.

College students are binge watching at rates higher than binge eating and binge drinking (Kelley-Weeder et al., 2012; Kutner, 2015; Pedersen, 2017); college mental health centers across the United States have reported a 30% increase in students seeking mental health services for depression, stress, and anxiety, but the student population has only increased by 5% (Center for Collegiate Mental Health, 2017). Given the addictive

nature of binge behaviors noted in psychological and medical literature (Gold, Frost-Pineda, & Jacobs, 2003; Heatherton & Baumeister, 1991; Leon et al., 2007), studying the multivariate relationships between and within psychological variables (i.e., depression, stress, and anxiety) and behavioral variables (i.e. binge drinking, binge eating, and binge watching) was warranted. In addition, understanding the multivariate relationships may provide college student services with empirical data to use for creating programs to identify maladaptive binge behaviors among students and help them more effectively cope with stress, anxiety, and depression.

Purpose of the Study

The purpose of this study was to examine multivariate relationships between binge watching, binge eating, binge drinking and depression, anxiety, and stress among college students. Previous studies demonstrated a positive correlation between other binge behaviors such as binge eating or binge drinking and stress, anxiety, and depression (Beiter et al., 2015). Because a positive correlation exists between other binge behaviors and stress, anxiety, and depression among college students, relationships could also exist between binge watching, stress, anxiety, and depression in the same population. Moreover, multivariate interrelationships may be found between binge watching, drinking, and eating, which combine to explain multivariate interrelationships between depression, anxiety, and stress.

Research Questions and Hypotheses

Multivariate canonical correlation was used to answer Research Question 1 (RQ1), and three separate multiple linear regressions were used to answer RQ2, RQ3, and RQ4.

RQ1: What is the multivariate relationship between the linear combination of binge watching, binge drinking, and binge eating with the linear combination of depression, anxiety, and stress among college students?

H_o1: The multivariate relationship between the linear combination of binge watching, binge drinking, and binge eating with the linear combination of depression, anxiety, and stress among college students is not significant.

H_a1: The multivariate relationship between the linear combination of binge watching, binge drinking, and binge eating with the linear combination of depression, anxiety, and stress among college students is significant.

RQ2: What is the relationship between the linear combination of depression, anxiety, and stress with binge eating among college students?

H_o2: After controlling for the student's age, gender, ethnicity, and year in college if related to binge eating, the linear combination of depression, anxiety, and stress is not related to binge eating.

H_a2: After controlling for the student's age, gender, ethnicity, and year in college if related to binge eating, the linear combination of depression, anxiety, and stress is related to binge eating.

RQ3: What is the relationship between the linear combination of depression, anxiety, and stress with binge drinking among college students?

H_o3: After controlling for the student's age, gender, ethnicity, and year in college if related to binge drinking, the linear combination of depression, anxiety, and stress is not related to binge drinking.

H_a3: After controlling for the student's age, gender, ethnicity, and year in college if related to binge drinking, the linear combination of depression, anxiety, and stress is related to binge drinking.

RQ4: What is the relationship between the linear combination of depression, anxiety, and stress with binge watching among college students?

H_o4: After controlling for the student's age, gender, ethnicity, and year in college if related to binge watching, the linear combination of depression, anxiety, and stress is not related to binge watching.

H_a4: After controlling for the student's age, gender, ethnicity, and year in college if related to binge watching, the linear combination of depression, anxiety, and stress is related to binge watching.

RQ5: What are the combined and relative effects of the Television Viewing Motives subscales in accounting for variance in binge watching?

Theoretical Framework for the Study

Two theories were used to develop the theoretical framework for this study. These theories included (a) escape theory (Heatherton & Baumeister, 1991) and (b) uses and gratification theory (Levy & Windahl, 1984). The use of these theories provided a

framework to explore both positive and negative motivating factors for engaging in binge behavior.

The escape theory explains the use of binge behaviors as a way to mitigate negative emotions by refocusing attention from negative self-perceptions to something in the immediate environment (Heatherton & Baumeister, 1991). Studies have shown that both binge eating (Heatherton & Baumeister, 1991; Higgins Neyland & Bardon-Cone, 2016) and binge drinking (Baumeister, 1991) are used to escape from negative emotions by refocusing attention from something negative to something in the immediate environment. Rosenbaum and White (2013) reported that binge eating and binge drinking share the component of cognitive avoidance found in escape theory. Escape theory has not been applied to binge watching in published empirical literature; however, binge watching may also provide a platform for cognitive avoidance as a form of escape (Panda & Pandy, 2017a).

Uses and gratification theory provides an explanation for how media is used to gratify human needs (McQuail, 2010) including cognitive, affective, personal integrative, social integrative, and tension free needs. Because of the nature of this theory, it can only be used to explain binge watching behavior. Unlike escape theory, which focuses on negative motivations to engage in binge behaviors (i.e., to escape from negative emotions), the uses and gratifications theory provides other explanations for binge watching including (a) learning from the media consumed (e.g., watching news or educational programs), (b) using media to satisfy emotional needs (e.g., connecting with characters in a program), (c) connecting or socializing with others (e.g., connecting with

others through engaging in conversation about a shared interest in the media), or relaxing (e.g., using media to decompress and escape a source of tension) (McQuail, 2010).

The current study focused on multivariate relationships between time spent binge watching, binge eating, and binge drinking and depression, anxiety, and stress among college students. The aforementioned theories provided a dual theoretical framework in which to explore the relationship between binge watching, depression, anxiety, and stress. Studies on binge behaviors identified in Chapter 1 are comprehensively explained in Chapter 2.

Nature of the Study

This quantitative study included a nonexperimental survey design to collect self-reported data and analyze the multivariate relationships between binge watching, binge eating, and binge drinking and depression, anxiety, and stress among college students ages 18 to 24 . The sample included college students enrolled full time at a college or university in the United States. Students who lived on campus and those who commuted were included in this study. All data came from primary sources using self-report questionnaires completed by college students. The Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1996) was used to assess symptoms associated with depression, stress, and anxiety experienced by the respondent over the previous week. The DASS-21 consists of 7 items for each of the three subscales and includes a Likert-type response from 0 (did not apply to me at all) to 3 (applied to me very much; Lovibond & Lovibond, 1996). Antony, Bieling, Cox, Enns, and Swinson (1998) concluded the DASS-21 had acceptable reliability and validity in a clinical and

community sample. In addition, Mahmoud, Staten, Hall, and Lennie (2012) used the DASS-21 with a sample of college students.

Questions concerning binge drinking, binge eating, and binge watching were used to capture participant engagement in these behaviors. Binge drinking questions followed guidelines recommended by the NIAAA (2003) to identify participants' pattern of alcohol consumption. The six-item set of recommended questions assessed drinking frequency and consumption that increased blood alcohol concentration to 0.08 grams percent or above (NIAAA, 2003). Such an increase in blood alcohol concentration occurs in a typical female when four or more drinks are consumed within 2 hours or in a typical male when five or more drinks are consumed within the same time frame (NIAAA, 2003).

Binge eating behavior was assessed using the Binge Eating Symptoms Measure (Mason & Heron, 2016). This is a two-question measure that requires participants to give a yes or no response to questions about overeating and feelings of embarrassment and loss of control if respondents engaged in overeating (Mason & Heron, 2016). Questions in this measure were intended to identify binge behavior and were not intended to diagnose binge eating disorder.

At the time of this study, an exhaustive search revealed only two published binge-watching instruments. Shim and Kim (2018) created a binge-watching measure that assesses motivations and individual differences in binge watching. Panda and Pandey (2017b) created a binge-watching instrument that measures motivations for binge watching, intentions to spend more time binge watching, and the subsequent gratification

obtained from engaging in binge watching. These published instruments were beyond the scope of this study; consequently, I followed the lead of other quantitative binge-watching researchers (Ahmed, 2017; Sung et al., 2015; Wheeler, 2015) and assessed binge-watching behavior using researcher-created questions. These questions were intended to identify binge-watching behavior in participants. The binge-watching questions were based on the operationalized definition of binge watching that described the phenomenon as watching two or more consecutive episodes of the same television show in one sitting (Ahmed, 2017; "Netflix Declares Binge Watching," 2013; Sung et al., 2015; Walton-Pattison, Dombrowski, & Presseau, 2018; Wheeler, 2015).

Definitions

Anxiety: A stress response that is "characterized by feelings of tension, worried thoughts and physical changes" (American Psychological Association, 2018, para. 1).

Binge drinking: For women, consuming four or more drinks within a 2-hour period and over the past 2 weeks, and for men, consuming five or more drinks within a 2-hour time period over the past 2 weeks (NIAAA, 2018).

Binge eating: Excessive food consumption accompanied by negative emotions and feelings of loss of control of food consumption despite being satiated (American Psychiatric Association, 2013).

Binge watching: Watching two or more consecutive episodes of the same television show in one sitting (Ahmed, 2017; "Netflix Declares Binge Watching," 2013; Sung et al., 2015; Walton-Pattison et al., 2018; Wheeler, 2015).

Depression: Experiencing feelings of sadness and loss of interest, which focuses on symptoms associated with depression (American Psychiatric Association, 2013).

Stress: "A particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources" (Lazarus & Folkman, 1984, p. 19).

Assumptions

Assumptions are used to narrow and bind a study (Leedy & Ormord, 2013). Assumptions in the current study included the following:

Assumption 1: Participants had sufficient command of the English language to read and understand survey questions.

Assumption 2: Participants were self-aware of their binge behavior and would honestly respond to survey questions.

Assumption 3: Measurable variables could adequately explain with escape theory and uses and gratification theory.

Assumption 4: A sample of college students ages 18 to 24 years in the United States would be willing to complete the survey.

Assumption 5: Findings that were statistically significant would relate to identified variables and not variables that were not measured.

Assumption 6: The sample would be representative of the population.

Scope and Delimitations

College students ages 18 to 24 years are the heaviest users of binge watching ("Binge Watching in the U.S.," 2018). Depression, anxiety, and stress are also prevalent

among this same population (Center for Collegiate Mental Health, 2017). College students ages 18 to 24 were included in this study. Although other age groups engage in binge watching behavior, Ahmed (2017) noted that binge watching behavior increased as age decreased in participants between the ages of 18 and 48 years. These findings made the 18- to 24-year-old college student population a more desirable group for the current study. Common theories used in binge behavior research include escape theory (Heatherton & Baumeister, 1991) and theory of planned behavior (Ajzen, 1991). Because the current study included a type of binge behavior that did not include a physical consumption (i.e., eating or drinking) but rather a visual consumption (i.e., binge watching), uses and gratifications theory (Levy & Windahl, 1984) provided a more appropriate framework to understand motives of television consumption.

Limitations

Self-report data were used in this study; consequently, the inaccuracy of information provided in the self-reports may have posed a limitation. In addition, survey questions did not allow participants to expand or offer clarification of their responses because the survey questions were in the form of Likert-type questions. Because psychological states and binge behaviors were not manipulated, the nonexperimental nature of this study precluded causal conclusions. Finally, the sample size may have been too small to permit generalization of findings to other populations.

Significance

Unlike other binge behaviors such as binge eating or binge drinking, binge watching is a fairly new phenomenon with a dearth of empirical research. Binge

behaviors are prevalent among college students (Kelley-Weeder, Jennings, & Wolfe, 2012; U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health, 2013), and binge behaviors have commonalities in that they are all addictive behaviors used unproductively as an escape outlet (Alavi et al., 2012). In 2015, more than 75% of college students reported binge watching (Kutner, 2015). This population is also at risk for experiencing stress, anxiety, and depression while in college (Kutner, 2015; Munir, Shafiq, Ahmad, & Khan, 2015). Previous research showed that binge drinking and binge eating are associated with poor academic and health outcomes (Petersen, 2016). Findings from the current study may provide college student services with empirical data to use in creating programs to help college students effectively cope with stress, anxiety, and depression.

Summary

College students are engaging in binge behaviors at alarming rates. Examining the relationships between binge behaviors and psychological factors may help college and university administrators and counseling center staff identify maladaptive coping methods used by students when engaging in binge behaviors. In Chapter 1, I provided an overview of the current study. In Chapter 2, I outline three major psychological factors experienced by college students and explain how binge behaviors are used as maladaptive coping methods to mediate negative emotions.

Chapter 2: Literature Review

Binge behavior is defined as a compulsive act of repeatedly overindulging in an activity, without control, and with disregard for negative consequences that may follow (de Feijter et al., 2016). Binge behaviors are common among college students (Kutner, 2015). Studies have shown evidence of binge watching among college students (Kutner, 2015; Matrix, 2014), but the relationship between binge eating, binge drinking, and binge watching and depression, anxiety, and stress was unclear, particularly the multivariate relationships.

Binge drinking among college students is considered a public health concern because of the prevalence on college campuses and consequences experienced by those who engage in the activity (Brown-Rice, Furr, & Jorgensen, 2015; Center for Behavioral Health Statistics and Quality, 2016; NIAAA, 2015). Hazardous alcohol consumption has also been related to stress (Kenney et al., 2013; Newton et al., 2014), depression (Martin et al., 2013), and anxiety (Martin et al., 2013; Stewart et al., 2001). Furthermore, various theories have been used to explain problem drinking, including escape theory (Baumeister, 1991) and the theory of planned behavior (Ajzen, 1991). Binge eating has also been extensively researched with empirical evidence supporting relationships between binge eating and depression (American Psychiatric Association, 2013; Araujo et al., 2010; Azarbad et al., 2010) and stress (Sulkowski et al., 2011).

Binge eating and binge drinking behaviors are similar because they are compulsive behaviors often associated with depression and anxiety, and engagement in these behaviors allows a person to escape from reality (Rush et al., 2009). Binge behavior

of any type often leads to negative outcomes. For example, researchers found that engagement in binge behaviors often resulted in poor academic outcomes for college students (Trolian, An, & Pascarella, 2016; White & Hingson, 2013). Researchers also found that binge behaviors resulted in negative health consequences (Deluchi et al., 2017; Hingson, Zha, & Smyth, 2017; Townshend, Kambouropoulos, Griffin, Hunt, & Milani, 2014; Tyler, Schmitz, & Adams, 2015).

An abundance of research exists on binge behaviors, including binge eating and binge drinking (Kelly-Weeder, Phillips, Leonard, & Veroneau, 2014; Kutner, 2015; NIAAA, 2015). However, little research was found on binge watching, and even fewer studies addressed the relationship between binge watching and psychological factors such as depression, stress, and anxiety among college students. Ahmed (2017) examined relationships between binge watching, depression, and loneliness in the United Arab Emirates. Wheeler (2015) examined relationships between binge watching, attachment, loneliness, and depression among college students. Other binge-watching studies addressed motivations (Devasagayam, 2014; Panda & Pandey, 2017a; Petersen, 2016; Shim & Kim, 2018; Sung et al., 2015) and consequences (Exelmans & Van den Bulck, 2017; Petersen, 2016) of binge-watching behavior.

A lacuna existed in research addressing the multivariate relationships between time spent binge watching, binge eating, and binge drinking and depression, anxiety, and stress among college students. This study was conducted to fill this gap. An increased understanding of the multivariate relationships between psychological and behavioral variables may provide college student services with empirical data to use for creating

programs to identify maladaptive binge behaviors among students and help them more effectively cope with depression, stress, and anxiety.

Literature Search Strategy

I used an exhaustive search strategy that included scholarly sources, media sources, and topic-related Internet pages. Although various sources were used, peer-reviewed journal articles were the primary sources for this study. The research literature was obtained from the following library databases: EBSCO's Academic Search Premier, PsycARTICLES, PsycEXTRA, and ProQuest Dissertation and Theses.

When selecting empirical literature, I used a date range of 2013 to 2018. Older search parameters were used to obtain seminal works related to theoretical perspectives. Key search terms included but were not limited to *binge eating*, *binge drinking*, *binge watching*, *binge viewing*, *marathon viewing*, *television addiction*, *depression*, *stress*, *anxiety*, *college students*, *university students*, and *emergent adults*.

Depression, stress, anxiety, binge eating, and binge drinking have been widely studied in the academic community. However, research on binge watching has been less prevalent. Consequently, the scope of the search on binge behaviors was broadened to include other forms of binging.

Theoretical Framework

Two main theories were used as the theoretical framework for this study. In this section, I explore theories related to binge eating, binge drinking, and binge watching. These theories include (a) escape theory (Heatherton & Baumeister, 1991) and (b) uses and gratification theory (Levy & Windahl, 1984).

Escape Theory

Escape theory explains how people use behaviors to avoid negative emotions by refocusing their attention from negative self-perceptions to something in the immediate environment (Heatherton & Baumeister, 1991). An escape or refocusing occurs when an event causes a person to realize his or her identity failed to live up to a desired standard; consequently, the person avoids thinking about failures and instead focuses "on the immediate present, concrete or low-level thinking, and [has] a refusal of broadly meaningful thoughts" (Heatherton & Baumeister, 1991, p. 89). According to escape theory, a conscious awareness of negative shortcomings (ego threat) contributes to negative affect. The avoidance of this awareness is an effort to escape from negative emotions (Heatherton & Baumeister, 1991) and to escape from self-awareness (Duval & Wicklund, 1972).

Escape theory is often associated with suicide as a means of escaping from self (Baumeister, 1990), but escape theory has also been used to explain binge behaviors. Examples of escape through binge behaviors are prevalent among college age men and women; however, escape theory has been applied more to binge eating than to binge drinking. Higgins Neyland and Bardon-Cone (2016) tested the escape theory of binge eating, which involved acculturative stress, family disconnection, and discriminatory stress, with Latino/a men and women between the ages of 18 and 25. Higgins Neyland and Bardon-Cone (2016) concluded that acculturative stress and binge eating relationships were mediated by negative emotions. As acculturative stress increased, so did binge-eating behavior (Higgins Neyland & Bardon-Cone, 2016). Similarly, Mason,

Lewis, and Heron (2017) noted that when stress was associated with discrimination, there was also an increase in negative emotions and binge eating resulted. Although escape theory provides a cogent explanation for why and how people escape aversive self-awareness and use cognitive deconstruction to remove higher meaning from awareness, Baumeister (1990) argued that it was difficult to sustain low levels of thinking, and a person's thinking could fluctuate between low and high levels, which could make it difficult to avoid negative emotions. Furthermore, when cognitive deconstruction was employed, responsibility and decision-making were avoided by averting self-awareness and engaging in mindless action, which could include binge behavior (Baumeister, 1990).

Escape theory was used in empirical studies to explain how binge eating mediates negative emotions (Higgins Neyland & Bardon-Cone, 2016). Because binge behaviors are compulsive acts of repeatedly overindulging in an activity without control and with disregard for negative consequences that may follow (de Feijter et al., 2016), escape theory may also elucidate binge-watching motivations associated with negative emotions. The basic tenets of escape theory are that negative emotions are avoided by refocusing attention from the negative to something else in the immediate environment (Heatherton & Baumeister, 1991). Panda and Pandey (2017a) identified one motivation for engaging in binge watching as an escape from reality. Consequently, it is possible that escape theory may explain how binge watching could be used to avoid negative emotions by redirecting attention from self to the behavior of binge watching.

Uses and Gratification Theory

Uses and gratification theory was introduced in the 1940s by Lazarsfeld-Stanton (Katz, Blumler, & Gurevitch, 1973). This theory was used to understand the consumption and gratification of various radio programs. The theory was later expanded in the 1970s to include other forms of media. This theory has also been used in research to understand why people seek out certain forms of media and how their media choices gratify needs and goals (Palmgreen, Wenner, & Rosengren, 1985).

Katz, Blumer, and Gurevitch (1973) asserted that media are used to gratify human needs. McQuail (2010) identified the five basic gratifications of media as (a) cognitive needs, (b) affective needs, (c) personal integrative needs, (d) social integrative needs, and (e) tension free needs. Cognitive needs are met when media are used to acquire knowledge, which might be obtained from watching news or educational programing (Katz, Haas, & Gurevitch, 1973). Affective needs are met when media are consumed to satisfy emotional needs (McQuail, 2010). Personal integrative needs are met by viewing media programing (such as shopping channels) with the purpose of maintaining self-esteem through programs that display the latest trends and objects, which consumers may purchase to improve their social status (McQuail, 2010). Social integrative needs are met when media are used to connect and socialize with others. Social integrative needs may be evident in a person's need to engage in a particular television program with the purpose of acquiring knowledge of the show to interact with others through discussions of a program (Pittman & Tefertiller, 2015). Tension free needs are met when a person engages in media to escape sources of tension (McQuail, 2010).

According to uses and gratification theory, the audience member takes an active role in viewing choices and has control and power over the cause and effect relationship between what is viewed and his or her behavior (Schramm, Parker, & Lyle, 1961). Because audience members are consciously aware of the amount of media they are consuming and their motivation for consuming media, they are also capable of completing self-report measures, which would provide data to be analyzed (Katz, Blumer, & Gurevitch, 1973). Self-report measures used in the uses and gratification theory have also given way to criticisms of the theory (Katz, Blumer, & Gurevitch, 1973).

Researchers who use the uses and gratification theory must assume that participants have adequate self-awareness of why they chose certain media and the need that consumption of the media gratifies (Pittman & Sheehan, 2015). Other criticisms include that the uses and gratification theory does not take into account the influential power media have over the consumer (Katz, Blumer, & Gurevitch, 1973). Researchers have also argued that the uses and gratification theory does not meet theoretical standards and, therefore, should be referred to as an approach (Blumler, 1979; Katz, Blumer, & Gurevitch, 1973; Ruggiero, 2000).

The application of uses and gratifications theory has evolved with the change of the consumption of media in the 21st century (Dunne, Lawlor, & Rowley, 2010). The evolution has been evident in the shift in application of the uses and gratification theory in research that included radio listeners (Conner, Lazarsfeld, & Stanton,1942), television viewers (De Bock,1980; Rubin, 1983), readers of printed material (De Bock, 1980), and

consumers of social media (Dolan, Conduit, Fahy, & Goodman, 2015; Whiting & Williams, 2013).

The application of the uses and gratification theory has also elucidated attitudes and behaviors regarding modern media consumption (Khan & Manzoor, 2013). Binge-watching research remains in its infancy, and few researchers have applied uses and gratification theory. In a recent study, Pittman and Sheehan (2015) applied uses and gratification to understand why self-reported binge watchers engaged in the activity, the factors that influenced binge watching behaviors, and the need served by binge watching. Pittman and Sheehan used a snowball sampling technique to recruit participants through social media. Those who were binge watching *House of Cards* on Netflix were invited to complete a survey. Of the 272 participants, females were more likely to binge watch than males (62%), and those under 40 were also more likely to binge watch than those over 40 (Pittman & Sheehan, 2015). Factor analysis was used to assess 27 statements made by participants about binge-watching behavior, and the results of the first factor varied from initial factors found in classical uses and gratification studies (Pittman & Sheehan, 2015). Participants reported entertainment and engaging characters as motivation for engaging in binge-watching behavior (Pittman & Sheehan, 2015). Participants also reported motivation factors similar to those found in classical uses and gratification studies, including relaxation, time filler, and pleasure (Pittman & Sheehan, 2015).

The limited research applying uses and gratification theory to binge-watching behavior provided a foundation for the current studies. Applying the uses and gratification theory may provide a better understanding of the rationale for engaging in

binge-watching behaviors. Factors in the uses and gratification theory may facilitate a more comprehensive awareness of motivating factors for binge watching.

Literature Review Related to Key Variables

Binge Watching

Although is it possible that some people overindulged in motion pictures and television prior to the current era, binge watching is a relatively new phenomenon born out of on-demand access to television programs and movies. Because binge watching is a new way of consuming media, no agreed upon definition exists in the media or scientific literature. Binge watching has been defined in popular media and empirical studies as watching between two and six episodes of the same television program in one sitting ("Netflix Declares Binge Watching," 2013; Sung et al., 2015; Walton-Pattison et al., 2018; Wheeler, 2015). Although the definition of binge watching remains fluid, both media sources and empirical researchers described binge watching as an overindulgence in programs that contain more than one episode and are watched within a short time period (Devasagayam, 2014). These programs may be streamed on demand to various personal electronic devices. Popular streaming services include Netflix, Amazon Prime, Hulu, and YouTube ("Binging Is the New Viewing," 2013).

A paucity in empirical studies exists, which relates binge watching to psychological factors; consequently, sources for this section include published media articles, conference proceedings, dissertations, theses, and the few empirical studies available at the time of this writing. Furthermore, published empirical studies are mainly concentrated in the media and marketing realm with fewer studies relating binge

watching to psychological health and even fewer including college students as participants. Empirical articles were sourced from the United States and abroad.

Hulu and Netflix are the most popular binge-watching mediums with 70% of Hulu subscribers and 80% of Netflix subscribers admitting to binge watching at least three episodes in one day ("Binging Is the New Viewing," 2013). Binge watching is experienced across age groups and genders, but findings in a study conducted in the United Arab Emirates revealed that binge watching was more prevalent among those who were single and under the age of 30 (Ahmed, 2017). Comparable results were reported by Deloitte (2017) in the Digital Democracy Survey that identified American 20-33-year-olds as binge watching more than did other age groups. No agreement exists in the empirical literature regarding which gender spends more time binge watching. A study conducted in the United Arab Emirates revealed no difference in the amount of time that men and women spent binge watching (Ahmed, 2017); however, a Dutch research agency reported that men spent more time binge watching than did women ("Binge-watching research," 2017). The mixed results in these studies may be due in part to the differences in cultures and geographic location.

Binge watching may be a planned or unplanned activity, and researchers have described the differences between the two types. Those who plan times to binge watch or use binge watching as a reward are considered intentional binge watchers; however, those who begin watching a program and find themselves unintentionally engaged in the activity are considered unintentional binge watchers (Riddle, Peebles, Davis, Xu, & Schroeder, 2017). Unintentional binge watchers were described as using binge watching

as a way to escape reality (Pena, 2015); consequently, unintentional binge watchers are also more likely to have more negative outcomes from binge watching than are intentional binge watchers (Riddle et al., 2017).

To understand how media are used to satisfy needs, Leung and Liang (2016) identified those persons with procrastination and impulsive tendencies as more likely to have problematic cell phone usage. Similarly, Sung et al. (2015) identified procrastinators as having greater difficulty in controlling their use of streamed media. Media streaming platforms feed into the impulsive nature of some watchers by automatically playing the next program in a series without any effort from the viewer. Self-identified binge watchers reported to both journalist Manley (2016) and researchers Petersen (2016) that the automatic play feature made the act of binge watching easy.

Binge watching has not been noted to have immediate health consequences (Devasagayam, 2014); however, binge watching can easily become a behavioral addiction that shares commonalities with other addictions such as eating, gambling, and substance addictions (Alavi et al., 2012). The addictive qualities of binge watching have been reported by a journalist (Hsu, 2014) and researchers (Devasagayam, 2014; Riddle et al., 2017; Sung et al., 2015), but unintentional binges are reported to be more closely related to addictions (Riddle et al., 2017).

Binge watchers have reported addictive behaviors in their binge-watching activities. For example, in a Dutch study (N = 32), 56% of participants reported difficulty in ceasing their binge-watching session (de Feistier, Khan, & Gisergen, 2016). Similarly, Riddle et al. (2017) found that addictive symptoms were more prevalent in those who

unintentionally binge watched. These researchers also reported a link between impulsivity and unintentional binge watching.

Results from two studies, which focused specifically on college students, revealed students' unawareness of their binge-watching behavior with respect to the actual time spent binge watching (de Feistier et al., 2016) and an unawareness of negative consequences associated with binge watching (Petersen, 2016). This unawareness contradicts the basic tenets of the uses and gratification theory, which suggests the watcher is actively engaging in the viewing and has power and control over their viewing and behavior associated with viewing (Schramm et al., 1961). This unawareness of negative consequences may be due in part to the lack of immediate physical side effects experienced as a result of binge watching (Devasagayam, 2014).

Similar to binge drinking and binge eating, binge watching is associated with depression (Ahmed, 2017; Devasagayam, 2014; Wheeler, 2015), attachment anxiety (Wheeler, 2015), and is considered a maladaptive coping mechanism. Researchers in one study that included medical students with depressive symptoms ($N = 94$) reported no association between binge watching and depressive symptoms (Boudali, Hamza, Halayem, Bouden, & Belhadj, 2017). The conflicting results in this study could be because of a lack of time and demanding schedules, which might prevent medical students from engaging in binge watching. In addition, binge watching is associated with stress, but more positively with participants reporting how they use binge watching to relax (Petersen, 2016). Furthermore, consequences of binge watching are also similar to

some consequences found in college students who binge drink to include loss of sleep, missing class, procrastinating on assignments, and lower grades (Petersen, 2016).

Jenner (2016) suggested binge watching should be studied along with other binge behaviors such as binge eating and binge drinking. This path has yielded evidence of relationships between other binge behaviors and depression, stress, or anxiety. For example, Sung et al. (2015) asserted that similar to binge drinking and binge eating, binge watching may also be related to depression. In a study that included residents of Abu Dhabi in the United Arab Emirates (N = 260), Ahmed (2017) also identified a relationship between binge watching and depression. Wheeler (2015) also noted a relationship between depression and binge-watching behavior.

Binge behaviors are similar because they all involve an overindulgence within a short period of time and are used as a form of escape (Heatherton & Baumeister, 1991). The similar nature of overindulgence found in binge eating, binge drinking, and binge watching was noted by de Feistier et al. (2016). Similar to other binge behaviors, the nascent research shows that binge watching is popular among college students (Kutner, 2015), and has the potential of negative consequences on their health and academic performance (Petersen, 2016). In addition, more college students reported binge watching than binge eating and binge drinking combined. Consequently, because binge behaviors share a similar nature of overindulgence (de Feistier et al., 2016) and can contribute to negative health and academic outcomes (Petersen, 2016), these behaviors should be examined as a possible maladaptive coping method used by college students to mediate the effects of emotions associated with depression, stress, and anxiety. It may also be

beneficial to explore binge watching as it relates to binge eating, binge drinking, and depression, anxiety among college students.

Binge Eating

Binge eating has long been identified as an eating disorder, which was first introduced by Henry Stunkard in the late 1950s as night eating syndrome. Binge eating disorder was not formally classified by American Psychiatric Association until much later. Recognizing that binge eating could occur at any time during the day, the original nocturnal component was removed from both the name of the disorder and the criteria describing the disorder (Brewerton, 2014). Binge eating disorder was only recently added to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) as an eating disorder classification. Prior to 2013, binge eating disorder was classified under the heading of Eating Disorders Not Otherwise Specified (American Psychiatric Association, 2000). Binge eating can be identified as clinically significant or subclinical. The behavior of binge eating may be identified as clinically significant (i.e., binge eating disorder) when an excessive amount of food is consumed at least once a week and over a period of three months. In addition, the excessive food consumption is accompanied by negative emotions and feelings of loss of control of food consumption despite being satiated (American Psychiatric Association, 2013). Although four severity groups are based on the frequency of binge eating (i.e., mild, moderate, severe, and extreme), an absence of empirical support exists for this severity criterion (Grilo, Ivezaj, & White, 2015). Subclinical binge eating, also identified as partial binge eating disorder, is considered when binge eating behavior is present

without meeting at least three or more of the criteria necessary for a binge eating disorder diagnosis (Crow et al., 2002).

Negative affect is a common feature of binge eating disorder and is supported by cognitive behavioral theories (Berger et al., 2014; Young et al., 2014). Heatherton and Baumeister (1991) provided a cogent argument for the significant role that negative affect plays in the development and maintenance of binge eating. Furthermore, they also asserted that binge eating was used to escape and avoid negative emotions, yet it failed to relieve depressive feelings (Heatherton & Baumeister, 1991).

As one of the associated features of binge eating disorder, depression is a common comorbidity (American Psychiatric Association, 2013; Araujo et al., 2010; Azarbad et al., 2010). Stress has also been associated with binge eating as a maladaptive form of coping (e.g., avoidant and emotion-focused) with stress (Sulkowski et al., 2011). Specifically, Sulkowski et al., (2011) noted a positive association between stress and binge eating when female college students used emotion-focused and avoidant coping methods. Because, binge eating disorder was only formally recognized in 2013, researchers have not researched this disorder as much as they have other eating disorders. One such binge eating disorder study (Hudson, Hiripi, Pope, & Kessler, 2007), which included English speaking adult participants (N = 9,282) in the United States, revealed that a lifetime prevalence of binge eating disorder was identified in 3.5% of women and 2% of men. Similarly, results from the World Health Mental Survey, which included participants (N = 24,124) from 14 developed countries, reported a lifetime prevalence estimate average of 1.9% for binge eating disorder and 1.0% for bulimia nervosa (Kessler

et al., 2013). Researchers of early binge eating disorder studies identified the construct as temporal (Fairburn, Cooper, Doll, Norman, & O'Connor, 2000), but researchers of current studies have demonstrated that binge eating disorder is more prevalent than are anorexia and bulimia and is a public health problem (Hudson et al., 2007; Kessler et al., 2013).

Binge Drinking

The first report of alcohol misuse by college students was published by the NIAAA in 1976. College binge drinking was later identified as a public health problem in 1993 after the Harvard School of Public Health College Alcohol Study released their findings outlining the degree, ramifications, and demographics of students involved in binge drinking behavior (Wechsler, Dowdall, Maenner, Gledhill-Hoyt, & Lee, 1998). This report revealed that 44% of college students could be classified as binge drinkers. Bing drinkers were defined as women who consumed four or more drinks consecutively and men who consumed five or more drinks consecutively. Furthermore, the degree of binge drinking among the population in this study increased to 80% for those college students who were also fraternity or sorority residents (Wechsler et al., 1998). This study was repeated in 1997 (Wechsler et al., 1998), in 1999 (Wechsler, Lee, Kuo, & Lee, 2000), and also in 2001 (Wechsler et al., 2002) with the resurveying of more than 14,000 students from 119 four-year colleges that had participated in earlier studies. Results from all survey years were compared and they revealed no change in overall percentage of college students who reported binge drinking behavior. Later studies showed the same 44% reporting binge drinking behavior as in the 1993 study (Wechsler et al., 2002).

Current research shows that binge drinking continues to be a public health problem among college students (Brown-Rice et al., 2015; Center for Behavioral Health Statistics and Quality, 2016; NIAAA, 2015). Binge drinking is more prevalent among college students with 37.9% reporting binge drinking within the past month compared to 32.6% of same age non-college students (Center for Behavioral Health Statistics and Quality, 2016). Other studies showed that as many as 50% of college students engaged in binge drinking (NIAAA, 2015). Although both men and women engage in binge drinking, men engage in binge drinking more often and consume more alcohol than do women (Brown-Rice et al., 2015). In addition, negative health and behavioral consequences are associated with college students' binge drinking behavior to include impaired decision-making (Townshend et al., 2014), blackouts (Deluchi et al., 2017), sexual assaults (Tyler et al., 2015), alcohol poisonings (Hingson et al., 2017), negative academic outcomes (White & Hingson, 2013), and reduced critical thinking skills (Trolian et al., 2016).

Various researchers have identified relationships between hazardous alcohol consumption and stress (Kenney et al., 2013; Newton et al., 2014), depression (Martin et al., 2013), and anxiety (Martin et al., 2013; Stewart et al., 2001). However, a more recent study found no significant associations between hazardous drinking, depression, and anxiety among college students (Nourse, Adamshick, & Stoltzfus, 2017). Furthermore, this same study identified a significant relationship between hazardous drinking and negative consequences. The inconsistencies in these studies may be because of differences in demographics.

Researchers have used multiple theories to explain the behavior of problem alcohol consumptions. The theory of planned behavior has been used to explain intentions and behaviors of hazardous alcohol consumption (Chen & Feeley, 2015; Rhodes & Clinkinbeard, 2013; Ross & Jackson, 2013). In addition, Baumeister (1991) proposed that the escape theory could also be used to understand how problem alcohol consumption may be used to escape negative emotions.

Binge drinking is also more researched than binge watching; consequently, the empirical literature on binge drinking may provide insight into other binge behaviors. Few researchers have explored relationships between binge behaviors. This study aims to fill this void by exploring relations between and within the psychological variables (i.e., depression, stress, and anxiety) and binge behaviors (i.e., binge eating, binge watching, and binge drinking).

Stress Among College Students

Lazarus and Folkman (1984) defined stress as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources" (p. 19). College students experience unique stresses related to developmental growth, interpersonal transitions, and stresses associated with adjusting to the academic institution (Mackinnon, Sherry, Pratt, & Smith, 2014). Furthermore, the status of the college student may also add additional stresses to include minority status stress (Arbona & Jimenez, 2014; McClain et al., 2016), acculturative stress (Claudat, White, & Warren, 2015; Jardin et al., 2017), financial stress (Britt, Mendiola, Schink, Tibbetts, & Jones, 2016; Robb, 2017), family achievement guilt (Covarrubias & Fryberg,

2015), and stress associated with being a first generation college student (Garriot & Nisle, 2017; Jenkins, Belanger, Connally, Boals, & Duron, 2013).

A traditional college student is typically between the ages of 18 and 24, and they make up 40.5% of the college student population in the United States (National Center for Education Statistics, 2015). Developmental psychologists consider a person between the ages of 18 and 24 in the stage of late adolescence (Santrock, 2017) or emerging adulthood (Arnett, 2000). During this stage, emerging adults experience and resolve conflicts such as autonomy and moral reasoning (Arnett, 2000). In addition, late adolescence is a transitional period in which a young person is still developing both emotionally and cognitively, and these developments may contribute to how these persons appraise and resolve stressful events (Davis & Compas, 1986). Unlike older adults, younger adults and adolescents have greater difficulty compartmentalizing emotional experiences (Harter et al., 1997), managing their emotions (Gross, 2013), controlling their impulses (Leppink, Odlaug, Lust, Christenson, & Grant, 2016), and suppressing anger (Wills, Sandy, Yaeger, Cleary, & Shinar, 2001). These difficulties may also contribute to maladaptive coping strategies used by college students to mediate the effects of stress. For example, Wills et al. (2001) found that younger adults' difficulty in suppressing anger was positively associated with alcohol use. In another study, which included 381 graduate and undergraduate students, Han and Pistole (2014) not only found an association between binge eating and emotion regulation, but they also asserted that binge eating was mediated by emotion regulation. Stress has also been linked to using binge behaviors as a maladaptive coping mechanism to include binge eating (Sulkowski

et al., 2011) and binge drinking (Pedersen, 2017). More specifically, Pedersen (2017) found that interpersonal stress was more likely to be linked to college students' binge drinking behavior than was academic and developmental stress. Despite engaging in binge drinking behavior to reduce stress, Hyman and Sinha (2009) asserted that binge drinking had the reverse effect and increased experiences of stress.

Stress is one of the top mental health complaints of college students with 45% of those seeking campus mental health services identifying stress as their presenting problem (Center for Collegiate Mental Health, 2017). If not properly managed, stress could lead to the use of maladaptive coping mechanisms to mediate the effect of stress (Watson, Velez, Brownfield, & Flores, 2016). In addition, empirical evidence suggests a relationship exists between stress, anxiety, and depression (Beiter et al., 2015). If students are not equipped with tools needed to mediate stress in healthy ways, then colleges may see an increase in anxiety and depression among students.

Depression Among College Students

The Center for Disease Control and Prevention (CDC, 2016) identified depression as a common mood disorder, which affects approximately 7.6 % of Americans over the age of 12. The American Psychiatric Associations's (2013) criteria for major depressive disorder includes nine criteria of which a person must exhibit at least five within a continuous two-week time period. Major depressive disorder is more prevalent in adults between the ages of 45-64 (CDC, 2016). Conversely, emerging adults (e.g., those between the ages of 18-24) are more likely to display fewer depressive symptoms than

are older adults, yet they still meet the criteria for a depressive disorder classified under *other depression* (CDC, 2016).

Reporting of depressive symptoms among college students has increased over the last six years with depression maintaining the second most common mental health complaint among college students (Center for Collegiate Mental Health, 2017). During the 2015-2016 school year, college and university counseling centers reported that 49% of those seeking counseling services identified depression as their presenting problem (Center for Collegiate Mental Health, 2017). The American College Health Association (2014) noted that 33.2% of college students (N = 66,887) reported depressed feelings that interfered with daily life functioning. College counseling centers have seen a 30% increase in services over five years, yet the student population has only increased by 5% (Center for Collegiate Mental Health, 2017). However, it is difficult to determine if an increase in depression among college students exists, or if college students are simply increasing their use of mental health services. Furthermore, it is difficult to conclude how many students who use college counseling services suffer from depressive symptoms because some students may not be aware of the depressive symptoms and others may have listed other reasons as their chief complaint for seeking mental health services. If results for national studies are indicative of how many people with depression seek professional help then the empirical data indicates few seek professional help for depression. Specifically, only 35% of those surveyed with depression in U.S. households reported seeking professional help for their depression (CDC, 2016).

Various factors contribute to depression among college students to include sexual orientation, gender, ethnicity, and student status. For example, non-heterosexual students were more likely to report depressive symptoms than were heterosexual college students (Kerr, Santurri, & Peters, 2013; Przedworski et al., 2015; Woodford et al., 2014). Various studies conclusively reported that depression and depressive symptoms were more prevalent in female college students than in male college students (Arbona, Burridge, & Olvera, 2017; Beiter et al., 2015; K. M. Smith, Chesin, & Jeglic, 2014). In addition, college students who identified as Black or Latino/a were more likely to suffer from depression than were students who identified as White (Smith et al., 2014). Although it is possible for the initial onset of depression to occur while in college, Auerbach et al. (2017) found that 83.1% of participants who completed The World Health Organization World Mental Health Survey had mental health disorders that began before entering college.

Depression is experienced by college students at all levels, but studies show that presenting with depression in the first year of college was related to a decreased likelihood of persisting on to graduation (Auerbach et al., 2016; Boyraz, et al., 2016). At one college, 48% of freshman reported clinically significant depressive symptoms (Brandy, Penckofer, Solari-Twadell, & Velsor-Friedrick, 2015). This high rate of depression among freshman may be contributed to the small population size (N = 188) and the participants were students at two small religious colleges. In a similar study with a much larger population (N = 141,189), 9.5% of the students surveyed described experiencing depression with some frequency (Eagan et al., 2014). Although these

statistics conflict, they show that depression continues to be a problem among college students.

Understanding the effect of depression on college students will help college and university administrators and counseling center staff develop resources to mediate depressive effects on their students. This knowledge is important because depression has a negative influence on academic performance and may impact attrition and matriculation (Auerbach et al., 2016; Boyraz et al., 2016). Furthermore, studies showed that some college students resorted to maladaptive coping, such as binge eating and hazardous drinking behavior (Bravo, Pearson, & Henson, 2017; Diulio et al., 2015), to mitigate the negative emotions associated with depression. However, inconclusive agreement exists on the relationship between depression and binge drinking with some studies reporting no significant associations (Nourse et al., 2017). Nevertheless, agreement is evident on the impact that depression has on college and university resources (American College Health Association, 2014; Center for Collegiate Mental Health, 2017) and the overall wellbeing of the college student (Carton & Goodbye, 2015; Siddaway, Wood, & Taylor, 2017).

Anxiety Among College Students

Anxiety is the leading mental health issue facing college students. In one major study, college and university counseling centers reported that 61% of those seeking counseling services (N = 150,483) identified anxiety as a major health concern (Center for Collegiate Mental Health, 2017). In a broader survey, which included students who may or may not have been treated at college counseling centers, 56.9% of college students (N = 66,887) reported feeling overwhelmed with anxiety within the past 12

months (American College Health Association, 2014). Other studies show noncollege peers also experienced anxiety but at higher rates than did college students (Kovess-Masfety et al., 2016). Academic or test anxiety is not unique to college students, but academic stress and performance expectations may help explain the prevalence of test anxiety among college students (Spielberger et al., 2015).

Another more severe form of anxiety is social anxiety, which is evident when a person fears being judged in social situations (Anxiety and Depression Association of America, 2017). In 2017, the Anxiety and Depression Association of America reported that social anxiety affected 8.6% of the American population with 36% of those affected seeking support only after having symptoms for 10 or more years. Fear of missing out is a common subtype of social anxiety in which a person fears missing out on social situations where peers might be engaged (Chandley et al., 2014). Fear of missing out is more prevalent among emerging adults than in older adults and is thought to be related to high use of social media (Becker, Alzahabi, & Hopwood, 2013).

Anxiety may have a negative impact on college students' emotional and academic performance. In one study, 21.9% of students claimed that anxiety negatively impacted their academic performance in the past 12 months by contributing to low or incomplete grades or their need to drop a class (American College Health Association, 2014). While some studies show a link between anxiety and academic performance (Brook & Willoughby, 2016; Núñez-Peña, Suárez-Pellicioni, & Bono, 2013; Putwain & Daly, 2013), another study showed no relationship between test anxiety and overall grade point average (Hartman, Waseeleski, & Whatley, 2017). Thus, the findings of how anxiety

impacts students academically remain mixed. Other studies relating anxiety and binge behaviors are similarly inconsistent. Researchers found an insignificant relationship between anxiety and binge drinking in one study (Nourse et al., 2017), although researchers in another study reported college students who experienced anxiety related to fear of missing out had greater heavy drinking intentions than did those who experienced test anxiety and clinical anxiety (Scalzo & Martinez, 2017). Anxiety, in the form of attachment anxiety, has also been related to binge eating (Han & Lee, 2017; Han & Pistole, 2014). Attachment anxiety is an insecure attachment style, which results in insecurities surrounding attachment or abandonment (Donges, Jachmann, Kersting, Egloff, & Suslow, 2015). Consequently, these insecurities may contribute to the use of maladaptive behaviors (i.e., binge drinking or binge eating) to cope with negative emotions associated with anxiety.

Summary

Depression, stress, and anxiety are the top three mental health complaints of college students. Each of these psychological variables affect the social, emotional, and academic wellbeing when not appropriately managed. Although some college students seek help from mental health counselors, others use maladaptive coping methods to mediate negative emotions. Some of these maladaptive methods include binge eating, binge drinking, and binge watching. The question that remains is whether multivariate relationships exist between time spent binge watching, binge eating, binge drinking and depression, anxiety, and stress among college students. The aim of this study is to explore

interrelationships between binge watching, drinking, and eating that combine to explain interrelationships between depression, anxiety, and stress.

In Chapter 2, I provided an overview of three major psychological factors experienced by college students and explained how binge behaviors are used as maladaptive coping methods to mediate negative emotions. In Chapter 3, I provided an overview of the research design, methodology, data collection, and analysis used in this study.

Chapter 3: Research Method

The purpose of this study was to examine multivariate relationships between binge watching, binge eating, and binge drinking and depression, anxiety, and stress among college students. I examined the amount of time college students spend binge watching and whether they engage in binge drinking and binge eating. I also assessed depression, anxiety, and stress in this same population. Chapter 3 includes a description of the research design, population, sampling and sampling procedures, data collection procedures, instrumentation, variables measured, data analysis plan, threats to validity, and ethical procedures.

Research Design and Rationale

I used quantitative methods and research questions for this study. A quantitative research design provides an objective method for determining relationships between variables (Black, 1999). The variables in this study included binge eating (dependent), binge drinking (dependent), binge watching (dependent), depression (independent), anxiety (independent), and stress (independent). A multivariate canonical correlational design allowed for the examination of relationships between and within the set of dependent and independent variables (see Black, 1999). Quantitative methods were used to obtain answers to the following research question: What are the multivariate relationships between time spent binge watching, binge eating, and binge drinking and depression, stress, and anxiety among college students?

Population

The targeted population included college students ages 18 to 24 . Participants were required to be currently enrolled at a college or university in the United States. The survey was hosted on Survey Monkey, but participants were recruited through Amazon's Mechanical Turk (MTurk) crowdsourcing research tool; consequently, participants were required to have an MTurk account. Initially, participants were offered $1.00 to complete a survey that was estimated take 15 minutes or less to complete. Once screened and considered a qualified participant, MTurk workers were given a link that directed them to the survey hosted on SurveyMonkey. MTurk is a crowdsourcing website that allows researchers from universities and businesses to recruit workers from a sample that is more diverse than a convenient sample of college students at one university (Sheehan, 2018). There were no specific gender, race, or ethnicity requirements to be part of this study.

The minimum sample size was based on stability of canonical coefficients and semipartial effect sizes in multiple regression. For canonical correlation, Stevens (1986) recommended 20 times as many cases as variables. There were six variables, so a sample size of 120 was adequate. For multiple linear regression with three predictors, alpha = .05, power = .80, Multiple-R^2 = .13 (a medium-size effect), and semipartial squared coefficients of .06 (a medium-size effect) for an individual predictor, a sample size of 116 was needed according to G*Power (Faul, Erdfelder, Buchner, & Lang, 2009).

Using specific information provided to MTurk, participants were invited to complete the survey hosted on Survey Monkey if answers to screener questions revealed

that participants were current college students in the United States between 18 and 24 years of age. The Survey Monkey platform allowed for inclusion of an online survey, informed consent, time stamp of surveys, and the option for participants to withdraw from the study. Furthermore, there were measures in place within Survey Monkey to protect and transmit the data into a secure database.

Instrumentation

The Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1996) was used to assess symptoms associated with depression, stress, and anxiety experienced by the respondent over the previous month. The DASS-21 consists of 7 items for each of the three subscales and includes a Likert-type response from 0 (did not apply to me at all) to 3 (applied to me very much; Lovibond & Lovibond, 1996). Antony et al. (1998) concluded that the DASS-21 had acceptable reliability and validity in a clinical and community sample, and Mahmoud et al. (2012) used the DASS-21 with a sample of college students.

Binge-eating, binge-drinking, and binge-watching questions were asked in the demographic section to capture binge behaviors. Binge eating symptom measure behavior questions consisted of two questions adopted from the Binge Eating Symptoms Measure created by Mason and Heron (2016). The Binge Eating Symptoms Measure is a two-item questionnaire that measures binge-eating behavior requiring a yes/no response from participants. To increase variance and improve reliability and validity, I replaced the yes/no response with a Likert-type scale that included the option to select never, rarely, sometimes, or often. The binge-eating questions were based on the definition of binge

eating as outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013) that identifies the two components of binge eating as lack of control when overeating and feelings of guilt. The first question asked about overeating in a short period of time, and the second question asked about loss of control while overeating (Mason & Heron, 2016). Similarly, binge-drinking behavior questions were asked in the demographics section. Alcohol consumption questions followed the NIAAA's recommended alcohol questions guidelines for creating 3, 4, 5, or 6 item questions (NIAAA, 2004). In addition, binge-drinking behavior questions differentiated binge drinking behavior by gender as identified by Wechsler et al. (1998). For example, binge drinking is identified in women who consume four or more drinks consecutively and in men who consume five or more drinks consecutively. Binge-watching questions were included in the demographic section identifying binge watchers as those who viewed two or more episodes of the same television show on any screen (i.e., television, computer, laptop, tablet, or cell phone) in one sitting. Questions were asked about the amount of time spent binge watching and medium used to binge watch.

The Television Viewing Motives Scale (TVMS; Rubin, 1983) was used to assess respondents' motives for viewing streamed television programs through a variety of viewing modes. The TVMS is used to assess the following motives: (a) relaxation, (b) companionship, (c) habit, (d) pass time, (e) entertainment, (f) social interaction, (g) information, (h) arousal, and (i) escape (Rubin, 1983). Weaver (2003) reduced the nine motives to five by using a principal components factor analysis and an oblique rotation to simplify structures, revealing a five factor solution accounting for 61.6% of the variance.

Weaver created a more workable number of items by combining items from Rubin's (1983) original motives revealing the following five motives: (a) pass time, (b) companionship, (c) relaxation, (d) information, and (e) stimulation. Respondents were asked to rate their motives for binge watching serialized programs with the 20-item TVMS that included a Likert-type response scale with five levels from 4 (strongly agree) to 0 (strongly disagree; Weaver, 2003). Conway and Rubin (1991) concluded that the TVMS had acceptable reliability and validity in a community sample, and Rubin and Perse (1987) used the TVMS with a sample of college students.

Research Questions and Hypotheses

RQ1: What is the multivariate relationship between the linear combination of binge watching, binge drinking, and binge eating with the linear combination of depression, anxiety, and stress among college students?

H_o1: The multivariate relationship between the linear combination of binge watching, binge drinking, and binge eating with the linear combination of depression, anxiety, and stress among college students is not significant.

H_a1: The multivariate relationship between the linear combination of binge watching, binge drinking, and binge eating with the linear combination of depression, anxiety, and stress among college students is significant.

RQ2: What is the relationship between the linear combination of depression, anxiety, and stress with binge eating among college students?

H_o2: After controlling for the student's age, gender, ethnicity, and year in college if related to binge eating, the linear combination of depression, anxiety, and stress is not related to binge eating.

H_a2: After controlling for the student's age, gender, ethnicity, and year in college if related to binge eating, the linear combination of depression, anxiety, and stress is related to binge eating.

RQ3: What is the relationship between the linear combination of depression, anxiety, and stress with binge drinking among college students?

H_o3: After controlling for the student's age, gender, ethnicity, and year in college if related to binge drinking, the linear combination of depression, anxiety, and stress is not related to binge drinking.

H_a3. After controlling for the student's age, gender, ethnicity, and year in college if related to binge drinking, the linear combination of depression, anxiety, and stress is related to binge drinking.

RQ4: What is the relationship between the linear combination of depression, anxiety, and stress with binge watching among college students?

H_o4: After controlling for the student's age, gender, ethnicity, and year in college if related to binge watching, the linear combination of depression, anxiety, and stress is not related to binge watching.

H_a4: After controlling for the student's age, gender, ethnicity, and year in college if related to binge watching, the linear combination of depression, anxiety, and stress is related to binge watching.

RQ5: What are the combined and relative effects of the Television Viewing Motives subscales in accounting for variance in binge watching? Because an exploratory model-building approach guided the analysis to answer this research question and to interpret findings with respect to this study's theoretical foundation, specific hypotheses were not applicable (see Jaccard & Jacoby, 2010).

Data Analysis Plan

Research hypotheses were tested using IBM SPSS version 25.0 (IBM, 2017). Canonical correlation was used to test the first hypothesis, and multiple regression was used for Hypotheses 2, 3, and 4. Results were interpreted using probability values and effect sizes as measures of the strength of the relationship. In addition, six assumptions of multiple regression were tested, including (a) linear relationships between dependent and independent variables; (b) presence of homoscedasticity; (c) absence of multicollinearity; (d) absence of significant outliers, high leverage points, and highly influential points; (e) normal distribution of errors; and (f) univariate and multivariate normality (see Black, 1999).

The six assumptions were tested as follows: (a) The linear relationship between each independent variable and each dependent variable was examined using bivariate scatterplots; (b) the presence of homoscedasticity was examined using a scatterplot of the standardized residuals plotted against the unstandardized predicted values; (c) the absence of multicollinearity was tested by examining the variance inflation factor (VIF) values; (d) the absence of significant outliers, high leverage points, and highly influential points was tested using case-wise diagnostics and standardized residuals; (e) the

examination of residuals (errors) was assessed using a frequency histogram of the residuals; and (f) univariate outliers were identified based on discontinuous values exceeding ±3.29 standard deviations from the mean, while the presence of multivariate outliers was assessed using the Mahalanobis distance test. In addition to procedures to test the hypotheses and answer the research questions, exploratory analyses were conducted to determine demographic and binge-behavior differences or relationships with the TVMS.

Threats to Validity

Internal Validity

Internal validity refers to how a study measured what it was intended to measure (Grimes & Schulz, 2002). Gall, Gall, and Borg (2003) cited 12 threats to the internal validity of a study, including history, maturation, testing, instrumentation, statistical regression, differential selection, experimental mortality, selection-maturation interaction, experimental treatment diffusion, compensatory rivalry by the control group, compensatory equalization of treatments, and resentful demoralization of the control group. These 12 threats are usually found in studies with pretests and posttests in a control group and treatment group. The current study was conducted as a single group descriptive study in which measurements were taken at one time. Consequently, the aforementioned threats did apply to this study.

External Validity

Addressing potential threats to external validity is necessary for the integrity and generalizability of research findings (Persaud & Mamdani, 2006). In addition, addressing

these threats demonstrates the researcher's conscious effort to connect the research findings to real-world applications (Persaud & Mamdani, 2006). Gall, Gall and Borg (2003) cited 12 threats to the external validity of a study. These include (a) the extent to which one can generalize from the experimental sample to a defined population, (b) the extent to which personological variables interact with treatment variables, (c) explicit description of the experimental treatment, (d) multiple-treatment interference, (e) Hawthorne effect, (f) novelty and disruption effects, (g) experimenter effect, (h) pretest sensitization, (i) posttest sensitization, (j) interaction of history and treatment effects, (k) measurement of the dependent variable, and (l) interaction of time of measurement and treatment effects. Only three threats were of concern in this study due to the single group design with all measurements taken at one point in time:

1. The extent to which one can generalize from the sample to a defined population would only be known after the data were gathered. I hoped that all participants identified as the target audience would participate and provide 100% sampling, but due to the respondent's right to decline participation, this might not have occurred.
2. The Hawthorne effect may have occurred because respondents knew that they were participating in a study, which may have slanted their beliefs and opinions.
3. The measurement of the dependent variables (binge eating, binge drinking, and binge watching) may have been slanted due to the possibility of socially

desirable responses. In addition, it was unknown to what extent respondents answered the survey questions in a truthful manner.

Statistical Conclusions Validity

Threats to statistical conclusion validity are a concern in qualitative and quantitative studies (Kratochwill et al., 2013). Statistical conclusion validity measures the reasonableness of the conclusions made about relationships between variables in a study. Peterson and Kim (2013) asserted that instrument reliability, data assumptions, and sample size are three conditions that threaten statistical conclusion validity. Addressing threats to statistical conclusion validity minimizes the likelihood of Type I and Type II error rates (Peterson & Kim, 2013).

Type I errors are present when positive conclusions are made about correlation of variables when none actually exist (Field, 2013). Type II errors are made when the research reveals no correlation when in fact correlations do exist (Field, 2013). For this study, the alpha level was set at .05 with a power level of .80 to minimize the likelihood of Type I and Type II errors. Furthermore, the sample size was factored to safeguard the viability of this study. To address the instrument reliability, the DASS-21 was found to have acceptable reliability and validity in a clinical and community sample to include college students (Antony et al., 1998; Mahmoud et al., 2012). Similarly, TVMS had acceptable reliability and validity in a community sample (Conwy & Rubin, 1991) and in samples including college students (Rubin & Perse, 1987). Data assumptions were addressed by testing the following: (a) The linear relationship between each independent variable and each dependent variable was examined using bivariate scatterplots; (b) The

presence of homoscedasticity was examined using a scatterplot of the standardized residuals plotted against the unstandardized predicted values; (c) The absence of multicollinearity was tested by examining the VIF values; (d) The absence of significant outliers, high leverage points, and highly influential points were tested using case-wise diagnostics and standardized residuals; (e) The examination of residuals (errors) was assessed using a frequency histogram of the residuals; and (f) univariate outliers were identified based on box-plots while the presence of multivariate outliers was assessed using the Mahalanobis distance test statistics.

Ethical Procedures

The purpose of this study was to examine multivariate relations between binge watching, binge eating, binge drinking and depression, anxiety, and stress among college students. This study was not implemented until approval was obtained from Walden University's Institutional Review Board. Participants were given informed consent (electronic format) prior to taking part in the study. This this was a confidential study, so names were not connected with data collected. Security measures were taken to safely guard participant responses. SurveyMonkey only releases survey data to the researcher. A password protected computer was used to download and save participant responses from SurveyMonkey. Access to these documents were only given to my faculty chair and myself. Since this was an academic research study, participants were given minimal incentives to participate and were also given the option to withdraw from the study at any time.

Summary

In Chapter 1, I provided an overview of the proposed study. In Chapter 2, I outlined three major psychological factors experienced by college students and explained how binge behaviors were used as maladaptive coping methods to mediate negative emotions. In Chapter 3, I provided an overview of the research design, methodology, data collection, and analysis proposed for this study. In Chapter 4, I outlined my findings, data analysis, and the results of the data collected.

Chapter 4: Results

The purpose of this study was to examine multivariate relations between binge watching, binge eating, and binge drinking and depression, anxiety, and stress among college students. Previous studies demonstrated a positive correlation between other binge behaviors such as binge eating or binge drinking and stress, anxiety, and depression (Beiter et al., 2015). Because a positive correlation exists between other binge behaviors and stress, anxiety, and depression among college students, this study focused on regressing binge watching on stress, anxiety, and depression in the same population. Multivariate interrelationships were also examined to determine the relationships between the set of binge behaviors (binge watching, binge drinking, and binge eating) and the psychological factors of depression, anxiety, and stress.

In this chapter, I present the results. I begin the chapter by describing the time frame for data collection, recruitment, and response rates. Next, I describe discrepancies in data collection that deviated from my initial plan outlined in Chapter 3. I also report data screening and cleaning, and the final baseline descriptive and demographic characteristics of the sample. Subsequent sections include the composite scaling and descriptive statistics of key variables, screening for potential covariates, and screening for regression assumptions. Finally, I report the canonical correlation results and the results of the four regressions organized by research questions.

Data Collection

Data collection lasted for 36 days from November 27, 2018 to December 23, 2018; a total of 121 participants answered the survey. The target population included

college students ages 18 to 24 who were currently enrolled at a college or university in the United States. Participants were recruited through Amazon's Mechanical Turk (MTurk) crowdsourcing research tool; consequently, participants were required to have an MTurk account. Participants were required to answer a three-question screener on MTurk to determine qualification. Qualified participants were offered $1.50 instead of my original plan to offer $1.00 to complete a survey that took less than 15 minutes to complete. The increase in payment was more in line with what other researchers on MTurk were paying for a survey that required 15 minutes to complete. The decision to increase payment amount was determined before IRB approval; consequently, the payment of $1.50 was approved by IRB before data collection began. Once screened and considered a qualified participant, MTurk workers were given a link directing them to the survey hosted on SurveyMonkey. A total of 121 participants completed the survey. After data screening and cleaning, data from 102 participants remained for statistical analysis. SPSS was used for data storage and analysis.

Data Screening and Cleaning

Initially, 121 people began the survey. After removing four people who each had 11 missing answers, the sample was reduced to 117. A series of box plots for the 15 study variables (11 scale scores plus four demographic variables) revealed 11 univariate outliers, which reduced the sample to 106.

After factor analysis of Television Viewing Motives Scale (TVMS) items, four cases were found to be univariate or multivariate outliers. Order 87 had a z-score of 4.74 on the TVMS relaxation factor and was a multivariate outlier with a Mahalanobis value

of 25.302 for the model to answer RQ5. Order 15 had very high, discontinuous Mahalanobis values for the model to answer RQ1 and RQ4. Order 58 had a z-score of -3.07 on binge watching and also had a very high, discontinuous Mahalanobis value for the model to answer RQ1. Order 5 had a z-score of -3.93 on the TVMS relaxation factor. These four cases were removed from further analysis, resulting in a final sample of 102. The target sample size presented in Chapter 3 based on power analysis was 120.

Because of a clerical error in setting up SurveyMonkey, the first of the DASS-21 stress items used a different response option format than all of the other items. The "4 = a little" option was not in the others and, more importantly, its location in the response order caused loss of ordinal level. Because of this, this item was excluded from the calculation of the DASS-21 stress subscale. Because underlying factor structure can be sample specific (Tabachnick, Fidell, & Ullman, 2007), instead of Weaver's (2003) operationalization of the TVMS subscales, which excluded 8 of the 20 items, I conducted a principal axis factor analysis that yielded five interpretable and meaningful factors with all items contributing and used the five saved factor scores to represent TVMS. Conducting sample-specific factor analysis enables the researcher to control for potential factorial structure variance and improve generalizability to the target population (Nunnally & Bernstein, 1994). Because the TVMS items capture different motivations, an overall TVMS score was not meaningful.

After elimination of the four cases noted previously, calculation of stress with just six (instead of seven) items, and calculation of five TVMS factor scores, descriptive statistics for normality and outlier screening purposes were calculated as shown in the

tables below. All skewness and kurtosis values were within normal distribution range. All z-scores had absolute values less than 3.29 except the pass time factor score, but its largest value of -3.40 was not severely discontinuous from the distribution of other values as indicated by a small skewness value (-0.81) and by graphical inspection (see Table 1). Multivariate outliers were not observed for any of the sets of variables for the five research questions (see Table 2).

Table 1

*Item and Scale Descriptive Statistics for Univariate Outliers and Normality (*N = *102)*

Variable	Zmin	Zmax	Skewness	Kurtosis
Binge				
Binge watch	-2.03	0.79	-0.88	-0.51
Binge eat	-1.41	1.94	0.11	-1.25
Binge drink	-2.19	1.75	-0.72	-0.13
DASS-21				
Stress	-1.61	2.60	0.26	-0.50
Depression	-1.18	2.31	0.45	-0.77
Anxiety	-1.05	1.95	0.49	-1.20
TVMS				
Escape loneliness	-1.86	1.87	0.10	-1.04
Not for information	-1.67	2.12	0.50	-0.71
Pass time	-3.40	1.64	-0.81	1.47
Stimulation	-2.52	2.27	-0.12	-0.08
Comfort	-2.77	1.50	-0.73	0.27

Table 2

*Multivariate Outliers by Research Question by Mahalanobis Distance (*N = *102)*

Model	Variables	*df*	χ^2 critical	χ^2 observed
RQ1	Binge watch, eat, drink; depression, anxiety, stress	6	22.458	17.712
RQ2	Binge eat, depression, anxiety, stress	4	18.467	15.669
RQ3	Binge drink, depression, anxiety, stress	4	18.467	14.020
RQ4	Binge watch, depression, anxiety, stress	4	18.467	14.046
RQ5	Binge watch, escape loneliness, not for information, pass time, stimulation, comfort	6	22.458	18.230

Descriptive Statistics of Sample

After data screening and cleaning, data from 102 participants remained for further analysis. There were more females (58.8%) than males (41.2%) in the sample. The most common racial/ethnic backgrounds were White (51.0%) followed by Black/African-American (15.7%) and Hispanic/Latino (15.7%). Most participants (83.3%) were full-time students. Over half the sample (56.9%) were either juniors or seniors. About half (52.0%) attended face-to-face courses with 27.5% attending hybrid classes and another 20.6% attending online classes. When queried as to where they lived, 37.3% reported living at home with family and 23.5% lived on campus. Most of the respondents (91.2%) were single and 82.4% reported not being in a fraternity or sorority or being inactive. Twenty-one percent of the respondents were collegiate athletes. The mean age was 21.59 (*SD* = 1.78). Table 3 provides descriptive statistics of the demographics of the sample.

Table 3

*Descriptive Statistics of Sample (*N = *102)*

Variable	Frequency	%
Sex		
Male	42	41.2
Female	60	58.8
Race		
American Indian/Native American	7	6.9
Asian	7	6.9
Black/African American	16	15.7
Hispanic/Latino	16	15.7
White/Caucasian	52	51.0
Biracial	1	1.0
Multiracial	2	2.0
Other	1	1.0
Part-time or fulltime student		
Part-time	17	16.7
Fulltime	85	83.3
Grade level		
Freshman (1st semester)	8	7.8
Freshman (beyond 1st semester)	14	13.7
Sophomore	22	21.6
Junior	20	19.6
Senior	38	37.3
How attend courses		
Online	21	20.6
Face-to-face	53	52.0
Hybrid	28	27.5
Where live		
On campus	24	23.5
Off campus	37	36.3
At home with family	38	37.3
Other	3	2.9
Marital status		
Single	93	91.2
Married	8	7.8
Separated/divorced	1	1.0
Fraternity/sorority status		
None	76	74.5
Active	18	17.6
Inactive	8	7.8
Athletic status		
Yes	21	20.6
No	81	79.4
	M	*SD*
Age	21.59	1.78

Forty-three percent of the sample reported that television was their primary viewing device followed by laptop computer (26.5%). When respondents were given "mark all that apply" pertaining to the viewing services they had, the most common were Netflix (83.3%), YouTube (66.7%), and Hulu (60.8%). Sixty-three percent reported that their binges were unplanned. The most common length for a show was 60 minutes (54.9%) followed by 30-minute shows (38.2%). When queried as to the difficulty they had in stopping viewing, 75.5% reported that it was sometimes or often difficult. Viewing being

difficult to stop had a mean rating of 2.95 (*SD* = 0.72). The average hours per sitting had a mean of 3.97 (*SD* = 3.54). The average number of episodes per sitting had a mean of 5.43 (*SD* = 6.30). Table 4 displays the descriptive statistics for program viewing related variables.

Table 4

*Descriptive Statistics of Program Viewing Related Variables (*N *= 102)*

Variable	Frequency	%
Primary viewing device		
Television	44	43.1
Computer	18	17.6
Laptop	27	26.5
Cellular phone	3	2.9
Tablet	9	8.8
Other	1	1.0
Viewing services[a]		15.7
Netflix	85	83.3
Hulu	62	60.8
Amazon Prime	55	53.9
On demand	16	15.7
HBO Go	21	20.6
YouTube	68	66.7
Other (incl. DVD)	39	38.2
Binges are		
Planned	38	37.3
Unplanned	64	62.7
Type/length of show		
30 minutes	39	38.2
60 minutes	56	54.9
Movies	7	6.9
Viewing difficult to stop		
Never	2	2.0
Rarely	23	22.5
Sometimes	55	53.9
Often	22	21.6
	M	*SD*
Viewing difficult to stop	2.95	0.72
Avg. hours per sitting	3.97	3.54
Avg. # episodes per sitting	5.43	6.30

[a] Viewing services were mark all that apply, so sum of percentages exceeds 100.

Descriptive Statistics of Key Variables

Binge watching was measured by a single item. Mean composite variables were computed for binge eating, binge watching, and each of the three DASS-21 subscales (depression, anxiety, stress). The 20 items of the TVMS were subjected to principal axis factor analysis with both orthogonal (uncorrelated) and oblique (correlated) solutions.

Item response was on a 1 (strongly agree) to 5 (strongly disagree) scale, which was reversed coded so that higher scores indicated higher agreement with an item. Seeking simple structure, I eliminated Items 4, 10, and 13, which had complex loadings across two or more factors. Of the remaining 17 items, five interpretable and meaningful factors emerged (see Table 5). Patterns of loadings were consistent for both the orthogonal and oblique solutions. Because of substantial correlations between factors and the likelihood that program viewing motivations may be related in the real world, the oblique solution was used in further analyses.

Table 5

*Variance Explained in Factor Analysis of 17 TVMS Items (*N *= 102)*

	Initial eigenvalues			Extraction sums of squared loadings		
Factor	Total	% Variance	Cum. %	Total	% Variance	Cum. %
Escape Loneliness	4.18	24.59	24.59	3.81	22.43	22.43
Not for Information	2.82	16.60	41.19	2.40	14.14	36.57
Pass Time	2.10	12.36	53.55	1.64	9.66	46.23
Stimulation	1.39	8.20	61.75	0.97	5.72	51.94
Comfort	1.05	6.20	67.95	0.66	3.91	55.85

Note. Kaiser-Meyer-Olkin measure of sampling adequacy = .710. Bartlett's test of sphericity was statistically significant, $\chi^2(136, N = 102) = 711.8, p < .001$.

The five factors accounted for 67.95% of all variance and 55.85% of shared variance. Only 25 of the 136 residuals (18%) had absolute values greater than .05. The Escape Loneliness factor accounted for the most variance, followed by Not For Information, Pass Time, Stimulation, and Comfort factors. The pattern and structure matrix factor loadings are shown in Table 6.

Table 6

*Pattern and Structure Matrices of 17 TVMS Items (*N *= 102)*

		Escape Loneliness		Not For Information		Pass Time		Stimulation		Comfort	
I watch television programs…	#	P	S	P	S	P	S	P	S	P	S
so I won't be alone.	6	**.792**	.849	-.089	-.249	.081	.122	-.111	.050	.102	.431
because it makes me feel less lonely.	7	**.764**	.840	-.104	-.272	.022	.063	-.078	.070	.139	.460
when there's no one to talk to or be with.	8	**.695**	.692	.027	-.172	-.089	.017	.115	.203	-.012	.301
so I can learn how to do things I haven't done before.	16	.006	.208	**-.897**	-.901	-.015	-.193	-.005	.090	-.029	-.050
so I can learn about what could happen to me.	15	-.045	.327	**-.668**	-.729	-.059	-.078	-.002	.305	.383	-.005
because it shows how other people deal with the same problems I have.	18	.167	.275	**-.660**	-.659	-.014	-.214	.213	.080	-.075	.347
so I can learn about things happening in the world.	17	.047	.124	**-.546**	-.552	.034	-.067	-.017	.050	-.130	-.127
because it gives me something to do	1	-.107	.038	-.110	.106	**.909**	.857	-.070	.123	.069	-.024
because it passes the time away.	2	.146	.213	.273	.345	**.536**	.606	.031	.149	.161	.211
because I just enjoy watching.	5	-.142	-.129	.088	.209	**.483**	.500	.060	.125	-.066	-.141
when I have nothing better to do.	3	.142	.165	-.052	-.012	**.408**	.427	.042	.150	-.095	-.050
because it's thrilling.	20	.084	.236	.008	-.107	-.061	.107	**.762**	.767	.091	.183
because it excites me.	19	-.112	.002	-.064	-.102	.058	.178	**.676**	.675	-.037	-.042
because it calms me down when I'm upset.	12	-.018	.359	-.063	-.053	-.104	-.160	-.021	.022	**.874**	.867
so I can forget about my worries and responsibilities.	11	.040	.317	.089	.089	-.048	-.054	.009	.044	**.701**	.723
because it helps pick me up when I'm feeling blue.	9	.236	.517	-.047	-.083	.023	.013	.000	.091	**.617**	.717
so I can get away from what I'm doing.	14	.135	.404	.092	.103	.231	.274	.157	.256	**.558**	.620

Note. P = pattern loading. S = structure loading.

The pattern loadings, principally used for interpretation, reflect the unique contribution of each factor in accounting for each variable. The structure loadings reflect the correlations of each factor with each variable. The pattern and structure loadings are consistent in identifying the principal variables that load on each factor.

The Escape Loneliness factor was substantially correlated ($r = .51$, $p < .001$) with the Comfort factor, and inversely related ($r = -.28$, $p = .004$) to the Not For Information

factor (see Table 7). The Pass Time factor had a small-to-medium correlation with the Stimulation factor (r = .24, p = .014) and with the Not For Information factor (r = .23, p = .020).

Table 7

*Correlations of Regression Estimated TVMS Factor Scores (*N = *102)*

Factor	1	2	3	4	5
1. Escape Loneliness	.794	-.282	.123	.185	.506
2. Not For Information	.004	.865	.230	-.143	.025
3. Pass Time	.217	.020	.818	.242	-.044
4. Stimulation	.062	.152	.014	.711	.093
5. Comfort	< .001	.803	.664	.352	.840

Note. Upper diagonal contains Pearson correlations. Lower diagonal contains 2-tailed *p* values. Main diagonal contains squared multiple correlations as factor reliability indices from an orthogonal solution.

Table 8 provides descriptive statistics of the key variables. All composites, indexed by Cronbach's alpha, had adequate reliability, and all factors, as indexed by squared multiple correlations from a comparable orthogonal solution, had adequate reliability.

Table 8

*Descriptive Statistics of Key Variables (*N *= 102)*

Item, Composite, or Factor	# items	Reliability	*M*	*SD*	Min.	Max.
Binge						
Watch	1	na	3.44	0.71	2.00	4.00
Eat	2	.790	2.26	0.89	1.00	4.00
Drink	6	.892	4.99	1.82	1.00	8.17
DASS-21						
Stress	6	.814	2.08	0.67	1.00	3.83
Depression	7	.901	1.92	0.78	1.00	3.71
Anxiety	7	.847	1.70	0.67	1.00	3.00
TVMS factors						
Escape Loneliness	3	.794	0.00	0.93	-1.73	1.74
Not For Information	4	.865	0.00	0.94	-1.57	2.00
Pass Time	4	.794	0.00	0.91	-3.10	1.50
Stimulation	2	.711	0.00	0.85	-2.15	1.94
Comfort	4	.840	0.00	0.93	-2.58	1.40

Note. Reliability for mean composite scales is indexed by Cronbach's alpha. Reliability for factors is indexed by factor squared multiple correlation from an orthogonal solution. Possible range of scores were 1-4 for binge watch and binge eat, 1-10 for binge drink, and 1-4 for stress, depression, and anxiety.

Screening for Potential Covariates

A number of variables were screened as potential covariates related to the binge variables of watching, eating, or drinking, and the DASS-21 subscales of depression, anxiety, or stress. A number of tables follow that report the various tests. For regression purposes it is commonly recommended to include covariates that have a simple correlation with an absolute value of .12 or greater because the partial correlations, controlling for other variables, can be significant.

Table 9 displays the correlations for age, hours watched, episodes watched, and stop difficulty with binge and DASS-21 variables. Of the 24 correlations, eight of the coefficients were large enough ($p \leq .12$) to be considered as potential covariates.

Specifically, age was positively related to binge eating (r = .26, p = .008), binge drinking (r = .20, p = .042), stress (r = .16, p = .102), and depression (r = .18, p = .071). Hours of watching was positively related to anxiety (r = .25, p = .011). The number of episodes watched was negatively related to binge drinking (r = -.17, p = .086) and depression (r = -.16, p = .102). In addition, the difficulty in stopping was positively related to stress (r = .16, p = .121; see Table 9).

Table 9

*Correlations of Age, Hours Watch, Episodes Watch, and Stop Difficulty With Binge and DASS-21 Variables (*N *= 102)*

	Binge watch		Binge eat		Binge drink		Stress		Depression		Anxiety	
Variable	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*	*r*	*p*
Age	-.04	.728	**.26**	**.008**	**.20**	**.042**	**.16**	**.102**	**.18**	**.071**	.14	.172
Hours watch	-.01	.986	.14	.167	.03	.732	.13	.183	.09	.380	**.25**	**.011**
Episodes watch	.05	.588	-.05	.631	**-.17**	**.086**	-.14	.162	**-.16**	**.102**	-.09	.354
Stop difficulty	.54	<.001	.07	.511	.06	.568	**.16**	**.121**	.06	.580	-.06	.528

Table 10 displays the independent *t* tests of sex, race, student status, and planned viewing with binge and DASS-21 variables. Females had higher scores for binge watching (p = .118) and binge eating (p = .058). Part-time students reported higher levels of binge eating (p = .050), binge drinking (p = .046), and stress (p = .019). Those who planned multiple episode viewing reported lower amounts of binge watching (p = .001), higher amounts of binge drinking (p = .013), and higher levels of anxiety (p = .004). No differences were found based on race. For student athletes, they reported lower levels of

binge watching ($p < .001$), higher amounts of binge eating ($p = .053$), higher amounts of binge drinking ($p = .006$), and higher amounts of anxiety ($p < .001$; see Table 10).

Table 10

*Independent t Tests of Sex, Race, Student Status, and Planned Viewing With Binge and DASS-21 Variables (*N *= 102)*

	Sex						
	Male (n = 42)		Female (n = 60)				
Key variable	*M*	*SD*	*M*	*SD*	*t*(100)	*p*	η^2
Binge							
Watch	3.31	0.72	3.53	0.70	1.58	.**118**	.024
Eat	2.06	0.81	2.40	0.93	1.92	**.058**	.035
Drink	5.15	1.84	5.15	1.81	0.74	.463	.005
DASS-21							
Stress	2.07	0.63	2.09	0.71	0.20	.843	< .001
Depression	2.03	0.91	1.84	0.67	1.21	.230	.014
Anxiety	1.73	0.70	1.68	0.65	0.37	.715	.001
	Student status						
	Part-time (n = 17)		Fulltime (n = 85)				
Key variable	*M*	*SD*	*M*	*SD*	*t*(100)	*p*	η^2
Binge							
Watch	3.53	0.72	3.42	0.71	0.56	.578	.003
Eat	2.65	1.04	2.18	0.85	1.98	**.050**	.038
Drink	5.79	1.31	4.83	1.87	2.02	**.046**	.039
DASS-21							
Stress	2.43	0.59	2.01	0.67	2.39	**.019**	.054
Depression	2.02	0.71	1.90	0.80	0.58	.562	.003
Anxiety	1.92	0.65	1.66	0.67	1.48	.142	.021
	Multiple episode viewing						
	Planned (n = 38)		Unplanned (n = 64)				
Key variable	*M*	*SD*	*M*	*SD*	*t*(100)	*p*	η^2
Binge							
Watch	3.13	0.78	3.63	0.60	3.58	**.001**	.113
Eat	2.34	0.79	2.21	0.95	0.71	.477	.005
Drink	5.56	1.60	4.65	1.87	2.53	**.013**	.060
DASS-21							
Stress	2.16	0.65	2.04	0.69	0.91	.363	.008
Depression	2.03	0.74	1.85	0.80	1.10	.273	.012
Anxiety	1.94	0.72	1.56	0.59	2.92	**.004**	.078

(continued)

Table 10 (continued)

Key variable	Race: White (n = 52) *M*	*SD*	Race: All other (n = 50) *M*	*SD*	*t*(100)	*p*	η^2
Binge							
Watch	3.50	0.73	3.38	0.70	0.85	.397	.007
Eat	2.29	0.92	2.23	0.88	0.33	.743	.001
Drink	4.91	1.74	5.07	1.91	0.45	.657	.002
DASS-21							
Stress	2.12	0.66	2.04	0.68	0.59	.558	.003
Depression	1.87	0.74	1.97	0.82	0.63	.530	.004
Anxiety	1.70	0.64	1.70	0.70	0.02	.987	< .001

Key variable	Student athlete status: Yes (n = 21) *M*	*SD*	Student athlete status: No (n = 81) *M*	*SD*	*t*(100)	*p*	η^2
Binge							
Watch	2.90	0.62	3.58	0.67	4.18	**< .001**	.149
Eat	2.60	0.72	2.17	0.92	1.95	**.053**	.037
Drink	5.94	1.51	4.74	1.82	2.79	**.006**	.072
DASS-21							
Stress	2.10	0.51	2.08	0.71	0.09	.928	< .001
Depression	2.12	0.53	1.86	0.83	1.37	.174	.018
Anxiety	2.14	0.70	1.58	0.61	3.62	**< .001**	.116

Table 11 displays the student level ANOVAs on binge and DASS-21 variables. For five of the six tests, no differences were found. However, for depression, Junior level students (M = 2.16) and senior level students (M = 2.02) had significantly higher levels of depression than did sophomores (M = 1.54; see Table 11).

Table 11

*Student Level ANOVAs on Binge and DASS-21 Variables (*N = *102)*

		Binge watch		Binge eat		Binge drink	
Level	*n*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Freshman 1st sem.	8	3.75	0.71	2.06	0.86	4.74	1.56
Freshman > 1 sem.	14	3.29	0.83	2.46	0.95	5.42	1.66
Sophomore	22	3.32	0.78	2.05	0.75	4.21	1.74
Junior	20	3.60	0.68	2.45	0.94	4.93	2.07
Senior	38	3.42	0.64	2.25	0.94	5.36	1.76
Statistic							
$F(4, 97)$		0.963		0.817		1.686	
P		.431		.518		.159	
η^2		.038		.033		.065	
		Stress		Depression		Anxiety	
Level		*M*	*SD*	*M*	*SD*	*M*	*SD*
Freshman 1st sem.	8	1.98	0.80	2.04	0.82	1.68	0.63
Freshman > 1 sem.	14	1.89	0.59	1.82	0.65	1.72	0.73
Sophomore	22	2.04	0.67	**1.54$_{ab}$**	0.66	1.47	0.53
Junior	20	2.08	0.80	**2.16$_{a}$**	0.98	1.69	0.67
Senior	38	2.21	0.61	**2.02$_{b}$**	0.71	1.83	0.72
Statistic							
$F(4, 97)$		0.664		2.145		1.044	
P		.619		.081		.389	
η^2		.027		.081		.041	

Note. Means in a column with the same subscript are statistically significantly different at $p < .05$.

Table 12 displays the fraternity or sorority status ANOVAs on binge and DASS-21 variables. For five of the six tests, no differences were found. However, for binge drinking, active students (M = 6.07) had significantly higher levels of drinking than either those not in (M = 4.84) and inactive students (M = 3.94; see Table 12).

Table 12

*Fraternity or Sorority Status ANOVAs on Binge and DASS-21 Variables (*N = *102)*

		Binge watch		Binge eat		Binge drink	
Level	*n*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Not in	76	3.49	0.70	2.21	0.90	**4.84$_{a}$**	1.81
Active in	18	3.28	0.75	2.39	0.80	**6.07$_{ab}$**	1.24
Inactive in	8	3.38	0.74	2.44	1.08	**3.94$_{b}$**	2.13
Statistic							
F(2, 99)		0.661		0.455		5.142	
P		.519		.636		.008	
η^2		.013		.009		.094	
		Stress		Depression		Anxiety	
Level	*n*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Not in	76	2.12	0.70	1.89	0.83	1.71	0.67
Active in	18	1.81	0.52	1.81	0.55	1.64	0.71
Inactive in	8	2.33	0.50	2.41	0.62	1.75	0.60
Statistic							
F(2, 99)		2.156		1.855		0.091	
P		.121		.162		.913	
η^2		.042		.036		.002	

Note. Means in a column with the same subscript are statistically significantly different at $p < .05$.

Table 13 displays the course delivery method ANOVAs on binge and DASS-21 variables. For five of the six tests, no differences were found. However, for binge eating, online students (M = 2.64) had significantly higher levels of binge eating than face to face students (M = 2.10; see Table 13).

Table 13

*Course Delivery Method ANOVAs on Binge and DASS-21 Variables (*N = *102)*

		Binge watch		Binge eat		Binge drink	
Level	*n*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Online	21	3.29	0.85	**2.64**$_a$	0.82	5.22	1.79
Face-to-face	53	3.43	0.69	**2.10**$_a$	0.90	4.64	2.04
Hybrid	28	3.57	0.63	2.27	0.89	5.47	1.23
Statistic							
F(2, 99)		0.972		2.830		2.152	
P		.382		**.**064		.122	
η^2		.019		.054		.042	
		Stress		Depression		Anxiety	
Level		*M*	*SD*	*M*	*SD*	*M*	*SD*
Online	21	2.23	0.58	1.96	0.57	1.92	0.63
Face-to-face	53	1.98	0.65	1.89	0.86	1.67	0.72
Hybrid	28	2.17	0.76	1.93	0.78	1.59	0.57
Statistic							
F(2, 99)		1.411		0.069		1.599	
P		.249		.934		.207	
η^2		.028		.001		.031	

Note. Means in a column with the same subscript are statistically significantly different at $p < .05$.

Table 14 displays the living arrangement ANOVAs on binge and DASS-21 variables. Binge watching was higher for off-campus students (*M* = 3.62) than on campus students (*M* = 3.25). Binge drinking was higher for off-campus students (*M* = 5.45) than students living at home with family (*M* = 4.37). In addition, stress scores were higher for off-campus students (*M* = 2.19) and students living at home with family (*M* = 2.18) than on campus students (*M* = 1.77; see Table 14).

Table 14

*Living Arrangement ANOVAs on Binge Variables (*N *= 102)*

		Binge watch		Binge eat		Binge drink	
Level	*n*	*M*	*SD*	*M*	*SD*	*M*	*SD*
On campus	24	**3.25**$_{a}$	0.68	2.29	0.75	5.27	2.20
Off campus	37	**3.62**$_{a}$	0.68	2.04	0.96	**5.45**$_{a}$	1.47
At home w. family	38	3.37	0.75	2.43	0.89	**4.37**$_{a}$	1.63
Other	3	3.67	0.58	2.50	1.00	4.89	3.43
Statistic							
F(3, 98)		1.633		1.316		2.566	
P		.187		.273		.059	
η^2		.048		.039		.073	
		Stress		Depression		Anxiety	
Level		*M*	*SD*	*M*	*SD*	*M*	*SD*
On campus	24	**1.77**$_{ab}$	0.57	1.81	0.71	1.67	0.72
Off campus	37	**2.19**$_{a}$	0.69	1.78	0.78	1.63	0.62
At home w. family	38	**2.18**$_{b}$	0.66	2.13	0.81	1.79	0.70
Other	3	2.06	0.92	1.71	0.49	1.62	0.54
Statistic							
F(3, 98)		2.399		1.588		0.414	
P		.073		.197		.744	
η^2		.068		.046		.013	

Note. Means in a column with the same subscript are statistically significantly different at $p < .05$.

Inferential Results

This section is subdivided into screening for multicollinearity and regression assumptions, canonical correlation results, and regression results organized by research question. For the regressions with covariates I recoded dichotomous variables to values of 0 and 1 to ease interpretation and created several dummy variables for those with three or more categories. These included the following IBM SPSS syntax commands:

```
recode sex (2=0) (1=1) into male.
recode part.full.time (1=0) (2=1) into fulltime.
recode planned (1=0) (2=1) into unplanned.
recode athlete (2=0) (1=1) into athlete.participate.

compute offcampus=0.
if live=2 offcampus=1.
compute athome=0.
if live=3 athome=1.
compute liveother=0.
if live = 4 liveother=1.
*The reference category for living arrangement (the 3 above) is on campus.

compute online=0.
if howattend=1 online=1.
compute hybrid=0.
if howattend=3 hybrid=1.
*The reference category for how attend (the 2 above) is face-to-face.

compute activein=0.
if frat.sor.status=2 activein=1.
compute inactivein=0.
if frat.sor.status=3 inactivein=1.
*The reference category for fraternity/sorority status (the 2 above) is live on
campus.
```

Preliminary Regression to Screen for Multicollinearity and Regression Assumptions

Because of the limited number of discrete scores on each of the binge variables, scatterplots with each of the DASS-21 variables is not informative with respect to

linearity. Collinearity may exist with correlations exceeding .70 (Tabachnick, Fidell, & Ullman, 2007). From the correlation matrix in Table 15 none of the binge variables were intercorrelated > .70, and none of the DASS-21 variables were intercorrelated > .70. In preliminary regression runs for models to answer RQ1 through RQ5 all VIF values were < 2.0, so no indication of multicollinearity for any of the models. All models had relatively normally distributed standardized residuals with all values between -2.6 and 1.9, so no concern about an unusually influential case. Scatterplots for each model of standardized residuals to standardized predicted did not reveal any serious nonlinearity or heteroscedasticity of residuals. Regression assumptions were adequately met for all models.

Table 15

*Correlations Among Binge and DASS-21 Variables (*N *= 102)*

Variable	1	2	3	4	5	6
1. Binge watch		.020	-.018	.022	-.177	-.308
2. Binge eat	.839		.159	.401	.336	.443
3. Binge drink	.857	.110		.226	.251	.249
4. Stress	.823	< .001	.022		.578	.586
5. Depression	.075	.001	.011	< .001		.622
6. Anxiety	.002	< .001	.012	< .001	< .001	

Note. Upper diagonal contains Pearson correlation coefficients. Lower diagonal contains two-tailed *p* values.

Canonical Correlation Results

A multivariate canonical correlation analysis was conducted to answer the following research question and test the corresponding null hypothesis.

RQ1: What is the multivariate relationship between the linear combination of binge watching, binge drinking, and binge eating, with the linear combination of depression, anxiety, and stress among college students?

H_o1: The multivariate relationship between the linear combination of binge watching, binge drinking, and binge eating with the linear combination of depression, anxiety, and stress among college students is not significant.

H_a1: The multivariate relationship between the linear combination of binge watching, binge drinking, and binge eating with the linear combination of depression, anxiety, and stress among college students is significant.

The first and second dimension statistically significantly contributed to the multivariate effect (see Table 16). The first dimension accounted for 81.42% of the multivariate variance and explained 33.4% of shared variance between the set of binge variables and the set of DASS-21 variables. The second dimension accounted for 17.58% of the multivariate variance and explained 9.8% of shared variance.

Table 16

*Canonical Dimension Reduction (*N = *102)*

Dimension	%	R_c^2	Wilks Λ	*F*	*df*	*p*
1	81.42	.334	.597	6.13	9, 233.79	< .001
2	17.58	.098	.897	2.72	4, 194.00	.031
3	1.00	.006	.994	0.60	1, 98.00	.439

Note. R_c^2 = squared canonical correlation.

Variable loadings on the first two dimensions are presented in Table 17. The standardized coefficients (β) reveal the variables that most contribute to a dimension. In Dimension I, participants with low anxiety scores tended to also have low scores on binge eating and drinking, but high scores on binge watching. Inversely, those with high

scores on anxiety tended to also have high scores on binge eating and drinking, and low scores on binge watching. These results will be further discussed in Chapter 5.

Table 17

*Variable Loadings on First and Second Canonical Dimensions (*N *= 102)*

	Dimension I			Dimension II			
Variate	β	*r*	r^2	B	*r*	r^2	h^2
Binge							
Watch	0.531	.522	.272	-0.847	-.853	.728	.999
Eat	-0.735	-.777	.604	-0.451	-.500	.250	.854
Drink	-0.331	-.458	.210	-0.201	-.257	.066	.276
Adequacy			.362			.348	
R_c & R_c^2		.578	.334		.313	.098	
Adequacy			.633			.215	
DASS-21							
Stress	0.003	-.619	.384	-1.272	-.785	.616	.999
Depression	-0.196	-.734	.538	0.137	-.165	.027	.565
Anxiety	-0.868	-.988	.977	0.695	.035	.001	.978

Note. β is the standardized canonical coefficient. *r* and r^2 are variable correlation and squared correlation with the variate. h^2 is the communality of a variable across both dimensions. R_c and R_c^2 = canonical correlation and squared canonical correlation.

In Dimension II, participants with low stress scores and high anxiety scores tended also to have low scores on binge watching and eating. Inversely, those with high stress scores and low anxiety tended also to have high scores on binge watching and eating.

Adequacy values are the proportion of variance a dimension extracted from a variate. In Dimension I, 36.2% of the variance in the binge set of variables was extracted, and 63.3% of the DASS-21 variables was extracted. In Dimension II, 34.8% and 21.5% of the binge set and DASS-21 set were extracted, respectively. A variable's communality (h^2) is the proportion of variance of a variable accounted for by both dimensions. Binge

drinking had a relatively low communality and contributed the least to the multivariate dimensions.

Regression Results

For each regression-related research question, analysis was conducted without covariates followed by a "best model" with covariates. Null and alternative hypotheses for the regressions without covariates were modified accordingly. Hypotheses for a model building approach are not relevant (Jaccard & Jacoby, 2010), so for the analyses with covariates only an exploratory research question was added to determine the best model via stepwise regression. Categorical covariates were dummy coded to facilitate interpretation of regression coefficients. The focal and reference categories of dummy variables are described as part of the report of results.

RQ2: What is the relationship between the linear combination of depression, anxiety, and stress with binge eating among college students?

H_o2: The linear combination of depression, anxiety, and stress is not related to binge eating.

H_a2: The linear combination of depression, anxiety, and stress is related to binge eating.

RQ2a: What is the best model that accounts for variance in binge eating from the following set of theoretically or empirically identified predictors: depression, anxiety, stress, gender, age, full or part-time student status, how attend courses, and athletic status?

Table 18 displays the binge eating score regressed on DASS-21 variables and covariates. The DASS-21 Only model was significant ($p < .001$) and accounted for 22.7% of the variance in binge eating. Anxiety was positively related to binge eating and uniquely accounted for 5.0% of the variance, $p = .014$. Stress was positively related to binge eating and uniquely accounted for 2.5% of the variance, and approached statistical significance with $p = .078$. Depression did not contribute to the model.

Table 18

*Binge Eating Regressed on DASS-21 Variables and Covariates (*N *= 102)*

	DASS-21 Only $R^2 = .227$, $F(3, 98) = 9.61$, $p < .001$				
Predictor	*B*	95% CI	*t*	*p*	sr^2
Constant	0.93	[0.39, 1.47]	3.43	.001	
Stress	0.28	[-0.03, 0.58]	1.78	.078	.025
Depression	0.03	[-0.24, 0.31]	0.22	.826	< .001
Anxiety	0.41	[0.09, 0.73]	2.51	.014	.050
	Best Model $R^2 = .265$, $F(3, 98) = 11.79$, $p < .001$				
Constant	1.09	[0.55, 1.62]	4.03	< .001	
Anxiety	0.44	[0.16, 0.73]	3.09	.003	.072
Male	-0.36	[-0.67, -0.04]	-2.26	.026	.038
Stress	0.27	[-0.01, 0.55]	1.90	.060	.027

Based on stepwise regression, the best model accounted for 26.5% of the variance in binge eating, up from the 22.7% from the DASS-21 Only model. Anxiety was the most important predictor, accounting for 7.2% of the variance, $p = .003$. Binge eating was higher for females than males, uniquely accounting for 3.8% of the variance, $p = .026$. Stress was positively related to binge eating and approached significance ($p = .060$) uniquely accounting for 2.7% of the variance.

RQ3: What is the relationship between the linear combination of depression, anxiety, and stress with binge drinking among college students?

H_o3: The linear combination of depression, anxiety, and stress is not related to binge drinking.

H_a3: The linear combination of depression, anxiety, and stress is related to binge drinking.

RQ3a: What is the best model that accounts for variance in binge drinking from the following set of theoretically or empirically identified predictors: depression, anxiety, stress, age, athletic status, planned or unplanned binge viewing, fraternity/sorority status, where live, and number of episodes watched per viewing?

Table 19 displays the binge drinking score regressed on DASS-21 variables and covariates. The DASS-21 Only was significant ($p = .040$) and accounted for 8.1% of the variance in binge drinking, however, none of the predictors were statistically significant.

Based on stepwise regression, the best six variable model was significant ($p = .001$) and accounted for 33.6% of the variance in binge drinking. Those who lived at home with parents did much less binge drinking than those who lived on campus, $p < .001$, uniquely accounting for 11.4% of the variance in binge drinking. Those inactive in a fraternity/sorority reported less binge drinking than those not in a fraternity/sorority ($p = .015$, uniquely accounting for 4.3% of the variance), but those active in a fraternity/sorority did more binge drinking than those unaffiliated ($p = .048$, uniquely accounting for 2.8% of the variance). Those participating in athletics did more binge drinking than those not participating, $p = .057$, uniquely accounting for 2.6% of the

variance). Depression was positively related to binge drinking, $p = .021$, uniquely accounting for 3.9% of the variance. Stress contributed to the model, uniquely accounting for 2.0% of the variance in binge drinking, but did not reach traditional cutoff for statistical significance, $p = .094$.

Table 19

*Binge Drinking Regressed on DASS-21 Variables and Covariates (*N = *102)*

	DASS-21 Only $R^2 = .081$, $F(3, 98) = 2.88$, $p = .040$				
Predictor	*B*	95% CI	*t*	*p*	sr^2
Constant	3.39	[2.20, 4.59]	5.64	< .001	
Stress	0.22	[-0.46, 0.90]	0.63	.527	.004
Depression	0.30	[-0.31, 0.91]	0.99	.326	.009
Anxiety	0.33	[-0.39, 1.05]	0.92	.362	.008
	Best Model $R^2 = .336$, $F(6, 95) = 18.73$, $p < .001$				
Constant	3.13	[2.07, 4.20]	5.83	< .001	
Stress	0.48	[-0.08, 1.04]	1.69	.094	.020
Depression	0.59	[0.09, 1.08]	2.35	.021	.039
Live at home with parents	-1.31	[-1.95, -0.67]	-4.04	< .001	.114
Inactive in fraternity/sorority	-1.44	[-2.60, -0.29]	-2.48	.015	.043
Active in fraternity/sorority	0.93	[0.01, 1.86]	2.00	.048	.028
Athletic participation	0.84	[-0.03, 1.70]	1.93	.057	.026

RQ 4: What is the relationship between the linear combination of depression, anxiety, and stress with binge watching among college students?

H_o4: The linear combination of depression, anxiety, and stress is not related to binge watching.

H_a4: The linear combination of depression, anxiety, and stress is related to binge watching.

RQ4a: What is the best model that accounts for variance in binge watching from the following set of theoretically or empirically identified predictors: depression, anxiety, stress, gender, full or part-time student status, athletic status, planned or unplanned binge viewing, and where live?

Table 20 displays the binge watching score regressed on DASS-21 variables and covariates. The DASS-21 Only model was significant (p = .001) and accounted for 16.2% of the variance in binge watching. Anxiety was most important, with a negative relationship with binge watching, p = .001, uniquely accounting for 10.8% of the variance. Stress was positively related to binge watching, p = .006, uniquely accounting for 6.7% of variance. Depression did not contribute to the model.

Based on stepwise regression, he best four variable model was significant (p < .001) and accounted for 24.1% of the variance in binge watching, up from the 16.2% of the DASS-21 Only model. Anxiety remained the most important and negatively related to binge watching, p = .008, uniquely accounting for 5.8% of the variance. Stress was the next most important and positively related, p = .042, uniquely accounting for 3.3% of the variance. Those participating in athletics did less binge watching than those who did not participate, p = .069, uniquely accounting for 2.7% of variance; and those who did not plan their viewing binge watched more than those who did plan, p .083, uniquely accounting for 2.4% of the variance.

Table 20

*Binge Watching Regressed on DASS-21 Variables and Covariates (*N *= 102)*

Predictor	*B*	95% CI	*t*	*p*	sr^2
	DASS-21 Only $R^2 = .162$, $F(3, 98) = 6.33$, $p = .001$				
Constant	3.67	[3.22, 4.12]	16.34	< .001	
Stress	0.36	[0.11, 0.62]	2.81	.006	.067
Depression	-0.09	[-0.31, 0.14]	-0.76	.448	.005
Anxiety	-0.48	[-0.75, -0.21]	-3.54	.001	.108
	Best Model $R^2 = .241$, $F(4, 97) = 7.69$, $p < .001$				
Constant	3.43	[2.93, 3.93]	13.64	< .001	
Stress	0.25	[0.01, 0.48]	2.06	.042	.033
Anxiety	-0.35	[-0.61, -0.10]	-2.72	.008	.058
Athletic participation	-0.34	[-0.71, 0.03]	-1.84	.069	.027
Unplanned viewing	0.26	[-0.03, 0.55]	1.75	.083	.024

RQ 5: What are the combined and relative effects of the Television Viewing Motives subscales in accounting for variance in binge watching?

Table 21 displays the binge watching score regressed on DASS-21 factor scores and covariates. The DASS-21 Only model was significant ($p < .001$) and accounted for 20.3% of the variance in binge watching. Binge watching was positively related to the not for information factor ($p = .001$, uniquely accounting for 9.2% of the variance) and the pass time factor ($p = .059$, uniquely accounting for 3.0% of the variance). The viewing motives to escape loneliness, for comfort, and for stimulation did not contribute to the model.

Based on stepwise regression, the best three variable model was significant ($p <$ .001) and accounted for 27.7% of the variance in binge watching, up from the 20.#5 of the TVMS factors only model. The most important predictor was athletic participation, *p*

= .001, uniquely accounting for 8.8% of the variance, with those who participated in athletics binge watching less than those who did not participate. Similar to the TVMS only model, those viewing not for information (p = .011, uniquely accounting for 6.5% of variance) or to pass time (p = .011, uniquely accounting for 6.4% of variance) were predicted to binge watch more.

Table 21

*Binge Watching Regressed on TVMS Factors and Covariates (*N = *102)*

	TVMS Only R^2 = .203, $F(5, 96)$ = 4.90, p < .001				
Predictor	*B*	95% CI	*t*	*p*	sr^2
Constant	3.44	[3.31, 3.57]	53.35	< .001	
Escape Loneliness	< 0.01	[-0.18, 0.17]	-0.05	.961	< .001
Not For Information	0.26	[0.11, 0.42]	3.32	.001	.092
Pass Time	0.15	[-0.01, 0.31]	1.91	.059	.030
Stimulation	0.10	[-0.06, 0.26]	1.29	.201	.014
Comfort	-0.03	[-0.20, 0.13]	-0.41	.684	.001
	Best Model R^2 = .277, $F(3, 98)$ = 12.49, p < .001				
Constant	3.55	[3.42, 3.69]	51.63	< .001	
Not For Information	0.18	[0.04, 0.32]	2.60	.011	.065
Pass Time	0.18	[0.04, 0.32]	2.59	.011	.064
Athletic participation	-0.54	[-0.85, -0.23]	-3.45	.001	.088

Summary

In summary, this study used survey data from 102 participants to examine multivariate relations between binge watching, binge eating, binge drinking and depression, anxiety, and stress among college students; and to examine specific multivariable regression models.

Two dimensions emerged from the multivariate canonical correlation analysis. On Dimension I, participants with low anxiety scores tended to also have low scores on binge eating and drinking, but high scores on binge watching. Inversely, those with high scores on anxiety tended to also have high scores on binge eating and drinking, and low scores on binge watching. On Dimension II, participants with low stress scores and high anxiety scores tended also to have low scores on binge watching and eating. Inversely, those with high stress scores and low anxiety tended also to have high scores on binge watching and eating.

Anxiety, stress, and gender were important predictors of binge eating. Binge drinking was influenced by where a student lived, fraternity/sorority status, athletic participation, depression, and stress. Binge watching was best predicted by a model including stress, anxiety, athletic participation, and whether binge episodes were planned or unplanned. With respect to motivations for binge watching, more binge watching was by those not involved in athletics and motivated not for information and to pass time.

In the final chapter, these findings were compared to the literature, conclusions and implications were drawn, and a series of recommendations was suggested.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this study was to examine multivariate relations between binge watching, binge eating, and binge drinking and depression, anxiety, and stress among college students. Because other studies showed a positive correlation between other binge behaviors and stress, anxiety, and depression among college students (Beiter et al., 2015), this study focused on regressing binge watching on stress, anxiety, and depression in the same population. Moreover, multivariate interrelationships were examined to determine the relationships between the set of binge behaviors (binge watching, binge drinking, and binge eating) and the psychological set of depression, anxiety, and stress.

I conducted a survey of 121 participants who identified as college students ages 18 to 24 and were currently enrolled at a college or university in the United States. Participants were recruited through Amazon's Mechanical Turk (MTurk) crowdsourcing research tool to answer an initial three-question screener to determine qualification. Once screened and considered qualified participants, MTurk workers were given a link directing them to the survey hosted on SurveyMonkey and were compensated $1.50 once the survey was completed. A total of 121 participants completed the survey. After data screening and cleaning, data from 102 participants remained for statistical analysis.

Once the survey was closed, submitted surveys were analyzed for inconsistencies and exclusions. Of the 121 submitted surveys, only 102 of the participants' surveys were used. Four surveys were removed for missing 11 answers. Four surveys were removed after a series of box plots for the 15 study variables (11 scale scores plus four demographic variables) revealed 11 univariate outliers. Four cases were found to be

univariate or multivariate outliers after factor analysis of Television Viewing Motives Scale (TVMS) items, which resulted in further elimination of another four surveys and a final valid sample of 102.

To determine the relationships between binge watching, binge eating, and binge drinking and depression, anxiety, and stress among college students, five questions were posed to examine possible relationships:

1. What is the multivariate relationship between the linear combination of binge watching, binge drinking, and binge eating with the linear combination of depression, anxiety, and stress among college students?
2. What is the relationship between the linear combination of depression, anxiety, and stress with binge eating among college students?
3. What is the relationship between the linear combination of depression, anxiety, and stress with binge drinking among college students?
4. What is the relationship between the linear combination of depression, anxiety, and stress with binge watching among college students?
5. What are the combined and relative effects of the Television Viewing Motives subscales in accounting for variance in binge watching?

For each regression-related research question, analysis was conducted without covariates followed by a best model with covariates. For the analyses with covariates, an exploratory research question was added to determine the best model via stepwise regression:

6. What is the best model that accounts for variance in binge eating from the following set of theoretically or empirically identified predictors: depression, anxiety, stress, gender, age, full- or part-time student status, how attend course, and athletic status?
7. What is the best model that accounts for variance in binge drinking from the following set of theoretically or empirically identified predictors: depression, anxiety, stress, age, athletic status, planned or unplanned binge viewing, fraternity/sorority status, where live, and number of episodes watched per viewing?
8. What is the best model that accounts for variance in binge watching from the following set of theoretically or empirically identified predictors; depression, anxiety, stress, gender, full- or part-time student status, athletic status, planned or unplanned binge viewing, and where live?

Survey data from 102 participants were used to examine multivariate relations between binge watching, binge eating, and binge drinking and depression, anxiety, and stress among college students, and to examine specific multivariable regression models. Key findings from this study showed that participants with low anxiety scores tended to have low scores on binge watching and drinking but high scores on binge watching. Those with high scores on anxiety tended to have high scores on binge eating and drinking and low scores on binge watching. Furthermore, individuals with low stress scores and high anxiety scores tended to have low scores on binge watching and eating.

Those with high stress scores and low anxiety tended to have high scores on binge watching and eating.

Anxiety, stress, and gender were important predictors of binge eating. Binge drinking was influenced by where a student lived, fraternity/sorority status, athletic participation, depression, and stress. Binge watching was best predicted by a model including stress, anxiety, athletic participation, and whether binge episodes were planned or unplanned. With respect to motivations for binge watching, more binge watching occurred among those not involved in athletics and motivated not for information and to pass time. A multivariate canonical correlation was used to test the first hypothesis, and multiple regression was used for Hypotheses 2, 3, and 4.

Interpretation of the Findings

The descriptive statistics of the participants revealed that more females (58.8%) than males (41.2%) responded to the survey. Although participants from various racial backgrounds responded, there were more participants who identified as White (51%) than all other races combined. Similar studies also included more White participants than any other race (Pena, 2015; Wheeler, 2015). Most participants (83.3%) were full-time students. Over half the sample (56.9%) were either juniors or seniors. About half (52.0%) attended face-to-face courses with 27.5% attending hybrid classes and another 20.6% attending online classes. Most participants (91.2%) were single. When queried as to where they lived, 37.3% reported living at home with family and 23.5% lived on campus. Most of the respondents (91.2%) were single, and 82.4% reported not being in a fraternity or sorority or being inactive. Twenty-one percent of the respondents were

collegiate athletes. As for age, the mean age was 21.59 (*SD* = 1.78). The current study was the only one on this topic to include age, marital status, student place of residence, race, program modality, year in college, sports affiliation, and fraternity/sorority affiliation. Other studies that addressed one or more of the variables I examined included fewer demographics. For example, Wechsler et al. (1998) concluded that those active in a fraternity/sorority were more likely to binge drink than those who did not. In addition, no other researchers considered how a student attended courses (i.e., hybrid, online, or face-to-face).

Forty-three percent of the sample reported that television was their primary viewing device followed by laptop computer (26.5%). When respondents were given "mark all that apply" pertaining to the viewing services they had, the most common were Netflix (83.3%), YouTube (66.7%), and Hulu (60.8%). This result differed from previous research in which Netflix was the most common streaming service and Hulu was the second ("Binging Is the New Viewing," 2013). One explanation for this difference is that not enough research has been conducted recently to include YouTube as a contender for streaming services.

Previous studies revealed that binge watching may be a planned or unplanned activity. Those who plan times to binge watch or use binge watching as a reward are considered intentional binge watchers; however, those who begin watching a program and find themselves unintentionally engaged in the activity are considered unintentional binge watchers (Riddle et al., 2017). The results from the current study showed that more than half of the binge watchers (63%) reported that their binges were unplanned. In

addition, the most common length for a show was 60 minutes (54.9%) followed by 30-minute shows (38.2%). When queried as to the difficulty they had in stopping viewing, 75.5% reported that it was sometimes or often difficult. A possible explanation for this result may relate to the addictive nature of binge watching. For example, Riddle et al. (2017) found that unintentional binge watching was related to impulsivity and addictive symptoms. In addition, the average time participants in the current study spent binge watching was nearly 4 hours, and participants watched an average of five episodes in one sitting.

In the first research question, I observed that participants with low anxiety scores tended to have low scores on binge eating and drinking but high scores on binge watching. Those with high scores on anxiety tended to have high scores on binge eating and drinking and low scores on binge watching. Findings in the current study do not support previous research that indicated an insignificant relationship between anxiety and binge drinking (Nourse et al., 2017). Conversely, other studies that included specific types of anxieties revealed relationships between binge eating and binge drinking. For example, Scalzo and Martinez (2017) found that college students who experienced anxiety related to fear of missing out had greater heavy drinking intentions than those who experienced test anxiety and clinical anxiety. Furthermore, anxiety in the form of attachment anxiety has been related to binge eating (Han & Lee, 2017; Han & Pistole, 2014). A possible explanation for these conflicting results may be that anxiety measured in the current study did not include specific subtypes of anxiety.

The current study also revealed that participants with low stress scores and high anxiety scores tended to have low scores on binge watching and eating. Those with high stress scores and low anxiety tended to have high scores on binge watching and eating. Previous studies indicated relationships between stress and binge watching (Petersen, 2016) and binge eating (Sulkowski et al., 2011) and anxiety and binge eating (Han & Lee, 2017; Han & Pistole, 2014), but Petersen (2016) related stress to how participants used binge watching, Sulkowski et al. (2011) related stress to how participants used binge eating and (Han & Lee, 2017; Han & Pistole, 2014) related binge eating to specific types of anxiety. There are several possible explanations that may explain why my findings differ from those in previous studies. For example, Petersen (2016) examined specific use of binge watching (planned or unplanned) qualitatively, while Sulkowski et al. (2011) included only female college student participants and related stress to specific types of anxiety to include fear of missing out. Other studies addressed binge eating in relation to attachment anxiety (Han & Lee, 2017; Han & Pistole, 2014). The results of these studies may differ from my results because of the methods used, populations studied, and specific types of binge watching and anxieties studied.

Despite depression being the second most leading complaint among college students (Center for Collegiate Mental Health, 2017), I did not find depression a factor in binge watching, binge drinking, or binge eating. Depression was found to be associated with binge watching in previous studies (Ahmed, 2017; Devasagayam, 2014; Wheeler, 2015). There may be several possible explanations for these conflicting results. One possible explanation may be that the populations in the current study and two of the three

aforementioned studies differ. Only one of the aforementioned studies (Wheeler, 2015) included college students, while the other two (Ahmed, 2017; Devasagayam, 2014) did not. In addition, Wheeler's (2015) study included only students from one Southeastern university; consequently, the differences in demographics may help to explain some of the differences in study results. Unlike Wheeler's study, the current study included students throughout the United States. In addition, the current study included students from various universities, those who were part-time students, and those who took classes online. Depression is a common comorbidity of binge eating disorder (American Psychiatric Association, 2013; Araujo et al., 2010; Azarbad et al., 2010), but this was not evident in the current study. Finally, there are similarities between this study and a recent study that indicated no significant associations between hazardous drinking and depression and anxiety among college students (Nourse et al., 2017). Differences in findings relating depression and binge watching, binge drinking, and binge eating may also be explained by the fact that emerging adults (e.g., those between the ages of 18 and 24) are more likely to display fewer depressive symptoms than are older adults, yet they still meet the criteria for a depressive disorder classified under *other depression* (CDC, 2016).

In the second research question, I observed statistically significant relationships between binge eating and anxiety. Anxiety was the most important predictor of binge eating, and more females than males engaged in binge eating. These results are consistent with other studies that indicated significant relationships between anxiety and binge eating among college students (Han & Lee, 2017; Han & Pistole, 2014) and that binge

eating is more prevalent in females than in males (Hudson et al., 2007; Kessler et al., 2013). Binge eating disorder was only formally recognized in 2013; consequently, researchers have not researched this disorder as much as they have other eating disorders.

In Research Question 2a, stepwise regression revealed that the best model accounted for 26.5% of the variance in binge eating. The DASS-21 Only model accounted for 22.7%. In addition, the best model also showed that binge eating was higher in females than males. Furthermore, this model also revealed that anxiety was the most important predictor in accounting for binge eating. In addition, stress was positively related to binge eating and approached statistical significance. The findings of the current study are consistent with those of Sulkowski et al. (2011) who noted a positive association between stress and binge eating when female college students used emotion-focused and avoidant coping methods.

In Research Question 3, I observed that depression, anxiety, and stress were not statistically significant in predicting binge drinking among college students when using the DASS-21 Only model. The findings of the current study concerning binge drinking and depression and anxiety are consistent with those of Nourse et al. (2017) who found no significant associations between hazardous drinking, depression, and anxiety among college students. Conversely, the findings of the current study concerning binge drinking and stress do not support the previous research that related stress and binge drinking. A possible explanation for this inconsistency may be that Pedersen (2017) found that a specific type of stress (interpersonal stress) was a better predictor of a college students'

binge drinking behavior than was academic and developmental stress, and only general stress was measured in the current study.

In Research Question 3a, I determined that the best six variable model was significant and accounted for 33.6% of the variance in binge drinking when accounting for age, athletic status, planned or unplanned binge viewing, fraternity/sorority status, where live, and number of episodes watched per viewing. Specifically, college students who lived at home with parents did much less binge drinking than those who lived on campus. Those inactive in a fraternity/sorority reported less binge drinking than those not in a fraternity/sorority, but those active in a fraternity/sorority did more binge drinking than those unaffiliated. It is encouraging to compare these results with that found by Wechsler's et al. (2002) who reported that students who were active in a fraternity or sorority were more likely to binge drink than those who were not. In addition, the current study revealed that those participating in athletics did more binge drinking than those not participating. The best six variable model also revealed that depression was positively related to binge drinking, but that stress contributed to the model, but did not reach traditional cutoff for statistical significance, $p = .094$.

In Research Question 4, I observed that anxiety was most important, with a negative relationship with binge watching. The current study showed that as anxiety levels increased, binge watching decreased. Inversely, as anxiety levels decreased, binge watching increased. In other words, participants with low anxiety did more binge watching than those with high anxiety. In addition, stress was positively related to binge watching, while depression did not contribute to the model. These results are consistent

with those of other studies and suggest that stress may play a role in binge watching behavior (Petersen, 2016), while there may not be an association between binge watching and depressive symptoms (Boudali et al., 2017).

In Research Question 4a, I determined that the best four variable model was significant and accounted for 24.1% of the variance in binge watching, up from the 16.2% of the DASS-21 Only model. Anxiety remained the most important and negatively related to binge watching. Stress was the next most important and positively related to binge watching. Those participating in athletics did less binge watching than those who did not participate. Those who did not plan their viewing binge watched more than those who did plan, which is consistent with previous studies (Riddle et al., 2017).

In Research Question 5, I observed that binge watching was positively related to the not for information factor and the pass time factor. These findings show that participants were not motivated to binge watch for cognitive needs, as described by Katz, Haas et al. (1973) as using media to acquire knowledge which might be obtained from watching news or educational programing. The current study does show that participants were motivated to binge watch in an effort to pass time. The viewing motives to escape loneliness, for comfort, and for stimulation did not contribute to the model. These results support the assertion that participants in this study were less motivated to binge watch because of negative emotions. Furthermore, these results help to fill the void in empirical literature by providing evidence that may help to explain binge viewing motives among college students.

The best three variable model was significant and accounted for 27.7% of the variance in binge watching, up from 20.3% of the TVMS factors only model. The most important predictor was athletic participation with those who participated in athletics binge watching less than those who did not participate in athletics. This result may be attributed to the fact that college athletes may have less leisure time to spend binge watching than non-athletes. Similar to the TVMS only model, those viewing not for information or to pass time were predicted to binge watch more.

Two main theories were used as the theoretical framework for this study. These theories include (a) escape theory (Heatherton & Baumeister, 1991), and (b) uses and gratification theory (Levy & Windahl, 1984). The escape theory explains how people use behaviors to avoid negative emotions by refocusing their attention from negative self-perceptions onto something in the immediate environment (Heatherton & Baumeister, 1991). The Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1996) were used to assess symptoms associated with depression, stress, and anxiety experienced by the respondent over the previous month. There are similarities between the current study and the conclusions drawn by Higgins Neyland and Bardon-Cone (2016) and Mason et al. (2017) whose research revealed positive relationships between stress and binge eating. Results from the current study also showed that stress is positively related to binge eating and binge watching. Unlike the aforementioned studies on stress and binge eating, the current study only reveals a correlation between stress and binge eating and binge watching, but a conclusion that binge eating or binge watching was caused by stress is unable to be determined. Similarly, the current study shows a clear relationship

between anxiety and binge eating, binge drinking, and binge watching, but the results of this study cannot explain if binge behaviors were caused by anxiety. Further work is required to establish such relations. It is possible to conclude that data from this study supports the use of the escape theory to explain avoidance behavior (binge eating, binge drinking, and binge watching) of those with anxiety, but causation can not be established.

With respect to the uses and gratification theory, this theory has been used in research to understand why people seek out certain forms of media and how their media choices gratify needs and goals (Palmgreen, Wenner, & Rosengren, 1985). McQual (2010) identified the five basic gratifications of media as (a) cognitive needs, (b) affective needs, (c) personal integrative needs, (d) social integrative needs, and (e) tension free needs. Weaver (2003) created a more workable number of items by combining items from Rubin's (1983) original motives revealing the following five motives: (a) pass time, (b) companionship, (c) relaxation, (d) information, and (e) stimulation (Weaver, 2003). The purpose of including this theory in the framework was to facilitate a more comprehensive view of motivating factors for binge watching that included motivating factors that were for purposes other than escape from negative emotions. It is encouraging to note that results from the current study showed that most of the participants were motivated to binge watch for reasons other than to escape negative emotions. Specifically, when considering the combined and relative effects of the Television Viewing Motives subscales in accounting for variance in binge watching, the DASS-21 only model revealed that viewing motives to escape loneliness, for comfort, and for stimulation did not contribute to the model. In fact, participants were more

motivated to binge watch when the viewing was not for information purposes and to pass time.

Limitations of the Study

The findings in this study are subject to at least three limitations. First, the incentive for participation may not have been very attractive to participants. Participants were paid $1.50 to answer 70 questions that took nearly 15 minutes to complete. Response rates were initially slow, which may have been a result of a low incentive to complete a lengthy questionnaire. Offering a larger incentive may have enticed more experienced MTurk workers to complete the survey, which may have varied the population to include more participants who identified as freshmen and sophomore college students.

Secondly, a convenience sample was used that included MTurk workers who were required to have an MTurk account and who also identified as a college student between the ages of 18 and 24. Using a crowdsourcing research tool limited my participation pool to those with an MTurk account. Conducting the study at a brick and mortar institutions may have ensured that participants who identified as a college student was in fact enrolled at a college or university. Including participants without an MTurk account may have also varied the population to include a more diverse group of participants.

Finally, one of the primary purposes of this study was to assess motivations for binge watching. The study participants were asked to indicate the amount of time they spent binge watching and the number of episodes they watched in one sitting. These

questions assume that the participant is aware of their binge watching behavior and the amount of time spent engaging in this activity. The TVMS was used to assess binge watching motives, but this measurement instrument is supported by the uses and gratification theory that assumes that participants show adequate self-awareness of why they chose certain media and that participants also understand their needs that the consumption of media gratify (Pittman & Sheehan, 2015). One criticism of the uses and gratification theory is that it does not take into account the influential power media have over the consumer (Katzet al., 1973). In particular, this study did not take into consideration the influence of the continuous watch feature built into streaming services that automatically plays the next episode without input from the consumer.

Recommendations

A study relating binge behaviors, to include binge watching, to psychological factors is relatively new to the field. The current study revealed that stress and anxiety were the two most important psychological factors related to binge behaviors. Consequently, it is recommended that further research be undertaken in the following areas:

1. This study examined relations between binge watching, binge eating, and binge drinking and stress. Although the results revealed a positive relationship to binge watching, future studies could examine specific subtypes of stress that are experienced specifically by college students. Some subtypes could include acculturative stress, family disconnection, discriminatory stress, and financial stress.

2. This study revealed that anxiety was positively related to binge drinking and binge eating and negatively related to binge watching. Further research might explore the impact that specific subtypes of anxiety has on binge behaviors in college students. For example, a future study may include specific subtypes of anxiety experienced by college students. Some of these subtypes may include fear of missing out, attachment anxiety, and test anxiety.
3. It would also be interesting to assess the relationship between course delivery method and binge watching behaviors. For example, a future study could compare binge behaviors of students who attend college courses online to those who attend face-to-face courses. Is there a difference in binge watching behaviors between those who attend traditional face-to-face courses and those who attend courses online?

Implications

The top three mental health complaints of college students are depression, anxiety, and stress (Center for Collegiate Mental Health, 2017). If not properly resolved, emotions associated with depression, anxiety, and stress can negatively impact students' academic success, wellbeing, and enrollment (Harris et al., 2015). Studies show that some students are engaging in binge behaviors to mitigate negative emotions associated with depression, anxiety, and stress. Specifically, previous studies reveal that 30% of college students reported binge eating within the previous week (Kelley-Weeder, Jennings, & Wolfe, 2012); and between 37.9 % (Pedersen, 2017) and 50% (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2015) of college students reported

engaging in binge drinking. Binge eating and binge drinking are behavioral addictions that have been found to often result in poor academic outcomes for college students (Trolian et al., 2016; White & Hingson, 2013). In addition, researchers also found that binge behaviors resulted in negative health consequences (Deluchi et al., 2017; Hingson et al., 2017; Townshend et al., 2014; Tyler et al., 2015). This study was intended to fill the gap in understanding the interrelationships that exist between binge behaviors and psychological factors using the escape theory and the uses and gratifications theory as a theoretical framework in which to examine the results.

The findings of this study are consistent in relating binge behaviors to two of the three psychological factors identified in the current study (anxiety & stress). Specifically, anxiety was positively related to binge drinking and binge eating, but a new result emerged showing a negative relationship between anxiety and binge watching. Similarly, another new result emerged showing a positive relationship between stress and binge watching.

Although some participants in the study reported experiences of depression, stress, and anxiety, the escape theory was limited in its use of explaining motivations for binge watching that were not associated with negative emotions. Perhaps this is because the findings only show a relationship between binge behaviors and psychological variables; thus, the escape theory could only be used in this study to explain a possible negative motivation for binge watching. The uses and gratification theory appeared to be a more inclusive theory in explaining binge watching motivations because it included both positive and negative viewing motives.

Binge behaviors have been understood to have a similar nature of overindulgence within a short period of time and they are used as a form of escape (Heatherton & Baumeister, 1991). The current study provides new contributions to the understanding of binge behaviors by showing that not all binges are equal nor are they all used as a form of escape. For example, in the current study, the viewing motives to escape loneliness, for comfort, and for stimulation were not significant motivating factors for binge watching. In fact, participants were more motivated to binge watch as a way to pass time and to view for purposes other than for information. However, with a small sample size, caution must be applied, as the findings might not be generalizable to other populations of college students.

Other new contributions made by this study show a positive relationship between stress and binge watching and a negative relationship between anxiety and binge watching. Furthermore, this study also showed that binge watching was best predicted by a model including stress, anxiety, athletic participation, and whether binge episodes were planned or unplanned.

The findings of this study may be of interest to college and university administrators and mental health center staff. College and university mental health centers have seen a 30% increase in college students seeking mental health services, yet the student population has only increased by 5% (Center for Collegiate Mental Health, 2017). The American College Health Association (2014) reported that out of the students who received mental health services on college campuses, 33.2% identified depression as their presenting problem, 45% reported stress, and 61% noted anxiety. In addition,

previous research has identified that college students are engaging in binge behaviors at alarming rates. Evaluated individually, any of these behaviors (binge eating, binge drinking, binge watching) or psychological variables (depression, stress, and anxiety) experienced by college students could have a negative impact on the health and academic performance of a college student. The current study shows the interrelationships between binge eating, binge drinking, and binge watching and depression, anxiety, and stress in college students. The results may provide college mental health student services centers with empirical data to use for creating programs to identify maladaptive binge behaviors and more effectively cope with stress, anxiety, and depression among college students.

Conclusion

Anxiety is the number one complaint of college students and this study shows that it is significant in predicting binge behaviors. When anxiety levels are high, then binge eating and binge drinking are also high, but binge watching levels are low. When anxiety levels are low, then binge eating and binge drinking are also low, but binge watching levels are high. So, it seems like college students are more likely to binge eat and binge drink when they are anxious, but they will binge watch when they are less anxious.

Stress is the second most common mental health complaint among college students and the current study showed a positively significant relationship between stress and binge watching. In other words, it appears that college students are more likely to binge watch when stress levels are high and less likely to binge watch when stress levels are low.

In this study, psychological variables (depression, anxiety, and stress) were related to binge behaviors. The results reveal that they do relate, but the results also suggest that binge watching was best predicted by a model that considered psychological factors (stress, anxiety), social factors (athletic participation), and planning (whether binge episodes were planned or unplanned). It was also concluded that depression was not a significant factor in binge watching behavior. Finally, not all binge watching is bad. Although the term *binge* has negative connotations which makes it appear to relate to a person engaging in an activity without a sense of control, this study revealed that most people who binge watch do so to pass time or for entertainment purposes.

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Appendix A: Screener Questions

1. Are you a full time college student?

2. What is your age?

Appendix B: Demographic Survey

1. What is your age?
    - 18
    - 19
    - 20
    - 21
    - 22
    - 23
    - 24
2. What is your sex?
    - Male
    - Female
3. What is your race/ethnicity?
    - American Indian/Native American
    - Asian
    - Black/African American
    - Hispanic/Latino
    - White/Caucasian
    - Pacific Islander
    - Biracial/Bi-ethnic

- Multiracial/Multi-ethnic
- Other

4. What is your student status?

    - Part-time
    - Full-time

5. What is your current college grade level?

- Entering Freshman
- Freshman who has completed at least one semester of college
- Sophomore
- Junior
- Senior

6. How do you attend college courses?

- Online
- Face-to-face
- Hybrid (i.e. a mix of online and face-to-face courses)

7. Where do you live during the school year?

    - On campus (i.e., dormitory)
    - Off campus housing (i.e., house or apartment)
    - At home with family
    - Other

8. What is your college major?

9. What is your marital status?

- Single
- Married
- Separated/Widowed

10. What is your fraternity or sorority status?

- I am not in a fraternity or sorority
- I am active in a fraternity or sorority
- I am inactive in a fraternity or sorority

11. What is your college athletics status?

- I participate on an organized college athletics team
- I do not participate on an organized college athletics team

Binge Watching

12. Over the past month, how often have you watched two or more episodes of the same television show in one sitting on any screen (i.e. television, computer, laptop, tablet, or cell phone)?

- Never
- Rarely
- Sometimes
- Often

13. What device do you usually use to watch television programs?

- Television

- Computer
- Laptop
- Cellular Phone
- Tablet (e.g. Ipad, Galaxy Tab, Amazon Fire, etc.)
- Other device not listed

14. What digital streaming services do you use (select all that apply)?

    - Netflix
    - Hulu
    - Amazon Prime
    - On Demand
    - HBO Go
    - None of the above

15. Do you watch television series through other means not previously described to include DVD collections?

    - Yes
    - No

16. Do you usually find that your time watching two or more episodes of the same television show is planned (i.e. you schedule a specific time to watch) or unplanned (i.e. you begin watching one episode and then find yourself watching multiple episodes)?

    - Planned
    - Unplanned

- I do not watch multiple episodes of the same television show in one sitting

17. When you are engaged in watching multiple episodes of the same television show in one sitting, how often do you find it difficult to stop?

    - Never
    - Rarely
    - Sometimes
    - Often

18. Over the past month, when you watched two or more episodes of the same television show in one sitting how many hours, on average, did you spend watching?

19. Over the past month, when you watched two or more episodes of the same television show in one sitting how many episodes, on average, did you watch?

20. What type of shows do you usually view, when watching two or more episodes of the same television show in one sitting?

    - Shows that run for 30 minutes or less
    - Shows that run for 1-hour
    - Movies
    - Other

Appendix C: Permission for use of the Television Viewing Motives Inventory

PsycTESTS®

Television Viewing Motives Inventory
Version Attached: Full Test

PsycTESTS Citation:
Weaver, J. B., III. (2003). Television Viewing Motives Inventory [Database record]. Retrieved from PsycTESTS. doi: http://dx.doi.org/10.1037/t12474-000

Instrument Type:
Inventory/Questionnaire

Test Format:
Respondents indicate how well each statement reflects their motives for watching television using a scale with five levels--"Strongly Agree" (4), "Agree" (3), "Neutral" (2), "Disagree" (1), and "Strongly Disagree" (0).

Source:
Weaver, James B. (2003). Individual differences in television viewing motives. Personality and Individual Differences, Vol 35(6), 1427-1437. doi: 10.1016/S0191-8869(02)00360-4, © 2003 by Elsevier. Reproduced by Permission of Elsevier.

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PsycTESTS™ is a database of the American Psychological Association

Appendix D: Permission for use of the Binge Eating Symptoms Measure

PsycTESTS

Binge Eating Symptoms Measure
Version Attached: Full Test

PsycTESTS Citation:
Mason, T. B., & Heron, K. E. (2016). Binge Eating Symptoms Measure [Database record]. Retrieved from PsycTESTS. doi: http://dx.doi.org/10.1037/t59251-000

Instrument Type:
Screener

Test Format:
The Binge Eating Symptoms Measure contains 2 items rated yes/no.

Source:
Mason, Tyler B., & Heron, Kristin E. (2016). Do depressive symptoms explain associations between binge eating symptoms and later psychosocial adjustment in young adulthood? Eating Behaviors, Vol 23, 126-130. doi: 10.1016/j.eatbeh.2016.09.003, © 2016 by Elsevier. Reproduced by Permission of Elsevier.

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Appendix E: Permission for use of the Depression Anxiety Stress Scale–21 (DASS–21)

PsycTESTS

Depression Anxiety Stress Scales
Version Attached: Full Test

Note: Test name created by PsycTESTS

PsycTESTS Citation:
Lovibond, S. H., & Lovibond, P. F. (1995). Depression Anxiety Stress Scales [Database record]. Retrieved from PsycTESTS. doi: http://dx.doi.org/10.1037/t01004-000

Instrument Type:
Screener

Test Format:
The DASS uses a 4-point Likert scale of frequency or severity of the participants' experiences over the last week. The rating scale is as follows: 0 = Did not apply to me at all; 1= Applied to me to some degree, or some of the time; 2= Applied to me to a considerable degree, or a good part of time; 3 = Applied to me very much, or most of the time.

Source:
Antony, Martin M., Bieling, Peter J., Cox, Brian J., Enns, Murray W., & Swinson, Richard P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. Psychological Assessment, Vol 10(2), 176-181. doi: 10.1037/1040-3590.10.2.176

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Appendix F: Permission to Use Recommended Alcohol Questions Six Question Set

The following information was found on the National Institute on Alcohol Abuse and Alcoholism website:

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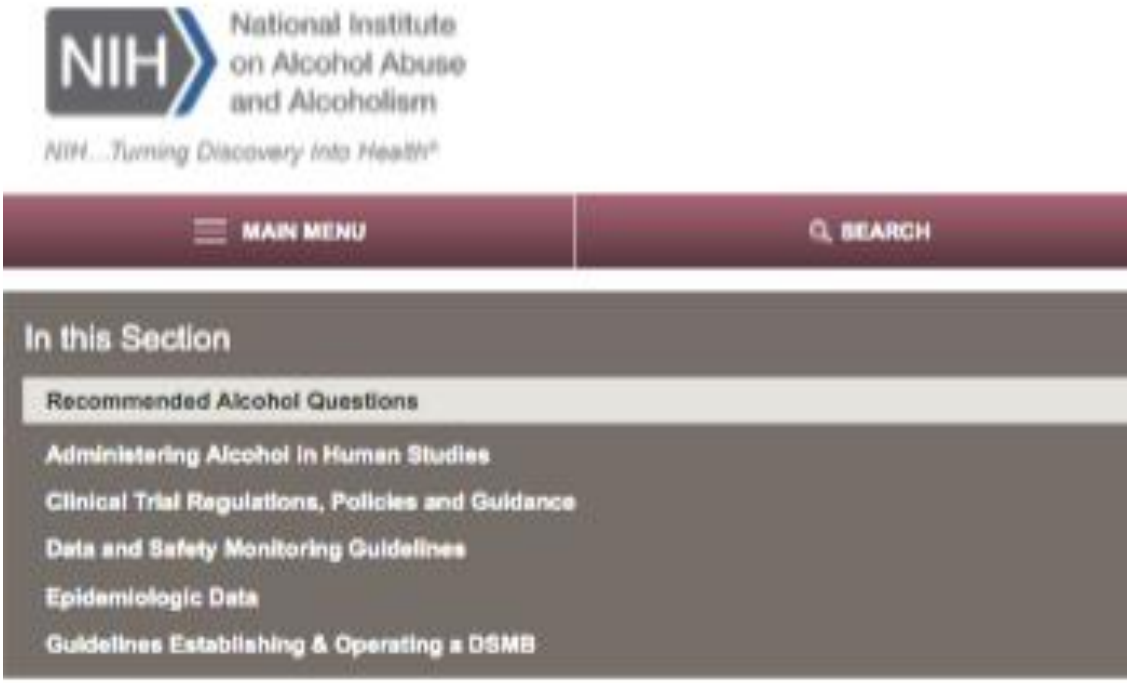
Appendix G: National Institute on Alcohol Abuse and Alcoholism Six Question Set

Recommended Alcohol Questions



Recommended Alcohol Questions

The Task Force on Recommended Alcohol Questions, a task force of NIAAA's Council met on October 15 and 16, 2003 in Bethesda Maryland to develop recommended minimum sets of downward compatible alcohol consumption questions, for researchers in other fields who only have resources to ask a limited number of alcohol-related questions. The recommended sets of 3, 4, 5 and 6 items presented here resulted from the work of that task force.

What Is The Minimum Number of Questions Which Should Be Recommended?

Research has shown the importance of learning about people's **patterns** of alcohol consumption, not just their average levels of consumption (e.g., average number of drinks consumed in a week). Patterns of alcohol consumption (that may include frequent regular drinking of small amounts, or infrequent episodes of consuming very large quantities all at one time) cannot be adequately described or differentiated by asking only two questions about drinking. Two questions can measure only averages (based on questions about typical drinking frequencies and quantities) or extreme patterns (such as abstinence and heavy episodic drinking). To more adequately capture the range of drinking patterns requires a minimum of three questions. Specifically, a measure of frequency of heavy drinking (5 or more standard drinks within a two-hour *_ period for men (4 or more for women), and standard questions about frequency of alcohol use and typical number of drinks per day when alcohol is used, are necessary to adequately describe drinking patterns and total volume of alcohol consumed.

This recommendation is consistent with those in the International Guide for Monitoring Alcohol Consumption and Related Harm (WHO, 2000, pg 57). It is also based on recent epidemiological studies on alcohol intake and risks which have demonstrated that for estimating risk of mortality, morbidity (including injuries) and other problems including drunk driving and social harms, it is essential to assess heavy quantity consumption in addition to usual frequency and quantity of consumption. The most widely used, pattern measure of heavy consumption is "binge" defined by a Working Group of NIAAA's Council as a pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08 grams percent or above. For the typical adult this pattern corresponds to consuming 5 or more drinks (male) or 4 or more drinks (female) in about 2 hours.

Six Question Set

Question 1 - (asks about frequency of past 12 month drinking)

During the last 12 months, how often did you usually have any kind of drink containing alcohol? **By a drink we mean half an ounce of absolute alcohol (e.g. a 12 ounce can or glass of beer or cooler, a 5 ounce glass of wine, or a drink containing 1 shot of liquor).** Choose only one.

Every day
5 to 6 times a week
3 to 4 times a week
twice a week
once a week
2 to 3 times a month
once a month
3 to 11 times in the past year
1 or 2 times in the past year

(IF RESPONDENT GIVES ANY OF THE ABOVE RESPONSES, GO TO QUESTION 2)

I did not drink any alcohol in the past year, but I did drink in the past
(GO TO QUESTION 1A)

I never drank any alcohol in my life
(GO TO QUESTION 1B)

1A - During your lifetime, what is the maximum number of drinks containing alcohol that you drank within a 24-hour period? (asked here only of those who did not drink any alcohol during the past 12 months)

36 drinks or more
24 to 35 drinks
18 to 23 drinks
12 to 17 drinks
8 to 11 drinks
5 to 7 drinks
4 drinks
3 drinks
2 drinks
1 drink
(DONE WITH ALCOHOL QUESTIONS)

1B - So you have never had a drink containing alcohol in your entire life. (asked only of those who say they never drank alcohol in their lives)

Yes, I never drank.
(DONE WITH ALCOHOL QUESTIONS)

No, I did drink
(GO BACK TO QUESTION 1 AND REPEAT)

Question 2 - (asks about number of drinks on typical drinking day in past 12 months)

During the last 12 months, how many alcoholic drinks did you have on a typical day when you drank alcohol?

25 or more drinks
19 to 24 drinks
16 to 18 drinks
12 to 15 drinks
9 to 11 drinks
7 to 8 drinks
5 to 6 drinks
3 to 4 drinks
2 drinks
1 drink

Question 3 - (asks about maximum drinks in a 24 hour period in past 12 months)

During the last 12 months, what is the largest number of drinks containing alcohol that you drank within a 24-hour period?

36 drinks or more
24 to 35 drinks
18 to 23 drinks
12 to 17 drinks
8 to 11 drinks
5 to 7 drinks
4 drinks
3 drinks
2 drinks
1 drink

Question 4 - (NEW QUESTION FOR 6 ITEM SET - NOTE ORDER CHANGE - NEW QUESTION IS #4) (asks about frequency of maximum drinks in last 12 months)

During the last 12 months, how often did you drink this largest number of drinks? Choose only one.

Every day
5 to 6 times a week
3 to 4 times a week
twice a week
once a week
2 to 3 times a month
once a month
3 to 11 times in the past year
1 or 2 times in the past year

Question 5 - (asks about frequency of binge drinking in past 12 months)

During the last 12 months, how often did you have 5 or more (males) or 4 or more (females) drinks containing any kind of alcohol in within a two-hour period? [That would be the equivalent of at least 5 (4) 12-ounce cans or bottles of beer, 5 (4) five ounce glasses of wine, 5 (4) drinks each containing one shot of liquor or spirits - to be provided by interviewer if asked.] Choose only one.

Every day
5 to 6 days a week
3 to 4 days a week
two days a week
one day a week
2 to 3 days a month
one day a month
3 to 11 days in the past year
1 or 2 days in the past year

Question 6- (asks about maximum drinks in 24 hours in lifetime)

During your lifetime, what is the largest number of drinks containing alcohol that you drank within a 24-hour period?

36 drinks or more
24 to 35 drinks
18 to 23 drinks
12 to 17 drinks
8 to 11 drinks
5 to 7 drinks
4 drinks
3 drinks
2 drinks
1 drink

There are many other important areas of inquiry related to alcohol consumption which are not addressed by the recommended questions. Researchers who want more detailed information about alcohol issues may want to consider asking additional questions in one or more of the following areas: more detailed and/or beverage specific consumption, alcohol problems including abuse and dependence, drinking contexts, drinking expectancies and reasons for drinking, concurrent use of other substances, and screening for alcohol problems as a goal of questions.

Another important consideration is other health-related variables which should be collected in conjunction with alcohol consumption information whenever possible. These are height, weight, smoking information and possibly a measure of health status.

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*Although questions on "binge" drinking have been asked in many national and population surveys, the 2-hour time frame represents a change. In the past, the question was typically framed using "in a *row*" or "on an occasion." On February 5, 2004, NIAAA Council approved the following definition: a "binge" is a pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08 gram percent or above. For the typical adult, the pattern corresponds to consuming 5 or more drinks (male), or 4 or more drinks (female), in about 2 hours." The questions recommended here reflect that definition. Further information about this definition is available at: http://pubs.niaaa.nih.gov/publications/Newsletter/winter2004/Newsletter_Number3.htm

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