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**ADVERSE CHILDHOOD EXPERIENCES AND CONTEXTUAL VARIABLES AS  
PREDICTORS OF FUTURE COLLEGE ADJUSTMENT AND ALCOHOL ABUSE  
AMONG FIRST-YEAR STUDENTS**

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by

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## ABSTRACT

Childhood maltreatment is a major problem internationally, with millions of children affected (Cross & Hershkowitz, 2017), and abuse can lead to many long-term effects throughout the lifespan (Felitti et al., 1998). The current study aimed to better understand the long-term impact of adverse childhood experiences (ACES) on functioning in first-year college students using data collected from a large, Mid-Atlantic university. Linear regression was used to examine the impact of cumulative ACES scores on college adjustment and alcohol use in the sample. The analyses suggested a significant relationship between ACES score and college adjustment, but a non-significant relationship between ACES and alcohol use. Moderation effects were also analyzed, and gender was found significantly moderate the relationship between ACES and college adjustment in the sample, with males displaying significantly lower college adjustment scores than females. The findings of this study have important implications for professionals in both the grade-school and post-secondary settings, and supports the use of trauma-informed practices with children and youth.

*Keywords:* ACES, college, adjustment, alcohol

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## CHAPTER 1

### INTRODUCTION

#### Background

Adverse childhood experiences (ACES), coined in 1998 by Felitti and colleagues, are common and affect children across the globe (Cross & Hershkowitz, 2017). Given the high rates of childhood ACES exposure, understanding the long-term consequences of such experiences is critical. While some individuals exhibit higher levels of resilience following traumatic events in their childhood (e.g., Banyard & Cantor, 2004), exposure to ACES may still lead to difficulties later in life across many facets of functioning (e.g., psychological, behavioral, and social; Dinehart et al., 2012).

Recent literature has emphasized the concept of *cumulative risk* as opposed to focusing on single indicators of risk in childhood. Researchers have examined the relationship between the number of risk factors experienced in childhood with behavioral, psychosocial, and health-related outcomes across the lifespan in a dichotomous manner: risk experienced versus risk not experienced (Horan & Widom, 2015). The Adverse Childhood Experiences scale (ACES; Felitti et al., 1998) is an example of this type of dichotomous and cumulative index. The current study aimed to understand the cumulative effect of cumulative risk (as measured by the ACES scale) on two areas of functioning among first-year college students: college adjustment and alcohol abuse. Contextual variables (i.e., race/ethnicity and gender) will be examined as moderators.

#### Study Specific Terms and Definitions

Trauma refers to an event or experience that can cause emotional or mental distress, such as abuse, neglect, or natural disasters. The current study will include references to the overall



concept of childhood trauma in the literature review, but the aim of this study is to evaluate outcomes of adverse childhood experiences. These experiences include forms of physical, emotional, and sexual trauma as well as various forms of household dysfunction (e.g., have a family member incarcerated or witness abuse towards one's mother or stepmother; Felitti et al., 1998). Some mental health professionals and researchers distinguish between significant and extreme traumatic events, such as sexual assault, and events or ongoing situations that cause distress, but are not generally considered intense or life-threatening, such as parental separation (Barbash, 2017). The ACES scale contains questions about both types of trauma, often referred to "large T" and "small t" traumas, respectively. The ACES scale does not differentiate between the two types of traumas, and both have equal weight in the overall score.

This study will also reference college adjustment, which references the degree to which students successfully adapt to college across various domains, such as social and academic (Jolley, 2019). In the current study, college adjustment is specifically measured by perceived positive affect, negative affect, homesickness, and overall college adjustment. Alcohol use disorder will also be referenced in the current study. This disorder is characterized by a pattern of uncontrolled alcohol use, involving preoccupations with alcohol and continued use of alcohol despite problems arising from use (Mayo Clinic, 2020). In the current study, alcohol use disorder is characterized by a score of eight or higher on the Alcohol Use Disorders Identification Test (AUDIT; Blanco et al., 2008).

## **Research Strategy**

As childhood abuse, trauma, and neglect continue to be experienced by youth in the United States, researchers and educators must continue to examine the potential long-term effects that may result as a consequence. Further, as the transition to college is a period marked

by academic, social, and emotional stressors (Rogers & Tennison, 2009), individuals embarking on this transition with a history of trauma exposure may represent a more at-risk population of students.

In the current study, the accumulation of adverse childhood experiences that occurred before the age of 18 will be examined in relation to the impact on functioning among first-year college students. Examining the impact of adverse childhood experiences is especially relevant, as some of these are factors that can be targeted by prevention or intervention efforts. Gender and race/ethnicity will be included as potential moderators, as these variables also have an impact on functioning due to social, and sometimes biological, influences (e.g., Banyard & Cantor, 2004; Mattanah, 2016; Keyes et al., 2008). Examining the impact of these contextual variables is essential so that professionals may be aware of these influences and more effectively target intervention.

### **Findings from the ACES Study and Childhood Trauma**

Felitti and colleagues (1998) constructed the ACES scale so as to retrospectively examine how the relationship between exposure to childhood abuse and household dysfunction is associated with subsequent health-risk behavior and disease in adulthood. The findings from their original study provide evidence to support the relationship between childhood exposure to adverse experiences and multiple risk or morbidity factors of several leading causes of death in adults (Felitti et al., 1998). Three potential areas of abuse addressed by the survey: psychological abuse, physical abuse, and sexual abuse. Household dysfunction was assessed by reported exposure to substance abuse, mental illness, violent treatment of the mother or stepmother, and criminal behavior. Interestingly, significantly fewer categories of exposure emerged among older individuals, White and Asian individuals, and college graduates relative to

younger people of color with less education (Felitti et al., 1998). Links between childhood exposure to these adverse events and alcoholism, use of illicit drugs, and other risky behaviors were reported (Felitti et al., 1998), prompting the current study question surrounding adverse experiences and alcohol use in a college sample.

While Felitti and colleagues' (1998) study had limitations, particularly in regards to the restricted sample of predominantly White individuals over the age of 35, it was revolutionary in examining the relationship between cumulative risk and adverse outcomes that affect individuals later in life (Horan & Widom, 2015). Intervention and prevention efforts emerged as a result of the results of the Felitti study (Horan & Widom, 2015), making the scale relevant to educational research and practice. While the original study examined odds ratios and the impact on health outcomes (with individuals endorsing 4 or more adverse experiences compared to those with none), the current study aims to examine regression coefficients for college adjustment and problematic alcohol use among students. The current study also aims to address whether the presence or absence of endorsed ACES factors (i.e., physical/emotional household abuse, sexual abuse, and exposure to household mental health problems) are likely to have an impact on future functioning in college students.

### **Contextual Variables**

Gender and race/ethnicity were examined as potential moderating contextual variables due to anticipated impact on the relationship between ACES and first-year student outcomes. Because these potential impacts are embedded in social contexts, it is important to view these factors as contextual as opposed to demographic (Committee on Pediatric Research, 2000).

## **Gender**

Mixed findings are evident in the literature on both the impact of gender on college adjustment and its impact on trauma (Banyard & Cantor, 2004). While research has shown generally similar patterns of adjustment in males and females, some differences have been noted. For example, women have been found to be better adjusted academically than men in the first semester of college (Banyard & Cantor, 2004). Given the mixed findings from previous studies, it is worthwhile to examine gender as a predictor of college adjustment in the current study.

More consistent findings of gender differences are evident in alcohol use disorders in the United States. Historically, men have been shown to drink more alcohol and have a higher likelihood of developing alcohol use disorders than women (Keyes et al., 2008). In a study conducted by Keyes and colleagues (2008), prevalence of all alcohol disorders is higher among men than women. The authors cited biological factors that may contribute to these differences, such as differences in male and female alcohol metabolism and greater sensitivity to adverse health effects due to heavy drinking in females (Keyes et al., 2008). However, while males are more likely to consume alcohol, binge drink, and abuse alcohol among younger cohorts of individuals, the differences between males and females have been diminishing due to changes in social mores and drinking norms as well as time-sensitive trends in advertising and exposure for young women (Keyes et al., 2008). Examining this difference in the current study will be beneficial to provide updated ratios on student alcohol misuse.

## **Race/Ethnicity**

Historically, minority students enrolled in college are at higher risk for leaving college before completing their degree due to difficulty adjusting to college (Suizzo et al., 2016), and this has been associated with historical prejudice in educational environments and the impact of

these prejudices on the transition from high school to college (Mattanah, 2016). The current study aims to provide up-to-date regression coefficients and odds ratios for college adjustment among minority students at a large, Mid-Atlantic university.

Differences in alcohol use among college students of different races and ethnicities has garnered little attention in research. The few existing studies have shown that African Americans tend to have lower drinking rates among young adults when compared to White individuals of the same age (Prendergast, 1994). However, African American men have higher rates of alcohol-related problems than White men (Prendergast, 1994). According to Prendergast (1994), alcohol use tends to be lower for African American students at predominantly Black colleges than for African Americans and White students at traditionally White colleges. Some studies have supported the conclusion that White individuals were more likely to drink alcohol and drink heavily than other racial or ethnic groups (e.g., Barnes & Welte, 1983). Among a sample of mainly first-year students at the University of California, Los Angeles, White students had the highest levels of drinking, followed by Hispanic, Native American, African American, and Asian American and Pacific Islander students (Prendergast, 1994). While studies have supported the conclusion that White students tend to drink more heavily than minority students, this conclusion should be further studied to provide an up-to-date picture and add to the scarce literature surrounding this specific topic.

### **Justification**

As a result of the widespread impact of adverse childhood experiences, it is essential to continue to collect information regarding the long-term effects of these traumas. As the transition to college is already a potentially stressful milestone, it is beneficial to understand the

variables that impact success and resilience in college. Relatedly, as alcohol abuse and excessive drinking may negatively impact academic performance and lead to other negative consequences (Prendergast, 1994), variables that may predict alcohol misuse should be examined.

### **Framework**

The current study is a quantitative research design with accumulated trauma as the research variable, and outcomes of college adjustment and problematic alcohol behaviors. Gender and race/ethnicity are moderators. The current study aims to fill gaps in the research in regards to the long-term effects of accumulated childhood traumas as measured by the ACES scale in a population of first-year college students.

### **Conceptualization**

The main research question the current study will address is: To what extent are childhood trauma, gender, and race/ethnicity valid predictors of future college adjustment and alcohol misuse? To answer this question, the interaction of these predictors will be analyzed using linear regression to examine college adjustment and problematic alcohol behaviors among college students. Gender and race/ethnicity will also be examined as potential moderators in order to study the impact of these contextual variables on the relationship between ACES scores and first-year college student functioning.

### **Rationale and Research Questions**

The transition to college is one filled with many stressors and challenges, including rigorous academics, new social structures, and increased independence (Jolley, 2017). A history

of traumatic stress may complicate this transition and negatively impact college adjustment (Banyard & Cantor, 2004). Childhood trauma has also been linked to problematic alcohol-related behaviors (Felitti et al., 1998). Therefore, studying the adjustment levels and alcohol-related behaviors in students with a significant accumulation of adverse childhood experiences is beneficial and informative. Given mixed prior evidence surrounding contextual variables that may impact these outcomes in first-year college students, questions regarding gender and race were addressed in an attempt to fill gaps in the literature. The current study aimed to extend the research on the adjustment to college and problematic alcohol-related behaviors of college freshmen by conducting linear regression to quantify how strongly the presence or absence of childhood maltreatment and contextual variables (i.e., gender and race/ethnicity) are associated with these outcomes.

Based on previous studies by Banyard and Cantor (2004), Smedly et al. (1993), Felitti et al. (1998), Prendergast (1994) and Keyes et al. (2008), the following research questions were formulated and addressed:

- R1. Does prior trauma have an impact on college adjustment among first-year college students and is this interaction moderated by gender and race/ethnicity?
- R2. Does prior trauma have an impact on alcohol use among first-year college students and is this interaction moderated by gender and race/ethnicity?

## CHAPTER 2

### LITERATURE REVIEW

#### **Adverse Childhood Experiences**

Many children are exposed adverse childhood experiences (Merrick et al., 2018) with potential long-term effects extending across the lifespan (Felitti et al., 1998), including into young adulthood and beyond. These adverse experiences may have an impact on first-year college students as they enter a new environment with different stressors (Jolley, 2017) and varying levels of support (Banyard & Cantor, 2004). Specifically, college adjustment and alcohol use among first-year college students may be impacted. Due to the high rates of child abuse reported in the United States each year (Levi et al., 2015), understanding the long-term risks associated with adverse childhood experiences and the consequences they may have on future functioning is vital. The psychological, behavioral, and social consequences related to these experiences have been well-documented (Dinehart et al., 2012), have links to developmental risks (Viezel et al., 2015).

#### **History of Trauma**

The conception and management of trauma have changed over history. As recently as the 1970s, it was thought that individuals without a family history of mental illness or other predispositions would develop only acute, short-term psychological stress when exposed to trauma (Jones & Wessely, 2006). Before the 1970s, individuals who suffered long-term consequences of trauma were considered to be vulnerable or the product of a degenerate family (Jones & Wessely, 2006). In 1980, the responsibility for long-term effects of trauma exposure



shifted away from the individual, which can be explained by the inclusion of Post-Traumatic Stress Disorder (PTSD) in the Diagnostic and Statistical Manual, 3rd Edition (DSM-III; Jones & Wessely, 2006). Since this shift, stressors have relaxed from the requirement of a life-threatening event to criterion that states symptoms are present after an individual experienced, witnessed, or was confronted with an event that either had actual or threatened death, serious injury, or threat to the physical integrity of oneself or others (Jones & Wessely, 2006). However, much of the literature surrounding trauma continues to examine outcomes as they relate to PTSD symptoms.

In trauma research, the field has developed from attempting to identify a unitary cause of child abuse (e.g., parental psychopathology) to the development of interactive theories of child abuse (Newberger & Newberger, 1982). These theories integrate factors in the individual and his or her history and environment that render him or her vulnerable to psychopathology resulting from child abuse (Newberger & Newberger, 1982). In other words, researchers have moved from finding a single cause of child abuse to finding reasons why some families are vulnerable and others are strong. This shift has directed researchers to focus on the more complex picture of child maltreatment (Newberger & Newberger, 1982).

In terms of childhood-specific trauma, researchers have historically spent little time researching the effects of exposure to trauma in early childhood (Buss et al., 2015). Previously infants and young children were thought to lack the perception, cognition, and social maturity to remember or understand traumatic events (Buss et al., 2015). Furthermore, mental health professionals were previously hesitant to diagnose trauma-related mental illness in children due to the associated stigmas related to such diagnoses (Buss et al., 2015). Today, it is widely accepted that children do have the capacity to understand and remember traumatic events.

Research has shown that even newborns have similar tactile and auditory senses to adults, suggesting that a child can experience stressful events (Buss et al., 2015).

A further study suggested that infants as young as 7 months can remember traumatic events for up to 7 years (Buss et al., 2015). Unfortunately, children may lack the communication skills necessary to accurately express and talk about their experiences (Buss et al., 2015).

Research has continued to expand to better understand the consequences of these traumatic events. Evidence has been presented that suggests children who experience traumatic events in early childhood are impacted well beyond their youth (Buss et al., 2015). In 1998, a groundbreaking study conducted by Felitti and his colleagues linked adverse childhood experiences to negative long-term health outcomes and effects across the lifespan (Felitti et al., 1998).

### **The Adverse Childhood Experiences Study**

Felitti and colleagues (1998) conducted a survey to retrospectively examine the relationship between exposure to childhood abuse and household dysfunction with later health-risk behavior and disease in adulthood. The authors received 9,508 responses to their survey, which was composed of questions adapted from a number of sources and posed questions regarding the individual's experiences prior to age 18 (Felitti et al., 1998). Three areas of abuse addressed by the survey including psychological abuse (two questions), physical abuse (two questions), and sexual abuse (four questions). Household dysfunction was surveyed by obtaining information on individuals' exposure to substance abuse (two questions), mental illness (two questions), violent treatment of mother or stepmother (four questions), and criminal behavior (one question; Felitti et al., 1998). This survey is now known as the Adverse Childhood Experiences Scale (ACES; Felitti et al., 1998).

Felitti et al. (1998) reported that as exposure to adverse childhood experiences increased,

prevalence and risk increased with smoking, severe obesity, physical inactivity, depressed mood, and suicide attempts also increased. Similar links were also found between childhood exposure to trauma and use and injection of illicit drugs, having had 50 or more intercourse partners, a history of sexually transmitted disease, heart disease, cancer, liver disease, skeletal fractures, and other health problems (Felitti et al., 1998). Later, Brown and colleagues (2009) also found that higher ACES scores were associated with an increased risk of premature death. Individuals with six or more ACES died nearly 20 years earlier, on average, than those without such risk factors (Brown et al., 2009). Adverse childhood experiences have also been associated with personality disorders, behavior disorders, and substance abuse (Nurius et al., 2015). Children who have been exposed to adverse psychosocial experiences demonstrate elevated risk for depression in addition to higher inflammation levels and multiple biological system dysregulations, with the effects of these adversities being independent of developmental contributors (Nurius et al., 2015).

The Felitti et al., (1998) study was the first to examine the relationship between cumulative risk and maladaptive outcomes in adulthood (Horan & Widom, 2015). Their work demonstrated potential connections between early intervention to prevent diseases and subsequent health risks that may lead to early death, and led to a call for professionals to be aware of these potentially preventable experiences (Horan & Widom, 2015). While the original study was based in the medical field, the ACES measure has possible relevance to intervention planning (Horan & Widom, 2015) as well as psychological and educational research.

### **Models of Risk**

Early research has focused on single indicators of risk in childhood. However, more recent literature emphasizes the concept of cumulative risk. Evidence suggests that diverse childhood adversities often co-occur, leading in this shift of attention from single forms to

cumulative exposures (Nurius et al., 2015). Childhood adversities tend to be interrelated, which creates layered stress (Nurius et al., 2015). This also exerts damage to various aspects of the developing brain, fosters maladaptive health, and is associated with limited protective relationships (Nurius et al., 2015). Researchers have examined the relationship between the number of risk factors experienced in childhood with behavioral, psychosocial, and health-related outcomes across the lifespan in a dichotomous manner (Horan & Widom, 2015). The ACES scale (Felitti et al., 1998) is an example of this type of cumulative index.

Two types of models are addressed by Horan and Widom (2015); additive and nonlinear. The additive model suggests a linear change in outcome based on risk level, meaning the higher the cumulative risk score, the more likely the individual is to demonstrate maladaptive outcomes. The nonlinear model suggests a threshold effect, or a point at which scores plateau for the outcome or little difference in outcome is evidenced beyond a certain point. According to this model, a significant increase in maladaptive outcomes occurs once the threshold had been met (Horan & Widom, 2015). A linear relationship between childhood cumulative risk and concurrent internalizing and externalizing disorders, psychiatric disorders, academic problems, and distress symptoms has been found in the literature (Horan & Widom, 2015), which supports the additive model of risk as adequately explaining cumulative childhood risk.

### **Long-Term Effects of Cumulative Childhood Traumas**

As stressors accumulate, individual coping and available resources to support recovery and health can become overwhelmed (Nurius et al., 2015). Horan and Widom (2015) reported the risk of the accumulation of childhood risk factors and discussed dichotomous indices used to evaluate these accumulations and their effects across the lifespan. In order to study the effects of cumulative risk, risk indices have been created to examine the relationship between the number

of risk factors experienced in childhood with negative outcomes later in life (Horan & Widom, 2015).

In their 2015 study, Horan and Widom matched abuse and neglected children with a control group based on socioeconomic status to reduce confounding explanations. Of their sample, 6.1% of the abused and neglected children experienced more than one type of maltreatment (e.g., physical abuse, sexual abuse, and neglect). This study found significant differences in years of education, mental health symptomatology, and criminal arrests for many of the individual indicators of childhood risk. Individuals who were exposed to any amount of childhood risk were more likely to complete fewer years of education, report more mental health symptoms, and have a higher likelihood of arrest in adulthood. Another study suggested that early childhood adversity carries a unique capacity to impair psychological well-being in adults, both independent of and cumulative with other contributors (e.g., social disadvantage or stressful adult experiences; Nurius et al., 2015). Exposure to cumulative, adverse events in childhood generate step-dose patterns wherein greater exposure to multiple forms of stressful experiences are associated with a wide range of impaired health outcomes (Nurius et al., 2015).

Early adversities such as those assessed through the ACES scale indicate many conditions characterized by multiple forms of chronic and acute stress (Nurius et al., 2015). Exposure to these stressors negatively affects stress responding and development, and also act as catalysts for future stress exposures and outcome disparities (Nurius et al., 2015). Exposure to traumatic stress has been associated with symptoms of Acute Stress Disorder, PTSD, depression, dissociation, and negative posttraumatic thinking (Carlson et al., 2016). Stressful events may accumulate into adulthood, which may lead to the accumulation of stress burden, social and behavioral difficulties, and an increase of their odds of negative mental health (Nurius et al.,

2015).

Due to the lifelong impact of childhood maltreatment and trauma, many possible consequences may develop as a result of adverse childhood experiences, beyond and relating to poor college adjustment and problematic alcohol use. Adverse childhood experiences may impact adults' mental health, physical health, and future relationships. These consequences include intimate partner violence (Dube et al., 2002b), sexual risk behaviors (Anda et al., 2001), obesity (Williamson et al., 2002), smoking (Anda et al., 1999), depression (Chapman et al., 2004), changes in neurobiology (Anda et al., 2006), work-related problems (Anda et al., 2004), and suicidality (Dube et al., 2001).

### ***Intimate Partner Violence***

Recognition of frequent intimate partner violence emerged during the 1980s, and since then guidelines issued by the American Medical Association in 1992 recommend screening every woman for domestic violence exposure (Dube et al., 2002b). The issues of violence against women and abuse and/or neglect of children are often treated as separate issues, although children of domestic violence victims are also often victims of abuse and neglect themselves. Additionally, these children are often present during violent altercations between their parents (Dube et al., 2002b). The consequences of witnessing intimate partner violence in childhood range from childhood behavioral problems to greater psychopathology in adulthood (Dube et al., 2002b).

Sadly, individuals who witness family aggression in childhood have a higher risk of becoming a victim or perpetrator of intimate partner violence as an adult (Whitfield et al., 2003). Whitfield and colleagues (2003) found a strong, graded relationship between the number of ACEs experienced in childhood and the risk of being a victim of intimate partner violence in

adulthood. Among men, a strong, graded relationship between the number of ACES and the risk of perpetrating intimate partner violence was found (Whitfield et al., 2003). Revictimization and retraumatization are both often learned inside the family and are associated with low self-esteem and often with dissociation during revictimization, commonly as a result of prior repeated trauma (Whitfield et al., 2003).

### ***Sexual Violence***

Children and adolescents exposed to adverse experiences in childhood are at an increased risk for experiencing lifespan violence (Ports et al., 2016). Child sexual abuse (CSA) in particular has been linked to poor psychological, social, and physiological outcomes across the lifespan (e.g., depression, dissociation, and low self-esteem; Ports et al., 2016). Victims of CSA are also vulnerable to future sexual violence (Ports et al., 2016). Ports and colleagues (2016) found a graded, dose-response relationship between the number of childhood ACES and the likelihood of experiencing sexual violence as an adult, demonstrating the cumulative effect of early trauma on adult sexual violence risk (i.e., the more ACES experienced, the higher an individual's odds of experiencing sexual violence later in life). However, CSA is not the only form of trauma that leads to an increased risk of experiencing sexual violence. Household mental illness, having an incarcerated household member, emotional neglect, physical abuse, and emotional abuse before the age of 18 are all associated with increased risk. Other ACES categories should not be discounted, however. Ports and Colleagues (2016) found that for those individuals who experienced CSA, other early adversities experienced by CSA survivors may heighten the risk for sexual violence in adulthood beyond the risk of CSA alone.

### ***Sexual Risk Behaviors***

A strong association exists between exposure to adverse childhood experiences and

unintended pregnancy for women and sexually transmitted infections (STIs) for both men and women (Hillis et al., 2001). For both men and women, each category of abuse measured by the ACES (emotional, physical, and sexual) and each category of household dysfunction (battered mother, household member substance abuse, household member mental illness, or household member criminal) was associated with an increased risk of STI (Hillis et al., 2000). As the number of ACES category exposure increased, so did the prevalence of STIs for both men and women (Hillis et al., 2000). Moreover, the prevalence of having an STI was five times higher for those who had exposure to 6 or 7 ACES categories than for those who were exposed to no ACES categories during childhood (Hillis et al., 2000).

Hillis and colleagues (2001) studied the effects of seven different categories of abuse and household dysfunction on sexual risk behaviors in a sample of women. These categories are: verbal abuse, physical abuse, sexual abuse, violence towards mother, household member substance abuse, household member mental illness/suicidality, and household member imprisonment. Each of the seven categories of childhood adversity were associated with increased risk of early onset intercourse, multiple sexual partners, and self-perceived risk of AIDS (Hillis et al., 2001).

Exposure to ACES categories is also related to adolescent pregnancy, unintended pregnancy in adulthood, and fetal death (Hillis et al., 2004). As one's ACES score increases, the risk of teen pregnancy also increases incrementally. It was previously thought that adolescent pregnancy itself was associated with an increased risk in fetal death, but Hillis and colleagues (2004) found that the higher the teens' ACES scores, the greater the risk of fetal death for their first and second pregnancies increased.

Historically, the focus of adolescent pregnancy has been centered around females with



little on males. Anda and colleagues (2001) found that frequent exposure to physical abuse, a battered mother, or sexual abuse at young ages or involves violence almost doubles males' risk of impregnating a teenage girl. This risk is the same for both adolescent and adult males. As with female risk, the impact of childhood exposure to violent or abusive experiences is cumulative (Anda et al., 2001). Males who impregnate adolescent females are more likely to have characteristics that may stem from domestic violence or other forms of dysfunctional family life, such as abusing substances, being emotionally troubled, and performing poorly in school (Anda et al., 2001).

### ***Obesity***

Higher risks of obesity have been found for adults who report sexual, physical, and verbal abuse as well as fear of physical abuse (Williamson et al., 2002). On average, individuals who reported abuse were 0.6-4.0 kg (or 1.32-8.82 lbs) heavier than adults who did not report childhood abuse (Williamson et al., 2002). Because of the reported increases in weight, risk for a body mass index (BMI) greater than or equal to 30 (which is considered to be obesity) ranged from 6-39%, and risk for a BMI greater than or equal to 40 (which is considered to be severe obesity) ranged from 6-88% (Williamson et al., 2002). Childhood abuse has been frequently documented among obese persons seeking weight-loss solutions (Williamson et al., 2002). Williamson and colleagues (2002) found that within their sample of individuals reporting abuse, the fraction of obesity cases attributable to abuse was 11% for a BMI of greater than or equal to 30 and 23% for a BMI of greater than or equal to 40. The risk of obesity in adulthood is most strongly associated with frequent verbal abuse and frequent physical abuse with injury, and the risk of obesity increases with the number of types of severe abuse experienced (Williamson et al., 2002).

### ***Smoking***

Smoking in adulthood is strongly associated with adverse childhood experiences (Anda et al., 1999). Anda and colleagues found that each of the eight categories of adverse childhood experiences studied showed an increased risk for the following smoking behaviors: early smoking initiation, smoking initiation as an adult, ever smoking, current smoking, and heavy smoking. Individuals who report 5 or more categories of adverse experiences had substantially higher risks of current smoking, ever smoking, smoking initiation, and heavy smoking (Anda et al., 1999). Moreover, adverse childhood experiences have been related to the maintenance of smoking behaviors in the presence of poor health and illness in adulthood (Edwards, Anda, Gu, Dube, & Felitti, 2007).

### ***Depression and Depressed Affect***

Childhood physical abuse, sexual abuse, and emotional abuse are all associated with and increased prevalence of depressive disorders (Chapman et al., 2004). Chapman and colleagues (2004) found a strong graded relationship between the number of ACES reported and recent lifetime and current depressive disorders for both men and women in adulthood, suggesting that consequences on adult mental health are higher for individuals who have experienced multiple forms of childhood abuse or household dysfunction. Emotional abuse has the strongest relationship to depressive symptoms among men and women, and emotional abuse is often combined with other forms of abuse (Chapman et al., 2004).

### ***Neurobiology***

Early stressors can cause long term changes in multiple brain areas and systems (Anda et al., 2006). For example, the hippocampus can grow new neurons in adulthood during a process called neurogenesis, but stressors inhibit neurogenesis and memory function (Anda et al., 2006).

Smaller hippocampal volume is found in adults with childhood abuse-related PTSD, but not for children with PTSD. This suggests that early, long-term and chronic abuse is necessary for this difference in hippocampal volume (Anda et al., 2006). Children with PTSD do have smaller whole brain and corpus callosum volume and alterations in cerebellum and frontal cortex structure (Anda et al., 2006).

Deprivation of appropriate experiences in childhood may reduce neuronal activity, which results in a decrease in neurotrophin production, synaptic connectivity, and neuronal survival. This results in brain organization and structure abnormalities, which affect multiple functions and behaviors in adulthood (Anda et al., 2006). Among those areas affected are the hippocampus (memory), amygdala (fear response), medial prefrontal cortex (memory retrieval), and other limbic structures that mediate anxiety and mood dysregulation (Anda et al., 2006).

### ***Occupational Performance***

Adverse childhood experiences affect several indicators of adult job performance, including: serious job problems, serious financial problems, and absenteeism. Using ACES data, Anda et al. (2004) found a strong, graded relationship between adverse childhood experience categories and the three indicators of worker performance. Workers sampled in Anda and colleagues' (2004) study who had four or more ACES were more than twice as likely to report each of the three indicators of impaired work performance than workers with an ACES score of zero.

### ***Suicidality***

Historically, childhood physical and sexual abuse have been associated with suicide attempts (Dube et al., 2001). Dube et al. (2001) found that the risk of suicide attempt increases two- to five-fold by any adverse childhood experience for both men and women, not only those

that fall under physical and sexual abuse. Parental separation or divorce had the lowest odds ratio for suicide attempt (OR = 1.9), and emotional abuse had the highest odds ratio (OR = 5.0). Dube and colleagues (2001) also found a graded relationship between ACES score and attempting suicide, with the likelihood of childhood/adolescent and adult suicide attempts increasing as ACES score increases. An ACES score of 7 or greater increased the likelihood of childhood adolescent suicide attempts 51-fold and adult suicide attempts 30-fold in the sample studied by Dube et al. (2001). Suicide attempts increase by 60% for each increase in ACES score (Dube et al., 2001).

### **Risk and Protective Factors**

The risk of child abuse and neglect is influenced by a combination of individual, relational, community, and societal factors. While children are not responsible for exposure to adverse childhood experiences, certain characteristics may increase risk for being abused or neglected (Center for Disease Control and Prevention [CDC], 2018). For example, risk is increased in children under four and in children who have disabilities or other special needs (CDC, 2018). These risk factors themselves may or may not be direct causes of childhood trauma; however, these factors are found to be associated with increased risk of exposure to adverse experiences in childhood (CDC, 2018). On the other hand, protective factors may buffer children from being abused or neglected (CDC, 2018) or aid in healing after experiencing trauma. Much of the existing literature examines trauma through the lens of PTSD symptoms. Although these symptoms were not measured in the current study, information related to PTSD risk is included here as trauma risk is often conceptualized in the literature in this way.

### ***Pre-Trauma Risk Factors***

Demographic variables including gender, race/ethnicity, education, and socioeconomic status are frequently studied pre-trauma risk factors (Carlson et al., 2016). These variables are often associated with a decreased availability of internal and external resources for individuals (Carlson et al., 2016). On an individual level, children younger than four years of age and children with special needs (e.g., disabilities, mental health issues, or chronic illness) are at an increased risk for experiencing childhood abuse or neglect (CDC, 2018). While the literature is mixed in terms of gender, some studies have found that individuals who are female are associated with an increased risk of PTSD following trauma that cannot be attributed to greater exposure to sexual assault, prior trauma, prior mental health disorder, or reporting bias (Carlson et al., 2016). Greater cognitive capacity and higher education level have been associated with lower risk of PTSD following trauma (Carlson et al., 2016).

Beyond demographic variables, environmental variables may also increase risk of psychological symptoms after trauma exposure. These include adverse childhood environments, prior trauma, pre-trauma psychopathology, and pre-trauma life stress (Carlson et al., 2016). Prior exposure to trauma has been associated with higher rates of PTSD and depression following exposure to subsequent stressors. Moreover, the frequency of prior trauma has been associated with the severity of later PTSD symptoms in these individuals (Carlson et al., 2016). Pre-existing psychopathology, emotional problems, and personality disorder have also been associated with PTSD and depression following trauma exposure (Carlson et al., 2016).

Risk factors are also associated with perpetration of adverse childhood experiences, including abuse and neglect. On an individual level, parents who themselves have a history of child abuse or neglect are at an increased risk for perpetration. A lack of understanding of

children's needs, child development, and parenting skills may also increase risk, as do parental characteristics such as young age, less education, single parenthood, low SES, and having a large number of dependent children to care for (CDC, 2018). Substance abuse and mental health issues in the family also put children at an increased risk of abuse or neglect, as do non-biological or transient caregivers in the home (CDC, 2018). Social isolation, family disorganization and violence, parenting stress, and poor parent-child relationships are family risk factors that may lead to perpetration and subsequent victimization of children (CDC, 2018). Violence in the child's community, poor social connections, and concentrated neighborhood disadvantage also increase perpetration risk (CDC, 2018).

### ***Post-Trauma Risk Factors***

Some post-trauma variables are related to PTSD, including acute psychiatric symptoms, lack of social support, social constraints, and life stress (Carlson et al., 2016). Symptoms of disorders that are associated with traumatic stress (e.g., depression) can also act as a risk factor (Carlson et al., 2016). Reminders of trauma associated with negative affect may lead to avoidance behaviors (Carlson et al., 2016). Depression symptoms such as hopelessness may block behaviors that could foster recovery, such as exercise and seeking social support (Carlson et al., 2016). Social constraints discourage disclosure or discussion of trauma and are positively related with PTSD (Carlson et al., 2016)

### ***Protective Factors***

Social support is often cited as a factor that accounts for a considerable amount of variance in long-term outcomes of individuals exposed to traumatic stress. These social supports can be in the form of family members or outside social networks (CDC, 2018). Specifically, social connections contribute to a person's well-being and can foster emotional and cognitive

processing of traumatic events (Carlson et al., 2016). Other protective factors include nurturing parenting skills, stable family relationships, parental employment, parental education, adequate housing, access to health care, and support for basic needs (CDC, 2018). Even in less-than-adequate environments, caring adults outside the family who are able to serve as a role model or mentor can act as a protective factor for children (CDC, 2018).

### **College Adjustment**

Many potential outcomes of adverse childhood experiences can impact individuals in young adulthood. One of the possible outcomes that will be discussed in this study is poor college adjustment. Poor college adjustment among first-year students can lead to negative outcomes for individuals later in life (Fier & Brzezinski, 2010). Therefore, it is important to understand not only how transitioning to college, mental health, and individual factors can impact future functioning, but how these factors might be influenced by previous adverse childhood experiences.

### **Development and College Transition**

Research surrounding college adjustment has shifted from viewing positive adjustment purely as a predictor of college achievement to understanding that it is instead a state of mind that can be achieved and is desirable (O'Donnell et al., 2018). The transition from high school to college marks a stressful event for first-year students and includes academic, social, and emotional challenges (Rogers & Tennison, 2009). While the transition is positive for many students, others' security, comfort, and ability to enjoy gratifying activities can be questioned as they are forced to establish new social support systems and renegotiate previous relationships (Rogers & Tennison, 2009). Even for those students that consider the transition to college to be

a positive one, students are anticipated to experience a period of adaptation. For most individuals, these difficulties are short-lived and cause little disruption. For others, however, the adjustment period can create levels of stress that may impact psychological and physical health (Jolley, 2017).

Individuals' late teens through early twenties are marked by profound change (Arnett, 2000). Young adults in this age range may transition to higher education in order to receive the education and training that, if successful, will likely lead to future occupations and incomes that may impact them over the course of their lives (Arnett, 2000). According to Marcotte et al. (2017), school transitions are stressful as they represent a double transition. One aspect of this transition is labeled a developmental transition, characterized by physiological, intellectual, and emotional changes that are specific to early adult development. The other, characterized by changes in level of education, school system structure, and requisite demands may be referred to as an institutional transition (Marcotte et al., 2017). This time represents a time of identity formation, in which different possibilities in work, relationships, and worldviews are explored (Arnett, 2000). Further, many contextual variables may impact individual development and college adjustment, including gender, racial identity, coping strategies, stress, social support, and attachment (Banyard & Cantor, 2004).

The transition to adulthood is marked by accepting responsibility for one's self, making independent decisions, financial independence, and developing a relationship based on equality with one's parents (Marcotte et al., 2017). This newfound liberty and independence may be exciting and pleasant, but may also be a period of distress and difficulty for those who are unable to possess the capacity to transition positively (Marcotte et al., 2017). When these developmental changes are coupled with the transition to college, it can result in negative



outcomes for those individuals who are unprepared to handle the transition in an adaptive manner. By the time individuals have reached their late twenties, most have made life choices that have life-long ramifications (Arnett, 2000). Because of this, mental health problems may emerge in the first year of college (Marcotte et al., 2017) which may contribute to poor college adjustment among first-year students.

### **Prevalence of Mental Health Concerns Among First-Year College Students**

Researchers have found that nearly 50% of first-year college students experience symptoms of a mental health disorder, and many students indicate their distress initially emerged when entering college (Marcotte et al., 2017). Negative symptoms may be related to factors associated with the transition to college, such as taking on new roles, development of new relations, greater academic requirements, and separation from family (Marcotte et al., 2017). The new freedoms associated with college require self-control and discipline, which incoming students may or may not be prepared to exercise.

A Canadian study indicated that 15% of college students had sought professional support for mental health issues (e.g., depression, anxiety, suicidal attempts; Marcotte et al., 2017). Price et al. (2006) found that 7% of male students and 14% of female students responded affirmatively to criteria for a major depressive disorder in a sample of first-year students. Research has also supported that college students have higher rates of depressive symptoms than the general population (Marcotte et al., 2017). In this population, 60% of students who experienced at least one mental health problem in college still experienced distress two years later (Marcotte et al., 2017). Moreover, many students enter college with a previous psychiatric diagnosis and therefore face additional challenges, including medication management, counseling appointments, academic accommodations, emotional variability, and sleep difficulty (Fier &

Brzezinski, 2010).

Indeed, college mental health professionals have noted an increase in complexity and severity in therapy center caseloads. Of college directors who replied to a national survey for counseling centers, 92% believe the number of students with severe psychological problems has increased in recent years, which is a major concern for their centers (Blanco et al., 2008).

### **Impact of Individual Factors on College Adjustment**

Tremendous individual variability exists among first-year college students. Among the factors that may contribute to college adjustment are gender and race/ethnicity.

#### ***Gender***

Horan and Widom (2015) suggested that exposure to cumulative risk in childhood may differentially affect males and females due to variability in response for family stress and due to the exposure to different types of trauma (e.g., women are much more likely to experience sexual assault than their male peers). Horan and Widom's (2015) study examined the differences between male and female respondents in academic, mental health, and behavioral outcomes in adulthood. When considering all college age individuals, males have a higher risk of having a psychiatric disorder (Blanco et al., 2008). A higher dropout rate among males has been found, and more females successfully attain a college degree (Horan & Widom, 2015). The odds of attending college in the first place are significantly lower for males than for females (Blanco et al., 2008). However, mixed findings exist regarding gender for both college adjustment and adverse outcomes related to trauma. While some research has raised concerns about men's success in college, other studies have shown similar patterns of college adjustment for males and females (Horan & Widom, 2015). It appears as though differential patterns of variables (e.g., internal and external risk and protective factors) may significantly contribute to differences

between genders (Horan & Widom, 2015).

Gender differences in college adjustment were noted by Banyard and Cantor (2004). Regarding academic adjustment, women adjusted better during their first semester of college than men; however, social and emotional adjustment was similar for men and women. Gender differences in college adjustment have also been viewed in association with trauma. In the aftermath of trauma, women reported higher levels of personal growth, purpose in life, perceived social support, peer attachment, and greater meaning making than their male peers (Banyard & Cantor, 2004).

### ***Race and Ethnicity***

Research has shown that minority students face unique stressors that may have negative effects on academic and psychological adjustment in college (Smedley et al., 1993). Racial and ethnic disparities have been found in college student departure rates, and studies have shown that African-American students in particular have experienced greater estrangement from college campus communities and heightened discomfort in peer and faculty interactions (Smedley et al., 1993).

Although measures have been taken to ensure access and equality in colleges and universities, many minority students graduate at lower rates than non-minority peers (Museus & Quaye, 2009). This leads to discrepancies in degree attainment between non-minority and minority college students, which is especially observed in predominantly White colleges (Smedley et al., 1993). Moreover, disproportionality of college enrollment is evident across different races and ethnicities. Odds of attending college are lower for individuals who are Hispanic, Native American, and Black than for non-minority individuals, and for those who are foreign-born compared to U.S.-born (Blanco et al., 2008). Notably, being Black, Asian, or

Hispanic decreases the odds of having a psychiatric disorder in college-age individuals (Blanco et al., 2008).

### **Outcomes of Poor College Adjustment**

Poor college adjustment has been linked to negative outcomes both in college and later in life. Some first-year students are not sufficiently prepared to deal with the social, personal, and academic demands of college life and are therefore more susceptible to psychological distress (e.g., anxiety or depression; Rogers & Tennison, 2009). Fier and Brzezinski (2010) noted that students with higher rates of psychological distress displayed lower academic motivation and failed to use learning strategies effectively. Academically, this corresponded with lower academic performance, lower academic confidence, less effective time management, higher test anxiety, and less effective use of study resources. Unfortunately, these same students are less likely to seek academic assistance or to persist in college (Fier & Brzezinski, 2010). Students with certain types of disorders (e.g., panic disorder or substance use disorders) are more likely to drop out of college than their peers (Fier & Brzezinski, 2010).

### **ACES and College Adjustment**

Many first-year students begin their college experience having already experienced trauma in their childhood (Banyard & Cantor, 2004). Comparable rates of child physical and sexual abuse are found between college and community samples (Banyard & Cantor, 2004). While some researchers have argued that college students represent a more resilient population of trauma survivors due to smaller observed effect sizes for college student samples (e.g., Jumper, 1995), other studies show that some students have trouble transitioning to postsecondary institutions because of trauma exposure in childhood (e.g., Duncan, 2000). The transition to

college may be complicated by prior victimization and trauma exposure, with traumas such as childhood abuse being linked to an increased likelihood of depression and suicide among college students (Banyard & Cantor, 2004), which is consistent with findings in the trauma literature (e.g., Chapman et al., 2004; Dube et al., 2001). Students with a history of trauma also have higher rates of dropping out than their peers. In fact, one study found that students who reported experiencing more than one form of childhood abuse (physical, sexual, or emotional) were significantly less likely to be enrolled by the second semester of college than nonvictims (Duncan, 2000).

College students represent an at-risk population for further victimization, as prior victimization is a risk factor for experiencing trauma while enrolled in college (Banyard & Cantor, 2004). Research has shown that exposure to higher levels of cumulative trauma are associated with negative college adjustment, especially in the areas of personal and emotional adjustment (Banyard & Cantor, 2004). However, Banyard and Cantor (2004) demonstrated that many protective factors can aid in positive adjustment, including higher levels of social support, internal locus of control, and meaning making about traumatic events.

### **Problematic Alcohol-Related Behaviors**

Childhood trauma has also been linked to problematic alcohol-related behaviors later in life (Felitti et al., 1998). Exposure to ACES is strongly associated with later alcohol abuse regardless of parental history. However, youth who were raised by alcohol-abusing parents are at a very high risk for alcohol abuse later in life (Dube et al., 2002a). Many studies have shown a relationship between childhood abuse and the subsequent risk of alcohol misuse, with ACES exposure having a risk of later alcohol abuse that is independent of parental alcoholism (Dube et

al., 2002a). However, for any given ACE score, the increase in prevalence of alcohol abuse was higher among individuals with a parental history of alcoholism (Dube et al., 2002a).

Research has found that exposure to childhood trauma is associated with many problematic alcohol use behaviors, including problem drinking (Klanecky, Ruhnke, & Meyer, 2019). Individuals aged 18 to 25 have the highest rates of alcohol use across the lifespan (Lui, 2019), which aligns with the age many individuals enrolled in higher education. Moreover, college-attending individuals report higher rates of past-month alcohol use than their noncollege-attending peers (58% vs. 48%, respectively; Lui, 2019). Therefore, studying the impact of ACES on alcohol misuse among college students is important, especially those in their first year, as this population is at-risk in terms of both prior trauma and age while simultaneously transitioning to a new environment.

According to Rinker, Diamond, Walters, Wyatt, and DeJong (2016), first-year college students are at risk for experiencing negative alcohol-related consequences. Despite the legal drinking age at 21 years in most areas of the United States, alcohol use is somewhat normative in the college environment, and students enter this environment while also navigating new stressors and freedoms (Prendergast, 1994). Negative outcomes of heavy drinking in college include both immediate and long-term consequences (Prendergast, 1994) such as the development of alcohol use disorders, poor academic performance, legal difficulties, and assault (Rinker et al., 2016).

### **Alcohol Use on College Campuses**

Attending college exposes individuals to unique environments and situations that may lead students to consume more alcohol than their same-age peers. Even when students come to college having had some experience with alcohol, aspects of college life that may intensify problematic drinking behaviors, such as unstructured time, availability of alcohol, inconsistent

enforcement of underage drinking laws, and limited interactions with parents and other adults. College students have higher binge-drinking rates than their non-college peers, and the first six weeks of freshman year are a particularly vulnerable time for heavy drinking and alcohol-related consequences due to social pressures and individual expectations at the start of the academic year (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2015).

Other factors related to the college environment may significantly impact alcohol use among students, such as strong Greek fraternity and sorority systems and prominent athletic programs. Students enrolled in universities with strong Greek and athletics presence tend to drink more alcohol than students attending other types of schools (NIAAA, 2015). Living arrangements may also impact alcohol use. Students living in fraternities and sororities have the highest levels of alcohol consumption, and students living with their families and commuting to campus had the lowest levels of alcohol consumption (NIAAA, 2015).

## **Prevalence**

In a 1989 survey of more than 56,000 college students, 85% of the respondents reported using alcohol at least once in the past year, and 66% reported using it at least once in the past month (Prendergast, 1994). Occasional intoxication is considered the norm among college-aged individuals, and many freshmen drink large quantities of alcohol (Wechsler & Isaac, 1991). In a survey of underage students from 14 colleges, 48% of the men and 37% of the women sampled reported having been drunk at least once in the past month. Further, 11% of men and 6% of women reported drunkenness four or more times in the past month (Wechsler & Isaac, 1991).

Wechsler and colleagues (2003) noted that four in five college students drink alcohol, and two in five engage in heavy episodic drinking, also referred to as binge drinking (defined as five or more alcoholic drinks in a row at least once in the past two weeks for men and four or more

drinks in a row for women). College students engage in heavy episodic drinking at higher rates than peers who do not attend college (Wechsler et al., 2003). In a sample of college students, 48% reported drinking to get drunk as an important reason for drinking, and 29% reported being intoxicated three or more times in a month (Wechsler & Nelson, 2008). Moreover, an estimated 20% of college students meet the criteria for an Alcohol Use Disorder (NIAAA, 2015). In one study, the most prevalent disorders found in a college sample were alcohol use disorders (Blanco et al., 2008). However, many students with high scores on alcohol use screeners and surveys highly suggestive of alcohol-related problems or alcoholism do not believe themselves to have a drinking problem (Prendergast, 1994).

### **Drinking-Related Problems on College Campuses**

Because of the heavy drinking that is fairly typical among college students, alcohol-related problems are also high in this population (Prendergast, 1994). Alcohol-related problems tend to increase with the level of consumption, but even low levels of alcohol use can result in negative outcomes (Prendergast, 1994). One problem associated with heavy drinking is high-risk sexual behavior, including unplanned sexual activity and failure to use protection during sex (Wechsler et al., 2003; Wechsler & Nelson, 2008). Binge drinking is also tied with psychosocial problems (Wechsler et al., 2003) and anti-social behaviors including vandalism and trouble with the police (Wechsler & Nelson, 2008). Health problems have also been associated with heavy drinking. This includes physical injury as a direct result of intoxication or from alcohol-impaired driving (Wechsler et al., 2003). In fact, over 1,800 students between the ages of 18 and 24 die each year from alcohol-related injuries, including vehicle crashes (NIAAA, 2015). Alcohol overdose is also associated with binge drinking (Wechsler et al., 2003). Consequences of harmful alcohol use also include an increased number in suicide attempts (NIAAA, 2015)



Another often cited alcohol-related problem is academic difficulty (Wechsler et al., 2003). About one in four college students report academic consequences from drinking (NIAAA, 2015). Heavy drinking can lead to academic difficulties, including skipping classes, low grades, and dropping out of school (Prendergast, 1994). Similarly, Wechsler and Nelson (2008) reported that binge drinking is associated with missing class, falling behind in school work, and a lower grade-point average (GPA). Overall, students who engaged in binge drinking reported experiencing five or more different problems related to alcohol use (Wechsler & Nelson, 2008). Students who engaged in binge consumption of alcohol at least three times per week were six times more likely to perform poorly on a test or project compared to those who drank alcohol but did not engage in binge drinking (NIAAA, 2015). Binge drinkers were also five times more likely to have a missed class when compared to their peers (NIAAA, 2015).

### **Impact of Individual Factors on Alcohol Abuse**

Alcohol use may be impacted by contextual variables. Factors that may contribute to alcohol use and development of symptoms related to alcohol use disorder include gender and race/ethnicity.

#### ***Gender***

When examining differences in alcohol use based on gender, men traditionally drink more alcohol and have a higher likelihood of alcohol use disorder than women in the United States (Keyes et al., 2008). Research trends have shown that males are still more likely to drink alcohol, binge drink, and abuse alcohol (Keyes et al., 2008). Specifically, male college students are at higher risk for binge drinking or heavy episodic drinking in the United States (Wechsler et al., 1995). However, in younger age cohorts, the differences between males and females have decreased. This shift has been related to trends in advertising and exposure for young women as

well as changes in the acceptability of alcohol use among females, decreasing the differences in alcohol-related behaviors (Keyes et al., 2008).

Regardless of birth cohort studied, the prevalence of all alcohol disorders remains higher in males than in females (Keyes et al., 2008). Biological factors may contribute to the differences in alcohol use among genders, including differences in alcohol metabolisms. Another difference is greater sensitivity to adverse health effects from heavy drinking in females. These biological differences may explain part of the gender gap in relation to problematic alcohol patterns in drinking (Keyes et al., 2008).

Different patterns in problematic alcohol use behaviors of males and females have also been noted in the literature. For example, whereas binge drinking remained higher for males than females in all cohorts, frequent binge drinking behaviors decreased among men in the youngest birth cohort but increased in younger cohorts of women. These patterns suggest that women should not be disregarded by researchers and clinicians as a group unlikely to develop alcohol problems, and may need specially targeted prevention and treatment efforts (Keyes et al., 2008).

### ***Race and Ethnicity***

When examining the college population, differences in alcohol use among different races and ethnicities has not garnered a large amount of attention in the literature. Whereas some studies that support the conclusion that African American students tend to have lower drinking rates among young adults when compared to White individuals of the same age, African American men have higher rates of alcohol-related problems than White men overall (Prendergast, 1994). In African American populations, alcohol use tends to be lower among

students at predominantly Black colleges than for students at traditionally White colleges (Prendergast, 1994).

Other studies support the conclusion that White individuals are more likely to drink alcohol and to drink heavily than other racial or ethnic groups (e.g., Barnes & Welte, 1983). Among a sample comprised of mostly first-year students at the University of California, Los Angeles, White students had the highest levels of drinking, followed by Hispanic, Native American, African American, and Asian American and Pacific Islander students (Prendergast, 1994). Lui (2019) recently presented similar drinking rate findings, but explained that ethnic minorities are likely to experience more negative alcohol-related consequences than their non-minority peers. For example, African American individuals are more likely to encounter legal problems resulting from alcohol, even at the same levels of consumption, when compared to European American individuals (Zapolski et al., 2014). While studies have supported the conclusion that White students tend to drink more heavily than minority students, this idea should be studied further to provide additional information to the scarce literature surrounding this topic.

### **ACES and Alcohol Use**

Research has shown that adults with higher ACES scores are at a higher risk of alcoholism (Anda et al., 2002). The 2001-02 National Epidemiologic Survey analyzed the relationship between ACES and lifetime alcohol dependence, finding that children with two or more ACES were at an increased risk of lifetime alcohol dependence than those who experienced one or no ACES (Loudermilk, Loudermilk, Obenauer, & Quinn, 2018). In adulthood, the combined effects of ACES and alcohol consumption may contribute to unhealthy alcohol-related behaviors, including binge drinking and Alcohol Use Disorder (Loudermilk et al., 2018). In a

recent study conducted in South Carolina, Crouch and colleagues (2018) found that participants with an ACE score of greater than four resulted in greater odds for binge and heavy drinking. Thus, ACES may greatly influence alcohol consumption later in life and have an impact on students in post-secondary settings.

An additional factor to consider in adult alcohol misuse is family history of alcoholism. One of the questions on the ACES survey asks respondents if they have ever lived with anyone who was a problem drinker or alcoholic, as this is an indicator of household dysfunction. Anda and colleagues (2002) found that alcoholism was higher among those who had alcohol-abusing parents than individuals with similar ACES scores who did not. Moreover, ACES have been found to be more common in alcoholic families, which increases the risk of personal alcoholism and/or marriage to an individual who is an alcoholic, leading to a heightened risk of cyclic adverse childhood experiences that puts the next generation at risk for experiencing ACES (Dube et al., 2002a). Because ACES have been associated with negative outcomes such as depression and anxiety, an individual who has been exposed to ACES may be compelled to use alcohol in an effort to escape, avoid, or regulate unpleasant emotions associated with childhood trauma (Dube et al., 2002a). Dube and colleagues (2002a) found that the effect of multiple ACES on the likelihood of problematic alcohol behaviors or marriage to an alcoholic was cumulative, which is consistent with the previously mentioned cumulative models of risk.

### **Current Study**

Previous research has shown that childhood trauma and ACES may have life-long implications, including possible impact on future college adjustment and alcohol misuse. First year students enrolled in post-secondary education encounter unique and multifaceted issues of

adjustment and alcohol consumption that may be influenced by prior adverse experiences. The current study was designed to assess the impact of trauma as measured by the ACES scale on future functioning in post-secondary settings.

The goal of the present investigation was to determine the extent to which ACES are valid predictors of future college adjustment and alcohol misuse. Gender and race/ethnicity were also examined as possible moderators given the possible social and societal impact of these contextual variables (e.g., Keyes et al., 2008; Blanco et al., 2008). Based on previous literature and two primary research questions, the following hypotheses were formulated and addressed:

R1. Does prior trauma have an impact on college adjustment among first-year college students and is this interaction moderated by gender and race/ethnicity?

Hypothesis 1: Students with higher levels of reported childhood trauma will have lower college adjustment than students with fewer endorsed ACES.

Hypothesis 2: The relationship between ACES score and overall college adjustment score will be stronger for students who identify as a minority than their Caucasian peers.

Hypothesis 3: The relationship between ACES score and overall college adjustment score will be stronger for male students than their female peers.

R2. Does prior trauma have an impact on alcohol use among first-year college students and is this interaction moderated by gender and race/ethnicity?

Hypothesis 4: Students with higher levels of reported childhood trauma have higher rates of self-reported alcohol misuse than students with fewer endorsed ACES.

Hypothesis 5: The relationship between ACES score and self-reported alcohol misuse will be stronger for non-minority students than for their minority peers.

Hypothesis 6: The relationship between ACES score and self-reported alcohol misuse will be stronger for male students than for their female peers.

## CHAPTER 3

### METHOD

#### Participants

A sample of 290 first-year college students enrolled in a large, mid-Atlantic university was recruited from education or health and wellness classes. Of the sample, 87% (254) of the students were female and 77% (224) identified as Caucasian. Participants were at least 18 years old ( $M = 18.26$ ,  $SD = 0.82$ ), and were compensated with extra credit for the course upon completion of the survey in accordance with class policy. Survey data was collected in fall of 2016. Participant demographics can be found in Table 1.

**Table 1**

*Distribution of Participants by Gender and Race/Ethnicity*

Race/Ethnicity	Gender		Total
	Male	Female	
Asian	4 (1.4)	25 (8.6)	29 (10.0)
African American	1 (0.3)	9 (3.1)	10 (3.4)
Latino/a or Hispanic	2 (0.7)	12 (4.1)	14 (4.8)
White	24 (8.3)	200 (69.0)	224 (77.2)
Other	5 (1.7)	7 (2.4)	12 (4.1)
Total	36 (12.4)	254 (87.6)	290 (100)

*Note.* Numerals in parentheses represent the percentage.

## Measures

### **Adverse Childhood Experiences Scale (ACES; Felitti et al., 1998)**

Respondents report adverse experiences that occurred before the age of 18. The scale includes 17 yes/no questions that were adapted from published surveys including the Conflicts Tactics Scale (Straus, 1979), the Wyatt Scale (Wyatt, 1985), and the National Health Interview Survey (Felitti et al., 1998). For all questions, the respondent indicates either *Yes* or *No* depending on his or her past experiences. Two categories that are targeted by the ACES scale: abuse and household dysfunction. Abuse includes psychological, physical, and sexual categories, and the household dysfunction categories include substance abuse, mental illness, mother treated violently, and criminal behavior in the household (Felitti et al., 1998). Later versions of the ACES include one question about parental separation or divorce (Substance Abuse and Mental Health Services Administration [SAMHSA], 2016). To be inclusive of household adverse experiences, this question was included in the scale in the current study. The scores from this scale are evaluated in a continuous, summative manner. Based on the sample of first-year college students in the current study, internal consistency of the ACES scale was considered minimally sufficient for research purposes (Cronbach  $\alpha = .68$ ; Ponterotto & Ruckdeschel, 2007). The complete list of questions can be found in the Appendix A.

### **College Adjustment Test (CAT; Pennebaker, 2013)**

The CAT is a 19-item Likert-type survey that examines the degree to which college freshmen have experienced various thoughts and feelings about coming to college in the week prior to taking the survey (Pennebaker, 2013). Each item is rated using a 7-point Likert scale from *Not at all* to *A great deal* (Pennebaker, 2013). The CAT questions and scoring guide can



be found in Appendix B.

Based on two samples of 287 and 260 entering college students, the internal consistency of the scale is acceptable (Cronbach  $\alpha = .79$ ) and 2-month test-retest study conducted with 196 college students was good ( $r = .65$ ). Factor analyses yielded three factors: General Negative Affect about Coming to College, Positive Affect (or optimism), and Homesickness that account for 46% of the variance (Pennebaker et al., 1990). Based on the sample of first-year college students in the current study, internal consistency of the CAT was considered minimally sufficient for research purposes (Cronbach  $\alpha = .69$ ; Ponterotto & Ruckdeschel, 2007).

### **Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 2001)**

The AUDIT is a screener comprised of ten items used to identify individuals at risk for alcohol problems. The screener is based on data from a large multinational sample and used conceptual-statistical rationale for item selection (Babor et al., 2001). Three domains of alcohol use are screened by the AUDIT: a) Hazardous Alcohol Use, b) Dependence Symptoms, and c) Harmful Alcohol Use. Results from previous studies support the reliability of the AUDIT. Test-retest reliability was high in a sample of non-hazardous drinkers, cocaine users, and alcoholics ( $r = .86$ ; Babor et al., 2001). According to the authors, a score of eight or higher on this scale is indicative of hazardous or harmful alcohol use, and therefore will be used as a cut-off score for high levels of alcohol misuse in this study. This cutoff score has been supported in the literature (Conigrave et al., 2006). Internal consistency of the scale is in acceptable range (Cronbach  $\alpha = .76$ ) based on the sample in the current study (Ponterotto & Ruckdeschel, 2007). The AUDIT questions and scoring guide can be found in Appendix C.

## **Brief Demographic Survey**

A brief survey was included to gather participants' demographic information. Participants' gender and race/ethnicity were surveyed. Participants were also asked to indicate class standing, as only first-year student data were analyzed. Other academic-related questions included the participants' current major, estimated high school GPA, and current estimated college GPA.

## **Procedure**

Participants completed an online survey which included questions from the ACES, CAT, and AUDIT scales through Qualtrics, with a consent form displayed prior to the start. First, participants completed the survey comprised of the original ACES questions with the added parental separation question, the CAT questions, and the AUDIT questions. For students not comfortable completing the questionnaire, an alternate assignment was provided. To ensure anonymity and to prompt honest answers, no identifying information was gathered, and only minimal demographic information (e.g., age, sex, ethnicity) was collected during the survey. At the end of the survey, a separate link to a different Qualtrics survey was displayed on which participants were asked to type their name, student identification number, and the course section in which they are enrolled in order to receive their extra credit.

## **Data Analyses**

The predictive value of adverse childhood experiences on post-secondary outcomes was analyzed using linear regression. This interaction was used to examine two different outcomes: overall college adjustment and problematic alcohol-related behaviors among college students.

Additionally, the moderating effects of gender and race/ethnicity were examined. Differences in these outcomes were predicted to be influenced by the interaction of contextual variables and the accumulation of ACES scores (including household physical and emotional abuse, sexual abuse, and household dysfunction).

College adjustment was evaluated on a continuous scale, and no cutoff score for maladjustment is utilized on the CAT. Therefore, linear regression was used to ascertain the interaction effects of prior trauma exposure on college adjustment. Moreover, gender and race/ethnicity were tested as potential moderators. The interaction that results from this analysis addressed hypotheses one through three. This analysis examined whether female first-year students had better college adjustment scores than males with similar ACES scores.

Linear regression was also performed to ascertain the effects of prior ACES exposure on the likelihood that the participants exhibit negative alcohol-related behaviors. Moreover, gender and race/ethnicity were tested as potential moderators. The interactions that were produced as a result of this analysis addressed hypotheses four through six.

## CHAPTER 4

### RESULTS

The purpose of this study was to examine the relationships between adverse childhood experiences and first-year college adjustment and alcohol use. The findings of this study are presented in the following sections. The relationship between cumulative ACES scores and college adjustment, along with potential moderation effects, are described first. This research aim was investigated using multiple regression. Second is the evaluation of ACES score and alcohol use among first-year college students using linear regression.

#### Data Cleaning

The data cleaning process was completed using Microsoft Excel and SPSS. Participants who did not meet the inclusion criteria were removed from the data set. This includes respondents who were under the age of 18 and who were not enrolled in their first year of college. Additionally, respondents who did not complete the entirety of the survey were removed. This resulted in a sample of 290, which is sufficient for regression (Wilson Van Voorhis & Morgan, 2007). Categorical variables were coded into a 0 or 1. Gender was coded as a 1 for female ( $n = 254, 87.6\%$ ) and 0 for male to reflect the majority of students who participated in the study. Race/ethnicity was coded as 0 for racial/ethnic minority and 1 for white ( $n = 224, 77.2\%$ ) to reflect the majority of students who completed the survey.

#### Descriptive Statistics

Table 2 displays the descriptive statistics for each endorsed ACES category. The highest endorsed ACES category was parental separation (27.2%), followed by household mental illness

(21.4%) and household substance abuse (21.0%). Almost half of the sample reported no adverse childhood experiences on the ACES (46.9%).

**Table 2**

***Prevalence of ACES Category and Total Score by Gender, Race/Ethnicity (%)***

Adverse childhood experiences (# of questions)	Gender		Race/ Ethnicity		Total
	Female	Male	White	Non- White	
Emotional abuse (2)	22.0	11.1	18.3	28.8	20.7
Physical abuse (2)	5.5	2.8	4.5	7.6	5.2
Sexual abuse (4)	4.3	5.6	3.6	7.6	4.5
Household substance abuse (2)	21.3	19.4	21.0	21.2	21.0
Household mental illness (2)	20.9	25.0	22.8	16.7	21.4
Mother treated violently (4)	7.9	5.6	7.1	9.1	7.6
Family member incarcerated (1)	4.8	0.7	2.4	3.1	5.5
Parental separation (1)	27.6	25.0	23.7	39.4	27.2
ACES total sum score					
0	45.7	55.6	38.3	37.9	46.9
1	20.9	19.4	19.2	25.8	20.7
2	11.8	5.6	11.6	9.1	11.0
3	7.9	2.8	7.6	6.1	7.2

Adverse childhood experiences (# of questions)	Gender		Race/ Ethnicity		Total
	Female	Male	White	Non- White	
4	5.9	8.3	4.0	13.6	6.2
5	3.8	0.3	4.5	3.0	4.1
6	2.4	0.0	1.8	3.0	2.1
7	0.4	5.6	1.8	0.0	1.4
8	0.3	0.0	0.0	0.3	0.3
Totals	87.6	12.4	77.2	22.8	100.0
ACES category sum score					
0	45.7	55.6	49.6	37.9	46.9
1	24.4	22.2	23.2	27.3	24.1
2	13.0	8.3	12.9	10.6	12.4
3	6.7	2.8	5.4	9.1	6.2
4	7.5	2.8	6.3	9.1	6.9
5	2.0	8.3	2.2	4.5	2.8
6	0.8	0.0	0.4	1.5	0.7

### Correlations Among Variables of Interest

Pearson correlations were calculated to explore the direction and strength of the relationships between variables of interest. Multiple significant correlations were found. Interestingly, none of the ACES categories correlated with alcohol misuse as measured by the AUDIT. The number of ACES categories endorsed did correlate negatively with positive affect ( $r = -.13, p < .05$ ) and overall college adjustment on the CAT ( $r = -.15, p < .05$ ), and positively with negative affect ( $r = .20, p < .01$ ).

These relationships indicate that as more ACES categories are endorsed, positive affect and overall college adjustment scores are lower. When more ACES scores are endorsed, negative affect on the CAT increases. No variable significantly correlated with homesickness. See Table 3 for the full correlation table.

**Table 3**

*Pearson Moment Product and Point-Biserial Correlations between ACES, CAT, and AUDIT Scores*

Measure	CAT				AUDIT
	Positive	Negative	Homesickness	Overall Adjustment	
Sum of ACES	-.14*	.22**	.01	-.16**	.03
ACES Categories					
Emotional Abuse	-.06	.20**	.00	-.12*	-.02
Q1	.10	.20**	.04	-.16**	.02
Q2	-.01	.11	-.04	-.03	-.05
Physical Abuse	-.12*	.21**	.08	-.18**	.04

Measure	CAT				AUDIT
	Positive	Negative	Homesickness	Overall Adjustment	
Q3	-.11	.23**	.10	-.19**	.04
Q4	-.09	.08	.02	-.08	.00
Sexual Abuse	-.12*	.10	-.03	.09	.05
Q5	-.08	.08	.09	-.10	.09
Q6	.14*	.10	.09	-.13*	-.02
Q7	-.09	.08	.05	-.09	.05
Q8	-.09	.08	.05	-.09	.05
Substance Abuse	-.07	.08	-.01	-.00	.08
Q9	-.03	.07	-.01	-.05	.08
Q10	-.08	.05	.00	-.06	.03
Mental Illness	-.02	.19**	-.03	-.09	.01
Q11	-.01	.20**	.00	-.11	.00
Q12	-.04	.07	-.09	.00	.02
Mother Violence	-.01	.03	-.06	.00	.02
Q13	-.02	.01	-.07	.01	.06
Q14	.04	.01	.03	.00	.01
Q15	-.06	.11	.07	-.11	-.07
Q16	.02	.00	-.11	.05	.00
Incarcerated Parent	-.15**	.01	.01	-.06	-.04
Q17	-.15**	.01	.01	-.06	-.04



Measure	CAT				AUDIT
	Positive	Negative	Homesickness	Overall Adjustment	
Parental Separation	-.10	.04	-.04	-.04	-.04
Q18	-.10	.04	-.04	-.04	-.04
CAT					
Positive Affect	--	--	--	--	.01
Negative Affect	--	--	--	--	.07
Homesickness	--	--	--	--	-.01
Overall	--	--	--	--	-.03
Adjustment					

*Note.* ACES = Adverse Childhood Experiences Scale (ACES; Felitti et al., 1998); CAT = College Adjustment Test (Pennebaker, 2013); AUDIT = Alcohol Use Disorders Identification Test (Babor et al., 2001); \* $p < .05$ , \*\* $p < .01$ .

In regard to contextual variables, Majority (White) status was positively correlated with scores on the AUDIT, meaning students who identify as White endorsed higher rates of alcohol misuse than their minority peers. A significant positive correlation emerged between Majority status and positive affect on the CAT. Meaning, conversely, there was a negative correlation between Minority status and positive affect on the CAT. Race/ethnicity did not significantly correlate with negative affect, homesickness, and overall adjustment on the CAT.

Male status negatively correlated with negative affect and homesickness on the CAT, meaning the relationship between females and these variables was positive. No significant correlations were found between gender and positive affect, overall adjustment, and AUDIT scores. See Table 4 for the full correlation table.

**Table 4**

***Point-Biserial Correlations between Gender, Race/Ethnicity, CAT Scores, and AUDIT Scores***

Contextual Variable	CAT			Overall Adjustment	AUDIT
	Positive	Negative	Homesickness		
Gender	-.09	-.15**	-.15*	.10	-.08
Majority/Minority Status	.17**	-.02	.09	.04	.36**

*Note.* Variables are coded Male = 1, Female = 0; Majority = 1, Minority = 0; \* $p < .05$ , \*\* $p < .01$ .

**Research Aim 1: ACES on College Adjustment**

To assess the relationship between prior adverse childhood experiences and current college adjustment, linear regression was completed using the cumulative scores from the ACES and the overall college adjustment scores obtained from the CAT. ACES scores were obtained by summing the score of the ACES questionnaire. Every question that was indicated added one point to the overall score. College adjustment scores were calculated using the scoring procedures on the CAT, which can be found in Appendix B. Moderation effects of gender and race/ethnicity were also tested following the regression procedure.

## **Assumptions**

Assumptions for linear regression were tested. The study design includes a continuous dependent variable, a continuous independent variable, and a dichotomous moderator variable. The additional assumptions were tested using SPSS. Linearity was assessed by visual inspection of a scatterplot. Upon visual inspection, this assumption was met. An independence of residuals was observed by a Durbin-Watson statistic of 1.978. Homoscedasticity and normality of the residuals (or amount of error) were both met. One outlier was removed upon inspection of the data.

## **Analysis**

After ensuring all assumptions of linear regression were met, the next step in the analysis was to run a multiple regression model to examine the impact of prior trauma on college adjustment.

A linear regression established that a summation of ACES scores could statistically significantly predict college adjustment,  $F(1, 287) = 8.665, p = .004$  and ACES score accounted for 2.6% of the explained variability in college adjustment scores. The regression equation was: college adjustment =  $80.318 - (1.458 \times \text{ACES score})$ .

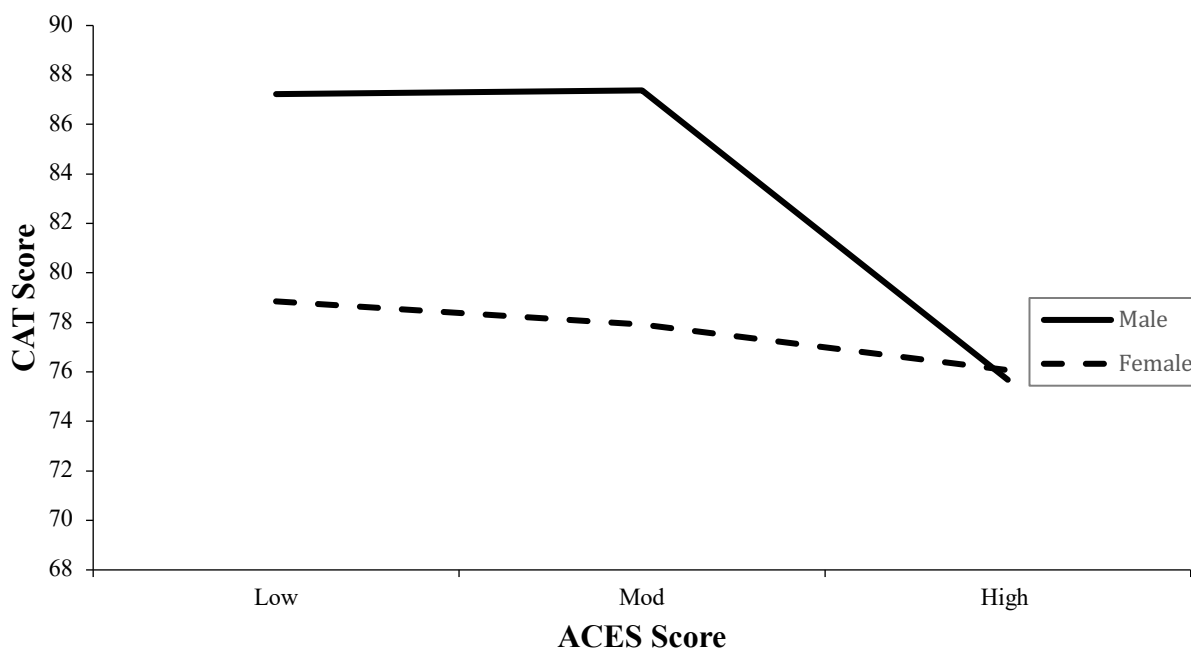
## **Potential moderators**

Gender and race/ethnicity were both examined as potential moderators in order to determine the impact they have on the relationship between ACES score on CAT overall adjustment scores. Hierarchical multiple regression was used to assess the potential moderation effect of gender and race/ethnicity on the relationship between ACES score and college adjustment.

## ***Gender***

A hierarchical multiple regression was run to assess the increase in variation explained by the addition of an interaction term between ACES score and gender to the main effects model. The assumptions were again tested to confirm they were met with the inclusion of the interaction term. Linearity was established by visual inspection of a scatterplot and there was no evidence of multicollinearity, as evidenced by no tolerance values less than 0.141. Although 14 unusual points were identified, none were deemed to need removal. The assumption of homoscedasticity was met by assessment of visual inspection of the studentized residuals plotted against the predicted values for female and male participants. The studentized residuals were normally distributed, as assessed by Shapiro-Wilk's test ( $p > .05$ ).

Gender moderated the effect of ACES score on college adjustment scores, as evidenced by a statistically significant increase in total variation explained of 1.5%,  $F(1, 286) = 4.432, p = .036$ . Overall, the relationship of ACES score to college adjustment score is different depending on whether the participant is male or female, and the simple regression lines for males and females have different slopes. Figure 1 displays the moderation effect of gender across low, moderate, and high ACES scores in the sample.

**Figure 1*****Moderation Effects of Gender on the Relationship between ACES and Overall CAT Scores***

For female participants, every one unit increase in ACES score is associated with a .926 decrease in college adjustment score. Simple slopes analysis revealed that the relationship between college adjustment scores and ACES scores in females ( $b = -9.26$ ,  $SE = .541$ ) was not statistically significant ( $p = .088$ ). For male participants, every one unit increase in ACES score is associated with a 3.847 decrease in college adjustment score. Simple slopes analysis revealed that the relationship between college adjustment scores and ACES scores in males ( $b = -.445$ ,  $SE = 1.278$ ) was statistically significant ( $p = .003$ ). The coefficient of the interaction term ( $b = 2.921$ ,  $SE = 1.387$ ) was statistically significant ( $p = .036$ ) indicating that gender moderated the relationship between college adjustment and ACES scores. The hierarchical regression blocks can be found in Table 5.

**Table 5*****Results of Hierarchical Regression of ACES and Gender Interaction***

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
ACES	-1.37	.050	-.16**	-3.85	1.28	-.45**
Gender	-4.67	2.70	-.10	-8.37	3.21	-.18**
ACES x Gender				2.92	1.39	.32*

***Race/Ethnicity***

Similarly, a hierarchical multiple regression was run to measure the increase in variation explained by the addition of an interaction term between ACES score and race/ethnicity to the main effects model. Unlike gender, race/ethnicity did not moderate the effect of ACES score on overall college adjustment scores, as the increase in total variation explained by adding the interaction of race/ethnicity and ACES score is not statistically significant. The increase of 0.0% is not statistically significant,  $F(1, 286) = 2.619, p = .051$ .

**Research Aim 2: ACES on Alcohol Use**

In the current study, the AUDIT was used to measure alcohol consumption and related behaviors among first-year college students. This scale provides a cumulative score ranging from 0 to 40, with lower scores indicating fewer alcohol-related problem behaviors. The literature also supports a cutoff score of eight as being indicative of hazardous or harmful alcohol use. The relationship was tested using linear regression. Hierarchical multiple regression was later used to test for potential moderation effects.

## **Assumptions**

Assumptions for linear regression were tested. The study design includes a continuous dependent variable, a continuous independent variable, and a dichotomous moderator variable. The additional assumptions were tested using SPSS. Linearity was assessed by visual inspection of a scatterplot. Upon visual inspection, this assumption was met. An independence of residuals was observed by a Durbin-Watson statistic of 2.097. The assumptions of homoscedasticity and normality of the residuals (or amount of error) were met. No outliers were removed upon inspection of the data.

## **Analysis**

After ensuring all assumptions of linear regression were met, the next step in the analysis was to run a linear regression model to examine the impact of prior trauma on alcohol use. This was done by summing the score of the ACES questionnaire. Every question that was indicated added one point to the overall score. Alcohol use scores were calculated using the AUDIT, which can be found in Appendix C.

A linear regression established that a summation of ACES scores does not statistically significantly predict alcohol use among first-year college students,  $F(1, 288) = 0.274, p = .601$ . Because ACES score was not a statistically significant predictor of alcohol use, moderator analyses were not performed.

## **Summary of Key Findings**

The results of these analyses provide varying levels of support for the research questions and hypotheses. First, the relationship between adverse childhood experiences and college

adjustment among first-year college students, as well as possible moderators, were examined. Through this analysis, it was established that a summation of ACES scores could statistically significantly predict college adjustment, and this relation is moderated by gender but not by race or ethnicity. To assess the second research question, which assessed the association between adverse childhood experiences and alcohol misuse among first-year college students, linear regression was again used. This analysis found that a summation of ACES scores does not statistically significantly predict alcohol use among first-year college students, and therefore moderation effects were not tested.



## **CHAPTER 5**

### **DISCUSSION**

This chapter will discuss the findings and implications of the current study, as well as how the findings relate to the current literature. The implications of the current study will also be reviewed. Chapter five will include a discussion regarding limitations and implications for future research.

#### **Review of Study**

The aim of the current study was to assess the relationship between exposure to adverse childhood experiences, as measured by the ACES scale, and college adjustment and alcohol use among a sample of first-year college students. The purpose was to add to the existing body of literature by continuing to examine the long-term effects of exposure to adverse childhood experiences. This study also examined possible moderator effects of gender and race/ethnicity to provide up-to-date information regarding these contextual variables and their effects on the studied relationships.

The sample was gathered through participation in a survey that contained demographic questions, the ACES survey, the CAT questionnaire, and the AUDIT alcohol use screener. The final sample included 290 first-year college participants. Linear regression was used to address the research questions and hypotheses detailed in the Introduction and Literature Review.

#### **Major Findings**

The results of the current study provide varying levels of support for the research questions and hypotheses. The first research question and related hypotheses were partially

supported. The second research question and related hypotheses were not supported.

### **Research Question One**

Research question one examined whether exposure adverse childhood experiences impact college adjustment in first-year college students and the potential impact of gender and race/ethnicity on this relationship. Linear regression was conducted to test the relationship between adverse childhood experiences and college adjustment among first-year college students. The moderation effects of gender and race and ethnicity were also investigated. The linear regression analysis revealed a significant relationship between ACES scores and college adjustment among first-year students. The ACES score accounted for 2.6% of the explained variability in college adjustment scores. This supports hypothesis one and the findings in the current literature (e.g., Banyard & Cantor, 2004).

Moderator analyses were completed for gender and race/ethnicity in order to test hypotheses two and three. While race/ethnicity did not have a significant moderation effect on the relationship between ACES score and college adjustment score, gender did have a significant effect on the relationship. Increased exposure to traumas measured on the ACES scale led to lower rates of college adjustment, but these relationships differed depending on whether the participant was male or female. In the female subsample, college adjustment scores decrease by .926 for every unit increase in ACES score. This relationship was not statistically significant. For males, every unit increase in ACES score is associated with a 3.847 decrease in overall college adjustment score. This relationship is statistically significant.

This finding supports the literature surrounding adverse childhood experiences and college adjustment (e.g., Banyard & Cantor, 2004). Overall, exposure to higher levels of cumulative trauma are related to lower levels of college adjustment. The current study

specifically examines this relationship among first-year college students. Interestingly, Banyard and Cantor (2004) mention that meta-analyses of the effects of childhood traumas have generally found smaller effect sizes among college student samples. This has led to discussions of whether college students represent a more resilient sample of trauma survivors (Banyard & Cantor, 2004). A small effect size (2.6%) for the relationship between ACES score and CAT score was also found in the current study.

Although mixed findings exist in the literature, some evidence suggests that ACES exposure may impact college adjustment differently for male and female students (Horan & Widom, 2015). In the current study, prior exposure to ACES had stronger effects on college adjustment in males than females. While both relationships were negative, as was the overall effect of ACES on college adjustment, the moderation effect of gender was significant in the male sample. This finding is limited in that this sample included many more female than male respondents. Interestingly, Blanco and colleagues (2008) noted that the odds of attending college are significantly higher for females than males. This statistic may have affected response rates, but a more equal distribution would still be expected.

Previously published literature would suggest that the effect of ACES would be different for non-minority and minority students. While many minority groups are at a decreased risk of having psychiatric disorders in college (Blanco et al., 2008), minority students face unique stressors when transitioning to college (Smedley et al., 1993). Overall, poor adult outcomes occur at higher rates for persons of color (Strompolis et al., 2019). While it was expected that prior ACES exposure would more negatively affect students who identify as a minority, this was not supported in the current study. This may be due to an unequal distribution of non-minority

and minority participants. Many more students who identified as a non-minority responded to the survey than minority students.

### **Research Question Two**

Research question two examined whether exposure adverse childhood experiences impact alcohol misuse among first-year college students and the potential impact of gender and race/ethnicity on this relationship. Linear regression was used to test the relationship between adverse childhood experiences and alcohol use among college students enrolled in their first year. The linear regression analysis established that ACES score does not significantly predict alcohol use. Moderation effects were not evaluated due to the non-significant relationship. Overall, all three hypotheses (four through six) related to this research question were not supported.

The high prevalence of drinking in the sample may contribute to the lack of support for the research question and hypotheses. The literature would suggest that higher ACES scores would lead to more problematic alcohol use among young adults (e.g., Felitti et al., 1998; Anda et al., 2002), but other factors that were not assessed in the current study may have led to higher than average rates of alcohol use in the sample. For example, previous studies have shown that first-year college students, especially those enrolled in their first six weeks, are at an increased vulnerability for heavy drinking and alcohol-related consequences (NIAAA, 2015). Data for the current study was collected during students' first semester. Moreover, the student sample was pulled from a large university with a strong Greek life and athletics presence. According to the NIAAA (2015), students in these types of environments tend to drink more alcohol than students attending other types of schools. In the current sample, 82.1% of first-year college students reported drinking alcohol.

Notably, 39.3% of the current study sample reported AUDIT scores that indicate hazardous or harmful alcohol use (i.e., meets the cutoff for alcohol use disorder [AUD]; Blanco et al., 2008). Of those who reported drinking alcohol (i.e., did not report “never” for question one of the AUDIT), 34.9% reported rates that meet the definition of binge drinking. Blanco and colleagues (2008) reported that roughly 20% of college students meet the criteria for AUD. The rate of 39.3% found in the current study is higher than expected based on other more representative samples. The effects of adverse childhood experiences may not significantly predict alcohol use in the current sample as would be expected due to other factors that may predict alcohol use (e.g., social pressure and individual expectations; NIAAA, 2015).

### **Complexity of Gender and Race/Ethnicity as Moderator Effects**

When contextual variables, such as gender and race/ethnicity in the current study, are examined in mental health and social research, conclusions must not suggest the effects of such factors are due to innate or genetically determined mechanisms (Committee on Pediatric Research, 2000). The existing literature supports the conclusion that these variables instead have strong social dimensions that interact with other contextual variables (Committee on Pediatric Research, 2000). While gender and race/ethnicity are often viewed as biological constructs, disparities in these variables generally do not reflect biological differences (Committee on Pediatric Research, 2000).

Evidence suggests that individual and institutional bias and prejudice may better explain disparities than genetic components. Social inequalities are well-documented in education. For example, Bécares and Priest (2015) described some of the effects of gender and race/ethnicity in education. Achievement gaps can exist due to gender discrimination, especially in subjects that are socially considered as typically male-oriented (Bécares & Priest, 2015). On average, White

students score higher than their minority peers, thus creating an achievement gap for racial/ethnic minorities. The existence of this gap is likely due to a complex interaction of factors, including the influence of socioeconomic resources, neighborhood and school characteristics, and family composition in patterning socioeconomic inequalities, and on the racialized nature of socioeconomic inequalities (Bécares & Priest, 2015). Moreover, Bécares and Priest (2015) explain that gender and race/ethnicity may intersect to create greater disparities.

These examples provide brief insight into the complexities of using gender and race/ethnicity as moderator variables. Expected differences for these variables are not due to genetics, but instead may be due to societal constructs (e.g., institutional bias or microaggressions). While the complex issue of disadvantage and social dimensions for gender and race/ethnicity were not measured as part of this study, it is important to view group differences in this study and in existing literature through this lens.

## **Limitations**

Limitations in the current study include unbalanced gender and race/ethnicity representation and sample limitations. Many more females than males completed the survey, which was not anticipated. Similarly, more non-minority students completed the survey than minority peers. Additionally, the sample was limited to students attending a single, large Mid-Atlantic university.

The ACES does not exhaustively include of all types of trauma. It is possible that students who have experienced other types (e.g., first-year students with military trauma, or who witnessed a shooting, or lived through a natural disaster) may also have adverse outcomes later in life. These traumas may lead to adverse experiences and alcohol use, but were not included in this study. Furthermore, resilience factors and other contextual variables, such as socioeconomic

status, were not measured as a part of this study. The small effect sizes and unsupported hypotheses suggest that other factors may have a greater impact on functioning among first-year college students.

### **ACES Score Distribution**

One consideration that arises when assessing the impact of trauma on college adjustment is the rate of enrollment in postsecondary institutions for those who have a history of adverse childhood experiences. Students come to college with varied histories, and prior research has suggested a prevalence of high ACES scores among these students (Mackay-Neorr, 2019). Karatekin's (2018) sample of undergraduate college students from a large public university in the Midwest found that 30% of respondents reported two or more ACES (in this study, the ACES categories were summed instead of summing questions). This is very similar to the distribution in the current study, where 29% of participants reported experiencing two or more ACES before the age of 18.

The Behavioral Risk Factor Surveillance System (BRFSS) is a large, nationally representative telephone survey. Between the dates of 2011 and 2014, 214,157 survey participants from 23 states were asked questions regarding ACES exposure (Merrick, Ford, Ports, & Guinn, 2018). The sum of ACES categories was reported in this study. Of the respondents, 61.55% had at least 1 ACE and 38.02% had two or more ACES. Only 38.45% of the respondents reported experiencing no ACES (Merrick et al., 2018). In the current study, almost half of the participants reported experiencing zero ACES (46.9%), which is higher than the more representative sample gathered by the BRFSS survey (Merrick et al., 2018). The

current study distributions are similar to Karatekin's (2018) sample distributions, in which 47% of college students reported 0 ACES.

The original ACES study, in which data was collected between 1995 and 1997, found almost two-thirds of respondents reported at least one ACE (Felitti et al., 1998), and replications have found similar prevalence rates have been found across settings and populations (Merrick et al., 2018). While over half of the respondents in the current study (53.1%) and Karatekin's (2018) study (51%) reported at least 1 ACE before the age of 18, these percentages are still lower than expected given the original ACES study (Felitti et al., 1998) and BRFSS (Merrick et al., 2018) samples. When looking at the difference in reports of four or more ACES across college and more representative samples, lower rates have been found in the college samples. In the current study, 10.4% of students reported exposure to 4 or more ACES categories, compared to 15.81% in the BRFSS survey (Merrick et al., 2018). In Karatekin's (2018) college sample, 8% of students reported four or more ACES. In both college samples, rates of exposure are less than that of the more representative community samples. These rates may suggest that individuals with histories of ACES exposure may not enroll in college at expected rates. Or, at minimum, these students do not enroll in the large, Mid-Atlantic university examined in the current study at expected rates. Otherwise, a distribution closer to that of the general population would be expected.

Those students who do enroll may represent a more resilient sample of trauma survivors, as Banyard and Cantor (2004) suggest. Even this if this is the case, resilience can continue to be fostered throughout college through available resources. This is especially true given the small effect size of ACES score on college adjustment found in the current study. Although ACES score is a significant predictor of CAT scores, the small effect size suggests other factors that



predict college adjustment were not accounted for in this study. These may be factors that impact resilience and help individuals transition to college with reasonable success. Future research should continue to examine the impact of support in relation to the impact of adverse experiences on college transitions and functioning in post-secondary education.

### **Implications for Students and Educators**

While not every high school student has plans to pursue post-secondary education, it is still important to foster resilience in those who have experienced trauma in order to help reduce the chance of negative outcomes later in life (e.g., depression; Chapman et al., 2004). For those with plans to pursue college education, educators and mental health professionals should be ready to help with the transition to college. Moreover, resources should be available to those who experienced trauma who are currently enrolled in college in an effort to increase rates of degree attainment and reduce negative outcomes of ACES that may be increased by the college environment (e.g., risky sexual behavior; Hillis et al., 2000).

### **High School**

The National Child Traumatic Stress Network (NCTSN, 2008) list of possible sources of adolescent trauma includes many of the ACES, including witnessing domestic violence, sexual abuse, and neglect. Trauma can impact student functioning in many ways, including increased absences, rates of drop-out, suspensions, and expulsions (NCTSN, 2008). Childhood trauma may also lead to a lower high school GPA and decreased reading ability (NCTSN, 2008). Students with previous trauma exposure are also at an increased risk for grade repetition and placement in special education (Davidson, 2017). Trauma symptoms may be misdiagnosed as attention deficits, learning disabilities, or conduct problems, especially in younger children (Davidson,

2017). While even single exposures to traumatic events can interfere with concentration and memory in the school setting, chronic exposure, especially in a student's early years, can have more drastic long-term consequences. These include an interference with effective problem solving, an inability to effectively focus, organize, and process information, and lower attention, memory, and cognition abilities (NCTSN, 2008). The literature has noted both behavioral and academic deficiencies in those who have experienced adverse childhood experiences.

Adolescents' reactions to trauma are determined by their subjective experiences, which can be influenced by developmental and cultural factors (NCTSN, 2008). However, it has been established in the literature that increased exposure to multiple traumas has more powerful effects on future functioning (e.g., Felitti et al., 1998; Banyard & Cantor, 2004; Nurius et al., 2015). Findings from the current study support this conclusion.

Given the behavioral and academic outcomes that may be impacted by adverse childhood experiences, it is possible that students with these experiences may be less likely to pursue post-secondary education. In fact, recent research has suggested that these outcomes reach beyond the individual level. Communities with higher ACE scores have higher rates of suspension and unexcused absences, with lower rates of high school graduation (NCTSN, 2017). These communities have fewer students progress to post-secondary education than communities with lower levels of ACES (NCTSN, 2017).

Trauma-informed schools help build resilience in students who have experienced childhood trauma and ACES. These schools are responsive to the needs of these students while also providing social, behavioral, and emotional supports and child and family services (NCTSN, 2017). These approaches are most effective when introduced early in students' school careers (NCTSN, 2017). Despite the supporting research and positive outcomes of implementing trauma

informed practices in schools, barriers remain to successful implementation. For example, trauma-informed schools require the engagement of all administrators, educators, and other staff members (NCTSN, 2017). As with other programming, buy-in can be difficult. These practices also require those working in the school to recognize when a student's behaviors are the result of trauma, and to not respond in a punitive and potentially harmful way (NCTSN, 2017). Although an abundance of research surrounding ACES and childhood trauma exists, students who have experienced trauma are still at an increased risk of receiving out-of-school discipline (NCTSN, 2017). Moreover, many schools continue to implement zero tolerance policies, which result in suspension or expulsion and lead to higher rates of dropout and justice system involvement (NCTSN, 2017). Police presence has also been used to respond to defiant behaviors that may be related to trauma (NCTSN, 2017). These practices can impact feelings of safety for students who have experienced trauma and can contribute to a school climate that is not trauma-informed (NCTSN, 2017).

Administrators and other school personnel must continue to learn of the benefits of trauma-informed practices. Research should continue to examine the barriers to effective implementation, as trauma-informed schools can aid in building resilience and reducing suspensions, expulsions, and rates of dropout. Additionally, prior research has suggested that males and females may not have the same response to ACES, and cumulative risk in childhood may affect these populations differently (Horan & Widom, 2015). This is supported by the current study. For example, males drop out of high school at a higher rate than their female peers (Horan & Widom, 2015). Future research should continue to determine the most effective interventions for students who have been exposed to trauma, and determine the most appropriate interventions by gender.

## College and Post-Secondary Settings

Although some research samples, such as the sample from the current study, would suggest lower rates of enrollment among those who have experienced ACES, high rates of ACES are still found in the college population (Karatekin, 2018). Moreover, transition to college may be complicated by trauma exposure, and students with a history of trauma are at an increased risk of dropping out, depression, and suicide (Banyard & Cantor, 2004). These prior experiences and cumulative risk are then combined with the stressors of college transition, including increased academic demand (Rogers & Tennison, 2009), a culture of heavy alcohol use (Prendergast, 1994), and identity formation (Arnett, 2000). Educational success may act as a protective factor against future negative outcomes. This is complicated by the fact that students with a history of ACES are at a higher risk for academic and behavioral problems that may interfere with learning and regulation when enrolled in college (Davidson, 2017).

As with grade school, creating a trauma informed post-secondary education climate requires administrators, faculty, staff, counselors, clinicians, and other members of the campus community to buy in to a campus-wide approach and better understand the impact of trauma on students (Davidson, 2017). By addressing students' needs in a holistic manner, they can improve relationships, better regulate emotions and behaviors, improve academically, and increase well-being (Davidson, 2017). Even when past trauma has not been identified, trauma-informed educators and learning environments will be beneficial (Davidson, 2017). Colleges should continue to educate personnel on information regarding trauma, brain development, treatments, and strategies to aid educators on providing effective support to students in need (Davidson, 2017).

Some core features of trauma-focused interventions include psychoeducation about posttraumatic stress reactions and grief reactions (NCTSN, 2017). Future research should continue to develop effective interventions, including an increased understanding of the needs for college students who are at an increased risk for revictimization while attending college or for negative outcomes later in life. Some student groups with specific risk factors for past or ongoing trauma include veterans, foster youth, refugee students, LGBGQ students, and nontraditional adult learners (Davidson, 2017). As previously mentioned, cumulative risk may impact males and females differently (Horan & Widom, 2015), and this is supported by the current study. This is an area that should continue to be researched in the college population. When students who have experienced prior trauma have their needs met, it is an opportunity to learn that there are safe places that can be stimulating and bring a sense of educational success and accomplishment (Davidson, 2017).

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## Appendix A

### The Adverse Childhood Experiences Scale

(ACES; Felitti et al., 1998)

#### Childhood Abuse:

##### Emotional

Did a parent or other adult in the household . . .

1. Often or very often swear at you, insult you, or put you down?
2. Sometimes, often, or very often act in a way that made you afraid that you might be physically hurt?

##### Physical

Did a parent or other adult in the household . . .

3. Often or very often push, grab, slap, or throw something at you?
4. Often or very often hit you so hard that you had marks or were injured?

##### Sexual

Did an adult or person at least 5 years older ever . . .

5. Touch or fondle you in a sexual way?
6. Have you touch their body in a sexual way?
7. Attempt oral, anal, or vaginal intercourse with you?
8. Actually have oral, anal, or vaginal intercourse with you?

#### Household Dysfunction:

##### Substance abuse

9. Live with anyone who was a problem drinker or alcoholic?

10. Live with anyone who used street drugs?

Mental illness

11. Was a household member depressed or mentally ill?

12. Did a household member attempt suicide?

Mother treated violently

Was your mother (or stepmother) . . .

13. Sometimes, often, or very often pushed, grabbed, slapped, or had something thrown at her?

14. Sometimes, often, or very often kicked, bitten, hit with a fist, or hit with something hard?

15. Ever repeatedly hit over at least a few minutes?

16. Ever threatened with or hurt by a knife or gun?

Incarcerated household member

17. Did a household member go to prison?

Parental separation or divorce

18. Were your parents ever separated or divorced?

## Appendix B

### The College Adjustment Test

(CAT; Pennebaker, 2013)

Use a 7-point scale to answer each of the following questions, where:

1      2      3      4      5      6      7

not at all                  somewhat                  a great deal

Within the LAST WEEK, to what degree have you:

1. Missed your friends from high school \_\_\_\_\_
2. Missed your home \_\_\_\_\_
3. Missed your parents and other family members \_\_\_\_\_
4. Worried about how you will perform academically at college \_\_\_\_\_
5. Worried about love or intimate relationships with others \_\_\_\_\_
6. Worried about the way you look \_\_\_\_\_
7. Worried about the impression you make on others \_\_\_\_\_
8. Worried about being in college in general \_\_\_\_\_
9. Liked your classes \_\_\_\_\_
10. Liked your roommate(s) \_\_\_\_\_
11. Liked being away from your parents \_\_\_\_\_
12. Liked your social life \_\_\_\_\_
13. Liked college in general \_\_\_\_\_
14. Felt angry \_\_\_\_\_
15. Felt lonely \_\_\_\_\_
16. Felt anxious or nervous \_\_\_\_\_

17. Felt depressed \_\_\_\_\_

18. Felt optimistic about your future at college \_\_\_\_\_

19. Felt good about yourself \_\_\_\_\_

Scoring Guide:

Positive affect=  $q9+q10+q12+q13+q18+q19$

Negative affect=  $q4+q5+q6+q7+q8+q14+q15+q16+q17$

Home sickness=  $q1+q2+q3+q15+q16+(8-q11)$

Overall adjustment=  $(64-(q1+q2+q3+q4+q5+q6+q7+q8))+q9+q10+q11+q12+q13+(32-(q14+q15+q16+q17))+q18+q19$

## Appendix C

### Alcohol Use Disorders Identification Test

(AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001)

1. How often do you have a drink containing alcohol?

*Never; Monthly or less; 2-4 times a month; 2-3 times a week; 4 or more times a week*

2. How many standard drinks containing alcohol do you have on a typical day when drinking?

*1 or 2; 3 or 4; 5 or 6; 7 to 9; 10 or more*

3. How often do you have six or more drinks on one occasion?

*Never; Less than monthly; Monthly; Weekly; Daily or almost daily*

4. During the past year, how often have you found that you were not able to stop drinking once you had started?

*Never; Less than monthly; Monthly; Weekly; Daily or almost daily*

5. During the past year, how often have you failed to do what was normally expected of you because of drinking?

*Never; Less than monthly; Monthly; Weekly; Daily or almost daily*

6. During the past year, how often have you needed a drink in the morning to get yourself going after a heavy drinking session?

*Never; Less than monthly; Monthly; Weekly; Daily or almost daily*

7. During the past year, how often have you had a feeling of guilt or remorse after drinking?

*Never; Less than monthly; Monthly; Weekly; Daily or almost daily*

8. During the past year, have you been unable to remember what happened the night before because you had been drinking?

*Never; Less than monthly; Monthly; Weekly; Daily or almost daily*

9. Have you or someone else been injured as a result of your drinking?

*No; Yes, but not in the past year; Yes, during the past year*

10. Has a relative or friend, doctor or other health worker been concerned about your drinking or suggested you cut down?

*No; Yes, but not in the past year; Yes, during the past year*

Scoring Guide:

Questions 1-8: The first response for each question = 0, the second = 1, the third = 2, the fourth = 3, and the fifth = 4

Questions 9-10: The first response for each question = 0, the second = 2, and the third = 4

## VITA

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#### **EDUCATION**

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August 2020	Ph.D., School Psychology, The Pennsylvania State University
May 2017	M.Ed., School Psychology, The Pennsylvania State University
May 2015	B.A., Psychology, The Indiana University of Pennsylvania

#### **PROFESSIONAL EXPERIENCE**

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2019-Present	School Psychologist, <i>Tuscarora Intermediate Unit 11</i> , McVeytown, PA
2019-2019	PA
2016-2018	Graduate Assistant, <i>Milton Area School District</i> , Milton, PA Graduate Research Assistant, <i>Clearinghouse for Military Family Readiness at Penn State</i> , State College, PA

#### **PRESENTATIONS**

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- Bell, K. M.** (2018, February). *Adverse Childhood Experiences Scale factors and future student outcomes*. Poster presentation at the National Association for School Psychologists Annual Conference in Chicago, IL.
- Fischer, A. V., **Bell, K. M.** (2018, February). *The feasibility of implementing a parenting program in schools*. Paper presentation at the National Association for School Psychologists Annual Conference in Chicago, IL.
- Bell, K. M.**, Sadler, D. (2015, May). *Effects of working memory capacity and load on the spatial profile of visual selective attention*. Presentation at the Psychology Honors Colloquium, Indiana University of Pennsylvania, Indiana, PA.
- Bell, K. M.**, Sadler, D. (2014, December). *Effects of working memory capacity and load on the spatial profile of visual selective attention*. Presentation at the Psychology Honors Colloquium, Indiana University of Pennsylvania, Indiana, PA.
- Bell, K. M.**, Patton, T., Smith, M. (2014, December). *The effects of adverse childhood experiences on future health*. Panel Presentation at Ben Franklin Elementary School, Indiana, PA.
- Bell, K. M.**, Patton, T., Smith, M. (2014, December). *The effects of adverse childhood experiences on future health*. Two panel presentations at Indiana Regional Medical Center, Indiana, PA.