ANALYZING THE RELATIONSHIPS BETWEEN ALCOHOL CONSUMPTION, COCAINE USE, RELATIONSHIP SATISFACTION AND DEPENDENCY

Honors Thesis

Presented in Partial Fulfillment of the Requirements
For the Degree of Bachelor of Science in Psychology

In the School of Arts and Sciences
at Salem State University

By

Valerie McBride

Dr. Darlene Crone-Todd
Faculty Advisor
Department of Psychology

***

Commonwealth Honors Program
Salem State University
2020

Abstract

Few studies have examined the direct relationship between alcohol consumption and cocaine use while analyzing the impact of social factors on these interactions. This study examined alcohol consumption, cocaine use, and participants' relationship satisfaction while also investigating the relationships each variable had with alcohol dependency and drug dependency. An online survey was administered through surveymonkey.com to 100 participants through a link that was posted on several Facebook pages and was sent to a university e-mail list. Of these 100 participants, 19 were excluded due to missing information. Significant relationships were found between alcohol variables, social factors, and dependency. No significant relationships between cocaine use and alcohol were found, however alcohol's involvement in cocaine users reported last use was analyzed as well as how often they used and whom they were with. Some limitations to this study included a small sample and relying on self-reported data.

Keywords: alcohol, cocaine, relationship satisfaction, dependency

Table of Contents

Acknowledgements

While I feel as though I cannot begin to express my immense gratitude for the remarkable support and advice I have received from my research committee, I would like to start by offering special thanks to Dr. Darlene Crone-Todd for her unwavering dedication to this project as well as for her valuable suggestions and criticisms, and for her enthusiasm for bringing this research to its completion. Also, I would like to extend exceptional appreciation for her advocacy for undergraduate researchers and for her willingness to be available at all times to answer any questions or to review any portions of this research. I am entirely grateful for her support as well as the support of Dr. Ben Miller and Dr. Joanna Gonsalves who have offered extensive assistance with data analysis and grammar review. I would also like to thank them for their steadfast dedication to this project and for their willingness to answer any and all questions that arose during data analysis. The entire research team's constructiveness and pivotal guidance has made the process enjoyable and fulfilling, and I will take their advice and shared knowledge with me as I continue my academic and professional career in psychology. Lastly, I would like to extend my gratitude to Scott Nowka whose constant encouragement and support for the completion of this project has not gone unnoticed and is hugely appreciated.

List of Tables/Figures

Introduction

Human beings appear to be hardwired to seek out things, people, or activities that bring us pleasure. There are biological and social factors that dictate our choices, our wants, our likes and dislikes. These factors affect our behavior. Since the 1960s when psychedelics rose to fame and popularity through the counter-culture movement, psychoactive drugs have been in news headlines for decades. Every year, we are hearing more and more about the opioid crisis, the rising rates of marijuana usage and its legalization, and about increasing numbers of individuals dying as the result of a deadly substance known as Fentanyl. The area of our brain dedicated to this reward-seeking behavior is known as the nucleus accumbens (Harvard Health Publishing, 2011). This is one of the main sections of our brain that is affected by drug use. Dopamine is the main neurotransmitter that is associated with this area of the brain, and most drugs either mimic or enhance the effects of dopamine. The nucleus accumbens is also surrounded by regions of the brain that are responsible for emotion regulation and physiological responses. Therefore, a drug that alters the functioning of the nucleus accumbens will also affect the emotions and physiological responses involved when taking that drug (Harvard Health Publishing, 2011).

Throughout history, drugs, specifically psychedelics, were used in therapy sessions in order to open clients' minds and allow them to walk through traumatic life events and life stressors that they would not otherwise discuss in a sober state (Sessa, 2014). As more information and research came out about these drugs, however, they began to be abused by individuals who were getting their hands-on street-made product. The drugs were eventually made illegal and, as a result, research on therapeutic uses of

hallucinogens was ended. Alcohol, cocaine, and other substances similar to them, can have devastating effects on the brain as well as the body. As with any substance, it is important to acknowledge the age of the individuals who are using these substances because their brains and bodies might still be developing. Affecting the development of the brain can have serious implications ranging from learning difficulties to impulsivity problems.

This study focuses on the rates of alcohol consumption and recreational cocaine use while also asking participants to report their level of satisfaction with their personal relationships, how often they engage in social activities (going out with friends, spending time with family, playing computer games, etc.), and asks participants to answer questions regarding both alcohol and drug dependency. Participants were offered numerous resources at the end of online survey that they took. Participants also answered questions about a variety of different drugs so as to not steer them to answer questions about cocaine (the drug of interest) in any particular way. The goal of this research was to determine whether there is a relationship between how much alcohol an individual consumes, whether they use cocaine and if it is used in conjunction with alcohol. The study also aimed to determine what roles that social relationships and activities play in these relationships and focused on alcohol/drug dependency's correlations with relationships satisfaction. This approach aided in determining the social reinforcers related to alcohol and cocaine use.

Background

Many areas of the brain are affected by drug use and are even altered in some way when occasional drug use crosses the line into drug dependence. Arguably the area of the brain that is most impacted by drug use is the area of the brain located in the limbic system known as the nucleus accumbens (Harvard Health Publishing, 2011). The nucleus accumbens neighbors other areas of the brain such as the amygdala, the hippocampus, and the hypothalamus, areas that are responsible for emotion regulation, physiological responses, and memory.

The nucleus accumbens is the main pleasure and reward center in the brain. It allows us to have strong reactions to objects, people, or substances that we like and causes us to seek those rewarding things out. The main neurotransmitter associated with the nucleus accumbens is dopamine. Dopamine is one of the neurotransmitters responsible for the pleasure and reward system in our brain, but it also plays a role in craving (Harvard Health Publishing, 2011); both a consequence, and continued cause, of substance addiction. Most drugs act on dopamine receptors and can, therefore, result in cravings for specific drugs and causes individuals to seek out those rewarding substances.

Following the ingestion of a drug, the body automatically has a physiological reaction, the person's emotions are affected, and a new memory of the experience is formed (Harvard Health Publishing, 2011). Stimulants, like cocaine, release a rush of dopamine in the brain. Due to cocaine being water soluble and resembling other neurotransmitters, such as dopamine and norepinephrine, it is able to cross the blood-brain barrier that is in place to protect our bodies and brains from potentially harmful substances. Even though the blood-brain barrier is known to be highly selective about

which molecules are allowed to enter the brain, due to the molecular structure of cocaine and other stimulants being similar to other neurotransmitters, they are allowed to pass through the barrier with little to no resistance (Brick & Erickson, 1998). Once the drug moves freely through the barrier, it is free to enter the brain and do its damage.

Drugs can have effects on the brain in many ways. They can block the reuptake of neurotransmitters, increase the release of a specific neurotransmitter, block enzymes that would normally break the molecule down and stop it from functioning, or they can directly bind to the receptor sites themselves (Brick & Erickson, 1998). Cocaine blocks the reuptake of dopamine in the brain. Normally, when dopamine is released into the synapse between neurons, after connecting with dopamine receptors on the receiving neuron, it is taken back up into the presynaptic neuron where it can eventually be used again. Drugs like cocaine, however, block this reuptake process and allow dopamine to float freely in the synapse where it is able to continue binding to the receiving neurons and continue producing its rewarding and pleasurable effects (Brick & Erickson, 1998). However, once a drug is first introduced into the system, our brains build a protection mechanism that is put in place to try and prevent the damaging effects of overstimulation from happening again.

Literature Review

Alcohol consumption has been shown to be linked with recreational drug use in party and/or nightlife settings. Vallance et. al (2016) identified a relationship between heavy episodic drinking (HED), also known as "binge drinking", and recreational drug use, specifically cocaine use. Men who used cocaine were two and a half times more likely to report HED and women were three times more likely to report HED (Vallance

et. al, 2016). It has become more common and even normalized for cocaine use to accompany alcohol consumption in party and nightlife settings because the "upper" effects of cocaine counteract the depressing effects of alcohol and allows people to stay energized and awake for longer periods of time. Consuming alcohol lowers the user's inhibitions and allows the user to "loosen up". This can lead to all sorts of impulsive behavior including drinking to excess, having unprotected sex, and trying other drugs (Brick & Erickson, 1998). In the United States today, young adults across the nation are being exposed to a greater variety of drugs as they become cheaper and more widespread on the streets.

As drugs become cheaper, they become more dangerous. Cheaper drugs usually indicate that the drug has been cut with another substance, commonly lethal drugs like Fentanyl or even bleach, and this led to the increased number of overdoses in the United States. According to the Center for Disease Control and Prevention, in 2017 alone cocaine was responsible for almost 1 out of every 5 overdose deaths. They reported that, between 2006-2012, there was a steady decline of cocaine-related overdose deaths. However, the rate of cocaine-involved overdoses has since risen by over 34% (CDC, 2019). Cocaine is becoming cheaper and this has been successfully connected to the increased rates of use (Williams et. al, 2006). The physiological effects of cocaine and alcohol play a significant role in the biological reinforcement and appeal of the drugs. Knowledge of these physiological effects allows for a better understanding of the reinforcing nature of said effects. Social reinforcers of drug and alcohol use will also be discussed.

Appeal and Biological Reinforcement

An important question surrounding drug use in general, but specifically in the young adult population, has to do with what makes it so appealing. Why do people, even after being made aware of the harmful and potentially fatal effects of drugs, continue to use substances, such as cocaine, on a regular basis? The answer to this question can be found when we acknowledge both physical and social factors that play a role in reinforcing the use of cocaine.

Physical factors that help to reinforce cocaine use include the sense of euphoria and omnipotence that is created, the incredible sense of well-being, and the seemingly endless energy that the drug provides. People who have reported using cocaine describe being able to stay awake for longer under the influence of stimulants and researchers claim that it "increases alertness and decreases tensions, self-doubt, and appetites" (Brick & Erickson, 1998, pg. 81). Another part of cocaine's physical appeal is that it has no severe physical withdrawal symptoms and it has an elimination half-life, the amount of time for 50% of the drug to be out of the system, of about one hour. Administering cocaine through insufflation, also known as "snorting", allows the drug to reach the brain within 3 minutes of administration (Brick & Erickson, 1998). If it is injected, the drug reaches the brain in fifteen seconds and effects begin immediately. Many young adults use cocaine to counteract the effects of alcohol at parties and social gatherings, thereby allowing them to stay awake and alert for a longer amount of time. It has even been discovered that, with "chronic use of both drugs (i.e. alcohol and cocaine), alcohol seems to increase the body's sensitivity to cocaine" (Brick & Erickson, 1998, pg. 80). The production of cocaethylene, a molecule that is produced in the liver when both cocaine

and alcohol (specifically ethanol) are present in the bloodstream, has a half-life greater than three times that of cocaine, allowing it to stay in the body for longer. Cocaethylene enhances the physiological effects of cocaine and, thereby, increases the risk of potentially fatal events such as heart attack and stroke (American Addiction Centers, 2019). Due to the enhanced cardiac effects of the product of alcohol and cocaine, the risk for immediate death increases 18-25-fold when cocaethylene is present in the body (Andrews, 2008).

The effects that cocaine has on the brain are dangerous and can be fatal when mixed with alcohol or taken in too large quantities. Cocaine has been shown to cause the loss of gray matter in the brain, a process that is normal in the brain of an individual over the age of 65 and one who is suffering from dementia (American Addiction Centers, 2019). One of the most disturbing effects, among many others, was described by one researcher at the Johns Hopkins University in an analogy. She compared cocaine to a housekeeper that throws away trash but also disposes of important items, as well. A garbage disposal-like system is normal in the body and is actually meant to rid the body and brain of waste and other material (Gara & Williams, 2016). Cocaine turns this "cleaning spree" into overdrive by throwing away vital things as well, like brain cells. Ultimately, the brain cells end up digesting each other and this can have detrimental effects on the brain as well as the body. Some individuals have reported engaging in repetitive (nearing compulsive) activity, such as rearranging furniture or reorganizing the contents of a bag or purse (Brick & Erickson, 1998). Soar et. al (2012) looked at schizotypal personality traits in recreational cocaine users and found that recreational

users scored higher on the trait tests, indicating that there is potential for psychosis/schizophrenic-like behavior and activity from using cocaine.

Weakened blood vessels from cocaine use are the cause of severe hypertension that leads to stroke, tachycardia, and seizures from constantly stimulating the central nervous system (Brick & Erickson, 1998). The creation of cocaethylene by the presence of alcohol and cocaine in conjunction increases these risks as it remains in the system for three times longer than cocaine and exacerbates cocaine's effects (American Addiction Centers, 2019). The depletion of dopamine and serotonin in the brain caused by using cocaine over time can lead to a sense of craving. Cocaine has been said, by some experts, to be the most addicting drug of all (Brick & Erickson, 1998). It is impossible to discuss the relationship between alcohol consumption and cocaine use without acknowledging the high likelihood of addiction and dependency. While prior studies have examined the relationship between binge drinking and recreational cocaine use, previous research has seldom asked participants about their possible alcohol and/or drug dependency when asking about cocaine use. Therefore, due to the addicting properties of cocaine and its common comorbidity with alcohol, the present study will analyze the relationship between alcohol use, cocaine use, and rates of alcohol and drug dependency.

Social Reinforcers

Imitation of models is required for learning, starts during infancy and childhood, and leads to children being more likely to imitate others. Imitative behaviors occur throughout the lifespan and can involve desirable and undesirable imitation. In the context of drinking alcohol with a friend or simply with another person, the action of the other person consuming alcohol can be thought of as a modeling cue that leads to one

drinking as well as an imitative behavior of the model (Bandura, 1969 as cited in Tomaszewski, Stickler, & Maxwell, 1980). The social settings in which we find ourselves do more to determine our behaviors than we may estimate for ourselves. Tomaszewski, et. al, found that through altering social settings with having someone exposed to a drinking companion and a non-drinking companion (i.e., the models), that social environments in which more alcohol is consumed by the models leads to more alcohol consumption by an individual person. Further, people are more likely to drink more alcohol if they are in a social setting in which their friends or acquaintances are consuming more alcohol (White et. al, 1991). This finding supports both the behavioral and social psychology perspectives that our peers have significant social influence over our behaviors, particularly when in large social settings. Therefore, the present study sought to determine the role that having friends who use cocaine and drink alcohol plays in the relationships between participants' alcohol and cocaine use.

Additionally, risk factors for future drug use have been identified in previous research on drug and alcohol abuse in adolescents. Risk factors include a lack of attachment to parents, neglectful or dismissive parenting, having friends or peers that use drugs, and having poor social skills (such as fulfilling relationships, numerous hobbies/activities) (NIDA, 2003). Other risk factors include having less socially enriching aspects to one's life such as engaging in fewer activities and having fewer relationships. Individuals that have less socially rewarding things or relationships in their lives are more likely to engage in drug use than those that have other socially enriching parts of their lives (more relationships, more hobbies).

Recreational Use v. Addiction

Cocaine has been said to be one of the most addicting drugs in existence. The combination of extreme grandiosity and the lack of withdrawal symptoms makes the drug appealing to people who want to feel that sense of euphoria and high energy without having to worry about the tremors and sweating that occur in normal substance withdrawal. However, these characteristics that make the drug so appealing also feed into the false belief that cocaine isn't all that bad for you. As stated earlier, cocaine is thought of as the most addicting drug and "the elimination of an aversive state coupled with a new-found euphoria makes for a behavior likely to be repeated" (Brick & Erickson, 1998). Therefore, it is highly likely that once someone uses cocaine and experiences the euphoric state of well-being, the use will be repeated. Repeated use can lead to extreme personality changes and can even cause some individuals to exhibit behavior similar to that of schizoid personality (Soar et. al, 2012). These personality changes can lead to users being short-tempered and they will eventually find usually pleasurable things to be undesirable (such as sex or playing their favorite sport). Frequent high doses of cocaine can cause a cocaine induced psychosis in which the user experiences delusions, paranoia, and hallucinations. These hallucinations, usually auditory, visual, and tactile, can last for a few days or up to a few months (Brick & Erickson, 1998).

A study conducted in Europe found that 5-6% of cocaine users will meet dependency criteria within their first year of use and about 21% of users will meet these criteria by the time that they are 45 years old (Hulka et. al, 2013). Unfortunately, addiction and dependency are costly and effective treatment programs are lacking in equal availability across the globe. Silverman et. al (2007) examined the effectiveness of

conducting urinalysis tests prior to an employee's shift in maintaining cocaine abstinence – an alternative to conventional drug treatment. Using urinalysis as a prerequisite for beginning a work shift was found to result in significantly high rates of cocaine abstinence in a cocaine dependent population. This type of employment-based reinforcement can be an alternative to traditional drug treatment, especially in individuals who have been treatment-resistant (Silverman et. al, 2007). Changing society's attitudes towards addiction is one of the first and most vital steps to developing better treatment programs for those struggling with addiction. Recognizing the effects of cocaine and alcohol addiction and understanding the social reinforcers involved in drug use may allow for more effective treatment programs with lower recidivism rates. As noted earlier, the rate of cocaine-induced overdose deaths has increased since their original decline between 2006-2012 and it is crucial that researchers get to the root of the problem; when, where, and with whom are individuals (highest use among young adults) using cocaine?

Rationale for Current Study

Prior research has investigated the rate of alcohol consumption in polydrug users, but few studies have sought to examine the relationship between alcohol and cocaine specifically. Most of the research that has focused on alcohol dependency in relation with cocaine use has failed to also investigate cocaine dependency in relation with alcohol dependency. As cocaine is said to be the most addicting drug, it is vital to examine the relationship of drug dependency with alcohol dependency. Lastly, the social factors that accompany drug use may play a significant role in participants' cocaine use and alcohol consumption. Therefore, social factors may also play a significant role in both alcohol

and drug dependency. The present study aimed to determine the significance of social factors in the relationships between alcohol consumption and cocaine use, as well as between alcohol dependency and drug dependency. Based on prior research, social relationships have a great impact on people's behavior, so examining relationship satisfaction and social activities in conjunction with alcohol and cocaine use will help to determine whether social factors play a significant role in determining participants' behavior. Therefore, the present study seeks to test five main hypotheses:

H1: Participants who self-report using cocaine will also have higher rates of alcohol consumption.

H2: Participants who self-report using cocaine will also report having lower self-reported relationship satisfaction.

H3: Participants who self-report using cocaine will also self-report participating in fewer social activities (reading, playing video games, going out with friends, etc.)

H4: Participants are more likely to self-report engaging in cocaine and alcohol use if they self-report having friends that engage in such behaviors.

H5: Participants whose self-reported scores for drug and alcohol dependency are scored as "high" or "moderate" (levels of dependency) will also report feeling less satisfied in their interpersonal relationships.

Method

Participants

        The online survey used to collect data for this study was approved by the

Institutional Review Board at Salem State University. Participants were recruited through

a convenience and snowball sampling method via an online social media platform

(Facebook) and via e-mail. A link to the online survey was posted on numerous Facebook

pages for thousands of individuals to see and was disseminated through an e-mail list at

the university. Social media users that saw the post were encouraged to share it on their

own Facebook pages and/or share it via e-mail with their peers and family members. Any

individual of any age, ethnicity, and gender identity was permitted to complete the

survey. This study focuses on the young adult population (18-25) as it has been shown to

have the highest rates of cocaine use. However, all age ranges were considered in data

analysis in order to develop a better understanding of the prevalence of cocaine use,

alcohol consumption, and dependency across the board. The only exclusion criterion was

that participants must be 18 years old or older in order to complete the survey.

Materials

        The materials used in this study included an online questionnaire consisting of the

following: (a) demographic questions including age, gender identity, ethnicity, and

employment/student status, (b) an adaptation of questions from the European School

Survey Project on Alcohol and Other Drugs (ESPAD), (c) the CAGE questionnaire to

determine alcohol dependence, and (d) the Drug Abuse Screening Test (DAST-10) to

determine drug dependency. Demographic questions included information about the

participants' age, ethnicity, gender identity, and employment status. The CAGE

questionnaire for alcohol dependence is a 4-item survey in which participants answer either "Yes" or "No" to questions relating to their feelings about their alcohol consumption ("Have you ever felt guilty about drinking", "Have you ever felt the need to cut down on your drinking"). This questionnaire is intended to measure an individual's level of dependence on alcohol. Each letter in the CAGE acronym represents the 4 questions that are asked (C indicates the question about cutting down on alcohol use, A represents the question about feeling annoyed at others' criticisms, G representing feeling guilty, and E indicating the need for alcohol as an "eye opener" the morning after a hangover). The ESPAD is a lengthy questionnaire that asks participants about their hobbies, relationships with others, their drug use, and alcohol consumption. Questions from this survey were adapted in order to best fit the research questions being asked ("How satisfied are you usually with your relationship with your father", "In the last 12 months, how often did you drink because it helps you enjoy a party", "How many of your friends would you estimate use cocaine"). Responses to these questions are in the form of Likert scales (5 or 7 point). The DAST-10 was used to measure drug dependence among participants. The 10 item questionnaire asks participants about their experiences and feelings towards their personal, self-reported drug use ("Do you ever feel bad or guilty about your drug use", Have you ever engaged in illegal activities in order to obtain drugs") and questions are answered with "Yes" or "No" responses.

Design

This study is correlational in nature and attempts to determine whether there is a relationship between how much alcohol an individual consumes and if they use cocaine, as well as to determine if having friends that use cocaine and/or engaging in social

activities would be significantly related to cocaine use and dependency. The study also examined the role that relationship satisfaction plays in those relationships. Through the use of composite variables created in order to have a single variable that was representative of each category (i.e. a composite variable for relationship satisfaction, another for alcohol consumption, another for social activities, and composite variables for CAGE questionnaire responses and DAST-10 responses). These variables were then tested through correlational analysis to determine if significant relationships exist between the variables.

 Procedures

The online survey was administered through surveymonkey.com. Participants' anonymity and confidentiality were protected as no questions required that participants submit their name, location, or any other identifying information, and no IP addresses were collected or stored during data analysis. Participants answered questions of a potentially sensitive nature, so ensuring that their responses were anonymous and entirely confidential was imperative. Upon completion of the survey, a list of resources was offered for participants in case they wanted to reach out to hotlines, organizations, or other sources of support for guidance. The resources included the Substance Abuse and Mental Health Hotline, a 24/7 confidential hotline where individuals can receive treatment referrals and information for those who are struggling with substance use disorders or have family members who are, a link to the American Addiction Centers website as well as the inclusion of their helpline, and a link to the Alcoholics Anonymous website. The confidential substance use resource at Salem State University was always included.

Participants were directed to the survey after clicking a link that was posted to several Facebook pages by the researchers and was sent out through a university e-mail list by faculty members. The survey link was accompanied by a brief explanation of the research and stated any potential risks and explained the survey's confidentiality and anonymity. Upon opening the survey, participants were required to confirm that they were 19 years old or older. If they selected that they were not at least 18 years old, then they were brought to the disqualification page and did not complete the survey. Following the age confirmation, participants were required to read and acknowledge that they read the disclosure statement which provided details about the survey, any potential risks and benefits of answering the questions, and an explanation of how confidentiality and anonymity was ensured. Once participants acknowledged that they had read the statement and consented to participate in the study, they began the survey, starting with demographic questions. If participants did not consent to participate, they, too, were brought to the disqualification page and did not complete the survey. Following the set of demographic questions were questions regarding hobbies and activities. From there, participants answered when the last day was that they drank alcohol. If a participant selected that they never drink alcohol, then skip logic built into the survey program brings them to the questions regarding cocaine. If participants self-reported that they have drunk alcohol at any point in their lifetime, then they proceeded to answer questions about how much they used and continued on to answer the CAGE dependency questions. Following questions pertaining to alcohol consumption, participants self-reported whether, in their lifetime, they had ever used cocaine. If a participant self-reported that they never used cocaine, then they skipped ahead to the matrix of other recreational drugs

in which they answered how many occasions in their lifetime they had had the opportunity to try drugs without trying them. Following was the same matrix but asking participants to report on how many occasions they had used the drugs. Once participants moved through these matrices, they answered questions about their relationship satisfaction, their estimates of how many of their friends engaged in certain behaviors (i.e. getting drunk, drinking alcohol, using cocaine), and finally, answered DAST-10 questions. No questions required a response other than the first two pertaining to age verification and consent. All other questions were voluntary and could be skipped if a participant wished.

Results

The study allowed participants of all ages to participate in the survey, if they were 18 years old or older. Participants (n=100) accessed the survey and 19 were excluded due to missing information. All excluded participants answered either only the age verification and consent questions or only answered survey questions up to the end of the demographic questions, leaving a total of n = 81 participants. Most of the participants were in the young adult population, between the ages of 18-25 (84%, 68/81 participants). When examining general drug use scores, 72% of participants' scores were in the low range of drug use, indicating that they very rarely used drugs in general. Approximately one quarter (28%) of participants scored in the medium range of drug use, and no participants scored in the high range of drug use. DAST-10 scores are interpreted in four different sections: (a) no problems reported, (b) low level of dependence, (c) moderate level of dependence, and (d) severe level of drug dependence. A minority (28.4%) of

participants had no problems reported, 35.8% scored in the low-level bracket of DAST-10 interpretations, 28.3% scored in the moderate level, and 3.7% of participants scored in the severe level of drug dependence. To theorize why 3.7% of respondents score high in the DAST-10 but no participants scored high for general drug use, further analysis was done. A Pearson correlation between a composite variable of DAST-10 scores and variables for every drug listed in the drug use matrix (item #28 in Appendix). Significant correlations were found for every drug but methamphetamine with marijuana being the largest ($r(78) = .666$, $p = .000$) followed by nicotine ($r(78) = .609$, $p = .000$), then both amphetamines and sedatives that were not prescribed to the participants ($r(78) = .387$, $p = .000$, $r(78) = .387$, $p = .001$), ecstasy/MDMA ($r(78) = .367$, $p = .001$), and lastly, hallucinogens ($r(78) = .337$, $p = .003$). There were also significant correlations between multiple drugs (see Table 1). CAGE scores are interpreted by no dependence (scores of 0), low dependence (scores of 1), and excessive drinking (scores of 2 or higher). Just over half (53.1%) of participants fell under the "No dependence" category, while 21% of scores were indicative of low alcohol dependency and 22.2% of participants' scores indicated excessive drinking. Almost all (97.5%, or 79/81) participants self-reported using alcohol at least once in their lifetime and 10.1% of these 79 participants also self-reported using cocaine at least once in their lifetime. This latter subgroup accounted for 9.9% of the total n=81 participants.

Table 1

Correlations

		DRUGdependence	Marijuana/hashish (cannabis)	Ecstasy/MDMA	Amphetamines without a prescription (like Adderall/Ritalin)	Nicotine	Heroin	Hallucinogens (LSD, Mushrooms, DMT)	Sedatives/tranquilizers without a prescription (like Xanax)	Methamphetamine
DRUGdependence	Pearson Correlation	1	.666**	.367**	.387**	.609**	.b	.337**	.387**	.070
	Sig. (2-tailed)		.000	.001	.000	.000	.	.003	.000	.541
	N		78	78	78	78	78	78	78	78
Marijuana/hashish (cannabis)	Pearson Correlation	.666**	1	.118	.330**	.570**	.b	.347**	.153	.112
	Sig. (2-tailed)	.000		.298	.003	.000	.	.002	.180	.322
	N	78	80	79	79	80	80	79	79	80
Ecstasy/MDMA	Pearson Correlation	.367**	.118	1	.060	.181	.b	-.020	.911**	-.017
	Sig. (2-tailed)	.001	.298		.602	.111	.	.864	.000	.879
	N	78	79	79	79	79	79	79	79	79
Amphetamines without a prescription (like Adderall/Ritalin)	Pearson Correlation	.387**	.330**	.060	1	.457**	.b	.280*	.031	-.038
	Sig. (2-tailed)	.000	.003	.602		.000	.	.012	.785	.742
	N	78	79	79	79	79	79	79	79	79
Nicotine	Pearson Correlation	.609**	.570**	.181	.457**	1	.b	.350**	.270*	.123
	Sig. (2-tailed)	.000	.000	.111	.000		.	.002	.016	.279
	N	78	80	79	79	80	80	79	79	80
Heroin	Pearson Correlation	.b	.b	.b	.b	.b	.b	.b	.b	.b
	Sig. (2-tailed)	.	.	.	.	.	.	.	.	.
	N	78	80	79	79	80	80	79	79	80
Hallucinogens (LSD, Mushrooms, DMT)	Pearson Correlation	.337**	.347**	-.020	.280*	.350**	.b	1	-.005	.357**
	Sig. (2-tailed)	.003	.002	.864	.012	.002	.		.966	.001
	N	78	79	79	79	79	79	79	79	79
Sedatives/tranquilizers without a prescription (like Xanax)	Pearson Correlation	.387**	.153	.911**	.031	.270*	.b	-.005	1	.141
	Sig. (2-tailed)	.000	.180	.000	.785	.016	.	.966		.214
	N	78	79	79	79	79	79	79	79	79
Methamphetamine	Pearson Correlation	.070	.112	-.017	-.038	.123	.b	.357**	.141	1
	Sig. (2-tailed)	.541	.322	.879	.742	.279	.	.001	.214	
	N	78	80	79	79	80	80	79	79	80

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

b. Cannot be computed because at least one of the variables is constant.

*** The drug variables are representative of how many occasions in which participants used each drug, DRUGdependence is a composite variable created by using the summed scores from participants' responses to the ten DAST-10 questions

Hypothesis 1

In order to test cocaine use's relationship to alcohol, a cocaine score (item #24 in the Appendix) was analyzed with a composite variable created to represent the amount of alcohol a participant consumes. The relationship was insignificant ($r(77) = .145$, $p = .209$). Therefore, H1 cannot be supported by this study.

Hypothesis 2

The variable that was representative of participants' cocaine use was tested with a composite variable comprised of participants' summed relationship satisfaction scores in order to determine if relationship satisfaction was related to cocaine use. The relationship

was insignificant ($r(78) = .039$, $p = .733$). Therefore, H2 cannot be supported by this study.

Hypothesis 3

The cocaine variable was analyzed using a composite variable created in order to represent participants' level of social engagements (reading, playing computer games, going out with friends) in order to determine the relationship between cocaine use and the amount of social enrichments in a participant's life. The relationship was insignificant ($r(80) = -.106$, $p = .351$), and thus H3 cannot be supported.

Hypothesis 4

To test the relationship between drinking alcohol and using cocaine and having friends who also do so, each participant variable was analyzed with its "friend" counterpart. Specifically, the composite variable of the amount of alcohol a participant self-reported consuming was used in a Spearman correlation with the variable that indicated how many members of a participant's friend group they would estimate drank alcoholic beverages. Similarly, the variable that indicates a participant's self-reported cocaine use was analyzed with the variable that indicates how many members of a participant's friend group would they estimate use cocaine. The relationship between a participant's self-reported alcohol use and having friends that drink alcoholic beverages was significant *($r(76) = .329$, $p = .004$) (*see Table 2). However, no significant relationship was found between a participant's cocaine use and their estimations of how many of their friends used cocaine ($r(78) = .194$, $p = .089$). Therefore, only part of H4 is supported: Having friends who use the drug is correlated with one's own drug use, but the number of friends using it is not.

Table 2

Correlations

			AMOUNTofalc	Drink alcoholic beverages?
Spearman's rho	AMOUNTofalc	Correlation Coefficient	1.000	.329**
		Sig. (2–tailed)	.	.004
		N	78	76
	Drink alcoholic beverages?	Correlation Coefficient	.329**	1.000
		Sig. (2–tailed)	.004	.
		N	76	79

**. Correlation is significant at the 0.01 level (2–tailed).

**AMOUNTofalc indicates a participants alcohol use and "Drink alcoholic beverages?" is the variable indicating a participant having friends that drink alcohol.

Hypothesis 5

Scores from the CAGE questionnaire were summed to create a composite score for alcohol dependence, the scores from individual relationship satisfaction questions (father, mother, friends, and significant others) were summed to create a single variable for relationship satisfaction, and the scores from DAST-10 were summed to create a single composite variable representative of drug dependence. The composite variable for alcohol dependence was tested with a composite variable for drug dependence and with relationship satisfaction (see Table 3). The only significant relationship was found between alcohol dependence and drug dependence, having a positive relationship ($r(75) = .436, p = .000$). No significant relationship was found between relationship satisfaction variables and alcohol dependence or drug dependence ($r(76) = -.013, p = .909, r(78) = -.077, p = .505$ respectively). Therefore, only part of H5 is supported: While different substance dependencies are correlated, drug dependency is not correlated with relationship satisfaction.

Table 3

Correlations

		ALCdependence	DRUGdependence	RELATIONsatis
ALCdependence	Pearson Correlation	1	.436**	−.013
	Sig. (2-tailed)		.000	.909
	N	78	75	76
DRUGdependence	Pearson Correlation	.436**	1	−.077
	Sig. (2-tailed)	.000		.505
	N	75	78	78
RELATIONsatis	Pearson Correlation	−.013	−.077	1
	Sig. (2-tailed)	.909	.505	
	N	76	78	79

**. Correlation is significant at the 0.01 level (2-tailed).

*** ALCdependence is the composite variable of participants' CAGE scores, DRUGdependence is the composite variable of participants' DAST-10 scores, and RELATIONsatis is a composite variable of participants' relationship satisfaction scores

Cocaine Results

Examining solely self-reported cocaine users, 50% reported only using the drug once (4/8 users), 25% reported using it a few times (2/8 users), and 25% reported using cocaine on a regular basis (2/8 users). A smaller number of cocaine users (12.5%) did not drink alcohol during the last time that they used. However, 50% of cocaine users reported alcohol being involved during the last time that they used cocaine (12.5% drank alcohol BEFORE using cocaine and 37.5% of users drank alcohol around the same time that they used cocaine). The remaining 12.5% of self-reported cocaine users do not remember whether alcohol was involved during the last time that they used the drug. Of the self-reported cocaine users, 12.5% reported using the drug alone (it is interesting to note that this participant also reported not drinking alcohol at all during their last use and had reported using the drug a few times in their lifetime); 75% of cocaine users reported

using the drug with friends (50% of those participants only tried cocaine once while 16.6% of users reported using the drug regularly, and 33.3% used cocaine a few times); and 12.5% of cocaine users reported using the drugs with family. "Family" was used as a general term and family relationships were not specified. The mean age of cocaine users was 30 years old; the mean relationship satisfaction scores were in a range to be interpreted as "Very satisfied", and 62.5% of cocaine users were female (5/8 self-reported users) while the other 37.5% were male.

Discussion

The amount of alcohol a participant consumes was found to be positively related with having friends who drink alcoholic beverages, which is consistent with previous research (Tomaszewski et. al, 1980) showing that individuals tend to imitate the modeled behavior of those with whom they are in close relationships. This concept of modeling was only consistent with previous research (Tomaszewski et. al, 1980) when comparing participants' alcohol consumption with their estimations of how many of their friends also drink alcohol. Surprisingly, the same concept did not apply to participants' cocaine use and their friends' cocaine use. This difference could be attributed to growing changes in the perception of recreational cocaine use. While cocaine overdose deaths have increased, the general use of cocaine among the United States population has declined, partly due to the increased knowledge about the potentially fatal effects of high doses and chronic use. Drug dependence was positively correlated with alcohol dependence, consistent with prior research (McCabe et. al, 2006) about the comorbid nature of alcohol and drug use.

Relationship satisfaction did not appear to play a significant role in any of the relationships. One possible explanation for this could be found in the fact that 75% of cocaine users reported using the drug with their friends, and it has already been shown that participants are more likely to drink alcohol if they report having friends who do so. Therefore, if drinking alcohol is a regular part of a friend group's behavior, then it can be expected that participants may be satisfied with these relationships if they consider the behavior to be a normal part of their gatherings. Also, if the participants who self-reported using cocaine are using with their friends, then they may consider using cocaine as a normal behavior for their friend group, or it may be irrelevant in determining participants' satisfaction with their relationships.

When examining participants' general drug use in relation to drug dependence in an additional analysis, each drug in the matrix (item #28 in Appendix) was significantly and positively correlated with drug dependence with the exception of methamphetamine. Further, various drugs were significantly and positively correlated with one another, which is consistent with previous research (Grove et. al, 2009) regarding polydrug use and the relationships between multiple drug use and dependency. Perhaps surprisingly, the present study suggests that having friends who use cocaine is not significantly correlated with participants' cocaine use; however, 28.4% of participants reported that at least a few of their friends use cocaine to their knowledge. Additionally, and inconsistent with prior findings (NIDA, 2003) engaging in social activities was not significantly related to cocaine use. The study had a very small sample of cocaine users and, therefore, results may not be indicative of the reality of cocaine's relationship with social factors. Also, previous research (NIDA, 2016) has shown that the age group with the highest

cocaine use is young adults (18-25). However, the mean age of the participants who self-reported using cocaine was 30. As stated previously, the small number of cocaine users in this sample may influence the results and their consistency with prior studies. Lastly, having friends that drink alcohol was significantly related to participants' own alcohol use. Alcohol is known to be a social drug that is often present at family, work, and social gatherings. The addition of a social acceptability scale may provide a clearer explanation for the difference in friends' influence on participants behavior. Lastly, while only 9.9% of the total sample self-reported using cocaine, 27% of participants reported having had the opportunity to try cocaine at least once in their lifetime without trying it. This is consistent with prior studies that have examined the increasing availability of cocaine (NIDA, 2016).

Some limitations to this study include the use of self-report measures. Self-report relies heavily on the honesty of participants and participants may be hesitant to report engaging in illegal behavior (using cocaine, drinking alcohol under the age of 21). Self-report methods also limit the ability to draw causality between variables, allowing for only correlational conclusions to be made. Additionally, the study asks participants to report on their experience with illegal drug use. Some participants may be hesitant to report such behavior, regardless of the survey's guaranteed confidentiality and anonymity. The sample size of this study was also rather small, with only 81 total participants and 8 self-reported cocaine users, so the sample cannot be representative of the United States population. A large and unexpected limitation to this study was the covid-19 pandemic. Many of the questions pertaining to alcohol and activities asked participants to answer how much alcohol they have had in the last 30 days and not all

activities (going out with friends and family, going to parties) could be continued during the unprecedented time. Alcohol sales have also increased during the quarantine that, at the time of the study, had been in place for at least a month (NCSolutions, 2020). This increase in alcohol sales may have inflated alcohol consumption measures and relationships as online alcohol sales have risen by 253% with in-person sales increasing by 55% (Associated Press, 2020). Lastly, the snowball sampling method that was utilized in this study does not guarantee that the sample is representative of the larger population. Also, people who shared the survey and/or participated in the survey may have shared the study with people who they know might fit the target population (cocaine users and alcohol users).

Future research should include utilizing a social acceptability scale to determine how participants think society views the use of certain drugs. This may allow for a possible explanation as to why friends had little relation to participants' cocaine use but had significant relation to participants' alcohol use. This social acceptability variable could be constructed by asking participants what they think their parents, friends, significant other, or coworkers would think if they used cocaine, got drunk, drank alcohol, etc. Also, the addition of an interview aspect to the study could allow for more specific and concise responses as to what the setting was in which participants last used cocaine. Allowing participants to explain who they were with, where they were, and what drugs were involved during the time of use could allow for a less vague depiction of the setting in which people normally use cocaine and/or use cocaine in conjunction with alcohol.

Appendix

1. Before proceeding, please confirm that you are 18 years of age or older.

    a. I am 18 years old or older

    b. I am under 18 years old

2. (Disclosure Statement)

    a. I have read the above information and I consent to participate

    b. I do not consent to participate

3. What is your age? (Please type the number)

4. What gender identity do you identify with?

    a. Male

    b. Female

    c. Prefer not to say

    d. Other

    *** *if 'Other' is chosen, then:*

5. Please write the gender identity that you identify with

6. What is your ethnicity?

    a. Hispanic or Latino

    b. Black or African American

    c. White or Caucasian

    d. Asian or Asian American

    e. Native Hawaiian or other Pacific Islander

    f. More than one ethnicity

    g. Other

    *** *if 'Other' is chosen, then:*

7. Please write your ethnicity.

8. Report your highest level of education

    a. Some high school

    b. High school/GED

    c. Some college

    d. Associate's

    e. Bachelor's

    f. Master's

    g. Doctorate

9. Are you currently attending a college/university?

    a. Yes

    b. No

    *** *if 'No' is chosen, then skip to question #11*

10. During the LAST 30 DAYS, on how many days have you missed one or more classes?

	None	1 day	2 days	3-4 days	5-6 days	7 days or more
Because of illness						
Because you skipped or 'cut' class						
Because of a hangover from drugs/alcohol						
For other reasons						

11. Are you currently employed?

    a. Yes

    b. No

    *** *if 'No' is chosen, then skip to question #14*

12. Are you a part-time or full-time employee

    a. Part-time

    b. Full-time

13. During the LAST 30 DAYS, on how many days have you missed one or more shifts at work?

	None	1 day	2 days	3-4 days	5-6 days	7 or more days
Because of illness						
Because you just didn't want to go into work						
Because of a hangover from drugs/alcohol						
For other reasons						

14. How often (if at all) do you do each of the following?

	Never	A few times a year	Once or twice a month	At least once a week	Almost every day
Play computer games					
Actively participate in sports, athletics or exercising					
Read books for enjoyment (not textbooks)					
Go out in the evening (to a bar, restaurant, party, etc.)					
Other hobbies (play an instrument, sing, draw, write, etc.)					
Spend time with friends					
Spend time with family					

15. When was the last day you drank alcohol?
   a. I never drink alcohol
   b. 1-7 days ago
   c. 2 weeks ago
   d. 3 weeks ago
   e. 1 month ago – 1 year ago
   f. More than 1 year ago
        *** if 'a' is chosen, then skip to question #24.

16. On how many occasions have you had any alcoholic beverage to drink?

	0	1-2	3-5	6-9	10-19	20-39	40 or more
In your lifetime?							
During the last 12 months?							
During the last 30 days?							

17. In the LAST 12 MONTHS, how many times (if any) have you had **five or more** drinks on one occasion? (A 'drink" is one cup/serving of an alcoholic beverage)
    a. None
    b. 1
    c. 2
    d. 3-5
    e. 6-9
    f. 10 or more times

18. In the LAST 12 MONTHS, on how many occasions (if any) have you been **intoxicated from drinking alcoholic beverages**? (For example: staggered when walking, not being able to speak properly, throwing up, or not remembering what happened)
    a. 0
    b. 1-2
    c. 3-5
    d. 6-9
    e. 10-19
    f. 20-39
    g. 40 or more

19. In the LAST 12 MONTHS, how often did you drink …

	Never	Seldom	Sometimes	Mostly	Always
Because it helps you enjoy a party?					
Because it helps you when you feel upset or nervous?					
To cheer up when you're in a bad mood?					
Because you like the feeling of drinking?					
To get drunk?					
Because it makes social gatherings more fun?					
To fit in with a group you like?					
Because it improves parties and celebrations?					
To forget about your problems?					
Because it's fun?					
To be liked?					
So you won't feel left out?					

20. Have you ever felt the need to cut down on your drinking?
    a. No
    b. Yes

21. Have you ever felt annoyed when people criticize your drinking?
    a. No
    b. Yes

22. Have you ever felt guilty about drinking?
    a. No
    b. Yes

23. Have you ever felt you needed a drink first thing in the morning to steady your nerves or to get rid of a hangover?
    a. No
    b. Yes

24. In your lifetime, have you ever used cocaine?
    a. Never
    b. I tried it once
    c. I tried it a few times
    d. I use(d) it on a regular basis
        *** *if "Never" is chosen, then skip to question #27.*

25. Think back to the last time you used cocaine. Was there alcohol involved?
   a. I did not drink alcohol
   b. I drank before using cocaine
   c. I drank after using cocaine
   d. I drank alcohol around the same time
   e. I do not recall

26. Think back to the last time you used cocaine. Who were you with?
   a. I was alone
   b. With friends (at a party, at home, another location)
   c. With strangers (at a party, club, or other location)
   d. With family

27. In your lifetime, on how many occasions have you had the **opportunity to try** the following but **did not try it**?

	Never	1-2	3-5	6-9	10-19	20-39	40 or more
Marijuana/hashish (cannabis)							
Cocaine							
Ecstasy/MDMA							
Amphetmaines **without a prescription** (like Adderall/Ritalin)							
Nicotine							
Heroin							
Hallucinogens (LSD, Mushrooms, DMT)							
Sedatives/tranquilizers **without a prescription** (like Xanax)							
Methamphetamine							

28. In your lifetime, on how many occasions have you used each of the following?

	Never	1-2	3-5	6-9	10-19	20-39	40 or more
Marijuana/hashish (cannabis)							
Ecstasy/MDMA							
Amphetamines **without a prescription** (like Adderall/Ritalin)							
Nicotine							
Heroin							
Hallucinogens (LSD, Mushrooms, DMT)							
Sedatives/tranquilizers **without a prescription** (like Xanax)							
Methamphetamines							

29. How satisfied are you usually with your relationship with …

	Very satisfied	Satisfied	Indifferent	Not so satisfied	Not at all satisfied	N/A
Your father?						
Your mother?						
Your friends?						
Your significant other?						

30. How many of your friends would you estimate …

	None	A few	Some	Most	Don't Know
Smoke cigarettes?					
Drink alcoholic beverages?					
Get drunk?					
Smoke marijuana or hashish (cannabis)?					
Take tranquilizers/sedatives (like Xanax) **without a prescription**?					
Take amphetamines (like Adderall/Ritalin) **without a prescription**?					
Take ecstasy/MDMA?					
Use hallucinogens (LSD, Mushrooms, DMT, etc.)?					
Use heroin?					
Use cocaine?					

31. Have you ever used drugs other than those required for medical reasons?
   a. Yes
   b. No

32. Have you ever used more than one drug at a time?
   a. Yes
   b. No

33. Are you always able to stop using drugs when you want to?
   a. Yes
   b. No

34. Have you ever had "blackouts" or "flashbacks" as a result of drug or alcohol use?
   a. Yes
   b. No

35. Do you ever feel bad or guilty about your drug use? (If you never use drugs, answer "No")
   a. Yes
   b. No

36. Do your friends or family ever complain about your involvement with drugs?
   a. Yes
   b. No

37. Have you ever forgotten about your family or friends because of your use of drugs?
    a. Yes
    b. No

38. Have you ever engaged in illegal activities in order to obtain drugs?
    a. Yes
    b. No

39. Have you ever experienced withdrawal symptoms (feeling sick, headaches, cold sweats) when you stopped taking drugs?
    a. Yes
    b. No

40. Have you ever had any medical problems as a result of your drug use (e.g., memory loss, convulsions/seizures, bleeding, etc.)?
    a. Yes
    b. No

References

American Addiction Centers. (2019). What are the effects of cocaine on the brain?

Retrieved from: https://americanaddictioncenters.org/cocaine-treatment/effects-

on-the-brain

American Addiction Centers. (2019). Cocaethylene effects and dangers: The product of

cocaine and alcohol use**.** Retrieved from

https://americanaddictioncenters.org/alcoholism-treatment/mixing-cocaine-and-

alcohol

Andrews, P. (2008). Cocaethylene toxicity. *Journal of Addictive Diseases, 16*(3), 75-84.

 https://doi.org/10.1300/J069v16n03_08

Associated Press. (2020). U.S. online alcohol sales jump 243% during coronavirus

pandemic. *MarketWatch*. Retrieved from:

https://www.marketwatch.com/story/us-alcohol-sales-spike-during-coronavirus-

outbreak-2020-04-01

Brick, J., Erickson, C. (1998). Drugs, the brain, and behavior: The Pharmacology of

Abuse and Dependence. *The International Journal of Neuropsychopharmacology,*

3(1), 87. https://doi.org/10.1017/S1461145799001698

Centers for Disease Control and Prevention. (2019). "Other drugs." *Centers for Disease*

Control and Prevention. Retrieved from

www.cdc.gov/drugoverdose/data/otherdrugs.html

Gara, C., Williams, S. (2016). New evidence in mice that cocaine makes brain cells

cannibalize themselves. Retrieved from

https://www.hopkinsmedicine.org/news/media/releases/new_evidence_in_mice_t
hat_cocaine_makes_brain_cells_cannibalize_themselves

Grove, C., Kelly, B. C., Parsons, J. T. (2009). Polydrug use among club-going young
adults recruited through time-space sampling. *Substance Use & Misuse, 44*(6),
848-864. doi: 10.1080/10826080802484702

Harvard Health Publishing. (2011). How addiction hijacks the brain. Retrieved
from https://www.health.harvard.edu/newsletter_article/how-addiction-hijacks-
the-brain

Hulka, L.M., Eisenegger, C., Preller, K.H., Vonmoos, M., Jenni, D., Bendrick, K.,
Baumgartner, M.R., Seifritz, E., Quednow, B.B. (2013). Altered social and non-
social decision-making in recreational and dependent cocaine users.
Psychological medicine, 44(5), 1015-1028.
https://doi.org/10.1017/S0033291713001839

McCabe, S. E., Cranford, J. A., Morales, M., & Young, A. (2006). Simultaneous and
concurrent polydrug use of alcohol and prescription drugs: prevalence, correlates,
and consequences. *Journal of studies on alcohol*, *67*(4), 529–537.
https://doi.org/10.15288/jsa.2006.67.529

NCSolutions. (2020). We're still buying booze. *NCS Covid-19 Resources*. Retrieved
from: https://www.ncsolutions.com/covid/were-still-buying-booze/

NIDA. (2016). Cocaine. Retrieved from
https://www.drugabuse.gov/publications/research-reports/cocaine

NIDA. (2003). What are the early signs of risk that may predict later drug abuse?

Preventing Drug Use among Children and Adolescents (In Brief). Retrieved from

https://www.drugabuse.gov/publications/preventing-drug-abuse-among-children-

adolescents/chapter-1-risk-factors-protective-factors/what-are-early-signs-

Sessa, B. (2014). Why psychiatry needs psychedelics and psychedelics need psychiatry.

Journal of Psychoactive Drugs, *46*(1), 57–62.

https://doi.org/10.1080/02791072.2014.877322

Silverman, K., Wong, C. J., Needham, M., Diemer, K. N., Knealing, T., Crone-Todd, D.,

Fingerhood, M., Nuzzo, P., & Kolodner, K. (2007). A randomized trial of

employment-based reinforcement of cocaine abstinence in injection drug users.

Journal of applied behavior analysis, *40*(3), 387–410.

https://doi.org/10.1901/jaba.2007.40-387

Soar, K., Mason, C., Potton, A., & Dawkins, L. (2012). Neuropsychological effects

associated with recreational cocaine use. *Psychopharmacology*, *222*(4), 633–643.

https://doi.org/10.1007/s00213-012-2666-4

Tomaszewski, R. J., Strickler, D. P., Maxwell, W. A. (1980). Influence of social setting

and social drinking stimuli on drinking behavior. *Addictive Behaviors,* (5), 235-

240. https://doi.org/10.1016/0306-4603(80)90045-3

Vallance, K., Roth, E., Thompson, K., Chow, C., & Martin, G. (2016). Partying last

weekend: Factors related to heavy episodic drinking among people who use

recreational drugs. *Substance Use & Misuse*, *51*(13), 1731–1740.

https://doi.org/10.1080/10826084.2016.1197262

White, H. R., Bates, M. E., & Johnson, V. (1991). Learning to drink: Familial, peer, and

media influences. In D. J. Pittman & H. R. White (Eds.), *Society, culture, and drinking patterns reexamined.* (177–197). Rutgers Center of Alcohol Studies.