AN EXPERIMENTAL STUDY COMPARING THE BIDIRECTIONAL
RELATIONSHIP BETWEEN MARIJUANA USE AND DEPRESSION IN
EMERGING YOUNG ADULTS

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DEDICATION

To all of the adolescents and adults who struggle every day of their lives with depression and addiction, we love you and are here for you. Keep fighting for strength while we continue to search for answers.
ABSTRACT

Marijuana is the most widely used illicit drug in the United States, and depression is the most widely diagnosed mental health condition in the United States. While there has been much research on both topics, the question of how they are related is still up for debate. The works, articles and research has not adequately addressed the relationship between adolescent marijuana use and adolescent depression. This research study found statistically significant data within the confines of demographics; in addition to several sets of data corroborating past research on the complex and complicated relationship between adolescent marijuana use and depression.

The intent of this research study was to help identify what comes first in adolescence; depressive episodes that lead to marijuana use, or early marijuana use leading to depressive symptoms. The findings showed the median age of onset for depression was 15 years old for marijuana users, and the initial marijuana use for those with severe depression was also 15 years old. All other categories had median onset for both depression and marijuana use as 17 years old. This information clarified the complexity of this relationship deeming a perfectly bidirectional relationship. This research study also revealed biological predisposition, the rate of use/depression among non-users as well as how religion, race, and political affiliation effect marijuana use and depression. The intent for this study is to gather information to be used towards research in preventative measures for adolescents who are at risk for addiction or mental health issues.
KEY WORDS: Adolescent depression, Adolescent marijuana use, relationship between depression and marijuana use

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________________________________________

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INTRODUCTION

Marijuana is the most widely used illicit drug in the United States, and depression is the most widely diagnosed mental health condition in the United States. While there has been much research on both topics, the question of how they are related is still up for debate. The works, articles and research has not adequately addressed the relationship between adolescent marijuana use and adolescent depression. This research study found statistically significant data within the confines of demographics; in addition to several sets of data corroborating past research on the complex and complicated relationship between adolescent marijuana use and depression.

The intent of this research study was to help identify what comes first in adolescence; depressive episodes that lead to marijuana use, or early marijuana use leading to depressive symptoms.

Legalization of Marijuana

The controversy over marijuana use is an ongoing battle in the United States. While many countries have legalized recreational as well as medicinal uses of the substance, the US is falling behind in the legalization of marijuana. Canada legalized medicinal uses of marijuana in 2001, having hundreds of thousands of patients registered for the use of medical marijuana. On October 17, 2018, Canada passed a new Federal Cannabis Act making it legal for adults to use, possess and even grow marijuana for recreational use. According to Canada’s national statistics, 4.9 million Canadians used more than 20 grams of marijuana per person last year prior to its legalization (Bilefsky, 2018). This federal legalization of recreational use is only the second in the world.
Canada’s Prime Minister, Justin Trudeau was at the foreground of this legalization; claiming its intent is to protect youth from consumption by legalization as well as the cessation of funneling millions of dollars into organized crime and gangs (Lee, 2018). While the United States Federal government is still waging a war against drugs, individual states in the US, as well as individual counties and municipalities are going against US Federal and State Policy and legalizing medicinal and recreational use, as well as decriminalizing laws to reduce overcrowding in jails. To date, 30 States in the US, including Arizona, New Mexico, Oklahoma, Louisiana, Florida, Illinois, Montana, North Dakota, Minnesota, Michigan, Ohio, West Virginia, Pennsylvania, Mary Land, Delaware, New jersey, Connecticut, New York, New Hampshire, Rhode Island and Hawaii, to name a few have legalized the use of medical marijuana, and 9 US States, including Alaska, Nevada, Colorado, Canada, Oregon, Washington, Maryland, Vermont, and Maine have made recreational use legal (Bereke & Gould, 2018). In 2017, Harris County, Texas District Attorney, Kim Ogg created a “misdemeanor marijuana diversion program” that ultimately would decriminalize low-level (less than 4 ounces) possession of marijuana as well as paraphernalia. The intent was to reduce about 10,000 misdemeanor arrests, open-up jail cells, and save law enforcement and prosecutors time and resources (Rogers, 2018). The program has confused many Harris County youths who are ignorant of State and Federal laws and who believe that it is legal to possess less than 4 ounces of marijuana in Texas. The laws are confusing, even for those who understand the laws. While Federal and State and even County laws in Texas make it illegal to possess marijuana, Harris County has taken the stand to not prosecute, and ultimately, law enforcement agents are given the power to decide whether or not to arrest and transport
suspects to jail, while the DA decides whether or not to prosecute (Rogers, 2018). This comes while the Federal US continues to list marijuana as a Schedule I drug (the same classification as heroin), making it illegal in all 50 US States to sell, grow, possess or use cannabis (Bereke & Gould, 2018). With Canada spearheading the legalization of marijuana use, they are moving into uncharted territory. Canada will be the first country in recent history to move away from criminal prohibition of marijuana into a sector of public health and safety, and harm minimization. Canada is doing this with limited peer-reviewed research and little to no information on how policy will play out agriculturally, financially, or with the public health (Cox, 2018).

Marijuana and The Brain

The marijuana controversy is not just about legalization, but also about the benefits and dangers of its use. People on both sides of this issue are extremely passionate about their position and are committed to transforming their rivals. However, before determining benefits or dangers of the substance, it is important to understand the biology and chemistry of marijuana and how it affects the brain. The psychoactive substance in marijuana is a chemical compound called a cannabinoid. Delta-9-tetrahydrocannabinol (THC) is the most mind altering cannabinoid in marijuana (Eisinger, 2016) The brain has a “rewards system” that assists in cognition, learning, memory, as well as reinforcing cues that often predict rewards or punishment. This is accomplished through changes in mesolimbic dopamine function that occurs in the endocannabinoid system. When cannabinoid type 1 (CB1) receptors are released into the brain (via marijuana use), the presynaptic (CB1) receptors that control dopamine neuron
activity in the midbrain, nucleus acumens, and the basal ganglia is blocked which then allows those areas to be flooded with dopamine. This supports goal directed behaviors and the brain is ultimately rewarded for marijuana use (Covey, Wenzel, & Cheer, 2015).

While the body does naturally produce endocannabinoids for the relief of pain, inflammation, stress, mood or fear, ingesting or smoking marijuana creates a greater sensation to assist the body to quickly eliminate those symptoms (Eisinger, 2016).

Immediate effects of cannabis intoxication include euphoria, sensation of slowed time, reduced anxiety or anxiety (dependent upon the person), increased appetite, dry mouth, and tachycardia (or increased heart rate) (Miller, Oberbarscheidt, & Gold, 2013). These immediate side effects can pose some positive or negative qualities dependent upon the person using them, the potency, and the amount used.

**Medicinal Qualities of Marijuana**

Benefits of marijuana use, include potential medicinal uses such as curbing anxiety or stress, assisting with insomnia, reduction of pain from inflammation, increasing appetite for cancer patients who are going through chemotherapy, or reduction of nausea for multiple conditions. However, as of September 2018, there were only a few cannabinoid-based medicines available for use across all of the countries who have legalized cannabis for medicinal uses. Oral capsules containing synthetic cannabinoid, oral capsules containing synthetic delta-9-THC, an oromucosal (nasal) spray, and the US FDA, recently approved Epidiolex, an oral solution for the treatment of two rare, but severe forms of Epilepsy (Ghosh, 2018). Research of the therapeutic benefits are limited because cannabis and single cannabinoids are considered newly marketable
pharmaceuticals. This means that they must go through strict and expensive approval procedures before they can be released for public use. In addition, unlike most other pharmaceuticals, cannabis compounds have uniquely broad therapeutic applications. For example, while THC cannabinoid receptors type 1 and type 2 have been identified to primarily regulate the endocannabinoid system, researchers are still discovering evidence of effects on many other physiological systems (Garner-Wizard, 2018). With little to no peer reviewed research (or comprehension of the effects on the physiological systems) on the long-term effects of marijuana use, heavy use or early use, legalization is somewhat of an uncontrolled nationwide experiment. An even bigger concern is the potential long-term effects of adolescent marijuana use. One theory suggests a potential epigenetic memory mark resulting from early exposure to marijuana, or behavioral and physiological effects (Ghosh, 2018).

**Negative Effects of Marijuana**

Negative effects of marijuana use range from low socioeconomic status and physical health conditions to anxiety, depression, issues with memory and lower cognitive performance. In addition, there is a wide range of how socioeconomic factors become a negative side effect of marijuana use. Marijuana users are often more socioeconomically disadvantaged based on education and employment (Choi, DiNitto, & Marti, 2016). Socioeconomic disadvantage can be explained by decreased motivation caused by cannabis use. However, motivation is an extremely complex construct and isolating motivation for the sake of research can be non-exhaustive. A recent meta-analysis of 22 studies on motivation and cannabis use over the prior decade found a
causal link between reduced motivation and marijuana use. In addition, that meta-
analysis yielded additional information on reward sensitivity and motivation, stating that
reduction in one area may not require a reduction in the other (Pacheco-Colon, Limia, &
Gonzalez, 2018). Ultimately, this information suggests that over time and with chronic
use, a reduction of dopamine synthesis in the body and therefore a reduced reward
sensitivity which would lead to a lack in motivation (Bloomfield, Morgan, Kapur,
Curran, & Howes, 2014). In addition, a continuance (or cycle) of marijuana use and
lower socioeconomic status can be found due to adolescents being raised in this type of
environment. Children raised in lower socioeconomic backgrounds are at higher risk for
substance use. They may be at risk due to fewer available substance-free alternative
activities (Andrabi, Khoddam, & Leventhal, 2017), added peer pressures, as well as ease
of access.

The potential physical side effects of marijuana use include weight gain,
cardiovascular risks, as well as bronchial airway issues and greater risk of airway
cancers. The link between weight gain and marijuana use has been found to be causal,
due to a side effect of THC being increased appetite and thus higher caloric intake. With
increased weight and obesity, comes a host of potential health issues including diabetes,
high blood pressure, high cholesterol as well as heart disease. However, the link between
cardiovascular risk and marijuana use is specifically confounded by the association of
marijuana use and greater alcohol use (Rodondi, MD, Pletcher, MD, Liu, PhD, Hulley,
MD, & Sidney, MD, 2006). Long term use of alcohol can lead to many health issues
including liver disease, addiction, bowel cancer, and health risks. Long term use of
smoking marijuana can also have negative effects on the bronchial airways. Smoking
marijuana poses a greater risk of bronchitis and general airway respiratory problems. In addition, marijuana’s carcinogens and co-carcinogens pose a greater risk for all respiratory cancers (Feeney & Kampman, 2016). While on the surface, marijuana appears to have few potential side effects in and of itself, the greater risks are the psychological effects that cannabis has on the brain, and the potential effects that have not yet been studied. Cannabis is a psychoactive substance with a great number of psychological effects, and some of these effects may present differently dependent upon the person. Marijuana is not benign, and it can produce serious mental health issues if used by someone who is predisposed to mental health issues. The greatest framework available for psychological and mental disorders comes from the American Psychological Association (APA). This framework is referred to as the DSM (Diagnostic and Statistical Manual of Mental Disorders), and it outlines mental health issues and gives specific guidelines to help quantify psychological disorders. Each time the manual is updated, it is given a consecutive number. DSM-5 is the first issue that identified heavy marijuana use as an addiction and a mental disorder. A significant amount of reliable and empirical research was completed over a period of 12 years, it completed the peer review process and passed a public health committee and council on psychiatry before it was universally accepted. Cannabis use disorder is the scientific diagnosis for a person who is considered addicted to marijuana. DSM-5 gives a very specific listing to assist in this diagnosis. In addition, it also specifies several symptoms of withdrawal including irritability, anger, aggression, anxiety, sleep difficulty or disturbing dreams, decreased appetite, depression, tremors, fever, abdominal pain and headache. In addition, DSM-5 lists numerous potential mental disorders that can arise from marijuana use including depression, bipolar
disorder, a-motivational syndrome, neuropsychological decline, psychotic disorders and schizophrenia. DSM-5 states that these signs and symptoms are not attributable to any other medical conditions, disorder, intoxication or withdrawal from other substances (Miller, Oberbarnscheidt, & Gold, 2013). Marijuana use is comorbid with multiple psychological disorders that promote negative well-being, lower life expectancy, anxiety and suicidality. While not everyone who uses marijuana becomes addicted, the potential is greater for people who have a biological predisposition, those who are vulnerable, where it is readily available and the potency of the cannabis (Miller, Oberbarnscheidt, & Gold, 2013).

**Adolescent Marijuana Use**

Areas of concern about marijuana use in adolescence are the psychological effects as well as physiological effects that marijuana use has on the brain. The adolescent brain is continuing to grow, and neurobiology is rapidly developing through age 25, emerging adulthood. It is during these formative years that early onset, as well as heavy marijuana use may have lifelong negative physical effects on the brain. It is important to understand the biological and chemical changes that occur in the brain during marijuana use to be able to understand the potential neurological damages that can occur from early or heavy marijuana use. Neurological studies have indicated that the primary cannabinoid receptor (CB1) has a much greater binding effect during adolescences than during adulthood. This binding, results in an increased release of dopamine to the rewards systems, which overtime can damage the limbic system resulting in further mood swings as well as damage to the hippocampus and frontal lobe executive functions (Wright,
Scerpella, & Krista, 2016). These two areas of the brain are responsible for many functions relating to memory, learning, retaining information and decision making, to name a few. Typical symptoms of marijuana use include paranoia, slow movement and reaction time, anti-nausea effects, impaired coordination and memory, increased appetite, and altered judgment. High marijuana use or early marijuana use affect and impair the Neocortex of the brain which controls judgment, sensation and thinking. This type of damage can lead to self-control issues and impulsivity issues. In addition to how THC affects the brain, adolescents also need to consider what form of marijuana they are smoking. In the last roughly 15-20 years, a new form of marijuana or synthetic weed took over the market. While synthetic weed is no longer legal, the substance is marketed specifically to adolescents, it is very inexpensive to produce, and it has become exceedingly popular in teens and young adults. Many teens are unaware that what they are purchasing is not marijuana at all. Chemicals used to make synthetic weed, also known as “spice” or “k12” can be even more dangerous than the effects of cannabis and cause acute onset of psychotic episodes in users (Hiers, 2012). It is not only synthetic marijuana, but simply the potency of different strains or specially farmed marijuana plants that can create a much greater risk of dependency as well as significantly increased symptoms of marijuana intoxication. As the potency of marijuana has increased over the past 16 years, there has been a positively associated increase with first-time cannabis admissions (Freeman, et al., pp. 2346-2351). A longitudinal study done on 662 Canadian youths between the ages of 12-18 were followed annually through the ages of 22-29. The study indicated across all age groups, the higher the marijuana use, the greater the risk of depressive symptoms as they aged. In addition, the earlier they began using marijuana,
the greater the risk of becoming chronic users (Thompson, Merrin, Ames, & Leadbeater, 2018).

**History of Depression in the US**

Depression can be traced back to the second millennium B.C. when this type of mental health condition was referred to as melancholia and was believed to be explained by demonic possession and evil spirits (Nemade, Reiss, PH.D, & Dombeck, PH.D., 2018). It wasn’t until the late 1700’s that the term “depression” came about. It was James Boswell’s biography that coined the phrase “depression” in his writings about Dr. Samuel Johnson’s personal battle with depression (Grob, Ph.D., 2013). Over the last 50 years, in recent history, there is a considerable increase in the number of people diagnosed with depression. While some studies indicate changes in lifestyle as well as the increased amount of electronics are to blame for the increase in diagnoses, others acknowledge the changes in the criteria to diagnose depression have widened to include a greater number of patients. Currently, DSM 5 criteria for the diagnosis of depression includes, symptoms lasting more than two weeks, decreased interest or pleasure in most activities, significant weight change, change in sleep, fatigue, change in activity, worthlessness, lack of concentration, as well as suicidal thoughts. Currently, there are 322 million people worldwide suffering from depression, and the prevalence is much greater in women than men (Ritchie & Roser, 2018). While some people believe this discrepancy is due to the fact that men are expected to hide their feelings or be perceived as weak, there are greater indications that the hormonal fluctuations women experience leave them at a greater risk for depression and depressive episodes.
Types of Depression

There are multiple types of depression to include Clinical Depression or Major Depressive Disorder, Persistent Depressive Disorders, Post-Partum Depression, Premenstrual Dysphoric Disorder as well as Seasonal Affective Disorder (or SAD). In addition, depression is also a feature of Bipolar Disorder and is considered an important aspect of this disorder. Clinical Depression is described in the DSM 5 and is a mental disorder that keeps people from functioning daily. Persistent Depressive Disorder is a much longer lasting version of Clinical Depression in that the symptoms are present on most days and lasts for at least two years. Post-Partum Depression begins with the birth of a child, is hormonal based and can last up to a year. Premenstrual Dysphoric Disorder is diagnosed when a woman experiences extreme and severe emotional changes a week prior to their menstrual cycle. While most women will experience these changes, the few women who meet the criteria in this disorder will experience symptoms that will change their lives in profound ways. Finally, SAD is a disorder associated with seasonal changes. Some people experience depressive episodes during fall and winter months when there is less sunlight available (Depression, 2018). Much research indicates that the lack of Vitamin D3 is to blame for SAD and therefore is often treated with sunlight or supplements.

Etiology of Depression

Depression is a widely misunderstood mental disorder. People who have never experienced depression have a difficult time understanding why someone cannot just “snap out of it”; or use their cognitive resources and motivation to just “get out of bed”. 
Unfortunately, it is not that simple. While there are many known causes of depression, there are just as many unknowns about what causes someone to slip into a depression where they feel lost, hopeless and unable to pull themselves out of the darkness. Some of the known causes of depression include biological predisposition, cognitive processing, gender, medicines and genetics. The root of biological causes includes having too many or not enough neurotransmitters. Neurotransmitters are chemicals in the brain that help to regulate brain function, including mood and emotional responses. People whose parents, grandparents or siblings have been diagnosed with depression have a much greater chance of being diagnosed with depression than their counterparts. Some researchers believe there is a genetic marker or genome that links depression between family members; however, others believe the connection is based on the environmental factors of watching a love one experience depression. Either way, the jury is out and having an immediate family member who is experiencing depression will increase a person’s chance of acquiring depression in their lifetime 5 times over (Faris, 2016).

People with cognitive issues or people with negative thought patterns are more likely to develop depression. Gender is also a known factor. Hormonal changes, pregnancy, and often having multiple responsibilities are some of the known causes for women having a greater predisposition for depression. In addition, medications and related drug use are causes for depression, as well as genetics includes having a family history of depression. Some situational life experiences, such as the loss of a loved one, can contribute to depression. However, this life event alone will not necessarily cause depression (Depression, 2018).
**Lifetime Effects of Depression**

While depression may affect people in multiple ways, typical long-term effects of living with untreated depression are quite similar. Depression negatively effects every area of a person’s life to include relationships, work, health and overall well-being. Relationships may suffer in many areas including, intimacy, affection, openness and sexuality. Depression can cause such severe feelings of hopelessness in people that it is difficult for them to engage in life and feel motivated to even get out of bed. They often lose interest in activities that they used to enjoy and can take on a pessimistic tone when encouraged. They may suffer from mood swings and appear apathetic and withdrawn. They may attempt to shut themselves off from life, which in turn, often deeply hurts the people that love them most. A romantic partner, friend or co-worker may not realize the seriousness of their depression and may lash out, which can promote a cyclical event. A 2018 study of depressed woman ages 16-23 indicated that their depression had a negative effect on their relationships, sexual motives, as well as feelings about themselves in sexual relationships. They reported less emotional energy for sexual activity, difficulty developing and maintaining relationships and were often having sex just to manage their depressive symptoms (Burke, PhD., Katz-Wise, PhD., Shrier, M.D., & Spalding, 2018). At work, people with depression often lack to motivation to even get to work. If they do show up to work, they have little energy to participate, often fail to perform, miss deadlines and may be paralyzed with indecision. A study done in 2003 showed that depression in the workplace cost employers $44 billion in lost productivity. These sobering numbers do not even include days absent, increased medical insurance premiums or loss of employees and the cost to replace them. This study coined the
phrase presenteeism; a play on the word absenteeism. Presenteeism occurs when individuals show up to work unable to function (Marano, 2003). Patients with depression may be having a difficult time in the workplace due to impeding health problems caused by their depression. Patients diagnosed with depression often have trouble with memory or decision making. They may experience great fatigue, making work nearly impossible. Some other side effects or health risks for patients with depression include heart disease, weight fluctuations including obesity, constricted blood vessels and an overall weakened immune system. People who suffer from depression have a much greater risk of developing general illnesses due to their weakened immune system. Physical inactivity as a part of depression lowers life expectancy by approximately 10.8 years, and depressed smokers have a lower life expectancy of 12.9 years (Jia, PhD, Zack, Gottesman, & Thompson, 2018). These factors combined have a heavy burden on the patient which ultimately leads to significantly overall lower well-being.

**Adolescent Depression**

Adolescence can be a challenging time when young boys and girls are reaching maturation. During this period of development, adolescents are experiencing many biopsychosocial events. Their bodies are physically changing with hormonal surges due to puberty, and these hormones can have an enormous effect on attitude, perception, as well as impulsivity. These changes can also bring on additional insecurities and self-awareness that can manifest in ways such as anxiety and depressive episodes. Some research suggests that depression is evident in 8% to 10% of older adolescents and that it
is two time more likely to occur in girls than in boys (Dawson, 2018). A common belief is that depression is more common in girls than in boys because of the stigma tied to mental health. Western society dictates that boys are not supposed to be emotional beings and therefore, they will often hide depressive episodes to avoid being labeled as weak or feminine. Others believe the hormonal changes young girls experience increase their chances of depression. In fact, these depressive episodes are generally deemed to be the moody teen phase. Regardless of how these emotions are perceived, the fact is that anxiety and depression are real for many teens, and can be a gateway for drug use, further depression and later psychotic episodes. Studies show that 70% of children or adolescents who experience major depressive disorder will relapse by adulthood (Dawson, 2018). Current research indicates a complex connection between psychological, biological and social factors that contribute to the association between puberty and depressive episodes (Lewis, et al., 2018).
LITERATURE REVIEW

There is an abundance of research on both depression and marijuana use, as well as multiple studies on adolescent depression and adolescent marijuana use. However, few researchers have studied the relationship between depression and marijuana use in adolescents. Those who have are on the fence about which comes first, depression or marijuana use. Both subjects are a broad area of study and are multifaceted, so the relationship between the two can be very complicated. Some research indicates a positive association between early perceived trauma, coping mechanisms and the hypothesis of self-medication (Khantzian, 1997). Marijuana use in adolescents and young adults is not positively associated with well-being and the negative effects of marijuana use undermines well-being. (Allen & Holder, 2014) In 2015, another study indicated that marijuana use is not only on the rise and more socially acceptable in emerging young adults, but also that they are more likely to be using marijuana as a coping mechanism and are at a higher risk for marijuana use problems, including psychological distress (Moitra, Christopher, Anderson, & Stein, 2015). A longitudinal study done in 2006 which included approximately 8000 participants indicated that current heavy marijuana users as compared to light or non-users had 50% greater odds of developing depression (Harder, Morral, & Arkes, 2006). Yet another, more recent study indicated there was no difference between early verses late onset and non-marijuana users when it comes to major depressive disorders. While this research study did a significant amount of testing and self-reported questionnaires, the participant pool was very small with only 34 participants (Osuch, et al., 2016). Another study done on Urban African Americans and Puerto Ricans that indicated a relationship between low self-control and
greater risk of high marijuana use, which was also tied to high depressive mood (Pahl, Brook, & Lee, 2014). A more recent study in 2018 was completed on the relationship between marijuana use and depression in adolescents and how it relates to brain function. This study used neuroimaging (fMRI) as well as measurement testing on depression and anxiety. The findings indicated a significant difference in OFC (Orbitofrontal Cortex) of the brain between marijuana users and non-users, which correlates to depression (Subramaniam, et al., 2018). This research study will help to identify the bidirectional relationship between marijuana use and depressive symptoms in adolescents and emerging young adults with intent for the information to be used towards research in preventative measures for adolescents who are at risk for addiction or mental health issues.
METHODOLOGY

Participants

Participants between the ages of 18 and older were recruited from three different colleges accredited by the Southern Association of Colleges and Schools Commission on Colleges. These three colleges were chosen to create diversity in the participant pool. Two of the colleges are public universities with great diversity. One of the two public universities have been identified as a historically black university to increase diversity. The third university is a private Baptist university, again chosen to increase sample diversity. Part of the questionnaire included demographics to help identify higher risk populations for depression and marijuana use. A convenience sample was taken of students at these colleges. They were recruited through the Psychology Departments and were not compensated for participation. The recruitment took place near the end of class when the professors distributed the information to the potential participants. The information included a link to the website Survey Monkey where questionnaires were completed.

Measures

Once participants accessed the website, they were required to provide an electronic informed consent in order to participate in the study. The inclusion criteria included participants between the ages of 18 and older, in later adolescence / early adulthood. Participants were not excluded due to never having used marijuana, nor were they excluded for currently taking prescription medications for depression. It was important to include these participants to allow comparison of non-marijuana users, as
well as participants who are clinically depressed. The participants were then be required to complete two questionnaires; (1) an adapted Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbauch) and (2) an adapted Expectancies Scale for Adolescent Marijuana Use (Malmberg, et al., 2012).

The Beck Depression Inventory (BDI) is a scale to help measure depression. It was created in 1962 and is currently used to measure behavioral manifestations of depression. This is a self-report questionnaire of 21 multiple choice questions. Responses are on a Likert Scale of intensity of feelings ranging from (0=I do not feel sad to 3=I am so sad or unhappy that I can’t stand it). This test is highly effective and is considered a useful tool for researching depression. BDI was adapted for this research study by adding a column requiring participants to list the age that they first remember feeling this way.

The Expectancies Scale for Adolescent Marijuana Use is used to assess adolescent expectancies of marijuana use. The test includes both positive and negative outcomes of marijuana use. The scale is intended to determine the attitude, social approval, and intention to initiate marijuana use. The responses are set up on a 4-point Likert Scale ranging from (1=totally disagree to 4=totally agree). ESAM is a self-report questionnaire consisting of 19 items. This scale was adapted by adding another column to include at what age the participant first remembers feeling this attitude towards marijuana use.
Procedure

The Institutional Review Board of Houston Baptist University granted the researcher permission to conduct a supervised research project on the topic of depression and marijuana use in adolescents. Emails were sent out to several professors at all college campuses previously discussed. All three universities accepted our proposal to use their student body as a part this research project. The professors were asked to disperse the information to their students who were directed to the website Survey Monkey where they logged in to complete the surveys. Initially, the participants completed an online informed consent form and were directed to the anonymous and private survey (see Appendix A Survey). The questionnaires took approximately 20 minutes to complete. The participants were then asked to complete a demographics survey. This survey included information about age, race, ethnicity, religion, socioeconomic background and predisposition to depression as well as substance abuse. At the end of the survey, the participants were thanked for their time and debriefed. Sample packet included in appendix A.
FINDINGS

Results

A one-way ANOVA was conducted to determine if ESAM scores for participants were different between politically affiliated groups. Participants were classified into 3 groups, Democrats \((n = 45)\), Republicans \((n = 26)\), and Independents \((n = 20)\). There was a statistically significant difference between groups as determined by one-way ANOVA \((F(2,88) = 4.953, p = .009)\). These results indicate Republicans are less likely to have a positive relationship with marijuana as compared to other politically affiliated groups. This information helps to validate preconceived notions about Republicans working to keep marijuana illegal, while Democrats have more liberal ideas about marijuana.

A one-way ANOVA was also conducted to determine if ESAM or BDI scores for participants were different between religious affiliations. Participants were classified into four groups, Christians \((n = 76)\), Muslim \((n = 2)\), Atheist/Agnostic \((n = 7)\) and Other \((n = 9)\). Although there was not statistically significant data in this one-way ANOVA, there was a strong difference between the groups. It is likely that statistical significance was not found due to the low number of participants in each of the groups. However, BDI scores between the groups indicate Atheist/Agnostics have an overall higher potential for depression with scores averaging 32, while Christians and Muslims have average BDI scores of 19.18 and 16.5 respectively. These differences can be attributed to the idea that religiosity helps to reduce depression through spirituality, meditation and rituals. On the other hand, there is the concept that Atheists/Agnostics are more likely to be honest about their depression, while other religions might feel the stigma associated with depression.
and depressive episodes is too great to admit to themselves or others that they may be experiencing depression.

A third one-way ANOVA was conducted to determine if there was a significant difference in ESAM or BDI scores for participants by age groups. The participants were classified into four age groups 18 – 26 (n = 83), 27 – 35 (n = 2), 36 – 44 (n = 3), and 45 and over (n = 4). Although no there were no statistically significant findings, likely due to the few participants in each group, there were large differences in the mean of BDI per age group. The findings indicate the younger age groups have a much more positive relationship with marijuana. As the age groups increase, the relationship with marijuana decreases from $M = 28.5522$ for age group 18 - 26 down to $M = 8.333$ for age group 36-44. However, after the age of 44, age group 45 and over jumps up to $M = 29.50$, indicating a closer relationship to marijuana over the age of 44.

**Descriptive Analysis**

A total of 94 participants completed the survey. Of the participants, 89.4% were between the ages of 18 and 26 (adolescence), 2.1% were between the ages of 27 and 35, 4.3% were between the ages of 36 and 44 and the remainder of 4.3% were over the age of 45. They described their race/ethnicity as 24.5% White or Caucasian, 18.1% Black or African American, 31.9% Hispanic or Latino, 17% Asian or Asian American and 8.5% were Mixed or Other. Their religious backgrounds consisted of 81% Christian, 2% Muslim, 7% Agnostic/Atheist and 10% other. The participants were asked to describe their political affiliation and 50.5% said they were Democrats, 28% were Republican and
21.5% described their political affiliation as Independent and one participant refused to respond.

Marijuana Use

Of the participants, 65% are either currently using or have used marijuana in the past, and 35% of the participants claim to have never used marijuana. The mean age of initial use of marijuana was 15 years old. The data range was 9 with the lowest being 12 and highest being 21. The Expectancies Scale for Adolescent Marijuana Use (ESAM) (Malmberg, et al., 2012) was given as a part of the questionnaire to the participants. This assessment helps indicate the relationship a participant has with marijuana. It helps to identify if a participant has a positive or negative feeling about marijuana use. The assessment is scored using both positive and negative questions and is totaled by implementing reverse scoring on the negative questions. It is then summarized to give an overall score for each participant. The higher the overall score, the more positively the participant feels about marijuana and marijuana use. The lower the score, the more negatively the participant feels about marijuana and marijuana use. Participants who had never used marijuana were automatically opted out of this portion of the survey since they had no knowledge of how it feels to use marijuana.

To establish predisposition, participants were asked to respond to a series of questions that would indicate their predisposition to mental illness as well as addiction. They were directed to only respond to mental illness if there had been an official diagnosis of mental illness. There were four questions about mental illness which were scored as a +1 for each family member (including the participant) who had previously
been diagnosed with mental illness. The questions about addiction did not include diagnosis; only of known struggles with addiction. Similar to the questions about mental illness, there were four questions about addiction which were scored as a +1 for each family member (including the participant) who had a known struggle with addiction. The scores in each category were totaled to give each participant a score of 0 – 4. Four being the highest predisposition to mental illness or addiction and zero being the least possible predisposition. While there were no statistically significant data, participants who were marijuana users had a 9% greater chance of being predisposed to mental illness and 22% greater chance of being predisposed to addiction.

**Adolescent Depression**

The Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock, & Erbauch) was presented as part of the survey taken by the 94 participants. According to the results of the BDI portion of the survey, 61% of the participants were experiencing no depressive symptoms, 11% were experiencing mild depression, 20% were experiencing moderate depression, and 9% of the participants were experiencing severe depression. The BDI was adapted by adding a column for the participants to disclose the age they were when they first remember feeling each type of depressive episode. The median age for each participant was calculated based on the age the participant first remembered feeling that type of depressive episode. The median ages range from age 1 through age 44. Participants who did not experience depressive episodes were able to opt out of responding to those questions. A total of 67 participants responded to the questions about
depressive episode onset. The average age of depression onset was rated against the participants BDI scores.

This information indicated that if the onset of depressive episodes occurred between early adolescents (ages 0-16), there was a gradual increase in their BDI score accordingly. Meaning that the earlier a participant began experiencing depressive episodes, the lower their BDI score was. Depressive episode onset after the age of 16, shows a gradual decrease in the BDI scores. This indicates that if depressive episode onset is later in adolescents, then current depressive episodes are less likely. This could be due to early adolescents learning coping skills at earlier ages, and therefore being able to manage their depression; while participants who encounter depressive episodes later in their adolescents may be more self-aware and able to seek help.

In addition, the participants whose BDI scores were considered a Category IV – Severe Depression showed a 92% greater predisposition than participants whose BDI scores were in the Category I – Mild or No Depression.

**Early Depressive Episodes and Marijuana Use**

There were no statistically significant data in the relationship between early marijuana use and adolescent depression. However, the median age for initial marijuana use was age 17 across all BDI Score Categories except for Category IV - Severe Depression. For this category the median age of initial marijuana use was only 15 years old, indicating that the earlier the participants began using marijuana, the higher their BDI Category and current depressive state later in life. Conversely, marijuana users had
a median age of depression onset of only 15 years old, while none users had a median age of depression onset of 17 years old. This indicates that marijuana users are experiencing the onset of depression at an earlier age than non-users. This trend could help substantiate the theory that marijuana users are self-medicating to deal with early depressive symptoms. In addition, participants who’s BDI scores were in the Category IV – Severe Depression were 3 times more likely to be marijuana users, while Category I – No Depression or Mild was 1 time more likely to be a user and Category III – Moderate Depression was .71 times more likely to be marijuana users. This also indicates the relationship between marijuana users and severe depression is much greater than that of non-users (see Appendix B for table on marijuana use and depression).

**Exploratory Analysis**

An exploratory analysis was conducted to observe the relationships between marijuana use, depression and demographics to include religious background, political affiliation as well as race or ethnicity (see chart 2 Appendix C). There was a large discrepancy between people of religious beliefs and non-believers or Atheists/Agnostics. Participants with religious affiliations such as Christian or Muslim had a much lower probability of being a marijuana-users than non-religious participants. In fact, Atheists/Agnostics had a ratio that indicated 5 times greater chance of being marijuana users than non-users. While Christians and Muslims had a median score of 43.95 and 36, Atheists/Agnostics reported median scores of 49.5 showing a greater appreciation for marijuana and marijuana use. The analysis of this research is further corroborated by other research studies indicating that religiosity is a protective factor against collegiate
substance abuse (Giordano, et al., 2015). Religiosity may also be a deterrent due to the meditation involved in some religious prayer and rituals. Meditation has shown to reduce stress and anxiety and therefore could be responsible for lower instances of depression and drug use. Again, further research in this area is necessary.

Race also played a role in determining which participants were more likely to have engaged in marijuana use. Caucasian, Latino and Mixed/Other participants were least likely to engage in marijuana use with ratios of less than 1 between users and non-users. However, African American participants were 2.25 times more likely to engage in marijuana use and Asian Americans were 3.33 times more likely to engage in marijuana use. The rate of depression was consistent between all races. However, age of onset varied drastically with Hispanic/Latino Participants experiencing depressive episodes from age 18 and Mixed Race/Other Participants experiencing depressive episodes as early as 11 years old. Differences of depression and marijuana use between races could be attributed to socioeconomic background, cultural differences, upbringing and family tolerance to drug use.

Political affiliations showed marked differences in marijuana use ratio of users to non-users. Republicans were the only group out of the demographic groupings to have a negative ratio meaning that in the category of participants who identified themselves with the Republican Party, there were more non-users than users. Democrats had a ratio of 1.62 of users vs. non users and the Independents had a ratio of 2.0, meaning two times as many Independents are marijuana users vs. non users. This indicates that people who affiliate themselves as being a part of the Independent Party are more likely to be
marijuana users than people who associate themselves to Democratic or Republican Parties.
DISCUSSION

This was a bi-directional research study to gain insight on the relationship between marijuana use and depressive episodes in adolescents and emerging young adults. Data analyzed in this research study support a strong relationship between adolescent marijuana use and depression. Findings suggest the median age of first marijuana use being 15 years old is associated with a higher BDI score indicating severe depression. In contrast, the findings also suggest the median age of the onset of depression is also 15 years old and it is linked directly to marijuana users. Non users have a 2 year later onset of depressive episodes being 17 years old. This information helps to corroborate prior research on marijuana use and depression. A 2018 study showed neuroimaging (fMRI) that demonstrated physical changes in the brain when adolescents used marijuana. Specifically, the changes in the brain were symptomatic of depression and anxiety (Subramaniam, et al., 2018). The data in this study also indicated that people with more severe forms of depression were 3 times more likely to be marijuana users. A longitudinal study completed in 2006 with 8000 participants also indicated a similar comparison, but only indicated a 50% increase in depression for marijuana users versus non-users or light users (Harder, Morral, & Arkes, 2006).

This current study goes beyond previous studies in that it is the first study to examine demographic information such as religion, political affiliation, race and predisposition and how it relates to marijuana use and depression in adolescents and emerging young adults. The intent was to gather additional information to help identify some aspect of this complexity that may or may not be related to marijuana use and depression as well as to help rule out possible self-selection biases.
Results of this demographic information indicate that Atheists/Agnostics are 5 times more likely to be marijuana users than people of other religions. They are also more prone to depression with median BDI scores more than 3 times higher than people of other religions. While more research is needed in this area, it is important to note that religiosity has been associated with lower rates of marijuana use and is considered an effective way to avert adolescent substance abuse.

Additional findings suggest that people who affiliate themselves with the Democratic Political Party or the Independent Political Party show a slightly higher positive association with marijuana use than people who associate themselves with the Republican Party. In addition, both the Democratic and Independent parties showed a ratio of 1.67 and 2.0 times as many marijuana users than non-users. Republicans on the other hand had a negative ratio, indicating there are fewer marijuana users than non-users who affiliate themselves with the Republican party. Again, additional research in this area is necessary to help confirm these findings as well as further research in this area.

When it comes to race, Asian Americans showed much lower predisposition to mental illness and addiction as compared to all other races including Caucasian, African American, Latino and Mixed Race. However, the ratio for marijuana users is 3.33 times greater than that of Asian American non-users. This occurrence could be due to cultural differences in Asian Americans. In the Asian American culture, mental health issues including addiction are considered a weakness. It is uncommon for Asian Americans to reach out for mental health conditions, making them less likely to have had extended family with mental health diagnoses, and therefore were less likely to show
predisposition. Future studies on the relationship with mental health, addiction and marijuana use should be carried forward.

Limitations

Previous studies have reported findings of a complex relationship between marijuana users and depression as it relates to adolescents and young adults. While this study further confirms these previous findings, it also highlights additional unexpected findings in demographical data that will need future studies to be carried forward focusing on these relationships. The results of this current research did not find statistically significant relationship between marijuana use and depression, however, it did indicate trends corroborating this relationship. This could be due to the modest sample size and limited number of participants in our study in addition to a snapshot in time. Although three local college institutions agreed to participate in this study, many of the college professors felt the topic was too provocative and were uncomfortable giving the information to their students. The study was limited by a fewer number of participants and was significantly less diverse than anticipated. Future longitudinal studies with a greater number of participants, across a broader, more diverse population may provide more insight into this complex relationship. Additionally, future research should include gender as additional demographic information to address potential differences in marijuana use and depression between male, females and other/not specified. Many studies have already indicated that females are predisposed to have greater issues with mood and anxiety than their male counter parts. This additional demographic may help further future research on this topic.
An additional limitation of the current study is that much of the data collected was self-report and based on historical information. Self-report bias has many weaknesses which includes participants not responding truthfully because they cannot remember the exact details and timeframes of their mental health history or drug use history. Self-preservation where a participant wants to present themselves in a socially acceptable manner is also a factor in self-report bias. Even when participants are aware of confidentiality, they often try to respond as they want to perceive themselves and not always honestly. Continued future studies collecting longitudinal data from the same group of participants can help reduce self-report bias. In addition, adding multiple demographic questions to keep the participant from figuring out the premise of the research study can help clear self-report biases.

The current study findings are a significant contribution in the study of the bidirectional relationship between adolescent marijuana use and depression. Adolescence is an important time in the formation of the brain. It is typical for adolescents to feel moody and emotional at times, which can translate to depression. Adolescents may reach for marijuana to self-medicate and to escape these feelings as opposed to using healthier coping mechanisms. This cycle only tends to further their depression and ensures their reliability to substance abuse. Contrarily, adolescents are often encouraged by their peers, social media, music and their desire to fit in with the crowd to begin using marijuana. When this occurs, physical changes to the limbic system as well as the frontal lobe that can cause more severe moodiness and emotional outbursts. These extreme mood swings can lead to depressive episodes that often last a lifetime. Future research is necessary to continue to the study of this complex relationship. The information and
statistical data on demographics are also a significant contribution to this complexity. By gathering information on marijuana users as well as people who struggle with depression; it may be possible to pinpoint some confounds that make this type of research so challenging.
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Appendix A

Informed Consent

Houston Baptist University

ADULT SUBJECT CONSENT FORM

Primary Investigator:

Dr. Joseph Pellitier

Student Researcher:

Stephanie Lynn Torres

Title of Project:

What Came First, The Marijuana Or The Depression? Reviewing The Bidirectional Relationship Between Marijuana And Depression In Emerging Young Adults

I acknowledge that on ______________, I was informed by ________________ of Houston Baptist University of a project having to do with the following:

Marijuana is the most widely used illicit drug in the United States, and Depression is the most widely diagnosed mental health condition in the United States. While there has been much research on both of these topics, the question of how they are related is still up for debate. The works, articles and research has not adequately addressed the relationship between adolescent marijuana use and adolescent depression. The intent of this research study is to help identify what comes first; depressive episodes that lead to marijuana use, or early marijuana use leading to depressive symptoms. In addition, this research study will help reveal biological predisposition, the rate of use/depression among non-users as well as how religion and socioeconomic status’ effect use and depression. This research study will help to identify the bidirectional relationship between marijuana use and depressive symptoms in adolescents and emerging young adults with intent for the information to be used towards research in preventative measures for adolescents who are at risk for addiction or mental health issues.

I am fully aware of the nature and extent of my participation in this project and the possible risks involved or arising from it. I understand that I may withdraw my participation in this project at any time without prejudice or penalty of any kind. I hereby agree to participate in the project.

Printed Name: electronic
Signature: electronic
Address: electronic
1. Sadness
   0  I do not feel sad
   1  I feel sad or blue
   2  I am blue or sad all the time and I can't snap out of it
   3  I am so sad or unhappy that I can't stand it
2. Pessimism
   0  I am not particularly pessimistic or discouraged about the future
   1  I feel discouraged about the future
   2  I feel I have nothing to look forward to
   3  I feel that the future is hopeless and that things cannot improve
3. Sense of Failure
   0  I do not feel like a failure
   1  I feel I have failed more than the average person
   2  As I look back on my life, all I can see is a lot of failures
   3  I feel I am a complete failure as a person (parent, husband, wife)
4. Dissatisfaction
   0  I am not particularly dissatisfied
   1  I don't enjoy things the way I used to
   2  I don't get satisfaction out of anything anymore
   3  I am dissatisfied with everything
5. Guilt
   0  I don't feel particularly guilty
   1  I feel bad or unworthy a good part of the time
   2  I feel quite guilty
   3  I feel as though I am very bad or worthless
6. Self-Dislike
   0  I don't feel disappointed in myself
   1  I am disappointed in myself
   2  I am disgusted with myself
   3  I hate myself
7. Self-Harm
   0  I don't have any thoughts of harming myself
   1  I feel I would be better off dead
   2  I have definite plans about committing suicide
   3  I would kill myself if I had the chance
8. Social Withdrawal
   0  I have not lost interest in other people
   1  I am less interested in other people than I used to be
   2  I have lost most of my interest in other people and have little feeling for them
I have lost all of my interest in other people and don't care about them at all

9. Indecisiveness
   0  I make decisions about as well as ever
   1  I try to put off making decisions
   2  I have great difficulty in making decisions
   3  I can't make any decisions at all anymore

10. Self-Image Change
    0  I don't feel I look any worse than I used to
    1  I am worried that I am looking old or unattractive
    2  I feel that there are permanent changes in my appearance that are unattractive
    3  I feel that I am ugly or repulsive looking

11. Work Difficulty
    0  I can do work about as well as before
    1  It takes extra effort to get started at doing something
    2  I have to push myself very hard to do anything
    3  I can't do any work at all

12. Fatigability
    0  I don't get any more tired than usual
    1  I get tired more easily than I used to
    2  I get tired from doing anything
    3  I get too tired to do anything

13. Anorexia
    0  My appetite is no worse than usual
    1  My appetite is not as good as it used to be
    2  My appetite is much worse now
    3  I have no appetite at all anymore

14. Smoking marijuana
    0  I have never smoke marijuana
    1  I like to smoke marijuana on occasion
    2  I like smoking marijuana even more than I used to
    3  I want to smoke marijuana all the time

If you responded "0" to question 14, you may opt out of questions 15-33

15. Smoking marijuana enhances my positive feelings.
16. Smoking marijuana makes me fit more in the group I like.
17. Smoking marijuana makes me feel good.
18. Smoking marijuana is fun.
19. Smoking marijuana helps me to loosen up.
20. Smoking marijuana is exciting
21. When I smoke marijuana, I care less what others think about me.
22. Smoking marijuana makes me relaxed.
23. I get creative, original ideas when smoking marijuana
24. I make a bad impression on others if I smoke marijuana.
25. Smoking marijuana elevates the risk of trying other drugs.
26. Smoking marijuana is bad for my health.
27. I can become addicted to smoking marijuana
28. Smoking marijuana makes me anxious or frightened.
29. Smoking marijuana makes me isolated.
30. People think I'm no fun when I smoked marijuana.
31. I become suspicious from smoking marijuana
### Median Age of Depression Onset

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<th>Moderate Depression III</th>
<th>Severe Depression IV</th>
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<td>16</td>
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</tr>
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<td></td>
</tr>
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### BDI Category

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<th>Median Age of Initial Marijuana Use</th>
<th>Median Predisposition to Mental Illness Score</th>
<th>Median Predisposition to Addiction Score</th>
<th>Marijuana User</th>
<th>Non User</th>
<th>Ratio of Marijuana Users vs. Non Users</th>
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</thead>
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<td>61</td>
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<td>18.98</td>
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<td>41.62</td>
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<td>Non Marijuana Users</td>
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<td>18.64</td>
<td>17</td>
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<td>Total Participants</td>
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<td></td>
<td></td>
<td>9%</td>
<td>22%</td>
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<tr>
<td>Religion</td>
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<td>% of Participants</td>
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<td>ESAM Score</td>
<td>Median Age of Initial Marijuana Use</td>
<td>Median Predisposition to Mental Illness Score</td>
<td>Median Predisposition to Addiction Score</td>
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<td>Atheist/Agnostic</td>
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<td>16</td>
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<td></td>
<td>91</td>
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<td>16%</td>
<td>2%</td>
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<th>% of Participants</th>
<th>Median BDI Score</th>
<th>Median Age of Depression Onset</th>
<th>ESAM Score</th>
<th>Median Age of Initial Marijuana Use</th>
<th>Median Predisposition to Mental Illness Score</th>
<th>Median Predisposition to Addiction Score</th>
<th>Marijuana User</th>
<th>Non User</th>
<th>Ratio of Marijuana Users vs. Non Users</th>
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<td>32.76</td>
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<td>6.63</td>
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<td>24.53</td>
<td>17</td>
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<td>1.28</td>
<td>17</td>
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<td>17%</td>
<td>4.75</td>
<td>15</td>
<td>32.18</td>
<td>20</td>
<td>1</td>
<td>1</td>
<td>13</td>
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<td>29.875</td>
<td>16</td>
<td>2.33</td>
<td>1.83</td>
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<td>93</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
<td>16%</td>
<td>2%</td>
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<tr>
<th>Political Affiliation</th>
<th># of Participant</th>
<th>% of Participants</th>
<th>Median BDI Score</th>
<th>Median Age of Depression Onset</th>
<th>ESAM Score</th>
<th>Median Age of Initial Marijuana Use</th>
<th>Median Predisposition to Mental Illness Score</th>
<th>Median Predisposition to Addiction Score</th>
<th>Marijuana User</th>
<th>Non User</th>
<th>Ratio of Marijuana Users vs. Non Users</th>
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<td>Democrat</td>
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<td>49%</td>
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<td>17</td>
<td>31.866</td>
<td>16</td>
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<td>1.46</td>
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<td>5.46</td>
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<td>16</td>
<td>1.67</td>
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<td>15</td>
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<td>17</td>
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<td>100%</td>
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<td></td>
<td>16%</td>
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Vita

Stephanie Lynn Torres

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Houston, Texas  77079
Tel:  (832) 451-5085
Email:  torres.stephanie1968@gmail.com

EDUCATION

Master of Arts in Psychology, College of Education and Behavioral Sciences, Houston Baptist University, Houston, TX. Major Field: General Psychology. Research interests: biopsychosocial motivation for substance abuse, mindfulness-based interventions and preventative measures, positive psychology. Master’s Thesis: What Came First The Marijuana Or The Depression: Reviewing The Bidirectional Relationship Between Marijuana And Depression In Emerging Young Adults. Chair: Professor Joseph Pelletier, August 2019. (Anticipated graduation).

Bachelor of Science in Psychology, College of Humanities and Social Sciences, University of Houston, Downtown, Houston, TX. Major Field: General Psychology. May, 2017.

Bachelor of Business Administration in Accounting, College of Business Administration, Texas A&M University-Kingsville, Kingsville, TX. Major Field: Accounting. December, 1993.

PRESENTATIONS


**ADDITIONAL RESEARCH EXPERIENCE**

Summer Research Project, Work Family Conflict, University of Houston-Downtown (Henney, S.).