

**EXPLORING THE ASSOCIATIONS BETWEEN INTERNET-BASED
PROFESSIONAL SOCIAL NETWORKING AND EMOTIONAL DISTRESS**

by

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ABSTRACT

Young professionals commonly use professional social networking websites. In light of emerging concerns regarding social networking use and emotional distress, the purpose of this study was to investigate the association between frequency of use of LinkedIn, the most commonly used professional social networking website, and depression and anxiety among young adults. In October 2014, we assessed a nationally-representative sample of 1,787 U.S. young adults between the ages of 19 to 32 regarding frequency of LinkedIn use, depression and anxiety, and socio-demographic covariates. We measured depression and anxiety using validated Patient-Reported Outcomes Measurement Information System measures. We used bivariable and multivariable logistic regression to assess the association between LinkedIn use and depression and anxiety while controlling for age, sex, race, relationship status, living situation, household income, education level, and overall social media use.

In weighted analyses, 72% of participants did not report use of LinkedIn, 16% reported at least some use but less than once each week, and 12% reported use at least once per week. In multivariable analyses controlling for all covariates, compared with those who did not use LinkedIn, participants using LinkedIn at least once per week had significantly greater odds of increased depression (adjusted odds ratio [AOR] = 2.10, 95% confidence interval [CI] = 1.31-

3.38) and increased anxiety (AOR = 2.79, 95% CI = 1.72-4.53). LinkedIn use was significantly related to both outcomes in a dose-response fashion. As depression and anxiety become leading contributors to disability adjusted life years, it is important to recognize the implications of these disorders and acknowledge them as major public health problems. Future research should investigate directionality of the found association and possible reasons to better address the burden associated with depression and anxiety.

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PREFACE

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1.0 INTRODUCTION

The use of social networking sites has increased in the past decade with approximately 74% of online adults in the United States participating in at least one social networking site (Duggan, 2014). Due to the growing number of adults using social networking websites, there has been increased interest in understanding the relationship between heavy usage and psychological well-being. Some studies have reported that increased social networking usage is associated with decreased mood and other negative outcomes (Chou & Edge, 2012; Fox & Moreland, 2015; Sagioglou & Greitemeyer, 2014; Steers, 2014); however, other studies found an association with positive outcomes (Ellison, Steinfield, & Lampe, 2007; Manago, Taylor, & Greenfield, 2012; Morgan & Cotten, 2003; Valenzuela, Park, & Kee, 2009; Wright & Rosenberg, 2013) or found no association at all (Jelenchick, Eickhoff, & Moreno, 2013). In addition to equivocal results, the majority of research has focused on the most popular social networking site, e.g., Facebook. No published research examines the use of professional networking websites, like LinkedIn, and its impact on and individual's mental well-being.

Several theories may explain the potential impact of social networking websites on an individual's mental health. Some important social theories include social comparison (Haferkamp & Krämer, 2011; Sagioglou & Greitemeyer, 2014; Steers, 2014), self-presentation (Haferkamp, 2012), and social rank theory (Sloman, Gilbert, & Hasey, 2003; Tandoc, Ferrucci, & Duffy, 2015). Although these theories provide a compelling argument as to how social

networking websites may affect an individual's mental health, research has yet to identify the directionality of previous studies showing an association between heavy use and a decline in well-being. Furthermore, data are needed to determine if increased use of professional networking websites e.g., LinkedIn, is similarly associated with a decline in psychological well-being.

In contrast to previous research that has primarily focused on Facebook, our study examines the effects of LinkedIn use and emotional distress by measuring depression and anxiety. Although LinkedIn is meant to advance an individual's career opportunities, it may be negatively impacting an individual's mental health by providing yet another platform to engage in self-presentation and social comparison. The purpose of our study is to explore the association between professional social networking websites use and emotional distress among young adults. Our findings can help to develop future public health prevention programs and reduce the incidence/burden of depression and anxiety.

This thesis includes an in-depth review of depression, anxiety, and social networking websites in the first chapter. Following the first chapter, will be a single, stand-alone journal article, which was submitted for publication in *Cyberpsychology, Behavior, and Social Networking*. Following the journal article is the final thesis conclusion.

2.0 DEPRESSION, ANXIETY, AND SOCIAL NETWORKING



Figure 1. *Depression Monster*



Figure 2. *Anxiety Monster*

The figures above depict anxiety and depression as part of Toby Allen’s Real Monsters Project. The Real Monsters Project consists of various mental disorder characters and aims to help individuals visualize and cope with their disorders. In addition to the visual character, each “monster” has a short story telling how it inflicts its disorder and symptoms upon others. The first figure is an illustration of the depression monster. According to Toby Allen, “The

depression monster floats around endlessly, always covering his eyes to hide itself from the outside world. Because of this it always bumps into people or other monsters causing more distress to itself each time. Its only relief is to wrap its fluid tail around a victim and share its depression with them. The victim is unaware of the monster but will register heaviness and will develop a state of deep depression. Meanwhile the monster absorbs any positive emotion from its host until it has had its fill and moves onto another host.”(Allen, 2016) Similarly, author and writer Elizabeth Wurtzel has stated, “That’s the thing about depression: A human being can survive almost anything, as long as she sees the end in sight. But depression is so insidious, and it compounds daily, that it’s impossible to ever see the end. The fog is like a cage without a key” (Wurtzel, pg 168). Recent episodes of celebrity deaths, like Robin Williams, cast a spotlight on depression and its effect on families and friends of those afflicted with depression.

Figure two is an illustration of the anxiety monster. Again, according to Toby Allen, “The anxiety monster is small enough to sit on its victim’s shoulder and whisper things in to their unconscious, eliciting fearful thoughts and irrational worries. The anxiety monster is often seen as weak in comparison to others but it is one of the most common and is very hard to get rid of. They often carry small objects linked to their victim’s anxieties such as clocks, which represent a common but irrational fear of things that might never happen. No-one has ever seen the face of the anxiety monster for it always wears a skull as a mask.”(Allen, 2016) Similarly, author Robert E. Neale describes anxiety as a “state more undesirable than any other, and we will try almost any maneuver to eliminate it. Modern man is living in anxious anticipation of destruction. Such anxiety can be easily eliminated by self-destruction” (Neale, pg 54). Toby Allen’s monsters help those suffering from mental disorders cope by visually imaging such monsters as the reason for their disorders. His images and stories portray how an individual with

depression or anxiety may feel and accurately captures depression's comorbidities. His work is a unique way to portray these two common disorders. Thus, his work helps to ease the burden associated with these highly prevalent, yet highly stigmatized disorders.

2.1 DEPRESSION

Depressive disorders are highly prevalent in developed and developing countries and account for 40% disability adjusted life years (DALYs) caused by mental and substance use disorders worldwide (Feinstein, Bhatia, Hershenberg, & Davila, 2012; Whiteford et al., 2013). By 2020, major depression is estimated to be the second most important cause of disability worldwide (Reddy, 2010). The 12-month prevalence rate of major depression among United States adults in 2014 was 6.7% (Hedden, Kennet, Lipari, Medley, & Tice, 2014). Lifetime prevalence rate of major depression among US adults ranges from 11.1% to 16.2%. (Bromet et al., 2011; Kessler et al., 2003). However, another study compared rates of depression across various states and found a lifetime rate between 6.8% and 21.3% (Strine et al., 2015).

Depression is a major public health concern as it has been associated with impaired social and cognitive functioning (Gomez-Hernandez, Max, Kosier, Paradiso, & Robinson, 1997; Joiner, Lewinsohn, & Seeley, 2002; Pellegrino, Peters, Lyketsos, & Marano, 2013; Rabins & Pearlson, 1994), reduced quality of life (Gaynes, Burns, Tweed, & Erickson, 2002; Saarni et al., 2007), and is highly comorbid (Chapman, Perry, & Strine, 2005). Additionally, the economic burden associated with major depressive disorder in 2010 was estimated to be 210.5 billion dollars annually (Greenberg, Fournier, Sisitsky, Pike, & Kessler, 2015). Depression is a disabling chronic illness that can also influence the outcome of other comorbid illnesses. Thus, due to the

direct and indirect costs associated with depression, it imposes a significant economic burden on society and is a major public health concern.

2.1.1 History of Depression

Depression has been largely characterized as a developed country's problem, sparing the millions of people living in the developing world. However, a brief reflection through history illustrates examples of depression dating back to Mesopotamia in the second millennium B.C. (Nemade, Staats Reiss, & Dombeck, 2007). Most would agree that Mesopotamia would not meet the current day criteria and definitions used to distinguish developed countries from developing countries, and yet accounts of depression were recorded. During those years depression, referred to as melancholia, was considered to be the result of demons or evil spirits (Toohey, 1987). Rather than using physicians, who treated physical ailments, depression was cured through priests or other spiritual healers (Nemade et al., 2007). Because depression affected the mind and not the physical body, traditional doctors were not responsible for treating those suffering (Jackson, 1986).

During the fifth century B.C., Greek doctors began to change the societal view of depression from being associated with demons and spirits to believing it to be a biological and psychological disease for which gymnastics, diet, music, baths, poppy extract and massages could alleviate the symptoms (Nemade et al., 2007). Hippocrates postulated that melancholia was caused by an imbalance in body fluids, called humors (Toohey, 1987). The four humors consisted of black bile, yellow bile, phlegm, and blood (Toohey, 1987). In order to be healthy, all four humors need to be in balance (Toohey, 1987). Hippocrates believed melancholia was due to an excess of black bile, specifically black bile located in the spleen (Toohey, 1987). Although

Hippocrates' theory of causation was inaccurate, his symptomatology of melancholia was nearly identical to modern-day symptoms of major depression and included food aversion, sleeplessness, irritability, restlessness, despondency, and fear or depression over a prolonged period of time (Jackson, 1986; Toohey, 1987).

After the decline of the Roman Empire, views of mental illness once again changed. During the Middle Ages it was again believed to be the result of demons, the devil, or witches inflicting their madness on those suffering (Nemade et al., 2007). This notion continued throughout the 16th century with multiple witch-hunts and executions of mentally ill patients (Nemade et al., 2007). During the 17th century, Hippocrates' views returned with doctors once again believing mental illness was the result of natural causes with patients requiring medical treatment to cure their illness (Jackson, 1986; Nemade et al., 2007). In the early 1600s, Robert Burton first identified some social determinants of depression such as poverty, fear, and solitude (Nemade et al., 2007). Despite the resurgence of the environmental and biological causes of depression, it was not until the late 19th century when therapeutic treatments became available (Nemade et al., 2007). This was due to the invention of psychodynamic theory and development of psychoanalysis (Nemade et al., 2007; Toohey, 1987).

During the 1950s and 1960s medical professionals had a strong understanding that mental illness was a result of biological, social, and environmental factors. During this time, professionals defined depression as either endogenous (caused by genetics or physical problems) or neurotic or reactive (caused by environmental changes such as a loss of a spouse) (Nemade et al., 2007). Those with endogenous depression were believed to be unaffected by external factors and their emotional pain was the result of their own suffering (Nemade et al., 2007). In contrast, those with reactive depression were thought to be affected by external factors that gives rise to their

depression (Nemade et al., 2007). During this same time, there was an increased interest in identifying and understanding the organic causes of mental illness and an increased use of pharmacology in the treatment of mental illness (Nemade et al., 2007; Wilson, 1993). Since the mid 20th century, mental health professionals and researchers have increased the number of psychological theories and pharmaceuticals used to reduce the burden of depression (Wilson, 1993).

2.1.2 Diagnostic Criteria for Depression

Attempts to track and classify mental disorders begin in the mid to late 19th century with a large push in the 20th century post World War II (American Psychiatric Association, 2014). During the mid 1800s, the United States attempted to track mental illness by using census data, which included seven categories of mental illness: melancholia, mania, monomania, paresis, epilepsy, dipsomania, and dementia (American Psychiatric Association, 2014). In the early 1920s, the development of psychiatric classifications by the American Psychiatric Association (APA) was included in the first edition of the American Medical Association's Standard Classified Nomenclature of Disease (American Psychiatric Association, 2014). Post-World War II, the World Health Organization (WHO) first included a section on mental disorders in the ICD-6, which was a big step in diagnosing and treating mental illness globally (American Psychiatric Association, 2014).

The publication of the ICD-6 led to the development and publication of the first Diagnostic and Statistical Manual of Mental Disorders in 1952 (American Psychiatric Association, 2014). In the first edition, the term depressive reaction was coined to describe those suffering from depression. The disorder was labeled as an anxiety that was relieved by

depressive symptoms and self-deprecation and was often the result of a significant loss (American Psychiatric Association, 1952). The second DSM was released around the same time as the ICD-8 with small changes in naming and description. Depressive reaction became depressive neurosis and instead of it being described as an anxiety relieved by depression and caused by a significant loss, depressive neurosis was a reaction of depression due to an internal conflict or a significant life event (American Psychiatric Association, 1968).

The most significant changes came with the publication of the DSM-III in 1980, which included specific diagnostic criteria, a multi-axial diagnostic assessment system, and a humble approach to the cause of mental disorders (American Psychiatric Association, 1980; Wilson, 1993). The term major depressive episode replaced depressive neurosis and was described as a mood disorder with a loss of pleasure (American Psychiatric Association, 1980). In this edition, a clear criterion was established for diagnoses, which included the requirement of four particular symptoms for two weeks (American Psychiatric Association, 1980). These symptoms included poor appetite, insomnia or hypersomnia, loss of interest or pleasure, loss of energy, feeling worthless, inability to concentrate, and suicidal ideation or attempts (American Psychiatric Association, 1980). Additionally, loss of interest or pleasure was required to be one of the four items (American Psychiatric Association, 1980).

Despite the advances in the DSM, the DSM-III showed inconsistencies and a revision was released in 1987 (American Psychiatric Association, 2014). This revision included a section titled Mood disorders, which contained major depressive episodes and major depressive disorder (American Psychiatric Association, 1987). The new criteria for diagnosis required at least five particular symptoms to be present in the same two-week duration (American Psychiatric Association, 1987). These symptoms included weight loss or gain, insomnia or hypersomnia,

psychomotor retardation or agitation, fatigue or energy loss, feelings of worthlessness or guilt, inability to concentrate, and suicide ideation or attempts (American Psychiatric Association, 1987). Additionally, a depressed mood or loss of interest in pleasure in most things was required for the entire two-week duration (American Psychiatric Association, 1987).

By 1994, the release of the fourth edition of the DSM included significant reorganization as well as the inclusion of additional disorders, but depression was still labeled as a mood disorder with similar criteria (American Psychiatric Association, 1994, 2014). The same symptoms were listed as in the DSM-III-R with the same requirement of one symptom being a depressed mood or loss of interest (American Psychiatric Association, 1994). The DSM-V was released in 2013 with new updates and criteria for proper diagnosis (American Psychiatric Association, 2014). The symptoms for diagnosis stayed the same as previous criteria; however, it was noted that symptoms can cause an impairment in daily or social functioning as well (American Psychiatric Association, 2013).

Thousands of years ago depression was identified as a medical condition; however, proper diagnosis and criteria were not well established until the 1980s. The current diagnostic criteria are similar to symptoms recognized during Hippocrates' time and illustrate the long history of depression. This shows that depression is not only affected by the most developed countries, but rather depression has been a neglected, underreported, and unrecognized public health concern throughout history.

2.1.3 Risk Factors for Depression

Prevention and treatment of depression requires a clear understanding of the potential risk factors and causal pathways associated with depression. A multitude of biological and psychosocial risk

factors have been identified that contribute to the development of depression. Although exposure to multiple risk factors can potentially increase an individual's susceptibility to depression, the mere exposure to these risk factors does not guarantee the subsequent development of depression. To date, various psychosocial risk factors have been associated with depression. A list of common risk factors for depression can be found below in Table 1.

Table 1. *Common Risk Factors Associated with Depression*

<i>Risk Factor</i>	<i>Reference</i>
Daily life stressors/ major life events	(Hammen, Adrian, & Hiroto, 1988; Lewinsohn & Roberts, 1994; Monroe & Bromet, 1986)
Education level	(Miech & Shanahan, 2000)
Low parental education	(Velez, Johnson, & Cohen, 1989)
Socioeconomic status/ income level	(Bruce, Takeuchi, & Leaf, 1991; Everson, Maty, Lynch, & Kaplan, 2002; Stansfeld & Marmot, 1992)
Social support	(Hammen et al., 1988; Monroe & Bromet, 1986)
Emotional reliance	(Lewinsohn, Gotlib, & Seeley, 1995)
Coping skills	(Block & Gjerde, 1991; Lewinsohn et al., 1995; Velez et al., 1989)
Interpersonal conflicts and behaviors	(Gotlib, 1982; Lewinsohn et al., 1995; Youngren & Lewinsohn, 1980)
Poor physical health	(Lewinsohn et al., 1995; Reinherz & Stewart-Berghauer, 1989)
Cigarette smoking	(Kandel, 1986)
Low self-esteem and body image	(Allgood-Merten, 1990)
Loss of a parent	(Reinherz & Stewart-Berghauer, 1989)

In addition to the common risk factors identified in Table 1, there are other risk factors, which are important in the development of depression. One of these factors is age. Because it is an important risk factor for the development and onset of depression, it will be discussed in

greater detail. Within the adult population, the probability of depression is highest among middle-aged adults with prevalence rates declining with advancing age (Blanchflower & Oswald, 2008; Byers, Yaffe, Covinsky, Friedman, & Bruce, 2010; Kessler et al., 2010). Measured 30-day, 12-month, and lifetime prevalence rates were significantly lower in adults ≥ 65 compared to adults in the 18-34, 35-49, and 50-64 year cohort (Kessler et al., 2010). Lifetime prevalence rates for individuals between the ages of 18-34 were 19.2% compared to 22.7% for 35-49 year olds, 20.7% for 50-64 year olds, and only 9.8% for those 65 or older (Kessler et al., 2010). Although the prevalence of depression tends to decline with age, some subgroups are particularly susceptible to depression compared to those in the general population. Within the older population, those living with other chronic medical conditions, living in a nursing home, or receiving home healthcare are particularly susceptible to higher rates of depression (Charney et al., 2003; Katz, 1996; Lyness, Niculescu, Tu, Reynolds, & Caine, 2006).

Similar to age, an individual's social environment and experiences play a role in the onset of depression. Childhood adversities such as loss of a parent, physical or sexual abuse, neglect, parental divorce, economic adversity, parental substance abuse or criminology, and parental mental illness have been associated with depression; these factors are strongly correlated with mood disorder onset (Green et al., 2010). Findings from Green's study showed childhood adversities to be associated with approximately 57% of childhood-onset mood disorders, 30.5% of adolescent-onset mood disorders, and 20.5% of middle-to-late adult onset mood disorders (Green et al., 2010). Furthermore, early life stressors and major life events have also been shown to impact remission and relapse rates of depression as well as disorder onset (Paykel, 2003).

In addition to childhood trauma and adversity, social support networks and social relationships can affect the development of depression. Compared to those with the highest

quality of social relationships, individuals who had the lowest overall quality of social relationships had over twice the risk of developing depression (Teo, Choi, & Valenstein, 2013). Additionally, criticism or perceived criticism from a spouse or partner has been linked to relapse or residual symptoms in those suffering from depression (Hayhurst, Cooper, Paykel, Vearnals, & Ramana, 1997; Hooley & Teasdale, 1989). Social relations and interactions can impact the development of depression even when two degrees of separation exist. Findings from the Framingham Heart Study showed that individuals who were in direct contact with someone who was depressed were 93% likely to be depressed as well (Rosenquist, Fowler, & Christakis, 2011). With further investigation, participants were 43% more likely to be depressed if there were two degrees of separation and 37% with three degrees of separation (Rosenquist et al., 2011). Thus in addition to a direct social relationship, distant social relationships, and an individual's social network can impact an individual's likelihood of being depressed.

In addition to psychosocial risk factors, numerous genetic risk factors exist for the development of depression. Findings from a meta-analysis of twin studies noted the heritability (an estimation of how much variation in a phenotypic trait in a population is due to genetic variation among individuals in that population) of liability was 37% (Sullivan, Neale, & Kendler, 2000). Interestingly, findings for heritability of liability to major depression were significantly higher for woman (42%) compared to men (29%) (Kendler, Gatz, Gardner, & Pedersen, 2006). Despite some advances in our understanding of genetic risk factors, the identification of specific genes associated with depression has not been successful. This is thought to be due to the heterogeneity of the major depressive disorder (Sullivan, 2015). However, recent data suggests an association of single nucleotide polymorphisms found on chromosome three that were present more often in patients with unipolar major depression or bipolar disorder as compared to healthy

controls (McMahon et al., 2010). Another study found that one single nucleotide polymorphism on chromosome 3 and two on chromosome 10 were associated with unipolar major depression, attention deficit disorder, autism spectrum disorder, bipolar disorder, hyperactive disorder, and schizophrenia (Cross-Disorder Group of the Psychiatric Genomics Consortium, 2013). The current belief is that major depression is due to genetic and environmental interaction that results in gene alteration and expression during brain development (Belmaker & Agam, 2008; Sullivan et al., 2000).

Contributing to the complex relationships between genetics, environmental factors and depression is brain structure, development, and abnormal functioning of neurotransmitters. Evidence of abnormal brain structure and function has been associated with depression; however, it is unclear if this is a cause of depression or contributes to the development of depression (Rot, Mathew, & Charney, 2009). Some of the most common neurotransmitters associated with depression are monoamines (dopamine, norepinephrine, and serotonin), gamma-aminobutyric acid (GABA) and glutamate (Krishnan, 2016). It was originally postulated that diminished neurotransmission of serotonin and norepinephrine were the cause of depression; however, this simplistic notion has been replaced with a much more complex dynamic system that is responsible for the development of depression (Krishnan, 2016; Nutt et al., 2006).

Unfortunately, there is not a single cause of depression but rather a multitude of various psychosocial, genetic, and neurobiological risk factors, which often interact and contribute to the development of depression. Exposure to a specific risk factor does not determine onset; however, exposure to multiply risk factors can increase an individual's chances of developing depression (Green et al., 2010).

2.2 ANXIETY

Anxiety disorders account for 14.6% of Disability Adjusted Life Years (DALYs) caused by mental and substance use disorders worldwide (Whiteford et al., 2013). A 12-month prevalence rate of any anxiety disorder is estimated to be 18.1% (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). A lifetime diagnosis of anxiety was found to range between 5.4% to 17.2% based on a study that evaluated lifetime diagnosis of anxiety between several different states within the United States (Strine et al., 2015). However, alternative studies suggest lifetime prevalence of anxiety disorders to be as high as 28.8% (Kessler, Berglund, et al., 2005). The large difference in rates may be attributed to some studies measuring all forms of anxiety while others only consider one type. Specification of which is often unclear. However, generalized anxiety is the most common form of mental disorders found in primary health care settings (Wittchen, 2002). Lifetime estimates of generalized anxiety disorders range from 5% (Kessler, Berglund, et al., 2005) to 11.9% (Kessler et al., 2008). In addition to being the most common anxiety disorder, comorbidity is common in patients with the majority of patients experiencing either major depression or another form of anxiety (Wittchen, 2002). Findings show that as many as 66% of patients suffering from generalized anxiety disorder (GAD) reported at least one other disorder, making GAD highly comorbid (Wittchen, Zhao, Kessler, & Eaton, 1994).

Because anxiety disorders have been linked to other mental and physical disorders, it is a major public health problem with significant economic consequences. The annual economic burden associated with anxiety in the United States is estimated to be between 42 and 47 billion dollars (DuPont et al., 1996; Greenberg & Sisitsky, 1999; Rice & Miller, 1998). Unfortunately, this cost is outdated, and the current cost is likely to be much higher.

2.2.1 History of Anxiety

Anxiety has only recently been considered a mental disorder; however, early references to anxiety and similar symptoms date back to Hippocrates' time (Crocq, 2015). In the Hippocratic Corpus, there is a description of a man suffering from great fear when he sees a certain woman and Hippocrates labels cases like this a medical condition called phobia (Hippocrates, 1994). In addition to Hippocrates, Cicero and Seneca played important roles in identifying anxiety, which has influenced modern day clinical features and treatments (Crocq, 2015). Anxiety was generally a characteristic symptom of depression or melancholia, and Cicero was the first to distinguish anxiety from sadness and identify the differences between trait anxiety (*anxietas*) and state anxiety (*angor*) (Cicero, 2002). Seneca, on the other hand, was most notably known for his book *Of Peace of Mind*, which described the ideal state of "peace of mind" (Seneca & Trans: Stewart, 1900; Seneca, 1984). This book describes the ideal state, which is when one is undisturbed (Seneca & Trans: Stewart, 1900; Seneca, 1984). He believed that the fear of death was the primary reason for being unable to live a carefree life (Seneca & Trans: Stewart, 1900; Seneca, 1984).

Seneca's ideas led to Kierkegaard and Heidegger's philosophy of living in the present moment, which have led to current-day techniques used in mindfulness meditation (Crocq, 2015). Coincidentally, Epicurus, a Greek philosopher from a competing school of thought, also stated the best way to achieve a happy life was to live free of worry and reach a state of *ataraxia* (Hossenfelder, 2006). Despite current beliefs about anxiety being a new medical condition, anxiety has been identified as a mental illness since 460 B.C. and thought to be the cause of a fear that prevented one from enjoying life to the fullest.

Despite early written records of anxiety, it seemed to disappear for centuries before formally being reintroduced during the 1600s by Robert Burton (Crocq, 2015). Burton is best known for his work on depression; however, at that point in time melancholia often incorporated anxiety (Crocq, 2015; Horwitz, 2013). Patients were more likely to be diagnosed with disorders other than anxiety. Burton believed fear and sorrow to be linked and were common symptoms of melancholia; however, he also noted that they could occur independently of each other (Burton, 1621; Crocq, 2015). Burton's understanding of anxiety as well as depression coincides with phenomenon often seen today with these two disorders being highly comorbid. Between the 16th and 18th centuries, people experiencing panic attacks or other forms of anxious symptoms were commonly diagnosed with either melancholia or "vapors" which was a term used for a nervous disorder (Montagne & Chaptal, 1750). It was not until the late 19th and early 20th centuries when anxieties became fully recognized (Crocq, 2015). George Beard described anxiety as being one potential symptom of neurasthenia (Shorter, 2005). However, Freud and Kraepelin are most well known during this period. Many of the terms used for anxiety disorders today were coined by Freud (Crocq, 2015), and Kraepelin recognized anxiety as the most frequent disorder of all abnormal effects, which affects the body and the mental state (Crocq, 2015; Kraepelin, 1909). Kraepelin also identified the differences between phobias, specifically, social phobias and other anxieties (Kraepelin, 1909). Throughout history, anxiety has been present; however, it has often been diagnosed and linked to depression. These previous findings led the way for the development and criteria written in the DSMs during the 20th century.

2.2.2 Diagnostic Criteria for Anxiety

Until the publication of the first DSM, anxiety disorders were often diagnosed as other disorders, such as depression. The publication of the first DSM did not identify anxiety disorders specifically; however, psychoneurotic disorders labeled anxiety as a chief characteristic for the disorder (American Psychiatric Association, 1952). In the first edition of the DSM, anxiety was perceived to be a danger signal created from a threat within the personality due to repressed emotions, resentment, or hostility (American Psychiatric Association, 1952). These danger signals give impulses, which result in anxiety and may be unconsciously expressed through a defense mechanism such as depression, conversion, or displacement (Crocq, 2015). Depending on how the anxious symptoms manifested, it could be labeled as anxiety reaction, dissociative reaction/conversion reaction, phobic reaction, obsessive-compulsive reaction, or depressive reaction (American Psychiatric Association, 1952; Crocq, 2015). Similar to the first edition, the second edition of the DSM included anxious symptoms under a different disorder, neuroses (American Psychiatric Association, 1968; Crocq, 2015). The type of anxious symptoms indicated the type of neuroses experienced. The categories were anxiety neurosis, hysterical neurosis, phobic neurosis, obsessive-compulsive neurosis, depressive neurosis, and neurasthenic neurosis (American Psychiatric Association, 1968; Crocq, 2015). In the first two editions of the DSM, anxiety was a characteristic of the specific disorder rather than labeled as a disorder.

The development of the third DSM clearly identified anxiety disorders, but labeling and criteria continued to change up to the most recent DSM, DSM-5. In the third edition of the DSM, an entire chapter was designated for anxiety disorders, which included phobic disorders, anxiety states, and post-traumatic stress disorders (American Psychiatric Association, 1980). The previous anxiety neurosis found in the second addition was separated into panic disorder and

generalized anxiety disorder under the category of anxiety states (American Psychiatric Association, 1980; Crocq, 2015). Additionally, the recognition of separate anxiety disorders experienced among children and adolescents were identified in the third edition (American Psychiatric Association, 1980). Other than the addition of acute stress disorders, the fourth edition of the DSM was largely the same as the third (American Psychiatric Association, 1994). The most recent edition of the DSM grouped anxiety disorders into three categories; anxiety, obsessive compulsive disorder, and trauma-and stressor-related disorders, which were all based on genetic, psychological, and neurobiological features (American Psychiatric Association, 2013; Crocq, 2015). The characteristics of anxiety disorders in the latest DSM match those recorded by ancient Greek and Latin philosophers while treatments from the 16th century contributed to modern day mindfulness exercises. The historical transition of the definition of anxiety disorders has been complex and may only continue as further research is conducted.

2.2.3 Risk Factors for Anxiety

From an evolutionary viewpoint, anxiety is a normal emotion designed to protect an individual from dangerous places and situations; however, exposure and duration of exposure to risk factors may cause stress levels to increase beyond the normal anxiety threshold and impair quality of life (Crocq, 2015). Similar to depression, anxiety is not the result of exposure to a single risk factor. A multitude of risk factors have been linked to anxiety, which affect an individual's susceptibility.

Social and environmental risk factors have been associated with anxiety. The size of an individual's social network and subsequently the number of social connections have been associated with anxiety disorders (Beekman & Bremmer, 1998; Forsell & Winblad, 1998;

Forsell, 2000). This association may be correlated to emotional support received, which has also been linked to anxiety (Beurs, Beekman, & Geerlings, 2001). Thus, anxiety is more prevalent in individuals with smaller networks, fewer social connections and lower emotional support (Beekman & Bremmer, 1998; Beurs et al., 2001; Forsell & Winblad, 1998; Forsell, 2000). Additionally, an individual's childhood socioeconomic status has been linked to anxiety (Moffitt et al., 2007). Low self-esteem or lack of self-efficacy (Beurs et al., 2001; Zelst & Beurs, 2003), low income level (Acierno, Brady, & Gray, 2002), unemployment (de Graaf, Bijl, Smit, Vollebergh, & Spijker, 2002), and even low educational attainment (Beekman & Bremmer, 1998) have been found to be risk factors for developing anxiety. Some of the most prominent risk factors are childhood trauma or maltreatment (de Graaf et al., 2002; Moffitt et al., 2007; Zelst & Beurs, 2003), loss of a family member (Beekman & Bremmer, 1998; Beekman, 2000; Beurs et al., 2001), and negative or traumatic life events (Acierno et al., 2002; Beekman, 2000; Safren, Gershuny, Marzol, Otto, & Pollack, 2002; Zelst & Beurs, 2003).

Recently, genetic risk factors have been explored to determine an individual's predisposition to anxiety as well as other mental disorders. The most common genes studied relate to neurotransmitter metabolism and signaling or stress response (Donner et al., 2012). Serotonin transporter and tryptophan hydroxylase genes are considered to be critical candidate genes in the development of generalized anxiety disorder (GAD) where a specific genotype (short/short) of the serotonin transporter gene-linked polymorphic functional region was found significantly more often in patients with GAD compared to control subjects (You, Hu, Chen, & Zhang, 2005). Although there have been advances in genetic research, it is still unclear how genes and environment interact in the development of anxiety. Further research is needed to

understand the gene-environment interaction that may contribute to the development of anxiety disorders.

2.3 SOCIAL NETWORKING WEBSITES

The explosive growth of social networking websites has led to approximately 74% of online adults in the United States being actively engaged in at least one social networking website (Duggan, 2014). Recent estimates indicate that the average user logs 1.72 hours per day on social networking platforms, representing about 28 percent of all online activity (Bennett, 2014). Specifically, the most popular social networking website, Facebook, is used by 72% of online adults, with 70% of its users being active daily (Duggan, 2015). However, other websites such as LinkedIn, Instagram, and Twitter have continued to gain popularity in recent years despite having fewer users and less daily activity (Duggan, 2015). Social networking websites are used to maintain connection and relationships with distant friends and family members or create new connections with others who share similar interests. Social networking websites can improve the lives of users by increasing accessibility and connection with others virtually. However, recent research has begun to investigate the potential negative effects these websites have on psychological well-being. Current literature shows mixed results regarding the use of social networking and psychological well-being. Due to the surge of online social networking platforms and subsequently the increased usage by the consumers, it is important to understand the association between heavy use and psychological well-being.

2.3.1 Benefits of Social Networking Use

Social networking websites improve connections between friends and family members; therefore, they can improve the quality of life for individuals afflicted with mental and physical disorders. Internet use has been shown to increase social involvement, and improve mental health (Kraut et al., 2002). It has been shown that internet usage can improve communication with friends and family members, thus decreasing depression in consumers (Bessière, Pressman, Kiesler, & Kraut, 2010). Similarly, increased use of the most popular social networking platform, Facebook, has been associated with increased social capital (Ellison et al., 2007; Steinfield, Ellison, & Lampe, 2008), life satisfaction (Valenzuela et al., 2009), and perceived social support (Manago et al., 2012).

Social networking websites often allow for individuals with similar interests to connect and share ideas in chat rooms or other group settings. Chat rooms and email contact have been shown to be associated with decreased depression (Morgan & Cotten, 2003). Often individuals who suffer from chronic diseases use the internet to connect with others who share their experience and often form a support group (Bender, Jimenez-Marroquin, & Jadad, 2011). One such example is the irritable bowel syndrome (IBS) self-help and support group that is the first and largest-online community to help patients with IBS (IBS Group, 2016). These social support networks can foster empowerment (Barak, Boniel-Nissim, & Suler, 2008), social capital (Beaudoin & Tao, 2007) and improve psychological well-being (Winzelberg et al., 2003). Social networking websites have been shown to have positive effects on an individual's psychological well-being by increasing social capital and support and improving life satisfaction.

2.3.2 Negatives of Social Networking Use

Although internet use and social networking websites can increase social capital and social support, they have also been linked to negative mental health effects. For example, heavy internet use has been associated with a reduced sense of well-being (Huang, 2010), as well as, an increase in loneliness, depression, and stress (Kraut et al., 1998). Despite these negative mental health outcomes, lonely and depressed individuals have been shown to develop a preference for creating social connections online, which can potentially worsen their mental health status further (Caplan, 2003). One study found that individuals who spent more time online were less likely to spend time with friends and family in their social environment (Nie & Erbring, 2002). This reduction in face-to-face interaction could contribute to the negative mental health effects.

Similar findings have been found for heavy online social networking use as have been found for substantial internet use. Individuals who spend more time on social networking platforms may experience less emotional support than those who spend less time on these platforms (Shensa, Sidani, Lin, Bowman, & Primack, 2015). Additionally, overall time spent on social media was associated with increased risk of depression (Lin et al., 2016). Users of the most popular social networking website, Facebook, said they felt worse after using the website and demonstrated an overall decline in life satisfaction over a period of two weeks (Kross et al., 2013). Reasons for this decline in well-being could be because people felt their time spent on social networking platforms to be less meaningful (Sagioglou & Greitemeyer, 2014) or a decline in mood could be due to constant social comparisons, which can create the feeling that their life did not compare to their peers (Chou & Edge, 2012; Fox & Moreland, 2015; Ryan & Xenos, 2011). Increased use of internet or social networking websites may heighten an individual's risk

of negative outcomes such as a decrease in life satisfaction or mood, and worsening of depression.

2.3.3 LinkedIn

LinkedIn is a professional social networking website that aims “to connect the world’s professionals to make them more productive and successful” (LinkedIn, 2016). Between 2014 and 2015 the percentage of users that logged in to LinkedIn daily increased significantly from 13% to 22% (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015). In contrast to Facebook, LinkedIn plays a pivotal role for adult men and women pursuing employment or advancing their careers. As young adults enter the workforce, LinkedIn is used as a tool by professionals to seek employment (Ryan, 2014), advance their career (Mayer, 2015), and excel in their current position (Shin, 2014). Although research studies have investigated the effects of social networking websites on psychological well-being, there currently is no research exploring the effects of professional social networking platforms. The majority of previous studies focused on the most common social networking website, Facebook (Kross et al., 2013; Ryan & Xenos, 2011; Sagioglou & Greitemeyer, 2014). Exploring the association between increased use of LinkedIn and an individual’s mental health status is an important preliminary step to understanding the relationship for future research and public health prevention programs.

3.0 JOURNAL ARTICLE

3.1 TITLE PAGE

ASSOCIATIONS BETWEEN INTERNET-BASED PROFESSIONAL SOCIAL NETWORKING AND EMOTIONAL DISTRESS

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3.2 ABSTRACT

Professional social networking websites are commonly used among young professionals. In light of emerging concerns regarding social networking use and emotional distress, the purpose of this study was to investigate the association between frequency of use of LinkedIn, the most commonly used professional social networking website, and depression and anxiety among young adults. In October 2014, we assessed a nationally-representative sample of 1,787 U.S. young adults between the ages of 19 to 32 regarding frequency of LinkedIn use, depression and anxiety, and socio-demographic covariates. We measured depression and anxiety using validated Patient-Reported Outcomes Measurement Information System measures. We used bivariable and multivariable logistic regression to assess the association between LinkedIn use and depression and anxiety while controlling for age, sex, race, relationship status, living situation, household income, education level, and overall social media use. In weighted analyses, 72% of participants did not report use of LinkedIn, 16% reported at least some use but less than once each week, and 12% reported use at least once per week. In multivariable analyses controlling for all covariates, compared with those who did not use LinkedIn, participants using LinkedIn at least once per week had significantly greater odds of increased depression (adjusted odds ratio [AOR] = 2.10, 95% confidence interval [CI] = 1.31-3.38) and increased anxiety (AOR = 2.79, 95% CI = 1.72-4.53). LinkedIn use was significantly related to both outcomes in a dose-response fashion. Future research should investigate directionality of this association and possible reasons for it.

3.3 INTRODUCTION

About three-fourths of online adults participate in online social networking.¹ Recent estimates indicate that the average user logs 1.72 hours per day on social networking platforms, which represents about 28 percent of all online activity.²

Recently, professional social networking sites have been increasing in popularity. LinkedIn, the most commonly used professional social networking website, aims “to connect the world’s professionals to make them more productive and successful.”³ Between 2014 and 2015, the percentage of LinkedIn users who logged in daily increased from 13% to 22%.^{4,5} LinkedIn plays an important role in career development with many individuals reporting it to be highly valuable both in the process of seeking employment,⁶ advancing their careers,⁷ and succeeding in their current position.⁸

However, to our knowledge, associations between use of professional networking websites such as LinkedIn and emotional health outcomes have not been previously assessed in the literature. This is an important gap because there are conceptual reasons why use of networking sites such as LinkedIn may be either positively or negatively associated with depression and/or anxiety.⁹ Alternatively, there could be no association. For example, it may be that individuals who use sites such as LinkedIn frequently may seek gratification,¹⁰ feel more connected,¹¹ more self-assured, and feel less anxious about work-related issues. However, it is also possible that people who use LinkedIn frequently may also feel increased depression and/or anxiety for a number of reasons, including feeling guilty for the time “wasted”¹² and feeling unable to measure up to others’ accomplishments.^{13–15} It may also be that increased use of LinkedIn results in similar outcomes as Internet and Facebook addiction, resulting in lower self-

esteem and overall life satisfaction.¹⁶ Alternatively, it may also have no effect on an individual's mental health.¹⁷ Therefore, this is an ideal topic for an empiric study.

The purpose of our study was to determine the association between frequency of use of LinkedIn and depression and anxiety among a nationally representative sample of young adults. Although by definition a cross-sectional study cannot help determine causality, we considered such a study an ideal way to begin exploring this new area. Given the mixed findings of prior research on other social networking sites, we did not have a specific hypothesis for the current investigation.

3.4 METHODS

3.4.1 Participants and Setting

We recruited our sample with the assistance of Growth From Knowledge (GfK), a large-scale web-based research company.¹⁸ GfK uses random digit dialing and address-based sampling to recruit participants representing over 97% of the U.S. population,¹⁹ and provides all participants with Internet access and computer hardware if needed. This process combines the validity of random sampling with the convenience and feasibility of Web-based data collection.

In October and November of 2014, we emailed our survey to a random sample of 3,048 non-institutionalized adults between the ages of 19-32 who had responded to a prior survey on a different topic (tobacco use). All participants provided Web-based consent to participate in the research study and 1,787 participants responded during this period. Compared with non-respondents, respondents were no different in terms of age, sex, or race/ethnicity. Each

participant received a \$15 cash-equivalent for his or her participation in the study, which required a median completion time of 15 minutes. The University of Pittsburgh Institutional Review Board approved the study.

3.4.2 Measures

Online surveys completed by participants assessed use of LinkedIn (independent variable), depression and anxiety (dependent variables), and covariates.

3.4.2.1 Use of LinkedIn

We measured use of LinkedIn by asking participants how often they visited or used LinkedIn on a weekly basis. We adapted this item and its response categories from those suggested by the Pew Internet Research study.²⁰ Because of the non-normal distribution of the data and to improve interpretability of results, we collapsed the independent variable based on the distribution of data. Categories represented included “None,” “Less than once a week,” and “1 or more times per week.” However, to ensure robustness of our results, we also conducted all analyses with this independent variable as continuous.

3.4.2.2 Emotional Distress

We measured both depression and anxiety using the respective Patient-Reported Outcomes Measurement Information System (PROMIS) 4-item short forms. PROMIS is a National Institute of Health Roadmap initiative that aims to provide precise, valid, reliable, and standardized questionnaires that measure patient-reported outcomes (PROs) across the domains of physical, mental, and social health.^{21,22} To improve precision and decrease respondent burden,

Item Response Theory was used to develop these scales.²³ Each scale used Likert-type items to assess the frequency of symptoms during the previous seven days. Response choices were “Never,” “Rarely,” “Sometimes,” “Often,” and “Always” (1-5). Thus, the total possible points ranged from 4-20 for each scale.

3.4.2.3 Depression

The PROMIS depression scale has been validated against the Center for Epidemiological Studies and Depression Scale (CES-D),^{22,24} the Beck Depression Inventory (BDI-II),^{22,24} and Patient Health Questionnaire (PHQ-9)^{22,24}. The depressive symptoms measured included negative mood, views of self-worthlessness, and social cognition (i.e. loneliness).²⁵ Because PROMIS measures the severity of depressive symptoms across a continuum of severity, rather than providing a dichotomous cut-off for clinical depression, we collapsed raw scores into tertiles of “Low,” “Medium,” and “High” for primary analysis. Using this measure as continuous was not possible because the sample distribution of scores was non-normal with a pronounced floor effect: 45% of respondents had the lowest possible score on this measure.

3.4.2.4 Anxiety

The PROMIS anxiety scale has been validated against the Mood and Anxiety Symptoms Questionnaire (MASQ), Generalized Anxiety Disorder Scale (GAD-7), and the Positive and Negative Affective Schedule (PANAS).²⁶ Symptoms assessed included feeling fearful, anxious misery, and hyperarousal.²³ For similar reasons to those described above regarding the depression scale, raw scores were categorized into tertiles of “Low,” “Medium,” and “High” for primary analysis. Approximately 38.3% of respondents had the lowest possible score on this measure.

3.4.2.5 Covariates

We assessed seven sociodemographic variables that may be associated with both social networking and emotional health outcomes. For analysis, we divided age into three groups (19-23; 24-26; 27 and above) and race/ethnicity into four categories (White, non-Hispanic; Black, non-Hispanic; Hispanic; Biracial/Multiracial/Other, non-Hispanic). We also assessed other demographic factors including living situation (with a parent or guardian; with significant other; or other), relationship status (single or in a committed relationship), household income (under \$30,000; \$30,000-\$74,999; or \$75,000 or more), and educational level (high school or less; some college; Bachelor's degree or higher). We also included self-reported average minutes per day spent on social media (0-30; 31-60; 61-120; 120 or more) as a covariate. We did this in order to isolate the association between LinkedIn use and depression and anxiety beyond any contribution of overall social media use.

3.4.3 Analysis

All participants who completed the PROMIS depression and anxiety scale questionnaire were included in analyses. Because <1% had missing data for these variables, this did not affect our results. Additionally, in order to take advantage of the nationally representative nature of the data, study-specific survey weights were used for all analyses. These weights were computed to adjust for non-response, non-coverage, and under- or over-sampling resulting from the sample design.

We first summarized the independent variable, the two dependent variables, and the eight covariates to describe the population.

Second, we used bivariable and multivariable ordered logistic regression to assess associations between our independent variable (LinkedIn use) and each of the dependent variables (depression and anxiety). Primary multivariable analyses controlled for all covariates. The presence of an overall linear trend between each ordered categorical independent variable and the dependent variables were tested using an established method. Ordered logistic regression was appropriate because each of the outcomes was ordered categorical. The proportional odds assumption was satisfied.

We conducted three sets of sensitivity analyses to assess the robustness of our results. First, while primary analyses collapsed LinkedIn use into three categories to improve interpretability of results, we also conducted all analyses using LinkedIn use as a continuous variable. Second, while primary analyses controlled for all covariates, confirmatory analyses included a more parsimonious set of covariates (only covariates with an association of $P < 0.15$ with the outcome). Third, while primary analyses used sampling weights, we also conducted all analyses without sampling weights. Because results for all sensitivity analyses were similar to primary results in terms of both magnitude of findings and significance, only primary results are presented here.

Statistical analyses were performed with Stata 12.1 (Stata Corp, College Station, Texas), and two-tailed P -values < 0.05 were considered to be significant.

3.5 RESULTS

3.5.1 Participants

The weighted sample was 50.2% female, 57.6% white, 13.0% African American, 20.5% Hispanic, and 8.9% of other race/ethnicity. Just over half (55.5%) were in a committed relationship, and about one-third (35.6%) reported living with a significant other. Those in the low household income category (under \$30,000) accounted for 22.8%, while those in the medium (between \$30,000 and \$74,000) and high (\$75,000 and above) categories accounted for 38.5% and 38.7%, respectfully. Approximately one-third of participants (35.9%) did not attend college, and 25.8% had a Bachelor’s degree or higher (Table 1).

Table 2 *Clinical, Social Media Use, and Demographic Characteristics of Participants*

TABLE 1. CLINICAL, SOCIAL MEDIA USE, AND DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

<i>Characteristic</i>	<i>All Participants (n = 1780) n (Column %)^a</i>	
<i>Clinical Characteristics</i>		
Anxiety Symptoms (raw score)		
Low (4)	682	(38.3)
Medium (5-8)	593	(33.3)
High (9-20)	505	(28.4)
Depressive Symptoms (raw score)		
Low (4)	793	(44.5)
Medium (5-8)	521	(29.3)
High (9-20)	466	(26.2)
<i>Social Media Use Characteristics</i>		
Checks per week on LinkedIn		
None	1,282	(72.04)
Less than once a week	292	(16.4)
1 or more times per a week	206	(11.6)
Minutes per day on Social Media		

Table 2 Continued

0-30	530	(29.8)
31-60	370	(20.8)
61-120	427	(24.0)
121+	453	(25.5)
<i>Socio-demographic Characteristics</i>		
Age, y		
19-23	598	(33.6)
24-26	442	(24.8)
27 and above	740	(41.6)
Sex		
Female	893	(50.2)
Male	887	(49.9)
Race		
White, non-Hispanic	1,026	(57.6)
Black, non-Hispanic	231	(13.0)
Hispanic	366	(20.5)
Biracial/Multiracial/Other, non-Hispanic	157	(8.9)
Relationship Status		
Single	792	(44.5)
In a committed Relationship	988	(55.5)
Living Situation		
Parent/Guardian	606	(34.1)
Significant other	633	(35.6)
By Myself/With Friends/Other	540	(30.4)
Household Income		
Low	406	(22.8)
Medium	685	(38.5)
High	689	(38.7)
Education Level		
High school or less	640	(35.9)
Some college	682	(38.3)
Bachelor's degree or higher	458	(25.8)

Please note that percentages for each variable may not total to 100 due to rounding. "Single" relationship status includes widowed, divorced, and separated, while "In a committed relationship" includes those who were engaged, married, or in a domestic partnership. For household income, low was defined as under \$30,000 per year, medium as \$30,000-\$74,999, and high as \$75,000 and above.

3.5.2 LinkedIn Use, Depression, and Anxiety

After applying sampling weights, 72.0% of the sample reported not using LinkedIn, while 16.4% reported using it less than once a week. The remaining 11.6% reported using LinkedIn one or more times per week. Nearly half (44.5%) reported no depressive symptoms in the past week and were placed in the low-risk group. About one-fourth (26.2%) were classified as high-risk, and the remaining 29.3% of participants were in the medium group. Just over one-third (38.3%) reported no anxious symptoms in the past week and were placed in the low-risk group. High-risk represented 28.4%, and medium-risk represented 33.3%.

3.5.3 Bivariable Associations

3.5.3.1 Depression

Participants who used LinkedIn at least once per week had significantly greater odds of having increased depression (Odds Ratio [OR]=1.90, 95% CI=1.22-2.97) compared to those who did not use LinkedIn. An overall linear association was found between LinkedIn use and depression ($P=0.01$) (Table 2). Covariates that had bivariable associations with depression were minutes per day on social media, sex, race, household income, and education level (Table 2).

Table 3. Bivariable and Multivariable Associations Between LinkedIn Use and Depression

TABLE 2. BIVARIABLE AND MULTIVARIABLE ASSOCIATIONS BETWEEN LINKEDIN USE AND DEPRESSION

<i>Characteristic</i>	<i>Bivariable OR (95 % CI)</i>	<i>P-value</i>	<i>Multivariable AOR (95 % CI)</i>	<i>P-value</i>
<i>Social Media Use</i>				
Frequency of Linked In Use		0.01		0.002
None	1 [Reference]		1 [Reference]	
< 1 check per week	1.01 (0.73-1.39)		1.35 (0.95-1.91)	
1 or more checks per week	1.90 (1.22-2.97)		2.10 (1.31-3.38)	
Minutes Per Day		<0.001		0.02
0-30	1 [Reference]		1 [Reference]	
31-60	1.19 (0.81-1.74)		1.18 (0.79-1.75)	
61-120	1.90 (1.29-2.80)		1.69 (1.14-2.49)	
121+	1.75 (1.22-2.52)		1.50 (1.02-2.19)	
<i>Socio-demographic</i>				
Age, y		0.76		0.57
19-23	1 [Reference]		1 [Reference]	
24-26	1.58 (1.12-2.22)		1.80 (1.23-2.64)	
27 and above	0.97 (0.71-1.33)		1.16 (0.79-1.70)	
Sex				
Female	1 [Reference]		1 [Reference]	
Male	0.72 (0.55-0.95)		0.76 (0.58-1.00)	
Race				
White, non-Hispanic	1 [Reference]		1 [Reference]	
Black, non-Hispanic	0.74 (0.46-1.19)		0.53 (0.33-0.86)	
Hispanic	1.23 (0.86-1.78)		0.96 (0.66-1.40)	
Biracial/Multiracial/Other	1.74 (1.19-2.55)		1.66 (1.10-2.48)	
Relationship Status				
Single	1 [Reference]		1 [Reference]	
In a committed Relationship	0.75 (0.57-0.98)		0.82 (0.57-1.17)	
Living Situation				
Parent/Guardian	1 [Reference]		1 [Reference]	
Significant other	0.77 (0.54-1.08)		0.88 (0.56-1.37)	
By Myself/With Friends/Other	0.94 (0.67-1.31)		0.91 (0.64-1.30)	
Household Income		0.001		0.004
Low	1 [Reference]		1 [Reference]	
Medium	0.65 (0.46-0.93)		0.67 (0.47-0.96)	
High	0.53 (0.38-0.75)		0.59 (0.40-0.88)	

Table 3 Continued

Education Level			0.001		0.004
High school or less	1	[Reference]		1	[Reference]
Some college	0.77	(0.54-1.08)		0.76	(0.53-1.10)
Bachelor's degree or higher	0.56	(0.40-0.78)		0.49	(0.32-0.75)

Abbreviations: CI, confidence interval; AOR, adjusted odds ratio.

Please note that *P*-values represent linearity for overall associations between ordered categorical variables and the outcome. "Single" relationship status includes widowed, divorced, and separated, while "In a committed relationship" includes those who were engaged, married, or in a domestic partnership. For household income, low was defined as under \$30,000 per year, medium as \$30,000-\$74,999, and high as \$75,000 and above

3.5.3.2 Anxiety

Participants who used LinkedIn at least once per week had significantly greater odds of having increased anxiety (OR=2.58, 95% CI=1.64-4.05) (Table 3) compared to those who did not use LinkedIn. A linear association was found between LinkedIn use and anxiety ($P<0.001$) (Table 3). Other variables associated with anxiety in bivariable analyses included minutes per day on social media, sex, race, living situation, household income, and education level (Table 3).

Table 4. Bivariable and Multivariable Associations Between LinkedIn Use and Anxiety

TABLE 3. BIVARIABLE AND MULTIVARIABLE ASSOCIATIONS BETWEEN LINKEDIN USE AND ANXIETY

<i>Characteristic</i>	<i>Bivariable OR (95 % CI)</i>	<i>P-value</i>	<i>Multivariable AOR (95 % CI)</i>	<i>P-value</i>
<i>Social Media Use</i>				
Frequency of Linked In Use		<0.001		<0.001
None	1 [Reference]		1 [Reference]	
Less than once a week	1.15 (0.84-1.58)		1.42 (1.02-1.98)	
1 or more times per a week	2.58 (1.64-4.05)		2.79 (1.72-4.53)	
Minutes Per Day		<0.001		0.006
0-30	1 [Reference]		1 [Reference]	
31-60	1.20 (0.80-1.81)		1.13 (0.77-1.68)	
61-120	1.69 (1.18-2.44)		1.41 (0.97-2.06)	
121+	2.08 (1.46-2.98)		1.64 (1.14-2.38)	

Sociodemographic

Table 4 Continued

Age, y			0.47		0.97
19-23	1	[Reference]		1	[Reference]
24-26	1.09	(0.79-1.51)		1.19	(0.83-1.71)
27 and above	0.89	(0.65-1.21)		0.99	(0.68-1.46)
Sex					
Female	1	[Reference]		1	[Reference]
Male	0.63	(0.48-0.82)		0.63	(0.48-0.83)
Race					
White, non-Hispanic	1	[Reference]		1	[Reference]
Black, non-Hispanic	0.92	(0.59-1.43)		0.71	(0.45-1.12)
Hispanic	1.28	(0.87-1.87)		1.03	(0.70-1.50)
Biracial/Multiracial/ Other	2.18	(1.37-3.46)		1.68	(1.05-2.70)
Relationship Status					
Single	1	[Reference]		1	[Reference]
In a committed Relationship	0.73	(0.55-0.95)		0.85	(0.59-1.18)
Living Situation					
Parent/Guardian	1	[Reference]		1	[Reference]
Significant other By Myself/With Friends/Other	0.70	(0.50-0.98)		0.75	(0.48-1.16)
0.94	(0.67-1.31)		0.84	(0.59-1.18)	
Household Income			0.008		0.02
Low	1	[Reference]		1	[Reference]
Medium	0.74	(0.53-1.05)		0.81	(0.57-1.14)
High	0.62	(0.44-0.87)		0.65	(0.44-0.97)
Education Level			0.04		0.03
High school or less	1	[Reference]		1	[Reference]
Some college	0.80	(0.57-1.13)		0.75	(0.52-1.07)
Bachelor's degree or higher	0.71	(0.51-0.99)		0.64	(0.42-0.97)
Education Level			0.04		0.03
High school or less	1	[Reference]		1	[Reference]
Some college	0.80	(0.57-1.13)		0.75	(0.52-1.07)
Bachelor's degree or higher	0.71	(0.51-0.99)		0.64	(0.42-0.97)

Abbreviations: CI, confidence interval; AOR, adjusted odds ratio.

Please note that *P*-values represent linearity for overall associations between ordered categorical variables and the outcome. "Single" relationship status includes widowed, divorced, and separated, while "In a committed relationship" includes those who were engaged, married, or in a domestic partnership. For household income, low was defined as under \$30,000 per year, medium as \$30,000-\$74,999, and high as \$75,000 and above

3.5.4 Multivariable Associations

3.5.4.1 Depression

In multivariable analyses, compared with participants who did not use LinkedIn, those who used LinkedIn at least once each week had significantly greater odds of having increased depression (Adjusted Odds Ratio [AOR]=2.10, 95% CI=1.31-3.38) (Table 2). We also found an overall linear association between LinkedIn use and depression ($P<0.002$). Other covariates that had an independent association with depression included minutes per day on social media, age, race, household income, and education level. For example, those who spend over 121 minutes per day on social media had greater odds of having increased depression (AOR=1.50, 95% CI=1.02-2.19). Compared with those ages 19-23, participants between the ages of 24-26 had greater adjusted odds of having increased depression (AOR=1.80, 95% CI=1.23-2.64), but those ages 27 and above did not have significantly increased odds of increased depression. Compared with White participants, Black participants had lower adjusted odds for depression, but biracial/multiracial individuals had higher odds for depression. Higher income and higher education were each independently associated with reduced odds depression (Table 2).

3.5.4.2 Anxiety

Compared with participants who did not use LinkedIn, those who checked LinkedIn at least once each week had significantly greater odds of increased anxiety (AOR=2.79, 95% CI=1.72-4.53) (Table 3). Additionally, there was a linear association between LinkedIn use and anxiety ($P<.001$) (Table 3). Covariates that had an independent association with anxiety included minutes per day on social media, sex, race, household income, and education level. For example, compared to those in the lowest quartile of social media use, participants who spent 121 minutes

or more per day on social media had greater odds of having increased anxiety (AOR=1.64, 95% CI=1.14-2.38) (Table 3). Also, biracial/multiracial participants were found to have greater odds of having increased anxiety (AOR=1.68, 95% CI=1.05-2.70) compared to white participants (Table 3). Increased household income and education level were each associated with reduced odds of anxiety (Table 3).

3.6 DISCUSSION

In this cross-sectional nationally-representative study of young adults, we found strong independent, linear associations between LinkedIn use and both depression and anxiety. This was true even when we controlled for total social media use, suggesting that our main finding was not simply an artifact of overall increased social media use.

These findings are consistent with prior work suggesting that overall social media use is associated with depression.^{12,13,27,28} However, this study extends findings of these other studies in two ways. First, these prior studies have focused only on depression, while the current study suggests that there is an association between social media use and anxiety as well. Second, prior studies focused on Facebook^{12,13,27} or multiple social media platforms,²⁸ while this current study examines use of LinkedIn. To our knowledge this is the first study to focus on a professional social networking platform.

It is important to acknowledge immediately that, because our data were cross-sectional, it is not possible to determine directionality of findings. For example, it may be that individuals who already feel depressed and/or anxious tend to turn to LinkedIn in an attempt to improve their personal life by exploring career options. Similarly, it is possible that individuals who are

experiencing job dissatisfaction and work-related stress in particular use LinkedIn more often to explore alternative job options. Furthermore, depressed people with anhedonia or social anxiety may find it easier to access an electronic platform rather than to try to engage with others in personal social and/or professional interactions.

Alternatively, it may be that those who spend more time on platforms such as LinkedIn may experience envy and/or the distorted belief that all others lead happier and more successful lives.^{14,29} While profiles are of course highly constructed, individuals who explore these sites, especially those who already may have a measure of anxiety and/or depression, may incorrectly get the sense that these idealized representations seen represent reality.^{14,29} This explanation is consistent with previous findings that suggest envy and social comparison are important mediators of social media use and emotional distress.^{29,30}

Whether the use of LinkedIn is a consequence of or a contributor to depression and anxiety, its continued use may further exacerbate these conditions for three reasons. First, there is some suggestion that individuals who spend a good deal of time online may feel regret and a sense of time wasted, exacerbating negative self-appraisal.¹² Second, increasing use of Internet portals such as LinkedIn can engender a type of addiction that is now recognized by the most recent Diagnostic and Statistical Manual of psychiatric conditions as an established condition related to both depression and anxiety.^{31,32} Third, some individuals who spend more time on social network platforms have an increased risk of experiencing negative interactions that may influence mood.³³ While LinkedIn is not often considered a fertile ground for displays of anger and disagreement, future qualitative research may be valuable in determining whether there are examples of such problematic interactions on this platform.

While our findings suggest overall patterns indicating associations between LinkedIn use and depression and anxiety, the situation is almost certainly more complex and nuanced in reality. For example, there are likely subsets of individuals who may experience improved mood as a consequence of using LinkedIn and sharing their successes with friends and colleagues. Indeed, some studies suggest that social networking may improve mood by facilitating positive social connection and improving social capital.³⁴⁻³⁸ Similarly, it may be that individuals experience negative emotions initially upon job searching with LinkedIn, but that ultimately they make improved professional connections leading to improved mood.

Therefore, it will be valuable for future research to examine a more nuanced set of variables assessing contextual factors related to LinkedIn use. For example, it may be interesting for future assessments to assess the reason for using LinkedIn, such as whether it is for networking, job searching, or gathering information and business ideas. It also may be useful to gather in future research more information about users' "type" of use. For example, some users tend to only observe others' interactions (these users are sometimes called "lurkers") while others tend to participate in discussions more actively. By more carefully typing users, future researchers may be able to determine whether risk of depression and/or anxiety may be higher with certain types of use.

Regardless of directionality, the suggestion that LinkedIn use and emotional health concerns are associated may open the door to interventions. For example, others have found potential benefit for leveraging Facebook to alleviate mental health concerns.^{39,40} While our findings are early, it may still be useful to begin to consider the particular character and type of interventions appropriate for this medium.

3.7 LIMITATIONS

Because we surveyed a large, national group of individuals, we were not able to use gold standard assessments of LinkedIn use, such as applications that confirm time logged into this platform. Therefore, we had to rely on self-report. It may be valuable for future work to validate self-report using intensive methodologies such as ecological momentary assessment. Similarly, our measures of depression and anxiety, while validated against other measures, were not gold standard assessments, which would have required professional interviews by mental health professionals. It should also be noted that we focused on LinkedIn as opposed to other work-related social media sites such as BranchOut, Zerply, AngelList, PartnerUp, VisualCV, and Opprtunity. While we focused on LinkedIn because it is the most commonly used social media site of its type, our findings are not necessarily generalizable to other social media sources.

3.8 CONCLUSION

Our results support and extend previous research studies that have found associations between depression or anxiety and use of other social networking platforms. Because many individuals, especially young adults, are beginning to use platforms such as LinkedIn on a regular basis, it will be valuable for future work to continue exploring directionality of these associations and contextual factors that may moderate these associations.

3.9 ACKNOWLEDGEMENTS

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3.10 AUTHOR DISCLOSURE STATEMENT

No competing financial interests exist.

3.11 REFERENCES

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4.0 THESIS CONCLUSION

In this cross-sectional nationally-representative study of young adults, we found strong independent, linear associations between LinkedIn use and both depression and anxiety. Although these results are similar to previous research studies that have examined an association between emotional disturbances and use of social networking platforms, we have further extended the field. Our study was novel as we evaluated the use of a professional social networking website, LinkedIn and its relationship to anxiety and depression. Prior research has focused primarily on a single platform, Facebook (Kross et al., 2013; Ryan & Xenos, 2011; Sagioglou & Greitemeyer, 2014), or multiple platforms (Lin et al., 2016). Additionally, to our knowledge prior research has looked at depression only (Kross et al., 2013; Lin et al., 2016; Ryan & Xenos, 2011; Sagioglou & Greitemeyer, 2014). Furthermore, this study is the first to evaluate the relationship between social networking use and anxiety.

Because many individuals, especially young adults, are beginning to use platforms such as LinkedIn on a regular basis, it will be valuable for future work to continue exploring directionality of these associations and contextual factors that may attenuate these associations. Future research should include qualitative methods to identify common themes around the use of LinkedIn, as it will advance the field of mental health and social networking by identifying risk factors. Additionally, reasons for use may help practitioners understand the potential benefits and consequences of using social networking websites and more clearly identify users who may be particularly susceptible to increased depression and anxiety with increased use.

Previous studies have found similar associations between internet social networking use and depression or other mood symptoms. For example, individuals who checked their social networking website regularly felt a decline in mood and overall life satisfaction (Huang, 2010; Kross et al., 2013). Similarly, studies showed how individuals often compare themselves to others on these social networking platforms, which may result in individuals believing that others are happier and more successful than them (Chou & Edge, 2012; Fox & Moreland, 2015; Steers, 2014). Although individuals engage in different activities on social networking websites, which may influence their mood, our study supports many of the previous studies that have found an association between increased use and negative affects on an individual's mental health. Because many studies have found this association, it is important for researchers to capture how individuals interact and engage on these websites to better understand why this association exists. It is likely that previously depressed or anxious individuals seek online support. This may result in increased use of social networks. It may also be that individuals who spend several hours on these websites may experience negative interactions, which may result in a depressed mood or anxious symptoms. Exploring how individuals interact on these platforms should be the next step for future research studies.

As depression makes its way to the leading cause of disability adjusted life years (DALY) and social networking websites continue to grow in popularity, it is important for public health practitioners to investigate the potential impacts these sites have on mental health. Anxiety and depression are common mental health disorders that are highly comorbid and are have large economic cost associated with them. We need to address these disorders by increasing awareness, reducing stigma and clearly identifying potential risk factors. This study supports previous studies that have found an association between increased use and emotional distress;

however, future studies need to address the contextual factors of this relationship in order to determine how increased use of social networking websites is related to depression and anxiety. After a clear understanding of this relationship, we can then begin to educate and warning those who may be at greater risk based on user types, interactions experienced online, and perceived susceptibility.

APPENDIX: GfK SURVEY



**Waterpipes Survey - Main
October 2014
- Study Details -**

Note: *This page may be removed when the questionnaire is sent to the client. However, it must exist in the version sent to OSD.*

SNO	S19025
Survey Name	Waterpipes Survey - Main
Client Name	University of Pittsburgh
Great Plains Project Number	310.111.00018.1
Project Director Name	Jwo
Team/Area Name	S2

Samvar (Include name, type and response values. "None" means none. Blank means standard demos. This must match SurveyMan.)	xWthdrn: Withdraw flag ; 1-Yes, 2-No
Specified Pre-coding Required	
Timing Template Required (y/n)	Enabled by default
Multi-Media	

Important: (This is the first iteration of wave 2...the numbers have changed since wave 1, as many of the questions have been removed/added/rearranged)

Waterpipes Survey Main
October, 2014
- Questionnaire -

[DISPLAY]

You completed a survey approximately 18 months ago that was being conducted by the University of Pittsburgh as part of a research project entitled “Waterpipe tobacco smoking among U.S. young adults” that investigates U.S. young adults’ use of waterpipes (otherwise known as hookah) to smoke tobacco and factors associated with use. This research project is funded by the National Institutes of Health (NIH) through a research grant (R01-CA140150-01). You are now being invited to complete a final follow-up survey for the same research project.

The survey will be on a variety of topics related to your health behaviors and beliefs. It will take about 15-20 minutes for you to complete.

In addition, there are financial incentives for you to participate in this study. You will be eligible for 15,000 points for completing the follow-up survey. The GfK Knowledge Networks point payment system equates 5,000 points to \$5.00, which will be mailed to you as a check from GfK Knowledge Networks (\$15.00 for the completed survey).

If you have questions about your rights as a participant in this study, or are dissatisfied at any time with any aspect of the “Waterpipe tobacco smoking among U.S. young adults” survey, you may contact one of the following: for technical issues, contact GfK Knowledge Networks at (800) 782-6899 and for issues related to the research, contact Brian Primack, MD, PhD, Principal Investigator at 412-586-9789.

IF XWITHDRWN =1, SHOW THE FOLLOWING DISPLAY THROUGH QZIP

[IF XWITHDRWN =1, DISPLAY]

Thank you again for your assistance with this important national study! To be sure we have the latest information we will start with some demographic questions.

[PPEDUC]

[PPEDUCAT]

QEDUC

[IF XWITHDRWN =1, SP; PROMPT]

What is the highest level of school you have completed?

- No formal education..... 1
- 1st, 2nd, 3rd, or 4th grade 2
- 5th or 6th grade 3
- 7th or 8th grade..... 4
- 9th grade 5
- 10th grade..... 6
- 11th grade..... 7
- 12th grade NO DIPLOMA 8
- HIGH SCHOOL GRADUATE – high school
DIPLOMA or the equivalent
(GED) 9
- Some college, no degree 10
- Associate degree 11
- Bachelor’s degree 12
- Master’s degree 13
- Professional or Doctorate degree..... 14

Variable name: PPEDUCAT
 Type: SP
 Variable Text: Education - categorical
 Response list:
 1. Less than HS
 2. HS
 3. Some college
 4. Bachelor or higher

QEDUC	PPEDUCAT
1-8	1
9	2
10-11	3
12-14	4

[IF XWITHDRWN =1, PPINCIMP]

QINCINTRO

The next question is about the total income of YOUR HOUSEHOLD for the PAST 12 MONTHS. Please include your income PLUS the income of all members living in your household (including cohabiting partners and armed forces members living at home). Please count income BEFORE TAXES and from all sources (such as wages, salaries, tips, net income from a business, interest, dividends, child support, alimony, and Social Security, public assistance, pensions, or retirement benefits).

QINC

[IF XWTHDRWN =1, SP; PROMPT]

Was your total HOUSEHOLD income in the past 12 months...

- Below \$35,000 1
- \$35,000 or more 2
- Don't know 3

QINC2

BASE: QINC=1

[IF XWTHDRWN =1, SP; PROMPT]

We would like to get a better estimate of your total HOUSEHOLD income in the past 12 months before taxes. Was it...

- Less than \$5,000 1
- \$5,000 to \$7,499 2
- \$7,500 to \$9,999 3
- \$10,000 to \$12,499 4
- \$12,500 to \$14,999 5
- \$15,000 to \$19,999 6
- \$20,000 to \$24,999 7
- \$25,000 to \$29,999 8
- \$30,000 to \$34,999 9

QINC3

BASE: QINC=2

[IF XWTHDRWN =1, SP; PROMPT]

We would like to get a better estimate of your total HOUSEHOLD income in the past 12 months before taxes. Was it...

- \$35,000 to \$39,999 1
- \$40,000 to \$49,999 2
- \$50,000 to \$59,999 3
- \$60,000 to \$74,999 4
- \$75,000 to \$84,999 5
- \$85,000 to \$99,999 6
- \$100,000 to \$124,999 7
- \$125,000 to \$149,999 8
- \$150,000 to \$174,999 9

\$175,000 or more 10

Variable name: PPINCIMP

Type: SP

Variable Text: HH income - profile and imputed

Response list:

1. Less than \$5,000
2. \$5,000 to \$7,499
3. \$7,500 to \$9,999
4. \$10,000 to \$12,499
5. \$12,500 to \$14,999
6. \$15,000 to \$19,999
7. \$20,000 to \$24,999
8. \$25,000 to \$29,999
9. \$30,000 to \$34,999
10. \$35,000 to \$39,999
11. \$40,000 to \$49,999
12. \$50,000 to \$59,999
13. \$60,000 to \$74,999
14. \$75,000 to \$84,999
15. \$85,000 to \$99,999
16. \$100,000 to \$124,999
17. \$125,000 to \$149,999
18. \$150,000 to \$174,999
19. \$175,000 or more

QINC2	QINC3	PPINCIMP
1		1
2		2
3		3
4		4
5		5
6		6
7		7
8		8
9		9
	1	10
	2	11
	3	12
	4	13
	5	14
	6	15
	7	16
	8	17
	9	18
	10	19

[PPMARIT]
QMARIT

[IF XWTHDRWN =1, SP]

Are you now married, widowed, divorced, separated, never married, or living with a partner?

- Married 1
- Widowed..... 2
- Divorced 3
- Separated 4
- Never married..... 5
- Living with partner..... 6

[PPHHHEAD]

QHEAD

[IF XWTHDRWN =1, SP]

Is your residence in . . .

- Your name only..... 1
- Your name with someone else's name
(jointly owned or rented) 2
- Someone else's name only 3

Variable name: PPHHHEAD
 Type: SP
 Variable Text: Household head
 Numeric range: 0-1 or 99

QHEAD	PPHHHEAD
1-2	1
3	0

[IF XWTHDRWN =1, PPHHSIZE]

QSIZE

[NUMBER BOX; RANGE 1-15; DO NOT ALLOW DECIMALS]

Including yourself, how many people currently live in your household at least 50% of the time?

[SPACE]

Please remember to include babies or small children, include unrelated individuals (such as roommates), and also include those now away traveling, at school, or in a hospital.

[\[PPT0 1\]](#)

[\[PPT2 5\]](#)

[\[PPT6 12\]](#)

[\[PPT13 17\]](#)

[\[PPT18OV\]](#)

Note this question does not appear in the Core profile. For panel members it is collected as part of recruitment.

QAGEGROUP

[NUMERIC GRID; RANGE 0-15; DO NOT ALLOW DECIMALS]

How many members are there in each age group in your household?

- 0 to 1 year old
- 2 to 5 years old
- 6 to 9 years old
- 10 to 12 years old
- 13 to 17 years old
- 18 years old or older

[PPWORK]

QWORK

[IF XWTHDRWN =1, SP]

Which statement best describes your current employment status?

- Working – as a paid employee 1
- Working – self-employed 2
- [SPACE]**
- Not working – on temporary layoff
from a
job 3
- Not working – looking for work 4
- [SPACE]**
- Not working – retired 5
- Not working – disabled 6
- Not working – other 7

[PPRENT]

QOWN

[IF XWTHDRWN =1, SP]

Are your living quarters. . .

- Owned or being bought by you or
someone in your household 1
- Rented for cash 2
- Occupied without payment of
cash rent 3

[PPHOUSE]

QHOUSE

[IF XWTHDRWN =1, SP]

Which best describes the building where you live?

A one-family house detached from any other house	1
A one-family house attached to one or more houses.....	2
A building with 2 or more apartments	3
A mobile home	4
Boat, RV, van, etc.....	5

[PPNET]

QINTER

[IF XWTHDRWN =1, SP; PROMPT]

Do you or anyone in this household connect to the Internet from home?

Yes	1
No.....	0

[PPSTATEN]

[IF XWTHDRWN =1, PPREG4; PROMPT]

QSTATE

[DROP DOWN LIST OF ALL STATES + WASHINGTON DC]

In which state do you live?

ME	11
NH	12
VT	13
MA	14
RI	15
CT	16
NY	21
NJ	22
PA	23
OH	31
IN	32
IL	33
MI	34
WI	35
MN	41
IA	42
MO	43
ND	44
SD	45
NE	46
KS	47
DE	51
MD	52

DC	53
VA.....	54
WV	55
NC	56
SC	57
GA	58
FL	59
KY.....	61
TN	62
AL	63
MS.....	64
AR	71
LA	72
OK	73
TX	74
MT	81
ID	82
WY.....	83
CO	84
NM	85
AZ	86
UT.....	87
NV	88
WA	91
OR.....	92
CA	93
AK	94
HI.....	95

Variable name: PPREG4

Type: SP

Variable Text: Region 4 – based on State of residence

Response list:

1. Northeast
2. Midwest
3. South
4. West

PPSTATEN	PPREG4
11-23	1
31-47	2
51-74	3
81-95	4

[IF XWTHDRWN =1, PPMSACAT; PROMPT]

QZIP

[NUMBER BOX – RANGE 0 TO 99999]

What is the zipcode where you live?

Zipcode:

Variable name: QZIP

Type: SP

[INTRODISPLAY]

For the following questions, please select the answer that best describes you.

[SP]

Q1. Which of the following applies to you? (*student_2*)

- I am a current high school student (1)
- I am a current college student (2)
- I am a current graduate student (3)
- I am not currently a student (4)

[Q1=2]

Q2. Where do you currently live? (*collegelive_2*)

- Campus residence hall (1)
- Fraternity/sorority housing (2)
- Other college/university housing (3)
- Off-campus housing (4)
- Parent/guardian housing (5)
- Other (please specify): _____ (6)

[MP;PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q3. Who do you currently live with? (*livingsit_2*)

- Parent/guardian (1)
- Significant other (2)
- Friends/acquaintances (3)
- By myself (4) [SP]
- Other (please specify): [TEXT BOX] _____ (5)

[SP]

Q4. What is your current relationship status? (*relationship_2*)

- Single (1)
- Engaged or in a committed dating relationship (2)
- Married or with a domestic partner (3)
- Separated, divorced, or widowed (4)

[SHOW Q5 AND Q6 ON THE SAME SCREEN]

[SP;PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q5. Are you a religious person? (*religex_2*)

- Definitely yes (1)
- Somewhat yes (2)
- Somewhat no (3)
- Definitely no (4)

[SP;PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q6. Are you a spiritual person? (*religint_2*)

- Definitely yes (1)
- Somewhat yes (2)
- Somewhat no (3)
- Definitely no (4)

[GRID;PROMPT]

[CUSTOM PROMPT TEXT: "YOUR ANSWER IS IMPORTANT TO US. PLEASE PUT YOUR BEST GUESS."]

Q6a. Please respond to the following items by marking one box per row.

	Poor (1)	Fair (2)	Good (3)	Very Good (4)	Excellent (5)
In general, would you say your health is... (<i>health_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In general, would you say your quality of life is... (<i>quality_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[GRID;PROMPT]

[CUSTOM PROMPT TEXT: "YOUR ANSWER IS IMPORTANT TO US. PLEASE PUT YOUR BEST GUESS."]

Q7. Thinking about the past 2 weeks, please indicate how often you have been bothered by:

	Not at all (1)	Several days (2)	More than half the days (3)	Nearly everyday (4)
Little interest or pleasure in doing things (<i>depress1_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feeling down, depressed or hopeless (<i>depress2_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[GRID;PROMPT]

[CUSTOM PROMPT TEXT: "YOUR ANSWER IS IMPORTANT TO US. PLEASE PUT YOUR BEST GUESS."]

Q8. In the past 7 days...

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
I felt worthless... (<i>worthless_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt helpless... (<i>helpless_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt depressed... (<i>depressed_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt hopeless... (<i>hopeless_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt fearful... (<i>fearful_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt it hard to focus on anything other than my anxiety... (<i>focus_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My worries overwhelmed me... (<i>worries_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt uneasy... (<i>uneasy_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[GRID;PROMPT]

[CUSTOM PROMPT TEXT: "YOUR ANSWER IS IMPORTANT TO US. PLEASE PUT YOUR BEST GUESS."]

Q9. In the past 7 days...

	Not at all (1)	A little bit (2)	Somewhat (3)	Quite a bit (4)	Very much (5)
My sleep was refreshing... (<i>sleeprefresh_2</i>)	<input type="checkbox"/> (5)	<input type="checkbox"/> (4)	<input type="checkbox"/> (3)	<input type="checkbox"/> (2)	<input type="checkbox"/> (1)
I had a problem with my sleep ... (<i>sleepprob_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I had difficulty falling asleep... (<i>sleepdiff_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[GRID;PROMPT]

[CUSTOM PROMPT TEXT: "YOUR ANSWER IS IMPORTANT TO US. PLEASE PUT YOUR BEST GUESS."]

Q10. In the past 7 days...

	Very poor (5)	Poor (4)	Fair (3)	Good (2)	Very good (1)
My sleep quality was ... (<i>sleepqual_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[GRID;PROMPT]

[CUSTOM PROMPT TEXT: "YOUR ANSWER IS IMPORTANT TO US. PLEASE PUT YOUR BEST GUESS."]

[NO ITEM STEM]

Q11.

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)
I feel left out... (<i>leftout_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel that people barely know me... (<i>barelyknow_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel isolated from others... (<i>isolated_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel that people are around me but not with me... (<i>notwith_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have someone who will listen to me when I need to talk... (<i>listen_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have someone to confide in or talk to about myself or my problems... (<i>confide_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have someone who makes me feel appreciated... (<i>appreciated_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have someone to talk with when I have a bad day... (<i>badday_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[GRID;PROMPT]

[CUSTOM PROMPT TEXT: "YOUR ANSWER IS IMPORTANT TO US. PLEASE PUT YOUR BEST GUESS."]

Q12. How well do the following statements describe your personality?

I see myself as someone who...

	Strongly Disagree (0) (0)	(1) (1)	(2) (2)	(3) (3)	(4) (4)	(5) (5)	(6) (6)	(7) (7)	(8) (8)	(9) (9)	Strongly Agree (10) (10)
...is reserved <i>(extravertr_2)</i>											
...is generally trusting <i>(agreeable_2)</i>											
...tends to be lazy <i>(conscientiousr_2)</i>											
...is relaxed, handles stress well <i>(neuroticr_2)</i>											
...has few artistic interests <i>(openr_2)</i>											
...is outgoing, sociable <i>(extravert_2)</i>											
...tends to find fault with others <i>(agreeabler_2)</i>											
...does a thorough job <i>(conscientious_2)</i>											
...gets nervous easily <i>(neurotic_2)</i>											
...has an active imagination <i>(open_2)</i>											

[GRID, SP]

Q12A.

Please select the answer that best describes you.

	Definitely No <i>(1)</i>	Probably No <i>(2)</i>	Don't Know <i>(3)</i>	Probably Yes <i>(4)</i>	Definitely Yes <i>(5)</i>
Losing control over how much I eat concerns me <i>(eat_control_2)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Someone (such as a health professional, a family member, or friend) has expressed concerns about my eating patterns <i>(eat_disorder_2)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My weight negatively affects the way I feel about myself <i>(eat_feel_2)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am satisfied with my eating patterns <i>(eat_satisfied_2)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Food dominates my life <i>(eat_dominant_2)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[DISPLAY]

The following questions ask about some health beliefs and behaviors. For the following questions, smoking includes even one puff. Remember, your responses will be completely confidential.

[SP;PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us and is completely confidential. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Remember, your response is completely confidential."]

Q13. Have you ever smoked from a cigarette? (*cigever_2*)

- Yes (1)
- No (2)

[IF Q13=1; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us and is completely confidential. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Remember, your response is completely confidential."]

Q14. Have you smoked from a cigarette in the past twelve months, even a puff? (*cigyear_2*)

- Yes (1)
- No (2)

[IF Q14=1 SHOW Q15-Q21]

[IF Q14=1]

[NUMBOX 0-30]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us and is completely confidential. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Remember, your response is completely confidential."]

Q15. Within the past 30 days, how many days did you smoke cigarettes? (*cig30day_2*)

Please enter a value.

[IF Q14=1]

[NUMBOX 0-60]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us and is completely confidential. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Remember, your response is completely confidential."]

Q16. On average, how many cigarettes did you smoke on each day that you smoked? (*cigavg_2*)

Please enter a value.

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[IF Q15 > 0; SP]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us and is completely confidential. Please put your best guess."]

Q17. How soon after you wake up do you smoke your first cigarette? (*ftnd1_2*)

- Within 5 minutes (1)
- 6-30 minutes (2)
- 31-60 minutes (3)
- After 60 minutes (4)

[IF Q15 > 0; SP]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us and is completely confidential. Please put your best guess."]

Q18. Do you smoke cigarettes more frequently during the first hours after awakening than during the rest of the day? (*ftnd2_2*)

- Yes (1)
- No (2)

[IF Q15 > 0; SP]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us and is completely confidential. Please put your best guess."]

Q19. Which cigarette would you hate most to give up? (*ftnd3_2*)

- The first one in the morning (1)
- Any other (2)

[IF Q15 > 0; SP]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us and is completely confidential. Please put your best guess."]

Q20. Do you smoke cigarettes if you are so ill that you are in bed most of the day? (*ftnd4_2*)

- Yes (1)
- No (2)

[IF Q15 > 0; SP]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us and is completely confidential. Please put your best guess."]

Q21. Do you find it difficult to refrain from smoking in places where it is forbidden (such as in church, at the library, in the movie theatre, etc.)? (*ftnd5_2*)

- Yes (1)
- No (2)

[IF Q13=1 AND Q14=1 AND Q15=0, REFUSED ;SP]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us and is completely confidential. Please put your best guess."]

Q17a. When you smoked cigarettes, how soon after you woke up did you smoke your first cigarette? *(ftnd1past_2)*

- Within 5 minutes (1)
- 6-30 minutes (2)
- 31-60 minutes (3)
- After 60 minutes (4)

[IF Q13=1 AND Q14=1 AND Q15=0, REFUSED ;SP]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us and is completely confidential. Please put your best guess."]

Q18a. When you smoked cigarettes, did you smoke more frequently during the first hours after awakening than during the rest of the day? *(ftnd2past_2)*

- Yes (1)
- No (2)

[IF Q13=1 AND Q14=1 AND Q15=0, REFUSED; SP]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us and is completely confidential. Please put your best guess."]

Q19a. When you smoked cigarettes, which cigarette did you hate most to give up? *(ftnd3past_2)*

- The first one in the morning (1)
- Any other (2)

[IF Q13=1 AND Q14=1 AND Q15=0, REFUSED; SP]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us and is completely confidential. Please put your best guess."]

Q20a. When you smoked cigarettes, did you smoke when you were so ill that you were in bed most of the day? *(ftnd4past_2)*

- Yes (1)
- No (2)

[IF Q13=1 AND Q14=1 AND Q15=0, REFUSED; SP]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us and is completely confidential. Please put your best guess."]

Q21a. When you smoked cigarettes, did you find it difficult to refrain from smoking in places where it was forbidden (such as in church, at the library, in the movie theatre, etc.?) (*ftnd5past_2*)

- Yes (1)
- No (2)

[SP]

Q22. Have you ever smoked an e-cigarette (electronic cigarette)? (*ecigever_2*)

- Yes (1)
- No (2)

[IF Q22=1;SP]

Q23. Have you smoked from an e-cigarette in the past twelve months, even a puff? (*ecigyear_2*)

- Yes (1)
- No (2)

[IF Q23= 1; numbox 0-30]

Q24. Within the past 30 days, on how many days did you smoke e-cigarettes? (*ecig30day_2*)

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[PROMPT]

[CUSTOM PROMPT TEXT: “Your answer is important to us and is completely confidential. Please put your best guess.”]

Q25. Have you ever used a vapor pen (a portable vaping device, also known as a vape pen, hookah pen, or an e-hookah)? [Please refer to picture]. (*hookpenever_2*)

- Yes (1)
- No (2)

[IF Q25=1]

[PROMPT]

[CUSTOM PROMPT TEXT: “Your answer is important to us and is completely confidential. Please put your best guess.”]

Q26. Have you used a vapor pen in the past twelve months, even one puff? (*hookpenyear_2*)

- Yes (1)
- No (2)

[IF Q26=1; NUMBOX 0-30]

[PROMPT]

[CUSTOM PROMPT TEXT: “Your answer is important to us and is completely confidential. Please put your best guess.”]

Q27. Within the past 30 days, on how many days did you use a vapor pen? (*hookpen30day_2*)

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[DISPLAY]

The next question(s) ask about marijuana use. For the following questions, smoking includes even one puff. Remember, your responses will be completely confidential.

[IF Q22=1 (USED E-CIGARETTE) OR Q25=1 (USED VAPOR PEN), SP; PROMPT]
[CUSTOM PROMPT TEXT: "Your answer is important to us and is completely confidential. Please put your best guess."]

Q27a. Do you own an e-cigarette or a vapor pen? (*hookpen30day_2*)

- Yes (1)
- No (2)

[SP]

Q28. Have you ever smoked marijuana? (*mjever_2*)

- Yes (1)
- No (2)

[IF Q28=1; SP]

Q29. Have you smoked marijuana in the past twelve months? (*mjyear_2*)

- Yes (1)
- No (2)

[IF Q29=1; NUMBOX 0-30]

Q30. Within the past 30 days, on how many days did you smoke marijuana?
(*mj30day_2*)

Please enter a value.








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[DISPLAY]

The following questions ask about some additional health beliefs and behaviors. Remember, your responses will be completely confidential.

[NUMBOX 0-50]








Q31. Think back over the past 30 days. What is the highest number of drinks you have had in a single sitting (about 2 hours)? (*bingealc_2*)

2 fl oz ¹ of regular beer	=	-9 fl oz ⁸ of malt liquor (shown in a 12- oz glass)	=	5 fl oz of table wine	=	3 -4 oz of fortified wine (such as sherry or port; 3.5 oz shown)	=	2 -3 oz of cordial, liqueur, or aperitif (2.5 oz shown)	=	1 .5 oz of brandy (a single jigger or shot)	=	1.5 fl oz shot of 80-proof spirits ("hard liquor")
												
about 5% alcohol		about 7% alcohol		about 12% alcohol		about 17% alcohol		about 24% alcohol		about 40% alcohol		about 40% alcohol

PLEASE ENTER A VALUE.

[SP]

Q32. How many times in the past 30 days have you had [IF PPGENDER=1 INSERT: "5"; IF PPGENDER=2 INSERT: "4"] or more alcoholic drinks on a single drinking occasion (about 2 hours)? (*drink30_2*)

2 fl oz ¹ of regular beer	=	-9 fl oz ⁸ of malt liquor (shown in a 12- oz glass)	=	5 fl oz of table wine	=	3 -4 oz of fortified wine (such as sherry or port; 3.5 oz shown)	=	2 -3 oz of cordial, liqueur, or aperitif (2.5 oz shown)	=	1 .5 oz of brandy (a single jigger or shot)	=	1.5 fl oz shot of 80-proof spirits ("hard liquor")
												
about 5% alcohol		about 7% alcohol		about 12% alcohol		about 17% alcohol		about 24% alcohol		about 40% alcohol		about 40% alcohol

None (1)

- Once (2)
- Twice (3)
- Three times (4)
- Four times (5)
- Five times (6)
- Six times (7)
- Seven times (8)
- More than seven times (9)

[SP]

Q33. Within the past 30 days, did you drive a vehicle after drinking any alcohol at all? (*drinkdrive_2*)

- Yes (1)
- No (2)

[DISPLAY]

The following questions ask about smoking tobacco from a hookah (also known as a water-pipe or narghile). These questions only ask about smoking tobacco, NOT marijuana. For following questions, smoking includes even one puff.

[SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us and is completely confidential. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Remember, your response is completely confidential."]

Q34. Have you ever smoked tobacco from a hookah? (*hookever_2*)

- Yes (1)
- No (2)

[IF Q34=1; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us and is completely confidential. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Remember, your response is completely confidential."]

Q35. Have you smoked tobacco from a hookah in the past twelve months? (*hookyear_2*)

- Yes (1)
- No (2)

[IF Q34=1 AND Q13=1]

[SP]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q36. Which did you try first: regular cigarettes or hookah? (*whichfirst_2*)

- Regular cigarettes (1)
- Hookah (2)

[IF Q35=1; NUMBOX 0-30]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Please put your best guess."]

Q37. Within the past 30 days, on how many days did you smoke tobacco from a hookah? (*hook30day_2*)

Please enter a value.

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[IF Q34=1; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Please put your best guess."]

Q38. The last time you smoked hookah, how soon after waking up in the morning did you smoke your first bowl of hookah tobacco? (*hookwake_2*)

- within 5 minutes
- 6-30 minutes
- 1-3 hours
- 4-6 hours
- 7-9 hours
- 10 or more hours

[IF Q37 > 0; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Please put your best guess."]

Q39. How many days in a row could you comfortably go without smoking hookah? (*hookwithout2*)

- 0 days
- 1 day
- 2 days
- 3 days
- 4 days
- 5 days

- 6 days
- 7 or more days
- I could comfortably go the rest of my life without smoking hookah

[IF Q37 > 0; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Please put your best guess."]

Q40. How often do you get annoyed when hookah smoking is not allowed (such as in someone's home who doesn't allow it)? (*hookprohib_2*)

- All the time (1)
- Most of the time (2)
- Sometimes (3)
- Never (4)

[IF Q37 > 0; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Please put your best guess."]

Q41. How often do you prefer smoking hookah instead of doing other activities? (*hookactiv_2*)

- All the time (1)
- Most of the time (2)
- Sometimes (3)
- Never (4)

[IF Q37 > 0; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Please put your best guess."]

Q42. Would you smoke hookah if you were so sick that you stayed home from work or school? (*hooksick_2*)

- Definitely (1)
- Probably (2)
- Possibly (3)
- No (4)

[IF Q37 > 0; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Please put your best guess."]

Q43. How often do you smoke hookah alone? (*hookalone_2*)

- All of the times I smoke (1)
- Most of the times I smoke (2)
- Some of the times I smoke (3)
- I always smoke with others (4)

[IF Q34= 1 and Q35=1 AND Q37=0/REFUSED; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: “Your answer is important to us. Please put your best guess.”]

[CUSTOM PROMPT #2: “Your response to this item is very important to the research study. Please put your best guess.”]

Q39a. When you smoked hookah, how many days in a row could you comfortably go without smoking hookah? (*hookwithoutpast_2*)

- 0 days
- 1 day
- 2 days
- 3 days
- 4 days
- 5 days
- 6 days
- 7 or more days
- I could have comfortably gone the rest of my life without smoking hookah

[IF Q34=1 AND Q35=1 AND Q37=0/REFUSED; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: “Your answer is important to us. Please put your best guess.”]

[CUSTOM PROMPT #2: “Your response to this item is very important to the research study. Please put your best guess.”]

Q40a. When you smoked hookah, how often did you get annoyed when hookah smoking was not allowed (such as in someone’s home who didn’t allow it)? (*hookprohibpast_2*)

- All the time (1)
- Most of the time (2)
- Sometimes (3)
- Never (4)

[IF Q34=1 AND Q35=1 AND Q37=0/REFUSED; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: “Your answer is important to us. Please put your best guess.”]

[CUSTOM PROMPT #2: “Your response to this item is very important to the research study. Please put your best guess.”]

Q41a. When you smoked hookah, how often did you prefer smoking hookah instead of doing other activities? (*hookactivpast_2*)

- All the time (1)
- Most of the time (2)
- Sometimes (3)

- Never (4)

[IF Q34=1 AND Q35=1 AND Q37=0/REFUSED; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Please put your best guess."]

Q42a. When you smoked hookah, would you smoke hookah if you were so sick that you stayed home from work or school? (*hooksickpast_2*)

- Definitely (1)
- Probably (2)
- Possibly (3)
- No (4)

[IF Q34=1 AND Q35=1 AND Q37=0/REFUSED; SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Please put your best guess."]

Q43a. When you smoked hookah, how often did you smoke hookah alone? (*hookalonepast_2*)

- All of the times I smoked (1)
- Most of the times I smoked (2)
- Some of the times I smoked (3)
- I always smoked with others (4)

[IF Q34=1; NUMBOX 1-99]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q44. Think back to the **last day you smoked tobacco from a hookah**. How many **different times** did you smoke during that day? (For example, if you smoked once in the morning and once at night, that counts as two times.) (*hook1day_2*)

Please enter a value.

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[IF Q34=1; NUMBOX 1-99]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q45. Think back to the **last time you smoked tobacco from a hookah**. How many **bowls** (also sometimes called “heads”) did you smoke? (*hookbowls_2*)

Please enter a value.

--	--	--

[SP]

Q46. Do you own a hookah? (*hookown_2*)

- Yes (1)
- No (2)

[IF Q34=1 AND Q46=1; SP]

[PROMPT]

[CUSTOM PROMPT TEXT: “Your answer is important to us. Please put your best guess.”]

Q47. How often do you use your own personal hookah when you smoke? (*hookprefer_2*)

- All of the times I smoke (1)
- Most of the times I smoke (2)
- Some of the times I smoke (3)
- Never (4)

[Q34=1; MP]

[PROMPT]

[CUSTOM PROMPT TEXT: “Your answer is important to us. Please put your best guess.”]

[PROMPT IF “OTHER” SELECTED AND NOTHING IS FILLED]

Q48. Where have you ever obtained hookah products? (Please check all that apply)

- From a physical store (1- checked; 2- not checked)(*hookstore_2*)
- Online/website (1; 2) (*hookweb_2*)
- As a gift (1; 2) (*hookgift_2*)
- From a friend/acquaintance (1; 2) (*hookacq_2*)
- At a bar/ café/ restaurant that allows hookah smoking (1; 2) (*hookcafe_2*)
- Other, please describe: _____ (1; 2; also coded as write-in words) (*hookother_2*)

[Q34=1; MP]

[PROMPT]

[CUSTOM PROMPT TEXT: “Your answer is important to us. Please put your best guess.”]

[PROMPT IF “OTHER” SELECTED AND NOTHING IS FILLED]

Q49. How have you learned to use hookah products? (Please check all that apply)

- Taught by friends/acquaintances (1- checked; 2- not checked) (*lrnfriends_2*)
- Taught by a staff member at a hookah bar or café (1; 2)(*lrnstaff_2*)
- From a website/online video (1; 2) (*lrnweb_2*)

- Other, please describe: _____ (1; 2; also coded as write-in words) (lnother_2)

[IF Q34=1; GRID]

[PROMPT]

[CUSTOM PROMPT TEXT: “Your answer is important to us. Please put your best guess.”]

Q50. How many times have you smoked tobacco from a hookah in these settings or situations?

	Never (1)	1-2 times (2)	3-5 times (3)	6+ times (4)
Your home (<i>home_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A friend or acquaintance’s home (<i>friendhome_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A bar/café/restaurant that allows hookah smoking (<i>bar_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A fraternity/sorority event (<i>fraty_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A religious or ethnic group event (for example, a Jewish or Arab organization) (<i>ethnicevent_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please fill in): __[TEXTBOX]__ (<i>otherplace_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[IF Q34=1; NUMBOXES 0-PPAGE]

[PROMPT TWICE]

[CUSTOM PROMPT #1: “Your answer is important to us. Please put your best guess.”]

[CUSTOM PROMPT #2: “Your response to this item is very important to the research study. Please put your best guess.”]

Q51. How old were you when you first smoked hookah? (*hookage_2*)

Please enter a value.

[SP]

Q52. Have you ever heard of using steam stones as an alternative to tobacco in a hookah? (*steamstone_2*)

- Yes (1)
- No (2)

[IF Q52=1; SP]

Q53. Have you ever used steam stones as an alternative to tobacco in your hookah? (*steamuse_2*)

- Yes (1)
- No (2)

[IF Q52=1; SP]

Q54. Compared to hookah tobacco, do you think that steam stones are: (*steamsafe_2*)

- A lot less harmful to a person's health (1)
- A little less harmful to a person's health (2)
- About the same harm to a person's health (3)
- A little more harmful to a person's health (4)
- A lot more harmful to a person's health (5)

[IF Q53=1; SP]

Q55. Have you ever added liquid nicotine (i.e. nicotine added to e-cigarettes) to steam stones in your hookah? (*steammic_2*)

- Yes (1)
- No (2)

[SP]

[PROMPT TWICE]

[CUSTOM PROMPT #1: "Your answer is important to us. Please put your best guess."]

[CUSTOM PROMPT #2: "Your response to this item is very important to the research study. Please put your best guess."]

Q56. Do you intend to smoke tobacco from a hookah at any time in the rest of your life? (*hookintend_2*)

- Definitely yes (1)
- Probably yes (2)
- Probably no (3)
- Definitely no (4)

[GRID ;PROMPT]

[CUSTOM PROMPT TEXT: "YOUR ANSWER IS IMPORTANT TO US. PLEASE PUT YOUR BEST GUESS."]

Q57. Please check one box in each row to describe how you think hookah tobacco smoking seems.

	Definitely No (1)	Probably No (2)	Don't Know (3)	Probably Yes (4)	Definitely Yes (5)
Attractive (att_attract_2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Romantic (att_romantic_2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fun (att_fun_2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Relaxing (att_relax_2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Harmful (att_harm_2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Addicting (att_addict_2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[NUMBOX 0-100]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q58. What percentage of people your age do you think have ever smoked tobacco from a hookah? Please fill in a value from 0 to 100. If you are not sure, please take your best guess. (hookperc_2)

_____ %

(enter 0-100)

[SP; PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q59. Among people your age, how socially acceptable is it to smoke tobacco from a hookah? (hookacc_2)

- Very socially acceptable (1)
- Moderately socially acceptable (2)
- Somewhat socially acceptable (3)
- Not socially acceptable (4)

[SP; PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q60. Do you have a close friend who owns a hookah? (hookfriend_2)

- Yes (1)
- No (2)

[SP; PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q61. Do you know anyone who owns a hookah? (*hookknow_2*)

- Yes (1)
- No (2)

[SP; PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q62. Does your father smoke hookah? (*hookdad_2*)

- Yes (1)
- No (2)
- I don't know (3)

[SP; PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q63. Does your mother smoke hookah? (*hookmom_2*)

- Yes (1)
- No (2)
- I don't know (3)

[SP; PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q64. Does one or more of your siblings smoke hookah? (*hooksib_2*)

- Yes (1)
- No (2)
- I don't know (3)
- I do not have any siblings (4)

[SP; PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q65. Have you ever been inside a hookah café, hookah bar, or restaurant that allows hookah smoking? (*hookcafeever_2*)

- Yes (1)
- No (2)

[SP; PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q66. Do you know where there is a hookah café, hookah bar, or restaurant that allows hookah smoking within 10 miles of where you live? (*cafeaware_2*)

- Yes (1)
- No (2)

[GRID]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q67. Please answer these questions to the best of your knowledge. In this question, we'd like you to compare smoking a single cigarette with a single hookah tobacco smoking session.

	Definitely Cigarette (1)	Probably Cigarette (2)	Don't Know (3)	Probably Hookah (4)	Definitely Hookah (5)
Which has more tar ? (<i>know_tar_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Which has more nicotine ? (<i>know_nicotine_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Which has more carcinogens (cancer-causing chemicals)? (<i>know_carcinogen_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Which has more carbon monoxide ? (<i>know_carbon_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Which has more heavy metals (like lead, nickel, and chromium)? (<i>know_metals_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Which one is more harmful overall? (<i>know_harm_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Which one is more addictive overall? (<i>know_addictive_2</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[IF Q28=1; SP]

Q68. Have you ever smoked marijuana from a hookah, even a puff? (*hookmj_2*)

- Yes (1)
- No (2)

[DISPLAY]

The following questions ask about your use of social media, such as Facebook, Twitter, and other websites or apps that serve as a social network. For these questions, please answer about your personal use of social media, and not use that is work-related.

[GRID]

[PROMPT]

[CUSTOM PROMPT TEXT: “Your answer is important to us. Please put your best guess.”]

Q69. Please indicate how often you visit or use the following social media platforms:

	I don't use this platform <i>(1)</i>	Less than once a week <i>(2)</i>	1-2 days a week <i>(3)</i>	3-6 days a week <i>(4)</i>	About once a day <i>(5)</i>	2-4 times a day <i>(6)</i>	5 or more times a day <i>(7)</i>
Facebook <i>(facebook_2)</i>							
Twitter <i>(twitter_2)</i>							
Google+ <i>(google_2)</i>							
YouTube <i>(youtube_2)</i>							
LinkedIn <i>(linkedin_2)</i>							
Instagram <i>(instagram_2)</i>							
Pinterest <i>(pinterest_2)</i>							
Tumblr <i>(tumblr_2)</i>							
Vine <i>(vine_2)</i>							
Snapchat <i>(snapchat_2)</i>							
Reddit <i>(reddit_2)</i>							

[MEDIUM TEXTBOX] [PROMPT ONCE]

Q70. If there are social media platforms you visit or use that are NOT on the previous list, please tell us their names.

[MEDIUM TEXTBOX] (*socmedother_2*)

[numboxes 0-60, 0-24]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please fill in both boxes."]

Q71. On average, how much time per day do you spend on social media for personal use (not work-related)? (*mediahours_2, mediaminutes_2*)

____[0-24]____ hours ____[0-60]____ minutes

[GRID]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q73. How often during the last year have you...

	Very Rarely (1)	Rarely (2)	Sometimes (3)	Often (4)	Very Often (5)
Spent a lot of time thinking about social media or planned use of social media? (<i>smthink_2</i>)					
Felt an urge to use social media more and more? (<i>smmore_2</i>)					
Used social media in order to forget about personal problems? (<i>smforget_2</i>)					
Tried to cut down on the use of social media without success? (<i>smcutdown_2</i>)					
Become restless or troubled if you have been prohibited from using social media? (<i>smprohib_2</i>)					
Used social media so much that it has had a negative impact on your job/studies? (<i>smimpact_2</i>)					
Checked social media in					

the 30 minutes after waking up in the morning? <i>(smwake_2)</i>					
Checked social media in the 30 minutes before falling asleep at night? <i>(smsleep_2)</i>					

[DISPLAY]

Twitter gives you the ability to “follow” other users so that their updates come to you. Other users can also choose to “follow” you. Please provide your best estimates for the next two questions, or log onto your Twitter account if you have one.

[numbox 0-99999999]

Q74. About how many followers do you have on Twitter?

(twitterfollowers_2)

Please enter a value.

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[numbox 0-99999999]

Q75. About how many people do you follow on Twitter?

(twitterfollow_2)

Please enter a value.

--	--	--	--	--	--	--	--

[numbox 0-9999]

Q76. About how many people are listed on your official Facebook friend list? (Please provide your best estimate or log on to your Facebook account if you have one).

(fbfriends_2)

Please enter a value.

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[GRID]

[PROMPT]

[CUSTOM PROMPT TEXT: "Your answer is important to us. Please put your best guess."]

Q77. Please indicate how the following statements apply to your use of social media.

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
Social media is part of my everyday activity. <i>(smeveryday_2)</i>					
I am proud to tell people I'm on social media. <i>(smproud_2)</i>					
Social media has become part of my daily routine. <i>(smroutine_2)</i>					
I feel out of touch when I haven't accessed social media for a while. <i>(smtouch_2)</i>					
I feel I am part of a social media community. <i>(smcommunity_2)</i>					
I would be sorry if the social media that I use the most shut down. <i>(smshutdown_2)</i>					

[IF XWITHDRWN =1, TEXTBOXES]

[WRITE THE ADDRESS DATA TO A SEPARATE DATABASE THAT WILL NOT BE ACCESSIBLE TO CLIENT SERVICES TEAM]

ADD1. Those are all of our questions. Thanks so much for your participation in our survey. In appreciation, we would like to send you a check for \$10. To be sure that we have the most current information, would you please provide your mailing address so that we can put the check in the mail? This information will not be connected with your survey responses in any way.

After you have entered your information, please make sure to click "Next".

Name (First/Last): **[TEXTBOX]**

Street Address (If applicable, include unit number): **[TEXTBOX]**

City: **[TEXTBOX]**

State: **[TEXTBOX]**

Zip Code : **[TEXTBOX]**

Prefer not to receive an incentive. **[SP]**

[INSERT STANDARD CLOSE]

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