12-2020

UNDERSTANDING WHY INDIVIDUALS USE CLUB DRUGS AT RAVES AND ELECTRONIC DANCE MUSIC EVENTS: A PEER CLUSTER THEORY APPROACH

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A Thesis

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

in

Criminal Justice

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ABSTRACT

Raves and Electronic Dance Music (EDM) events are part of a growing culture of entertainment for young people around the world. The dangers of these events include fatalities related to drug use, overheating, dehydration and lack of harm reduction services. This study explores drug use at rave events through a survey examining EDM attendee experiences. Using a binary logistic regression model, this investigation examines the relative importance of five factors: (1) peer group drug use and (2) peer influence on behavior, drawn from peer cluster theory, (3) presence of security features that may dissuade drug use controls for rational choices, (4) the presence of drugs at events, and (5) the social supply of drugs accounting for drug networks enabling the supply of illicit drugs to participants. The results of the study suggest that peer groups heavily impact an individual's decision to use drugs at an event. Peer group drug use was strongly correlated with individual drug use at the EDM. Peer influence on drugs and alcohol use was also correlated with individual drug use. Security and drug presence overall were not found to be significant. The social supply of drugs was present within the peer groups, and found significant once peer group drug use was removed. Due to the current restrictions on raves set by the Illicit Drug Anti-Proliferation Act of 2003, action should be taken to ensure harm prevention resources are available at all events. Future research should be conducted to expand the literature on club drug use at rave events and peer groups formed around the rave and EDM culture.

ACKNOWLEDGEMENTS

I would first like to thank my thesis chair, Dr. Gisela Bichler, for her constant dedication and encouragement throughout this journey. She helped me navigate through this intimidating but exciting writing process and has been more than helpful throughout this five year project. Her guidance and willingness to help me at any hour on a moment's notice was truly appreciated.

I would also like to thank my committee members Dr. Andrea Schoepfer and Dr. Nerea Marteache. Dr. Schoepfer walked me through the graduate school process from day one and continued to encourage me and remind me that the best thesis is a completed thesis. She kept me motivated and reassured me that even having a meltdown (particularly in her office) was all part of the process. Dr. Marteache was always available to discuss the next step in the process and related to me on a personal level with our little ones. She motivated me in many ways and provided great feedback and advice when I needed it.

Finally, I would like to thank my family and friends for the constant support and words of encouragement. Adam, dad, mom, Brittany and Alisha - thank you all for your unwavering support, motivation, input, and free babysitting services. Of the countless times I wanted to give up, you all reminded me of the reasons I must keep going.

DEDICATION

To Adam and Connor, I love you both so very much.

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CHAPTER ONE

INTRODUCTION

Raves and Electronic Dance Music (EDM) events are organized dance parties at a nightclub, outdoor festival, warehouse, or other private property typically featuring performances by Disk Jockeys (DJs) playing a flow of electronic dance music. These events are becoming commonplace, with EDM events occurring on a weekly basis in many locations worldwide. Raves are characterized by the electronic dance music, large crowds, eccentric costumes and often the use of "club drugs," which mostly consist of forms of MDMA (ecstasy).

Studies on rave attendees in the United States consistently reveal that ecstasy use is higher among attendees relative to other populations such as criminal offenders and high school and college students (Yacoubian et al. 2004). Although not every rave attendee uses drugs, in a national study, they were more likely to report drug use and more frequent use of 18 different drugs, with frequent rave attendance found to be associated with higher odds of use of each drug (Palamar, Griffin-Tomas & Ompad 2015). With large crowds of people dancing in close quarters, casualties have occurred due to the combination of MDMA use, overheating and dehydration. While dancing all night long participants often forget to stay hydrated, are too intoxicated to remember to take care of themselves, or do not have a water station readily available to them to take a break. The use of MDMA alone can speed up breathing, rise one's body

temperature and increase sweating, causing dehydration if not consumed with large amounts of water throughout the event.

Deirdre (Dede) Goldsmith, a Virginia native, political science degree graduate and former aide to former Congressman Rick Boucher, speaks about her experience with rave events, harm reduction services and drug use within the facilities. On August 30, 2013, Dede's daughter, Shelley, attended a "Dada Life" show, held at the EchoStage event center (see Figure 1). Shelley was just 19 years old, and took MDMA before the event with her friends. Hours later, she collapsed on the dancefloor and was taken to the hospital in an ambulance. Shelley passed away on August 31, 2013, and the toxicology report declared her cause of death related to MDMA intoxication, hyperthermia, heat stroke and cardiac arrest (Weinstein 2015).

Figure 1. Rave event flyer.
Source: http://www.clubglow.com/dc-concerts-2/dada-life-8-30-13-at-echostage/

Dede declares her daughter's death is a casualty of the War on Drugs and legislation passed that addresses drug use at raves and EDM events. In 2003, the R.A.V.E. (Reducing Americans' Vulnerability to Ecstasy) Act was passed as an addition to the crack house statute passed in 1986. With this R.A.V.E. Act, promoters of events are held responsible if they are suspected of promoting or

enabling drug use at their events. As a result, promoters have reduced the availability of harm reduction services at events out of fear of prosecution for "allowing" drug use at their site. Services such as free water, drug testing, medical aid, counseling and drug information are significant in preventing overdoses and deaths. Rave and EDM promoters are not mandated to provide harm reduction services by law, and the services are provided voluntarily by non-profit organizers typically only if requested. The lack of such services results in many overdoses that could have been prevented.

While the direct effects of the R.A.V.E. Act have yet to be assessed, reports show that deaths continue to occur. From 2016-2017, 201 deaths occurred at music festivals in general, with 41 directly linked to overdoses (Turris, Jones & Lund 2018). From 2006-2016, 29 confirmed deaths occurred at EDM events hosted by Los Angeles area companies (Lin II 2016). Thus, drug overdoses and the safety of EDM events require continued investigation to understand what can be done to prevent future harm.

Outline of Study

In order to understand how to effectively prevent overdoses and casualties at EDM events, drug use at the events must be understood. Chapter 2 investigates the history of EDM events and drug use patterns of attendees. Not all rave goers use drugs, but those who do are not typical drug users. Drug users at EDM events are not usually addicted or habitual drug users; instead,

rave attendees may only use illicit drugs on the event date, maintaining a non-drug involved lifestyle while attending school and/or work.

Chapter 3 provides the theoretical basis for the study, integrating the peer cluster theory and touching on rational choice theory, social learning theory, and social supply. This study presents the argument that an individual's peer group greatly influences their decision to use or not use illicit drugs at EDM events. It is suggested that rave attendees are consuming drugs out of their own free will and are rationally choosing to use (or not use) substances during the event by weighing the costs and benefits of drug use amongst the presence of security. It is further proposed that the overall drug presence and social supply of drugs within the group affects an individual's decision to use drugs.

Chapter 4 outlines the proposed methodology. The current study explores the factors influencing an individual to use drugs at a rave or EDM event. The study uses a snowball sampling method with self-report survey data to get a better understanding of the circumstances surrounding an individual at a rave where drugs are present. Factors explored are the peer group's drug use, the peer group's overall influence, the presence of security at the event, the presence of drugs at the event, and social supply within the group. The data obtained was analyzed through a binary logistic regression model and multiple one-way analysis of variances (ANOVAs) to assess the relative influence of factors on drug use. Bivariate correlations, independent samples *t* tests and cross-tabulations were also used to compare the independent variables.

Following the results is a discussion of future research potential and policy implications to combat this issue.

CHAPTER TWO

LITERATURE REVIEW

The Problem

Raves excite all senses with bright colorful flashing lights, extravagant costumes, and endless hours of dancing to a hypnotic beat. Surrounded by thousands of high-energy partygoers, there are few experiences quite as exhilarating as a rave or Electronic Dance Music (EDM) event. This section provides a brief history of how raves began and how they have changed over the years. It outlines the problems EDM events can cause on a social and criminal level. Then, the discussion turns to the nature of drug use associated with EDMs.

A Brief History of Raves

The rave/dance party phenomenon began in the United Kingdom's "acid house" scene of the 1980s. This culture then became popular in Europe, North America, and Australia as it has evolved over the years (Lenton, Boys, & Norcross 1997). Raves have since spread worldwide. The contemporary EDM scene is but one subculture present in the rave-club culture continuum (Kavanaugh & Anderson 2008). What began as an underground secret set of parties has transformed into an organized, licensed, and promoted worldwide culture of partying.

Raves began as secret underground weekend long party events but have evolved into sponsored events largely supported by the public and promoted on social media platforms. In the 1980s, raves were held in clandestine locations such as farm fields and underground buildings. Event locations were given out just days prior in order to avoid being shut down. Rave attendees typically wore baggy clothing, baseball caps, tee shirts, and clutched infant toys and even sucked on pacifiers (Dennis & Ballard 2002). Attendees sucked on pacifiers to prevent teeth grinding while taking hallucinogenic drugs.

The culture has evolved, and now raves are legally and socially accepted events that are planned in advance with rave dates posted online and tickets made available long before the event takes place. The EDM realm has evolved into a billion-dollar industry, with the top 5 EDM DJ artists making from 25-46 million dollars in 2019 alone (Mercuri 2019). EDM events are held at popular locations where concerts take place. Insomniac Events is one of the largest tour promoters that organized 48 EDM events across fourteen cities for over three million attendees from 2010-2014 (https://www.insomniac.com/events/). Upon reviewing the Insomniac website, the following festivals and raves were listed: Electric Daisy Carnival (EDC), Nocturnal Wonderland, Beyond Wonderland, Escape, Audiotistic, Electric Forest, Countdown, Hard Summer, HARD Day of the Dead, Middlelands, Holy Ship!, Paradisco, Bassrush, Basscon, and many more. Events are occurring in many states with a plethora of dates in order to continue generating revenue.

The attire has drastically changed from the grass roots raves, with most rave goers wearing minimal clothing, matching outfits, bright colors, and holding signs that display popular memes or phrases related to their favorite DJ. The popularity of rave events has grown immensely in the past decade, and the risks that follow along with these events have grown simultaneously. These events are now defined as large dance parties featuring either DJs or live performers that play electronic dance music. EDM events are not to be confused with music festivals, which are simply community events, which feature live musical performances that are often presented with a theme (Le 2017).

EDM events appear to be full of lighthearted fun and excitement, however, the nature of these events often result in detrimental occurrences. According to the Los Angeles Times, as of 2016, there have been at least twenty-nine confirmed deaths nationwide since 2006 among people who attended raves organized by Los Angeles area companies alone (Lin II & Hamilton 2017). Seven of these deaths occurred in San Bernardino County and eight occurred in Los Angeles County. These numbers only represent the raves held by Southern California companies, and do not include any of the other states or countries worldwide which house rave events. In 2018, seven young people died from suspected drug overdoses at the “Trip to the Moon” event located in Hanoi, northern Vietnam. At this international EDM event, thirteen other attendees visited the hospital for treatment for drug related issues while as many as 700 others sought help from on-site medical staff during the festival (Palin 2018). In

comparison, as of 2014 (during its 16-year run at that time) the Coachella music festival had just two documented deaths, both related to overdoses (Westhoff 2014, & Trew 2014).

Other extremely popular raves not included in the above statistics are the Electronic Daisy Carnival (EDC) in Las Vegas and Ultra in Miami, which bring in hundreds of thousands of attendees. In 2018, it was estimated that 411,400 people attended EDC. EDC was given the "Music Festival of the Year" award in 2017. However, at the 2017 EDC event, one attendee died and 1,000 received medical treatment. The festival was originally held in California but was moved to Las Vegas in 2011, shortly after a fifteen-year-old girl was reported deceased as a result of an overdose at the event in 2010 (Romero 2014). Since 2011, nine individuals have died while attending the festival. Additionally, 95 felony arrests were made one year, most of which were for drug offenses.

At music festivals observed globally, from 2016-2017, 201 deaths were reported in the two-year period, with nearly 20 deaths each year related to overdose/poisoning (Turris, Jones & Lund 2018). This was found to be a large increase from data recorded from 1999-2014, in which 722 deaths were reported in the 16-year period, with only six deaths a year related to overdose/poisoning (Turris, Jones & Lund). It appears that drug use at music festival events has increased and continued research into this issue is needed.

The R.A.V.E. Act

Public perceptions of raves and drug use are typically unfavorable, unless they themselves are participants. The use of club drugs, large crowds and overdoses have caused negative connotations associated with EDM events. In the United States, the perceived danger associated with these events led to the passing of the R.A.V.E. (Reducing Americans' Vulnerability to Ecstasy) Act in 2003. Currently known as the Illicit Drug Anti-Proliferation Act (Hunt, Moloney, & Evans 2009), this legislation was introduced by then-Senator Joe Biden in 2002 as an extension to the 1986 crack house statute. The crack house statute was enacted to combat the crack epidemic by making it a felony to manage a building for the purpose of producing, storing or selling a controlled substance (Mohr 2018). The intended purpose of the stipulations of the legislation was to reduce Americans' vulnerability to ecstasy and prohibit individuals from profiting from production and distribution of controlled substances.

An unintended consequence of government intervention was the reduction in harm prevention services made available by many festival organizers. Due to the broad terminology and zero tolerance nature of the act, simply having harm reduction services available at a rave made organizers vulnerable to legal action as the services could be taken as an indication that the festival organizers were allowing or promoting drug use at the event. Festival organizers faced harsh fines and possible jail time for permitting or encouraging drug use on their premises (Mohr 2018). However, removing harm reduction services such as

medical aid and drug testing sites places the rave attendees at a higher risk of overdose or a medical emergency.

Parents of rave goers and rave attendees noticed this monumental issue caused by the R.A.V.E. Act, and launched an online petition to amend the R.A.V.E. Act. The founder of this petition is Dede Goldsmith, as mentioned above. She writes that if harm reduction services were available at the event, her daughter's life might not have ended. As of February 10, 2020, the petition was signed by over 20,000 people (https://amendtheraveact.org/). The petition asks congress to amend the 2003 Illicit Drug Anti-Proliferation Act to ensure that event organizers and venue owners can implement common sense safety measures, including harm reduction services, that are associated with drug use without fear of prosecution by federal authorities.

One health and safety organization that is utilized at rave events is called DanceSafe. DanceSafe is a public health organization that promotes health and safety within the nightlife and EDM community. The organization focuses on harm reduction and education in relation to drug use and EDM events. DanceSafe provides safe spaces for individuals to engage in conversations about drug use and safety, free water and electrolytes to prevent dehydration and heatstroke, safe sex tools to avoid unwanted pregnancies and the spread of sexually transmitted infections, free ear plugs, information on drug effects and potential harms, and even drug screening services to prevent overdose and death (About DanceSafe 2019). There are many chapters of DanceSafe, and

the organization is now nationwide. Each chapter maintains the goal of assisting in creating a safer EDM environment.

Harm reduction services such as DanceSafe should be utilized at every event without the fear of prosecution under the R.A.V.E. Act. According to the Executive Director of DanceSafe, Mitchell Gomez, DanceSafe will "only set up at events where we have permission to be at. What specific services we offer is a negotiation for each event, and we only are able to (drug) test at about 25% of the events we service" (Gomez 2020). Without approval from the event promoters, harm reduction services may not be available at an EDM event. The director of DanceSafe further advised that it is a split between DanceSafe being invited to events versus them reaching out and asking to attend events, but they are often the ones reaching out to the event promoters (Gomez 2020). If harm prevention services were mandatory at all EDM events, the number of drug overdose incidents would potentially decrease.

Drug Use and Prevalence of Ecstasy

A common notion is that rave attendees ingest certain drugs to enhance their rave experience. Hallucinogenic drugs, particularly ecstasy, heighten the user's senses and increase sensitivity to touch, as well as to the sound of the music. One's appreciation for EDM is sometimes thought to be heightened by using ecstasy, to the point that it induces a form of trance for the individual (Kavanaugh & Anderson 2008). The "techno" computerized hypnotic, rhythmic rave music has been described as repetitive, loud, fast, and mind-numbing

(Dennis & Ballard 2002). This mind-numbing experience allows for attendees to escape reality and enter a different world within the music and drug high. This trance and hyper-stimulation of senses intensifies the entire rave experience, which may be why these dance festivals have such a high tendency toward club drug use.

Studies show that several drugs are linked to attending EDMs. For example, rave attendees are more likely to have ever tried LSD, inhalants, ecstasy, and amphetamines (Lenton et al. 1997). In the general population, it was estimated by the 2018 National Survey on Drug Use and Health that approximately 2% of the United States population used hallucinogens (LSD, PCP, peyote, mescaline, psilocybin, mushrooms, ecstasy, ketamine and salvia divinorum) within the past year (SAMHSA 2019). On a study conducted on rave attendees in 2002, 24% of attendees interviewed reported using ecstasy and 30% tested positive for MDMA by oral fluid analysis (Yacoubian, Deutsch, & Schumacher 2004).

The most prevalent drug in the rave culture is 3,4-methylenedioxymethamphetamine (MDMA), commonly referred to as ecstasy. Emergency visits related to MDMA have increased by more than 120% from 2004 to 2009, while emergency visits for other drugs have remained the same (Armenian, Mamantov, Tsutaoka, Gerona, Silman, Wu & Olson 2013). Although it cannot be assumed this increase is solely due to raves, this increase has occurred just as the popularity of raves and EDM events with club drug use has

increased. High prevalence rates suggest that ecstasy may be heavily embedded within the rave subculture (Yacoubian et al. 2004). Rave attendees using drugs are typically from the middle class and predominantly Caucasian (Yacoubian et al. 2004).

MDMA use often results in detrimental medical issues for the user at rave events. Ingesting the drug, in combination with repetitive dancing and lack of hydration often leads to dehydration. Ecstasy use contributes to dehydration as it causes increased heart rate, perspiration and overall body temperature. In a case report following 12 MDMA intoxicated patients in San Francisco, severe adverse reactions to MDMA included hyperthermia, seizures, cardiac dysrhythmias, metabolic disturbances, disseminated intravascular coagulation, renal failure and psychiatric disturbances (Armenian et al. 2013). Of the 12 patients, 2 patients died, 6 experienced long-term side effects and 6 had a complete recovery. Eight patients required emergent intubation and 5 required emergent dialysis for acute renal failure, acidosis and hyperkalemia. For the 2 deaths, both Coroners' investigations listed MDMA intoxication as part of the cause of death, suggesting that MDMA use can induce fatal side effects.

Many factors may influence whether individuals use drugs at events when they do not normally use illicit substances daily. Drugs may be used to heighten the musical and visual experience, to fit in with their friends (peer approval), to escape their reality while in this rave world, (experimentation or rebellion), or simply out of boredom (Mason 2010; Hunt, Moloney & Evans 2009). Drug usage

amongst rave attendees is hard to predict due to the inconsistencies in when they might use drugs, as it may not be due to an addiction.

As illustrated in Shelley Goldsmith's death, her mother described her as an excellent student and not known to be a habitual drug user. Friends stated Shelley used ecstasy on her way to the EDM event with most of the peer group. Ecstasy use among rave attendees can be inconsistent and only used on event dates rather than an everyday use or addiction. Patterns of club drug use are abnormal and not consistent with an addicted drug user, making it hard to research and analyze.

Variety of Drug Use at Raves: Desired and Adverse Effects

In order to understand the severity of drug use among rave attendees, the presence of drugs and the dynamic of their effects on users must be examined. The presence of "club drug" usage has increased over the past two decades and is a current trend for young rave attendees. The club drug use trend began in the 1990s and has grown each year up to present time. "Designer" or "club" drugs describe drugs used in the club setting which include ecstasy (MDMA), gamma-hydroxybutyrate (GHB), Rohypnol, ketamine, lysergic acid diethylamide (LSD) and methamphetamine (Rome 2001). GHB, Rohypnol and ketamine are drugs that also fall into the "date rape" drug category. These serious substances are used frequently within the rave setting. Designer and other drugs are obtainable and affordable at raves, in addition to "power drinks" which consist of

fruit juice mixed with amino acid powders and B vitamins to replenish fluids lost during strenuous dancing (Rome 2001).

Club drugs are dangerous enough on their own, however, often the drugs being distributed at a rave pose an even greater risk as they are not being sold in their pure form. Much of what is sold as ecstasy is not pure MDMA, but a combination of methylenedioxyamphetamine (MDA), N-ethyl-methylenedioxyamphetamine (MDE), LSD, amphetamine, caffeine, heroin and/or lactose (Rome 2001). The mix of various drugs and caffeine pose a dangerous threat to the drug user's health. Drugs commonly associated with serious heat injury (i.e. dehydration, heat exhaustion, heat stroke) include amphetamines, cocaine, MDMA, methamphetamine and phencyclidine (PCP). Most of this list of dangerous drugs include drugs used frequently by rave goers. Ravers may also "stack" their drugs by taking three or more MDMA tablets at once or by mixing MDMA with LSD, alcohol or marijuana (Rome 2001). Some drug users will also take a variety of drugs throughout the rave to maintain their high. Stacking these drugs increases the risk of overdose, as high amounts of the substance or multiple substances in an individual's system causes a variety of adverse effects.

Drug users at a rave consume drugs like MDMA in search of a high or a "rush," occurring shortly after consumption. After the rush, users experience a sudden clarity and intensification of perceptions such as brighter and crisper colors, which enhances light shows that are often part of the rave experience (Rome 2001). An increase in sensation and overall euphoric feeling is typically

the goal of taking the club drug. The desired effects of using GHB are euphoria, disinhibition and sexual enhancing effects. Desired effects of ketamine are feeling relaxed, hallucinations, loss sense of pain and visual distortions. Drug users take Rohypnol in hopes of achieving muscle relaxation, amnesia and disinhibition. Methamphetamine is used to feel an intense sensation (rush), and a lasting high shortly after (Rome 2001). However, there are often adverse effects of these drugs that users are not educated on.

Adverse effects of ecstasy use include depression, memory loss, paranoia, rhabdomyolysis (breakdown of tissue and damage to kidneys), depletion of serotonin, arrythmias, coma, dehydration, heat injury, and overdose (Yacoubian et al. 2004, Rome 2001). Ketamine ingestion can lead to impaired motor functioning, hallucinations, tachycardia, hypertension, respiratory depression and increased risk of seizure. Use of Rohypnol can cause decreased blood pressure, mental lethargy, respiratory depression, impaired motor coordination, hallucinations and potential overdose when combined with alcohol. LSD and PCP can lead to increased body temperature, abnormalities in sensory perceptions and tremors. GHB sedates the body, slows heart rate, may cause mydriases or miosis (pupil dilation or constriction), bradycardia, hallucinations and/or coma. Methamphetamine use can cause mydriasis, vasoconstriction (narrowing of blood vessels) of extremities, tremors, hypertension, palpitations, cardia arrhythmias, hyperthermia, seizures, paranoia, psychosis and even death (Rome 2001).

The adverse effects of club and designer drugs are severe and life threatening. A public health investigation on morbidity and mortality found that nationally, MDMA related emergency department visits increased 74.8% from 2004-2008 (MMWR 2010). The investigation found MDMA use at rave events to be an ongoing and underreported public health problem (MMWR 2010). Rave attendees have the highest propensity to use club drugs, and face health risks while at events with limited access to medical and preventative care. Raves and their potential for numerous deaths and emergency medical visits have gained recognition in Congress, resulting in legislation being passed to combat the drug use at such events.

CHAPTER THREE

THEORETICAL FOUNDATION

Risky Behavior and Togetherness

Of interest to the present study is drug use by rave attendees. Although many studies have been conducted on raves and club drug usage, few investigate the peer groups within the culture, and how individuals within that peer group may influence one another to abuse drugs while at a rave event.

The use of drugs at electronic dance music events can be attributed to the sense of risky behavior and belongingness that the participant feels. Groups of rave attendees call themselves “families” and seem to connect with one another on a higher level when experiencing raves together. Families have also been defined in other music groups such as the rock band Grateful Dead. Families were defined in this setting as a group of “Deadheads” who whirl like dervishes to transport themselves into meditative states (Adams & Sardiello 2000). The Family attends all concerts together and state that shows/concerts are comparable to other religious services such as masses, but are a far more powerful spiritual experience (Adams & Sardiello 2000). Families in both settings take the experience of the event very seriously and seek a trance like state while listening to the music.

The vibrant lights, repetitive music and possible drug use can put participants in another state of mind with one another. “The purpose of the night out is to consume and enjoy the immediate whether that be in the form of drugs,

or music or the spectacle" (Hunt et al. 2009, p. 614). Mind-altering substances are used by young people to allow them to escape the routine elements of structure and control that are experienced in normal everyday life.

Hunt et al. (2009) also suggests that other qualities may be leading young people to behave in a particular way at rave events. In addition to mood-altering drugs enhancing the excitement of dance events, the risky nature of using drugs may promote the excitement they seek as well. Knowing that they are participating in a risky activity can provide excitement and an escape from everyday life, where behavior is more mundane. Young people like to take risks, and if they are pursuing an activity that is defined by society as risky, that can bring an excitement in and of itself (Hunt et al. 2009). The evaluation of young ravers' perceptions of risk at these events has yet to be examined.

Rational Choice Theory

The rational choice theory of crime suggests that individual criminals are rational, decision-making agents (Cornish & Clarke 1986, 2014). There are important factors involved in a person's decision to engage or not engage in a particular act, and the criminals themselves decide whether to commit a crime or not. Formal or official sanctions have little effect on individuals' decisions to commit crime in this theory, while extralegal or informal factors have the most influence on the decision (Cornish & Clarke 1986, 2014). Fear of being arrested is not of utmost concern with a crime being committed in the light of rational

choice. Factors such as family, friends, religion and employment may influence an individual to commit a crime or choose not to.

> Finally, the influence of peers has a profound impact on individual perceptions of the pros and cons of offending by significantly decreasing the perceived risk of punishment if people see their friends get away with crimes. (Tibbetts, 2012, p. 57)

This suggests that if an individual observes his/her friends committing a crime and no punishments or risk is perceived, they are more likely to see the behavior as safe and engage in it as well. Applying this theory to the current study, if an individual observes friends at the rave event consuming drugs without any consequences, the perceived risk of punishment is decreased, and they are more likely to consume drugs as well. If there is a lack of security presence or individuals being punished for drug use, the individual will be more likely to engage in risky behavior and consume drugs at the event.

Another point, possibly the most important in rational choice research, suggests that the expected benefits of the crime had one of the most significant effects on an individual's decisions to offend. In particular, the pleasure offenders would get from offending was found to be one of the main factors in the decision to offend (Cornish & Clarke 1986, 2014). If rave attendees seek the pleasure that is gained from the consumption of drugs, particularly ecstasy, in combination with the rave atmosphere and event in general, they will be likely to use the drug to gain that pleasure. The benefits in this scenario outweigh the

risks if there is no potential punishment observed as other rave attendees may be observed using drugs with no negative repercussions.

Normative rationality suggests that if committing a crime has a higher utility than not committing the crime, and the acceptable risk of being caught does not outweigh the desirable amount to gain, then the individual will decide to commit the crime (Cornish & Clarke 1986, 2014). On the other hand, the perceived likelihood of being caught and punished should reduce crime, supporting the hypothesis of deterrence. In the current study, it is predicted that rave attendees will be deterred by the presence of effective security-- the benefits of consuming drugs will be matched with the perceived possibilities of being caught and punished for it.

Solidarity and the Peer Cluster Theory

A sense of camaraderie is felt among rave members participating in events together. Again, groups of friends and fellow rave goers often create "families" and generate a name for their group that raves together. Families have been present not only in the rave setting, but also in the rock music world such as the Grateful Dead research conducted from the late 1980s to the early 2000s. The families observed consisted of a group of individuals who attend concerts together regularly, and partake in dancing, meditating, communal smoking of marijuana, and spinning (Adams & Sardiello 2000). An emphasis is placed on

living in the moment and following the family's set of rules and rituals as opposed to the entire community attending a concert.

Two dimensions of solidarity have been discovered at rave events, social-affective and behavioral-organizational solidarity (Kavanaugh & Anderson 2008). Social-affective solidarity is the meaning ravers' participation or involvement in the scene gave them. Individuals described personal and emotional experiences and focused on the PLUR (Peace, Love, Unity, and Respect) ethos. Behavioral-organizational solidarity includes tangible activities and behaviors that rave participants engaged in. These activities include but are not limited to dancing, staying up late, drug use, and other norms common at rave and EDM events. Drug use has been found to contribute to solidarity at EDM events and the rave scene in general (Kavanaugh & Anderson 2008).

Although drug use contributes to the sense of solidarity amongst rave attendees, it also leads to the detachment from the EDM scene. Excessive, prolonged drug use leads to users no longer feeling connection to the scene. If one becomes too involved in drug use, he/she encounters negative experiences such as addiction, manipulation, or victimization (Kavanaugh & Anderson 2008). Excessive drug use is deemed incompatible with bonding through music as experienced by limited drug users. If there is a distinct difference between limited and habitual drug users, which may lead to detachment from the rave culture, it has yet to be further examined.

The peer cluster theory suggests that socialization characteristics play a major role in influencing adolescent behavior. This psychosocial theory views drug use as a symptom of underlying social or psychological problems, rather than viewing drugs as the cause of problems in an adolescent's life. In this theory, the single dominant variable in adolescent drug use is the influence provided by the peers whom the adolescent associates with (Oetting & Beauvais 1987). These associates shape an individual's perspective of drugs and drug use, and they share ideas and beliefs that become rationales for drug use. The peer group will use drugs together, at particular times and places, and share the same ideals about drugs (Oetting & Beauvais 1987). Peers are not seen as pressuring one another to use drugs but inviting associates to partake in using drugs together. Peer groups can be large or small, with formal and informal group types.

The peer cluster is "seen as an active, participating agent in shaping the norms and behaviors of that cluster, in deciding whether, when, and how to use drugs." (Oetting & Beauvais 1987, p. 206). Results from a prior study indicate that socialization characteristics are highly predictive measures of adolescent drug use (Oetting & Beauvais 1987). This suggests that socialization characteristics, which include peer clusters, are likely a large cause of adolescent drug use. The group of people one interacts with will influence them to partake in certain activities, one being drug use. If a large percentage of the peer group are actively using drugs, it is suggested that an individual will be more likely to use

drugs as well. Results have been consistent with the peer cluster theory, indicating that peer drug associations essentially dominate in predicting drug involvement (Oetting & Beauvais 1987). However, peer cluster theory does not indicate that there are no other influences aside from peers; other factors are important in influencing an individual into potential drug use. Drug use cannot be pinpointed to one influencing factor, but a multitude of factors, with peer groups being one of the more influential predictors.

Dance musicians and their culture have been outlined and described as a deviant occupational group itself (Becker 1963). Dance musicians are described as a group of outsiders with an unconventional occupation, where drug use is part of the culture. Cliques develop between musicians where they build relationships by providing each other with gigs and steady employment (Becker 1963). Individuals who attend music concerts from these "deviant groups" develop their own culture,

> "Where people who engage in deviant activities have the opportunity to interact with one another they are likely to develop a culture built around the problems rising out of the differences between their definition of what they do and the definition held by other members of society" (Becker, 1963, p. 81).

The environment within the EDM world could be emulating in the same way, with a culture of deviant activities building during an event where groups of friends choose to either use drugs or refrain.

Social Learning Theory and Social Supply

The social learning theory of crime suggests that “new patterns of behavior can be acquired through direct experience or by observing the behavior of others,” (Bandura 1977 p. 3). Behavior is learned from the environment through the process of observational learning (McLeod 2016). In observational learning, people are surrounded by influential “models,” such as children learning from parents, and in this case, individuals learning from friends within their peer group (McLeod 2016). These models provide examples of behavior for individuals to observe and later imitate. In this case, an individual’s peer group can display the behavior of using drugs at a rave event. An individual observes the peer group’s behavior and may imitate the drug use if the group is seen using the drugs without any negative consequences.

Once an individual imitates a behavior, the group will respond with either reinforcement or punishment (McLeod 2016). In young children, if a child is seen hitting, they are likely to receive punishment by the parent. In the rave setting, if an individual uses drugs after observing the peer group use drugs, they are likely to receive reinforcement for engaging in the same behavior. Responses are automatically and unconsciously strengthened by their immediate consequences, and individuals essentially behave accordingly to gain beneficial outcomes or to avoid punishing ones (Bandura 1977).

Research on social groups suggest that peer context is a robust predictor of adolescent substance use (Mason 2010). Thus, if an individual observes

another peer within their group using drugs, they are more influenced to participate in the behavior as well, supporting social learning theory. Substance use behaviors can be associated with a selected social group that influences through peer modeling of the behavior and may be seen as an opportunity to cope with mental health and family issues (Mason 2010). Rave attendees may seek drug use at the event to escape reality and fully delve into the EDM scene with mind altering drugs.

The way in which rave attendees are obtaining drugs either before or at an EDM event varies. However, there is a mechanism that in more recent years, a supply of drugs is not always distributed for a profit. A drug supply that involves the non-commercial supply of drugs to friends and acquaintances for little or no profit has become known as “social supply” (Coomber, Moyle, Belackova, Decorte, Hakkarainen, Hathaway, Laidler, Lenton, Murphy, Scott, Stefunkova, Ven, Vlaemynck & Werse 2018). Social supply suggests that drugs are distributed to friends with little to no profit being made, creating a different dynamic compared to the profit driven drug dealer. Individuals obtain drugs before or at EDM events likely in this fashion. Ravers have been found to participate in group and “party buying” practices (Coomber et al. 2018). There is a high incidence of drug users sharing, swapping, exchanging and “chipping in” to purchase drugs for an event.

In a study examining more than 10 countries, social supply was posited as the primary mechanism through in which recreational substances like ecstasy

and ketamine are accessed and distributed in non-traditional settings (Coomber et al. 2018). Understanding the distribution of ecstasy and ketamine is pertinent to rave drug use research, as ecstasy and ketamine are highly prevalent in the rave scene among attendees.

Social suppliers typically sell drugs only to friends: in this scenario, the supply is commercial but the recipients are known (Coomber et al, 2018). Most individuals attending raves attend in groups, not alone, and one member of the group is likely a social supplier or has a connection with one. Data suggests that social supply extends to small scale social distribution of club drugs such as ecstasy, cocaine, methamphetamine and ketamine (Coomber et al, 2018). With drugs being distributed by friends and trusted group members, an individual may be more inclined to consume drugs as there is a level of trust present. If the drugs were supplied by a typical profit driven dealer who is a stranger, there might be more hesitance in purchasing and using drugs at a certain event.

If illegal substances are readily available through a social supplier, and other members of the social network are observed using the drugs, it is likely an individual will also partake in the behavior. Fearful and defensive behavior of getting caught (in this case using drugs at an event) is typically extinguished by observing others engage in the feared activities without any adverse consequences (Bandura 1977). So long as other group members are observed using drugs without any negative consequences, an individual's fear of engaging in drug use will be eliminated.

CHAPTER FOUR

METHODOLOGY

Overview

The current study examines rave attendees who have attended at least one EDM event which typically features electronic music, dancing and drug use. The primary objective is to examine the effect peer groups have on an individual's use of club drugs at rave events. Perceptions of event security and overall drug presence will also be investigated. This inquiry into the propensity towards drug usage among rave participants also controls for participant age and total number of events attended. Participants were recruited at two points in time through a snowball sampling method and data collection involved anonymous surveys administered online using Survey Monkey®. The differences between samples were minimal, as assessed with independent samples *t* tests, cross-tabulations, and Chi-squared tests. Finally, a binary logistic regression model and a series of ANOVAs were utilized to test the unique contributions of each independent variable.

Hypotheses

H1: Controlling for other factors, strong peer influence is predicted to be positively associated with reported individual club drug use at EDM events.

H2: Controlling for other factors, perceptions of effective security will decrease reports of individual club drug use at EDM events.

H3: Controlling for other factors, individuals will be to be more likely to use club drugs at EDM events if drugs are openly observed being used and/or sold, rather than if drugs are not present.

H4: Peer group club drug use will have the strongest effect on an individual's reported club drug use at EDM events while controlling for other factors.

H5: Social supply will be reported amongst respondents, and will have a positive correlation with the individual's club drug use.

Data Source

Participant Recruitment

Sampling for the study targeted a population of individuals at least eighteen years of age, who have attended at least one electronic dance music (EDM) event within the last year. An EDM event was defined as a dance party where live DJs play music, often accompanied with a light show. There are different types of events that rave goers attend, categorized as large or small. Large events take place over multiple days and often draw stadium sized crowds (over 50,000). Nocturnal and Escape are the two main companies who host these large events. Small events occur on a single night and draw fewer than 50,000 people.

Data collection protocol were repeated to generate two cross-sectional data sets. The first set of data (N=34) was generated through a snowball sample launched by a full-time faculty member, two graduate students, and eleven students enrolled in an undergraduate research methods class during the winter quarter of 2017. My role in the project was to co-develop the EDM survey that participants were invited to complete online. Snowball sampling is reported to be an appropriate purposeful method of data collection in qualitative research (Naderifar, Goli & Ghaljaie 2017). In a study examining 11 different research studies, snowball sampling was found to be an appropriate method in order to target specific groups of people and target characteristics that are not easily accessible (Naderifar, Goli & Ghaljaie 2017). Rave groups are a specific group of people and were deemed best accessible through a snowball style sampling method.

I recruited the second wave of participants during the spring quarter of 2020 (N=37). The data generated through the second wave of participants provides an opportunity to test whether a shift in the language used in one question would improve the completion rate of social supply questions. During the first round of the study, participants' completion of the survey began to decline after a question asked the participant to name friends in their group and answer questions related to their friends. In the second round of the study, the question was altered to make the participant feel more comfortable answering questions.

The first round asked participants: *Using nicknames or first names list up to 6 people that you went to an EDM with in the past year. (If you went to events with fewer people, do not enter extra names. If you went to events with more than 6 people, list the people you went with most often.)*

The second round was altered to state: *Using pseudonyms (use fake names so you DO NOT identify anyone), list up to 6 people that you went to an EDM with in the past year. (If you went to events with fewer people, do not enter extra names. If you went to events with more than 6 people, list the people you went with most often.)* This small revision of the question was made to increase the completion rate of the survey, stressing anonymity to the participant.

A research proposal was submitted to the Institutional Review Board (IRB) twice, once for the first survey administration and once in relation to the second round of data collection. The surveys were approved both times by the IRB for release to adult subjects. In the first round of the survey, social media and personal networks were used to recruit participants in several ways. Each member of the research team posted messages on their social media accounts (e.g. Facebook, Twitter, Instagram, and Group Meet). The message included a link to the survey posted on Survey Monkey®. Participants were then invited to post the flyer on their own social media accounts to attract others, thus continuing the snowball sample. Of note, researchers who attend EDM events purposely sent emails and messages to their friends and relatives who were known to have attended a rave within the last year.

In the second round of the survey, social media and personal networks were also used to recruit participants in several ways. I posted messages to my Instagram and SnapChat accounts, and sent text messages encouraging family members and friends to post the survey to their Facebook and Twitter accounts as well. The survey link was provided as well as a QR code to the survey. An email was also sent to the Criminal Justice Department faculty at a Southwestern University with a request that instructional staff share the survey with students to get more exposure. A brief video explaining the survey with an introduction to the project was also provided to faculty, along with the survey link and QR code.

To improve consistency of participant recruitment, across both phases of solicitations, standardized recruitment messages were used:

Email

Hello [fill in name],
I am writing to invite you to participate in a survey about security and safety at Electronic Dance Music events (a.k.a. Raves). This survey is for a class research project by criminal justice majors at California State University, San Bernardino.
The purpose of the project is to understand safety issues associated with dance parties.
This is a voluntary and confidential survey; it should take no more than 20 minutes of your time.
Please consider helping us out! To get started all you need to do is follow this link http://www.surveymonkey.com/r/DANCE_PARTY.
Feel free to pass this invitation along to anyone over 18 years of age who might be interested!
Thank you,
[fill in name]

Social Media Posts

Do you like to dance? If so, there is a new study underway to gather information about Electronic Dance Music events and festivals (a.k.a. Raves). This survey is for a class research project by criminal justice majors at California State University, San Bernardino.

The purpose of the project is to understand safety issues associated with dance parties.
This is a voluntary and confidential survey; it should take no more than 20 minutes of your time.
Please consider helping us out! To get started all you need to do is follow this link http://www.surveymonkey.com/r/DANCE_PARTY.
Feel free to pass this invitation along to anyone over 18 years of age who might be interested!
Thank you,
[fill in name]

Twitter
Do you dance? New study on Raves! To participate go to http://www.surveymonkey.com/r/DANCE_PARTY.
#EDM #raves #CSUSB

Each member of the research team for the first round of data attempted to recruit at least 15 people. Researchers from round 1 were instructed to:

- Keep a record of all the places they posted.
- Keep a record of the number of people invited to participate.
- Keep a record of any comments that were returned by people.
- Keep a record of any "reposting," "retweeting," etc. that their invitation triggered.

I followed the same protocol when round 2 was conducted by myself.

Email to faculty

Hello,

My name is Brandi Burns and I am a graduate student in the Criminal Justice MA program here at (name of University). I am working on a thesis that investigates the safety and security of Raves and Electronic Dance Music (EDM) Events. I created an anonymous and confidential survey to collect data. My committee advised me to reach out to faculty for assistance in disseminating the survey to students.

If you could please share this online survey with your students, I would greatly appreciate it.

> I have attached an introduction video for participants with a link and QR code to the survey to this email (preferred method).
>
> If you prefer to send students the survey link with a written description (without the video), I have attached that option as well.
>
> Thank you for your time,
> Brandi Burns
> Criminal Justice M.A. Candidate

Sample

To qualify for the study, respondents had to indicate they read the consent statement, be at least 18 years of age, and had attended at least one EDM event in the last year, where an EDM was defined as a dance party where live DJs play music, often accompanied with a light show. For the first round of the study, in total, 73 people attempted the survey. Of which, 15 people were not qualified as they had not attended an EDM the prior year, and 3 people did not read the consent statement. The final sample of the first wave after excluding disqualifications included 55 respondents. About 62% of qualified participants completed the entire survey, resulting in 34 usable survey responses. Calculating the completion rate using the total amount of people who attempted the survey results in an overall response rate of 46%. The average amount of time taken to complete the survey was 14 minutes and 42 seconds.

The second round of the study was conducted in the spring quarter of 2020 and followed the same guidelines as the first round. For the second round of the study, in total, 98 people attempted the survey. Of which, 16 people were not qualified as they had not attended an EDM the prior year, and 10 people did

not read the consent statement. The final sample of the second wave after excluding disqualifications included 72 respondents; of which 51.4% of qualified participants completed the entire survey, resulting in 37 usable survey response. Calculating the completion rate using the total amount of people who attempted the survey results in an overall response rate of 37%. The average amount of time taken to complete the survey was 10 minutes and 52 seconds.

With both rounds of data combined, there was a total of 71 participants and a total overall response rate of 41%.

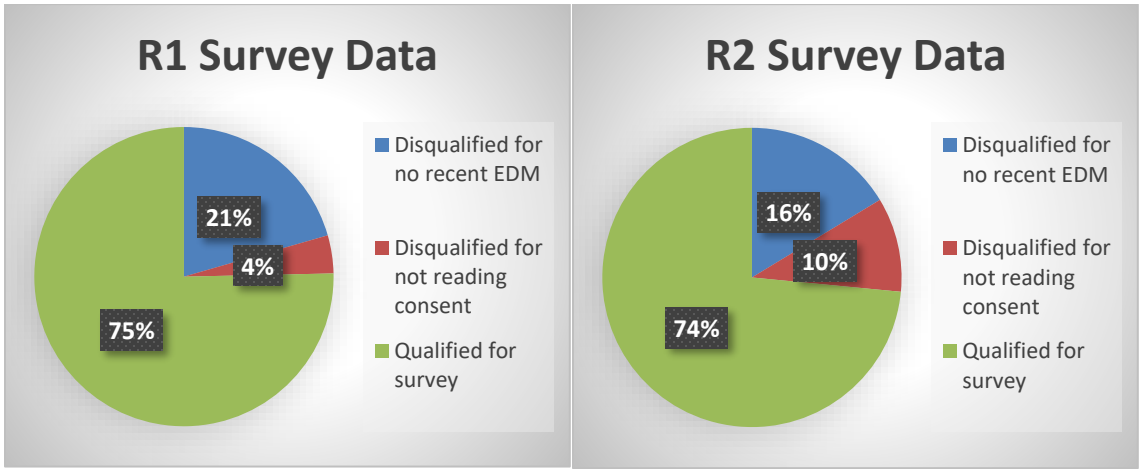

Figure 2. Comparing survey data from R1 and R2.

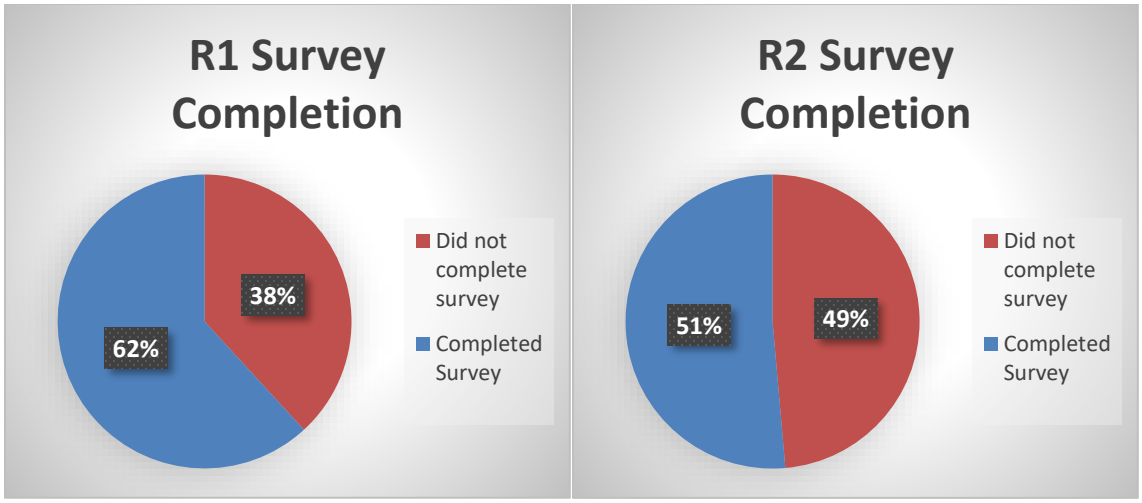

Figure 3. Completion rates of qualified respondents from R1 and R2.

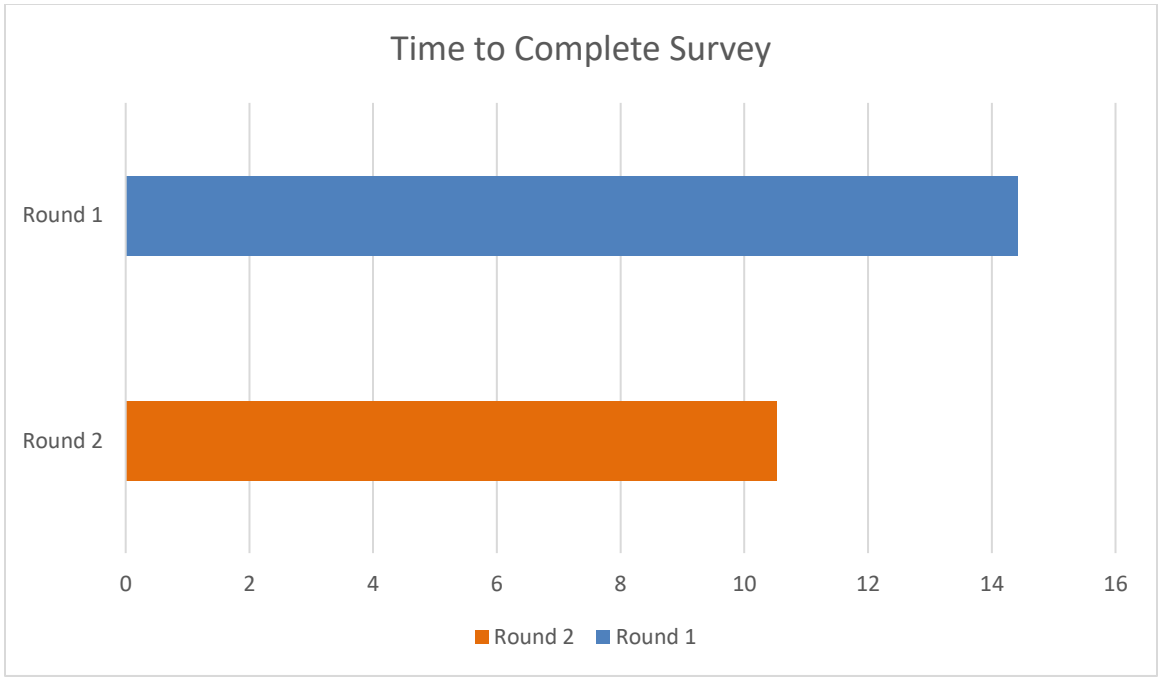

Figure 4. Time to complete survey for R1 and R2.

Combining Data Sets

In order to determine whether to combine the two data sets for analysis, the samples were compared on nine control variables. Participants' age, years in their home, total # of EDM events attended in the last year, peer group size, distance travelled to an event, employment, school, relationship status and gender were examined.

Age. Participants were asked what year they were born, and answered this question by entering the 4-digit year that they were born. Age was calculated by subtracting the year the person was born from the year the survey was completed.

The number of years living in their current home. Participants were asked how many years they have lived in their current home, and answered this item by entering the number of years.

The total number of events attended. Total number of events attended was measured with one item including two parts: *How many RAVES have you attended in the last year?*

- ___ *large events (Large RAVES take place over multiple days and often draw stadium-sized crowds, i.e., over 50,000 people. EDC, Nocturnal, and Escape host such events.)*

- ___ *small events (Small events, hosted by companies such as Bass Rush, occur on a single night and draw fewer than 50,000 people.)*

Respondents entered the numbered amount of events they attended for each category, large and small, which were combined to represent total events.

Peer group size. Participants were asked how many people are usually in their group, including the number of people they travel to the event with or arrange to meet there. Responses were captured with a five-point scale, where *none; I go by myself* was valued at 1, *1-5 people* was 2, *6-16 people* was 3, *17-20 people* was 4, and *21 or more* scored a value of 5.

Distance typically travelled to attend events. Participants were asked how far from home they typically travel to go to an EDM event of any size. Responses were captured with a four-point scale, where *0-25 miles* was valued at 1, *26-50 miles* was 2, *51-75 miles* was 3, and *more than 75 miles (76+ miles)* scored a value of 4.

Employment. Participants were asked if they normally work more than 20 hours per week. Respondents answered this question by checking a box for either *yes* (1 point) or *no* (0 points).

School attendance. Participants were asked if they attend school at least 10 hours per week (high school, college, trade school, university, or academy). Respondents answered this question by checking a box for either *yes* (1 point) or *no* (0 points).

Relationship status. Participants were asked if they were in a committed relationship (e.g., married, living in a domestic partnership, engaged). Respondents answered this question by checking a box for either *yes* (1 point) or *no* (0 points).

Gender. Participants were asked what their gender was and responded by checking a box for *male* (1 point), *female* (2 points), or writing in a text box for *other,* typing in what they identify as.

As shown in Table 1, Rounds 1 and 2 of data show the mean age of the participant to be mid to late twenties. The average amount of years spent in the home ranged from 7-8. The mean group size averaged 2-3 people. Both Rounds reported approximately the same distance travelled, which represented 26-50 miles. Most of the respondents reported to be working. The phases differed in the number of respondents attending school, with the majority in Round 1 attending school, and the majority in Round 2 not attending school. Approximately half of both rounds reported to be in a relationship. In Round 1

most participants were male while Round 2 was dominated by female respondents.

Table 1. Sample description.

	Round 1 (2017)			Round 2 (2020)		
	Mean or Percent	Std Dev	N	Mean or Percent	Std Dev	N
Age (in years)	24.31	4.60	32	29.14	7.69	28
Years in home	7.82	6.73	33	8.52	8.31	29
Events attended	6.56	5.32	34	4.29	4.49	36
Group size	2.79	.85	34	2.53	.88	36
Distance traveled from home (miles)	2.74	1.11	34	2.49	1.17	37
Working 20+ hours	69.70%	--	33	83.33%	--	30
Attending school	66.67%	--	33	43.33%	--	30
In a relationship	45.45%	--	33	56.67%	--	30
Gender (Male)	62.50%	--	32	40.00%	--	30

Two analytic procedures were used to investigate whether differences in the two rounds of data were significant. Independent samples *t* tests were performed for the continuous variables, while cross-tabulations and Chi-squared tests were used to assess differences between samples for discrete variables. If

substantive differences were discovered, the samples would be treated independently and analyzed separately.

Table 2 reports the independent samples *t* tests for the continuous variables. Only one significant difference was found: the mean age of the two samples was significant at the p<.01 level. The second sample was older than the first. Notably, the mean difference in the number of total events attended was nearly significant with the first sample reporting higher average attendance. None of the other variables showed any significance.

Table 2. Independent samples *t* tests for continuous variables.

	R1 Mean (SD)	R2 Mean (SD)	t value	Sig. (2-tailed)
Age (in years)	24.31 (4.60)	29.14 (7.69)	-2.995	.004
Years in home	7.82 (6.73)	8.52 (8.31)	-.366	.716
Events attended	6.56 (5.32)	4.29 (4.49)	1.919	.059
Group size	2.79 (.85)	2.53 (.88)	1.292	.201
Distance traveled from home	2.74 (1.11)	2.49 (1.17)	.918	.362

Table 3 presents cross-tabulations and Chi-squared tests for the discrete variables. The two rounds of data were not found to be significantly different for any of the discrete variables. The p-values (Sig.) were all greater than .05,

showing that comparing the data from the two rounds showed no statistical significance, deeming them appropriate to combine into one sample for analysis.

Table 3. Chi-squared tests for discrete variables.

	R1	R2	Pearson's Chi-squared value	P value
Not employed or working less than 20 hours (per week)	30.30%	16.67%	1.611	.204
Working 20+ hours	69.70%	83.33%		
Attending school	66.67%	43.33%	3.465	.063
Not enrolled in school	33.33%	56.67%		
In a relationship	45.45%	56.67%	.790	.374
Not in a relationship	54.55%	43.33%		
Male	62.50%	40.00%	3.139	.076
Female	37.50%	60.00%		

In sum, the first round of data may represent a younger group of hardcore ravers, with the average age being 24 and total events attended averaging 6.56. The second round of data may represent an older, more recreational rave attendee, with the average age being 29 and total events attended averaging lower at 4.29. This difference may be due to the sampling strategy as the research team in 2017 was younger with younger peers to share the survey with,

and the second round conducted by myself in 2020 (3 years later) would age the participant pool by 3 years. I decided that the majority of the findings were not significantly significant in their differences, and combining the data generates a more representative total sample of attendees. Due to age and total events attended showing significance within these tests, they were used as control variables within the binary logistic regression model.

Additional sample description information to note included that 76% of respondents reported that the DJ playing at the event was very important/most important to the group of people they attended the EDM with. 49% reported that the group they attend the EDM with has a lot of influence/major influence on the music that they listen to. 50% reported that the group influences the EDM events that they go to. 82% reported seeing someone at the event using drugs, and 30% stated they saw someone at the event buying drugs. 54% reported seeing someone being treated for a medical issue at the event. 75% of respondents stated they saw free water/hydro stations at the event often/very often/most often. 68% reported using these hydro stations at the events they go to. Finally, 63% reported that security makes the biggest difference in the availability of drugs at an event.

Variables

Dependent Variable

Individual club drug use. Individual club drug use represents the respondent's use of club drugs at rave and EDM events. Club drugs are

prevalent in the rave and EDM scene, and often consumed before or during the event (Rome 2001, Turris et al. 2018, Weir 2000, Yacoubian et al. 2004, & Armenian et al. 2012). Participants were asked to rate how often they use (consume) the following substances before or while at an EDM event: (1) Alcohol, (2) Pot, (3) Prescription pills (e.g. tranquilizers, narcotic pain medications), and (4) Club drugs (methamphetamine, GHB, Rohypnol, cocaine, ketamine). Responses were captured with a six-point scale, where *never* was valued at 0, *rarely* was 2, *sometimes* was 4, *often* was 6, *very often* was 8, and *most often* scored a value of 10, with higher scores indicating more drug usage.

Table 4 shows the reported drug use for all categories. The highest percentage for reported alcohol use was for *most often*, at 27%, with all other responses spread out amongst the categories. Most participants claim to not use marijuana while at a rave with *never* marked at 43%. However, the second highest percentage for marijuana use is *most often* with 19%. The overwhelming majority of participants claim to not use prescription pills at an event, with 91% claiming *never*. No participants claimed to use prescription pills for the categories of *often*, *very often* or *most often*. Just under half of respondents stated they never use club drugs at an event (49%). However, 18% claim to use club drugs *most often*, and responses for *often* and *very often* were reported as well.

Table 4. Reported drug use by individual at events.

	N	Never	Rarely	Some-times	Often	Very Often	Most Often
Alcohol	66	9 (13.6%)	7 (10.6%)	11 (16.7%)	9 (13.6%)	12 (18.2%)	18 (27.3%)
Marijuana	67	29 (43.3%)	9 (13.4%)	9 (13.4%)	3 (4.5%)	4 (6.0%)	13 (19.4%)
Prescription pills	67	61 (91.0%)	4 (6.0%)	2 (3.0%)	--	--	--
Club drugs	67	33 (49.3%)	5 (7.5%)	7 (10.4%)	6 (9.0%)	4 (6.0%)	12 (17.9%)

In table 5, bivariate correlations were utilized to explore associations amongst drug use reported by the respondent. There was a moderate, positive correlation amongst marijuana use and club drug use ($r_s = .55$, $p < .01$). This suggests high values of marijuana use are associated with high values of club drug use. No other significant findings were made amongst individual reported drug use.

Table 5. Spearman's rho bivariate correlations: Individual drug use.

	N	Mean (SD)	Alcohol	Marijuana	Prescription Pills	Club drugs
Alcohol	66	5.88 (3.541)	1.000	--	--	--
Marijuana	67	3.49 (3.994)	.239	1.000	--	--
Prescription pills	67	.24 (.818)	-.209	.041	1.000	--
Club drugs	67	3.37 (3.973)	.188	.550**	.131	1.000

**p<.01

Due to the current study focusing on club drug use and the serious effects of these specific drugs being used while at an EDM event, only club drugs will be focused on for further analyses. The variable was represented by asking how often the participant uses (consumes) any of the following substances before or while at the EDM event: club drugs (e.g., ecstasy, methamphetamine, GHB, Rohypnol, cocaine, ketamine). The variable was dichotomized for the binary logistic regression analysis as: *never*, *rarely* = 0; and *sometimes, often, very often, most often* = 1.

In order to analyze the use of club drugs at EDM events, responses will only be considered as drug use when the participant reports using club drugs *sometimes, often, very often or most often*. For participants reporting to *never* or *rarely* use club drugs, they will be counted as no drug use. This is to ensure that respondents who typically use club drugs at the event will be analyzed, and

those who have only experimented or rarely use drugs will not be mixed in with regular drug users. Table 6 shows the dichotomized dependent variable, and the respective amounts for club drug use or not.

Table 6. Dichotomized dependent variable.

	N	%
No club drug use (0)	38	56.7
Club drug use (1)	29	43.3

Independent Variables

Peer group club drug use. Peer club drug use pertains to the amount of drug use by the individual's peer group members. It is hypothesized that individuals who have peer group members who use drugs will be more likely to use drugs as well, as peers drug associations are highly predictive of individual drug use (Mason 2010, Oetting & Beauvais 1987). Participants were asked to rate how often the people they go to dance parties with use (or consume) club drugs (e.g., ecstasy, methamphetamine, GHB, Rohypnol, cocaine, ketamine) before or while at the EDM event. Responses were captured with a six-point scale, where *never* was valued at 0, *rarely* was 2, *sometimes* was 4, *often* was 6, *very often* was 8, and *most often* scored a value of 10. Higher scores indicate more club drug usage amongst the peer group.

Peer influence on behavior. Peer influence on behavior represents the amount of influence a peer group has on the respondent. Peer group influences on an individual affect an individual's decision making on their activities (Oetting & Beauvais 1987). It is hypothesized that individuals who are strongly influenced by their peers are more likely to use club drugs at the event. Participants were asked to rate how much the group of people they attend EDMs with have influenced them in the following ways: (1) *Style*, (2) *Use of drugs or alcohol*, (3) *Goals in life*, (4) *Relationships*, (5) *Music they listen to*, (6) *Activities*, (7) *EDMs they go to*, (8) *Job/career*, and (9) *Identity*. Responses were captured with a five-point scale, where *no influence* was valued at 0, *a little influence* was 2, *some influence* was 4, *a lot of influence* was 6, and *major influence* scored a value of 8. Higher scores represented more peer influence, and answers for each question were summed to represent total peer group influence on behavior at EDMs.

Security presence at the event. Security presence at the event pertains to the individual's perception of security presence at EDM events. It is believed that the perception of effective security will impact the individual's decision to use club drugs while at the event. If effective security is observed, the risk will outweigh the benefit of using drugs, thus impacting the individual to not use drugs (Cornish & Clarke 1986/2014). Respondents were asked to indicate their level of agreement with the following eight items (three reverse coded): (1) *Security thoroughly checked props and personal items*, (2) *Security were visible in the*

parking areas, (3) *There were some areas in the facility that made me feel unsafe*, (4) *The event was well organized and staffed,* (5) *Security personnel were visible throughout the event*, (6) *Signs prohibiting specific activities were clearly visible and posted around the event*, (7) *People were able to freely leave and reenter the event*, and (8) *The place got so crowded it was hard to move around*. Level of agreement was captured with a four-point scale, where *strongly agree* was valued at 1, *agree* was 2, *disagree* was 3, and *strongly disagree* scored a value of 4. Thus, lower scores indicate a perceived safer event (more likely to be caught for deviant behavior), and higher scores indicate a less secured event (less likely to be caught for deviant behavior). Three questions were inversely coded prior to being summed to generate the index score.

Drug presence at the event. The drug atmosphere of the rave and EDM scene is believed to be a factor in one's decision to use club drugs. Individuals who attend raves report an increased amount of drug use when compared to those who do not attend raves (Palamar, Griffin-Tomas & Ompad 2015). It is predicted that drug presence at the event will be positively correlated with individual drug use. Participants were asked if they observed any other people at the last event they went to (1) using drugs, or (2) buying drugs. Responses were captured with a *yes*, *no*, or *not sure*, where *yes* was valued at 1 and *no/not sure* were valued at 0. Higher scores on this summative index indicate more drug presence in the area/atmosphere.

Social supply. Social supply refers to the non-commercial supply of drugs to friends and acquaintances for little or no profit (Coomber et al. 2018). Social supply is posited as the primary mechanism through in which recreational substances like ecstasy and ketamine are accessed and distributed in non-traditional settings, such as raves (Coomber et al. 2018). Participants were asked to name 6 people they attend EDMs with, and of these 6 people, they were asked to rate how likely the person is to bring drugs to the EDM for others. Responses were captured with a four-point scale, where *unlikely* was valued at 1, *possible* was 2, *likely* was 3, and *most likely* scored a value of 4. The variable was dichotomized to represent social supply or not, with *unlikely* and *possible* coded as 0; and *likely* and *most likely* coded as 1.

Table 7 displays the minimum and maximum values for each independent variable, as well as the mean and standard deviation. Approximately half of respondents reported people in their peer group using club drugs. Peer influence was reported on the lower end, showing respondents did not claim to be very influenced by their peers. The average for security presence at an event shows events are viewed as not very secured, and there is a strong presence of drugs at these events. Nearly half of all respondents reporting one friend in their peer group being a social supplier of drugs at the event.

Table 7. Independent variables' descriptive statistics.

	No. of items	Alpha*	N	Min	Max	Mean	Std Dev
Peer group club drug use	1	n/a	67	0	10	4.93	3.99
Peer influence on behavior	9	.874	69	0	72	25.74	16.47
Security presence at event	8	.622	66	9	25	16.92	3.63
Drug presence at event	2	.385	66	0	2	1.20	.64
Social supply	1	n/a	71	0	1	.451	.501

*Cronbach's Alpha.

Table 8 displays the bivariate correlations utilized to explore associations amongst the independent variables. There was a weak, negative correlation amongst peer group club drug use and security presence at the event ($r_{s=}$ -.301, $p<.05$). This suggests that events observed to be less secure result in less club drug use, as the security variable is inversely coded. There was a weak, positive correlation amongst peer group club drug use and the presence of drugs at the event ($r_{s=}$ .302, $p<.05$). This suggests that with more drug presence at the event, more peer group members were observed using club drugs. A moderate positive correlation was discovered between peer group club drug use and social supply ($r_{s=}$ .580, $p<.01$), indicating that with higher reports of social supply within the

group, the more peer group members were using club drugs. Social supply and peer influence on behavior had a weak positive correlation ($r_{s=}$ .259, $p<.05$), suggesting groups experiencing social supply also report increased peer influence. Finally, a weak positive correlation was found between social supply and drug presence at the event ($r_{s=}$ .307, $p<.05$), suggesting increased reports of social supply lead to increased overall drug presence at the event.

Table 8. Spearman's rho bivariate correlations for independent variables.

	Peer group club drug use	Peer influence on behavior	Security presence at event	Drug presence at event	Social supply
Peer group club drug use	1.00	--	--	--	--
Peer influence on behavior	.230	1.00	--	--	--
Security presence at event	-.301*	-.158	1.00	--	--
Drug presence at event	.302*	.099	.109	1.00	--
Social supply	.580**	.259*	-.066	.307*	1.00

**p<.01, *p<.05

Analytic Plan

The current study utilizes a binary logistic regression model and a series of one-way analysis of variances (ANOVAs). Binary logistic regression is a form of analysis used to estimate correlations between the dependent variable and various independent variables while simultaneously controlling for these variables (Fox, Levin & Forde 2014). The dependent variable is a dichotomized variable, in this case representing club drug use or not (coded as 0 = *no club drug use* or 1 = *club drug use*). Binary logistic regression assumes a non-linear distribution in the dependent variable, which allows for the most accurate coefficients for estimating the relationship between the dichotomized dependent variable and various independent variables. An ANOVA gains information about the relationship between the dependent and independent variables, testing for significant differences between means (Fox, Levin & Forde 2014).

CHAPTER FIVE

RESULTS

The aim of the study is to examine how the five independent variables influence the dependent variable. The goal is to analyze what might influence an individual to use club drugs at an EDM event (see Figure 5). Peer group club drug use, peer influence on behavior, presence of security, presence of drugs, and social supply at rave events are presented as factors in one's decision to use drugs at an EDM event (Oetting & Beauvais 1987, Mason 2010, Palamar, Griffin-Tomas & Ompad 2015, Coomber et al. 2018). The peer cluster theory suggests an individual's peer group and the rave atmosphere (security, drug presence) will affect one's decision to use club drugs at an event.

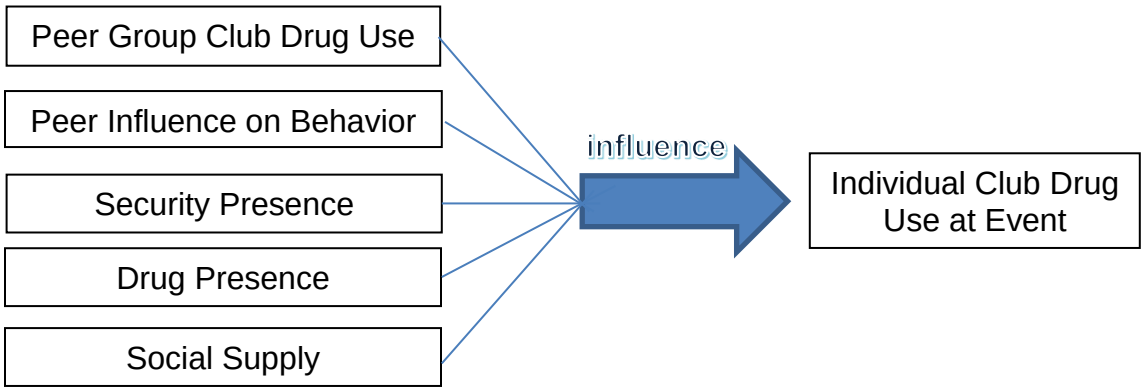

Figure 5. Independent variables influencing dependent variable through the peer cluster theory.

Table 9 displays the binary logistic regression coefficients, standard errors, Wald statistics and odds-ratios for individual club drug use. The Wald test is used to estimate the significance of relationships between variables. Odds ratios greater than one indicate an increase in the likelihood of individual club drug use with a one unit increase in a predictor variable. Odds ratios less than one show that odds are less likely with a one unit change.

The regression coefficient for peer group club drug use is .671, peer influence on behavior is .045, security presence at event is .126, drug presence at event is -.019, and social supply is -.317. The Wald test determines the contribution of each predictor. The predictor variables with p-value (Sig.) less than .05 contribute significantly to the predictive ability of the model.

According to the Wald criteria, peer group club drug use has an effect on individual club drug use as it is highly significant, with a p-value of .000. The effect of peer group drug use on an individual's drug use was consistent with other drug types as well, such as marijuana and alcohol.[1] Peer influence on behavior is nearly significant with p-value equal to .083. The B coefficient for peer group club drug use is .671, carrying a positive sign indicating that increased club drug use within the peer group increases the probability of the individual to use club drugs. The B coefficient for peer influence on behavior is positive as well, indicating that increased peer group influence could increase the

[1] Peer group alcohol use showed a positive correlation with individual reported alcohol use at rave events (B=.520, p<.01); and peer group marijuana use showed a positive correlation with individual reported marijuana use at rave events (B=.487, p<.01), see Appendix A.

probability of the individual to use club drugs as well, however, was not statistically significant.

Further, the odds ratio for peer group club drug use is 1.956 and ranged between 1.345 and 2.843. This indicates that for each unit increased in peer group club drug use, the odds ratio increased the probability of individuals to use club drugs by 1.956 times compared to a peer group with minimal club drug use. Meanwhile, the odds ratio for peer influence on behavior is 1.046 and ranged between .994 and 1.101, indicating no significant association between exposure and outcome.

There were 12 missing cases within the data, representing 16.9% of missing data, suggesting the validity of the model was not drastically reduced by missing cases. The Chi-squared estimate is the figure used to determine whether the logistic model results are significant. This model is significant ($p<.001$). The Cox & Snell and Nagelkerke pseudo R-Squared estimates respectively show that this model explains 47% to 63% (rounded) of the variation in the dependent variable.

As social supply and peer group club drug use were correlated with one another through bivariate correlations, a sensitivity test was utilized removing peer group club drug use from the binary logistic regression model. Once peer group club drug use was removed from the model, social supply became significant in influencing the dependent variable. This may indicate that

multicollinearity is present and peer group club drug use is undermining the significance of social supply within the model.

Table 9. Binary logistic regression analysis of individual club drug use.

	Club drug use by individual (N=59)					95% C.I. for Exp (β)		Sensitivity Test
	B	S.E.	Wald	Sig.	Exp (β)	Lower	Upper	B
Peer group club drug use	.671	.191	12.343	.000	1.956	1.345	2.843	--
Peer influence on behavior	.045	.026	2.999	.083	1.046	.994	1.101	.027
Security presence at event	.126	.124	1.034	.309	1.134	.890	1.446	-.062
Drug presence at event	-.019	.693	.001	.978	.981	.252	3.815	.291
Social supply	-.317	.853	.139	.710	.728	.137	3.873	1.202*
Age	-.019	.088	.044	.833	.982	.826	1.167	.031
Total events attended	-.001	.003	.030	.863	.999	.993	1.006	-.001
Constant	-6.795	3.59	3.582	.058	.001			-1.701
R^2 (Nagelkerke)	.634							.245
R^2 (Cox & Snell)	.474							.184
-2 LL	43.451							69.395
χ^2	χ^2 = 37.916, (p=.000), d.f. = 7							p=.063
Missing cases	12 (16.9%)							12 (16.9%)

*p<.05

Due to peer influence on behavior being nearly significant with the small sample size, the data was further analyzed with the influence index separated, including each individual influence item from the survey. Nine separate one-way ANOVAs were utilized to test differences in the average drug use among the five response options within each influence indicator.

Table 10 shows the descriptive statistics for the individual influence items. Table 11 displays the 9 one-way ANOVA findings, showing a significant positive correlation between influence on drug/alcohol use and individual club drug use, with a Sig. of .004. This suggests that there is a difference in the average individual drug use depending on the level of influence of the group on drug/alcohol use. No other significant peer influence items were significant.

Table 10. Influence index descriptive statistics.

		N	Mean	Std. Dev.	Std. Err.
Style	No influence	22	2.55	3.713	.792
	A little influence	16	4	4.195	1.049
	Some influence	18	4.22	4.11	.969
	A lot of influence	6	2	3.347	1.366
	Major influence	5	3.6	4.98	2.227
Drug/Alcohol Use	No influence	28	1.21	2.846	.538
	A little influence	13	4.46	3.755	1.042
	Some influence	12	5.33	4.03	1.163
	A lot of influence	7	4.86	4.14	1.565
	Major influence	7	5.14	4.88	1.844
Goals in Life	No influence	40	2.65	3.8	.601
	A little influence	11	5.27	4.315	1.301

	Some influence	8	3.5	4.106	1.452
	A lot of influence	3	5.33	5.033	2.906
	Major influence	5	3.6	3.578	1.6
Relationships	No influence	27	2.44	3.735	.719
	A little influence	12	3.17	3.95	1.14
	Some influence	14	2.71	3.292	.88
	A lot of influence	9	6.22	4.738	1.579
	Major influence	5	5.6	3.847	1.72
Music Listened To	No influence	9	3.33	5	1.667
	A little influence	10	3.8	4.467	1.413
	Some influence	13	1.69	2.428	.674
	A lot of influence	18	3.11	3.954	.932
	Major influence	17	4.71	3.996	.969
Activities	No influence	17	3.65	4.703	1.141
	A little influence	9	2.22	3.528	1.176
	Some influence	19	2.53	3.186	.731
	A lot of influence	8	3.5	4.243	1.5
	Major influence	14	4.86	4.13	1.104
EDMs Attended	No influence	9	1.11	3.333	1.111
	A little influence	7	2	3.651	1.38
	Some influence	17	3.06	3.614	.876
	A lot of influence	15	4.13	4.24	1.095
	Major influence	19	4.63	4.166	.956
Job/Career	No influence	45	3.56	4.283	.638
	A little influence	9	3.11	3.887	1.296
	Some influence	7	2	2.582	.976
	A lot of influence	1	6	--	--
	Major influence	5	3.6	3.578	1.6
Identity	No influence	42	2.81	3.928	.606
	A little influence	8	5.5	3.964	1.402
	Some influence	11	3.27	3.927	1.184
	A lot of influence	3	6.67	3.055	1.764
	Major influence	3	2.67	4.619	2.667

Table 11. One-way ANOVAs between individual club drug use and peer influence index items.

	SS	df	MS	F	Sig.
Influence on Style	45.906	4	11.476	.715	.585
Influence on Drug/Alcohol Use	229.346	4	57.336	4.376	.004
Influence on Goals in Life	72.523	4	18.131	1.16	.337
Influence on Relationships	127.726	4	31.931	2.166	.083
Influence on Music Listened To	69.995	4	17.499	1.117	.357
Influence on Activities	57.783	4	14.446	.91	.464
Influence on EDMs Attended	99.687	4	24.922	1.64	.175
Influence on Job/Career	22.472	4	5.618	.342	.849
Influence on Identity	83.68	4	20.92	1.354	.26

Note: SS=Sum of squares, MS=Mean squares.

Post hoc comparisons for the influence on drug/alcohol use using the Tukey HSD test indicated that the mean score for no influence (M = 1.21, SD = 2.846) was significantly different than some influence (M = 5.33, SD = 4.03), see Table 12. The remaining influence responses did not significantly differ from one another.

Table 12. Post hoc test for influence on drugs/alcohol variable.

				Tukey's HSD Comparisons			
Group	N	Mean	SD	No influence	A little influence	Some influence	A lot of influence
No influence	28	1.21	2.85				
A little influence	13	4.46	3.76	.07			
Some influence	12	5.33	4.03	.013	.974		
A lot of influence	7	4.86	4.14	.134	.999	.999	
Major influence	7	5.14	4.88	.089	.994	1.00	1.00

CHAPTER SIX

DISCUSSION AND CONCLUSION

Implications

Raves and EDM events continue to grow in popularity and have become a crucial facet of the music and entertainment industry. Generating billions of dollars worldwide, these enormous events do not come without risk. Drug use, particularly club drug use, is prominent in the EDM scene. Club drug use in the rave scene was confirmed and present within the current study (Lenton, Boys & Norcross 1997). Peer group club drug use was found to be positively correlated with an individual's club drug use. This suggests that one's peer group's use of club drugs will have a strong effect on whether or not an individual will use club drugs at an event. Peer group drug use has shown to be the dominant variable in an individual's drug use at an EDM event (Oetting 1987).

Some studies suggest that attendees are consuming drugs out of their own free will, with peer pressure not typically reported by young drug users (Coomber et al. 2018, McIntosh, MacDonald & McKeganey 2006). The declining role of peer pressure occurs as children get older, and their decision to experiment with drugs is increasingly a matter of personal choice (McIntosh et al. 2006). However, the present study found peer influence to be significant in one's decision to use drugs. When an individual stated their peer group influenced them to use drugs or alcohol, the individual was more likely to use drugs. A significant difference was found amongst those reporting no influence, and those

reporting some influence from their peers. Reports of club drug use amongst rave attendees suggests that ecstasy and club drugs may be heavily embedded within the rave subculture (Yacoubian, Deutsch & Schumacher 2004). Since MDMA use at rave events is an ongoing and underreported public health issue (MMWR 2010), the current findings may represent a conservative measure of the actual amount of drugs being used by participants.

The presence of security was not found to be significant in the current study. This may suggest that regardless of perceptions of security, individuals are decision making agents that are choosing to use club drugs while at an event (Cornish & Clarke 1986, 2014). Security may not be deterring nor influencing a raver to use or not use drugs. If individuals observe their friends using drugs without any consequences, they may be more inclined to use drugs. The fear of being arrested may not be of utmost concern to the raver if they are consuming drugs in the light of rational choice, thus making security presence insignificant to them (Cornish & Clarke 1986, 2014). The influence of the raver's peers show to have a profound impact on individual perceptions of the pros and cons of club drug use, supporting Rational Choice Theory (Tibbetts 2012). Further, the benefits of drug use might outweigh the risk of being caught, with pleasure being one of the most significant effects on an individual's decision to offend (Cornish & Clarke 1986, 2014). Further, the negative correlation discovered could be related to the fact that individuals who are recreational users feel safe knowing

that security is around in case something were to happen as they do not use drugs often.

The presence of drugs at an event was also insignificant in the current study. The atmosphere of the rave/EDM event and the drug culture overall was not found to significantly impact the individual to partake in or refrain from club drug use. This may be due to the other drug variables such as social supply and peer group club drug use accounting for similar factors, thus making drug presence overall not as prevalent. The individual might also be more concerned with their own peer group rather than other attendees using drugs, as their main focus is their own group. Whether or not strangers are using drugs around them may not be relevant to the individual.

Controlling for other factors, peer influence on drug and alcohol use was positively correlated with individual club drug usage, supporting the first hypothesis. Drug use appears to contribute to solidarity at EDM events (Kavanaugh & Anderson 2008). Half of the respondents reported some form of club drug use, suggesting a high prevalence of club drug use at raves and EDM events (Lenton, Boys & Norcoss 1997). This may support the theory of Social Learning, suggesting individuals observe their peers using drugs at the event then imitate the behavior, however, time order could not be determined.

Peer group club drug use was found to significantly influence individual club drug use in the binary logistic regression model, supporting the fourth hypothesis. As predicted, a strong positive correlation was discovered between

an individual's club drug use and their peer group's club drug use. Peer drug associations essentially dominate in predicting drug involvement, consistent with the peer cluster theory (Oetting & Beauvais 1987). A peer cluster is an active participating agent in determining when and whether to use drugs. Peer drug associations dominate in predicting drug involvement (Oetting & Beauvais 1987). If more information is gathered on peer cluster groups and their dynamics, a better understanding of their drug use would result in more effective harm prevention services.

Although social supply was not found to be significant in the binary logistic regression model, when a sensitivity test was conducted it was found to have a significant relationship with individual club drug use. This suggests that multicollinearity between social supply and peer group club drug use caused social supply to become insignificant, as the two independent variables were significantly correlated. Social supply was also linked to overall drug use at raves through bivariate correlations. Social supply was significantly correlated to peer group drug use, peer influence on behavior, and overall drug presence at the event. This indicates social supply is an important factor when addressing drug use at rave events and determining how individuals are obtaining their drugs. Additionally, 45% of respondents reported that someone in their group is likely/most likely to bring drugs to the EDM for others, indicating a high amount of social suppliers within groups attending raves. This shows that social supply is

present in the rave and EDM scene, and that the non-commercial supply of drugs to friends and acquaintances is utilized in the rave culture (Coomber et al. 2018).

Limitations, Reliability and Validity

As with all research, the current study is limited in some aspects, which encourages future research to contribute to the growing literature. First, the study contains a small sample size that primarily stemmed from one location, a southwestern university. One location distribution for the survey cannot result in findings that can be generalized across an entire state or country. However, the survey was promoted via social media in order to reach a variety of respondents possibly in various locations.

The snowball sample method was used in order to reach members of the EDM community, and focused on individuals who attend raves regularly in order to obtain the most relevant data. Snowball sampling is an appropriate method of data collection in qualitative research, and is used to target specific groups of people, such as rave groups (Naderifar, Goli & Ghaljaie 2017). Study members posted to their social media accounts and also emailed the survey to family and friends known to attend at least one EDM event in the past year. This limits the sample to a small pool of participants, but it is suggested that the survey is then exposed to other groups of friends and family through the snowball sample design. The snowball sample method has been used to access hidden and hard-to-reach populations such as drug users, and is used in the current study to penetrate the rave culture (Atkinson, Rowland & Flint 2001).

Survey administration was conducted online, thus limiting the sample to those with access to the internet and social media platforms. It is likely that the survey did not reach participants who do not utilize social media platforms, and individuals without internet access could not be included in the sample at all. The survey was administered through surveymonkey.com, and unless someone was enrolled into the university course mentioned earlier or heard by word of mouth, the only way to know about the survey is through the internet and social media. However, the internet is a useful tool for reaching hidden populations of illicit drug users, with increased ease of data entry and improved confidentiality for respondents (Miller & Sønderlund, 2010).

Surveys collect data at a single point in time, and it is difficult to measure changes in trends unless two or more surveys are conducted at different points in time. Thus, in this study, two rounds were conducted three years apart in order to enhance the data and make it more robust. Comparing data collected in two different time periods created a larger sample with respondents that slightly differed in age and number of EDM events attended. This created a wider range of data, and a more representative sample of rave attendees.

During the first wave of the study, the percentage of data completeness was lower than expected. It is important to have a high completion rate for the survey to get the most accurate results when comparing the sample with other studies. However, once it was discovered that the completion rate was low, the survey was altered in hopes of raising the completion rate during a second wave.

Questions related to the individual's peer group were revised, and became less intrusive on the participant. The new survey question did not ask for group member names as it did before, stressing anonymity, as this is the question where the majority of participants stopped completing the survey. Upon review of the results, the completion rate did not improve, and actually decreased a bit which was not expected. This may be due to the older, more recreational ravers in the second round not having a regular group of people that they attend with, as they attend on occasion rather than regularly. This also may indicate that respondents from both rounds are reluctant to report on their friends and provide details on their suppliers of drugs. The low response rate may result from intrusive and personal questions, however, these questions were necessary in order to obtain data on the target community. There may be a threat to the internal and external validity of the study from the bias that is formed around discussing illegal drug use and respondent's friends' supplying the illegal drugs.

Data in the present study is self-reported and cannot be confirmed to be completed by just one individual entirely through as it was not conducted in front of a study member. However, self-report data has been deemed reliable and valid among researchers and scholars. In particular, the validity of self-reported ecstasy use among club rave attendees has been examined and considered valid. By comparing self-reported drug use to an oral fluid (OF) test, results determined self-report data as valid. The majority of respondents were discovered to have told the truth about their recent ecstasy use patterns

(Yacoubian & Wish, 2006). Concordance was high in this study testing validity, with 88 percent of the self-reports agreeing with the oral fluid test results (Yacoubian & Wish 2006). However, there is a limitation to this finding, the small number of participants and the fact that only one area has been studied thus far. If rave attendees behave similarly across different locations, though, it can be assumed that their self-report data will be valid and represent their drug use sufficiently.

Similarly, the reliability of self-report data for drug use surveys in other studies is high. In similar studies examining heroin and cocaine users, self-report data was compared to urine samples. Individuals' self-reports showed good reliability, with participants providing the same response at both time points (Napper, Fisher, Johnson & Wood 2010). Psychometrically sound self-report measures of amphetamine use are essential for understanding and describing drug use, thus are a good measure to use in the current study.

Conclusion

Rave events across the world have become incredibly popular within the last decade. EDM events have grown into a billion dollar industry, with a large following of young people. Club drug use is part of the culture, in addition to dressing in costumes, dancing all night long and listening to hypnotic music mixed by live DJs. The rave phenomenon has sparked controversy over event safety and precaution measures, with many concerns over drug overdoses and

unsafe conditions. As mentioned throughout the study, some young people are even dying at events, which unfortunately happened to 19 year old Shelley Goldsmith as a result of ecstasy overdose and overheating. Shelley's mother mourns her daughter's death and continues to advocate for more harm reduction services to be accessible at events and for the R.A.V.E. Act to be amended.

The current study supports the notion that drugs are very much present in the rave scene, with high amounts of alcohol, marijuana, and club drug use reported by the respondents. With such a strong drug presence at the event, promoters could provide a "drug free" zone at the event, encouraging individuals that they do not need to use drugs to fit in and reassuring attendees that not every guest is using drugs.

Attendees typically arrive to the events with or meet up with a group of friends. These peer groups play a large role in influencing individuals to use or not use drugs while at the event. In addition, if the peer group uses club drugs, the individual is more likely to use club drugs as well. With peer groups playing such a large role in the use of drugs at events, counseling for an entire group of people should be available at events, to inform all group members of the risks and potential harms of drug use. Furthermore, if someone is receiving medical services for a potential drug overdose, all members of the peer group should be evaluated as it is likely other members have taken the same or similar drugs in similar amounts. Instead of singling out individuals at rave events, services

should be geared towards groups of people as it is evident that drug use is related to the peer group one is with at an event.

Understanding that drug use is prevalent at these events should encourage lawmakers to reevaluate the current R.A.V.E. Act in place. EDM promoters and event centers should be mandated to provide harm prevention services without fear of federal prosecution for “encouraging” drug use. Services such as drug purity testing, access to water, group counseling, medical evaluations, drug information pamphlets and condoms should be provided to limit any possible overdoses or unsafe sex practices at events. Hydro stations were reported to be utilized by a large amount of attendees, indicating the services are used and necessary. Mandatory harm prevention services would limit the amount of incidents occurring at rave and EDM events.

The presence of security was not significant in the current study, which could suggest that individuals are not concerned with the overall event security presence as it outside of their own peer group. If security personnel were able to approach groups of people and introduce themselves, become known on a more personal level, the individual might remember the presence of security and factor that into their decision to use drugs or not. Additionally, the presence of security may not be significant if individuals are using drugs before the actual event or in the parking lot. Once individuals are inside of the event they might not be concerned with security as they no longer have drugs on their person or anything illegal that security can kick them out or arrest them for. Another possibility is

that recreational drug users actually feel more comfortable taking drugs if security is present as they are not experienced, knowledgeable drug users and they feel safe knowing they can seek help if necessary. For all of these reasons, security presence might not have had a significant impact on one's decision to use club drugs at the event.

The presence of drugs at the event was also insignificant, which coincides with the previous assumption that individuals are not concerned with the drug or overall rave atmosphere outside of their own peer group. It was discovered that the social supply of drugs is prevalent in the rave seen and individuals are typically receiving drugs from someone within their group, so the presence of drugs amongst others at the event is irrelevant to the user. However, if funds were allocated to more harm prevention services such as group drug purity testing, attendees may be more inclined to not use drugs if they find out their drugs are impure. Providing drug information and testing drugs for groups of attendees without the threat of arrest could decrease the risk for overdose. People with less experience in using drugs need more drug knowledge as they are not regular users, so providing accurate drug information to attendees is vital to reducing overdoses. Drug counseling for the peer group could also impact the entire group as they typically influence each other to use or not use drugs while at the rave.

Additionally, individuals reported that the specific DJ playing at an event is extremely important to the peer group. The peer group influences one another

on what music they listen to and what EDMs they go to, so if more research was conducted on specific DJ events and drug use, subcultures could be discovered associating high amounts of drug use to particular events or DJs. Increased policing for drugs when particular DJs are playing or events are occurring could result in reduced incidents.

Future research should examine rave peer cluster groups across the world. If individuals are most influenced by their peers, the peer group structure should be further evaluated. Limited research is available on rave events and peer groups formed around raves. Learning more about rave peer groups could provide more insight on drug use and supply within the culture. In order to limit overdoses and fatalities at these increasingly popular and frequent events, more must be discovered about the growing and evolving rave culture.

APPENDIX A:

MARIJUANA AND ALCOHOL BINARY LOGISITIC REGRESSION MODELS

Marijuana Binary Logistic Regression Model

	Marijuana use by individual (N=59)					95% C.I. for Exp (β)	
	B	S.E.	Wald	Sig.	Exp (β)	Lower	Upper
Peer group marijuana use	.487	.138	12.5	.000	1.627	1.242	2.131
Peer influence on behavior	.021	.022	.926	.336	1.021	.9779	1.066
Security presence at event	.096	.111	.758	.384	1.101	.887	1.367
Drug presence at event	-.029	.572	.003	.959	.971	.316	2.980
Social supply	-.632	.721	.768	.381	.532	.129	2.185
Age	.088	.074	1.392	.238	1.092	.944	1.263
Total events attended	-.002	.005	.217	.641	.998	.989	1.007
Constant	-7.129	3.337	4.562	.033	.001		
R^2 (Nagelkerke)	.475						
R^2 (Cox & Snell)	.356						
-2 LL	55.443						
χ^2	$\chi^2 = 25.924$, (p=.001), d.f. = 7						
Missing cases	12 (16.9%)						

Alcohol Binary Logistic Regression Model

	Alcohol use by individual (N=58)					95% C.I. for Exp (β)	
	B	S.E.	Wald	Sig.	Exp (β)	Lower	Upper
Peer group alcohol use	.520	.175	8.776	.003	1.682	1.192	2.372
Peer influence on behavior	.039	.030	1.757	.185	1.040	.981	1.102
Security presence at event	-.289	.166	3.014	.083	.749	.541	1.038
Drug presence at event	.69	.664	1.079	.299	1.993	.543	7.318
Social supply	-.992	.978	1.029	.310	.371	.055	2.522
Age	-.063	.075	.718	.397	.939	.811	1.087
Total events attended	.007	.110	.004	.949	1.007	.812	1.249
Constant	3.231	3.564	.822	.365	25.303		
R^2 (Nagelkerke)	.467						
R^2 (Cox & Snell)	.306						
-2 LL	40.543						
χ^2	$\chi^2 = 21.180$, (p=.004), d.f. = 7						
Missing cases	13 (18.3%)						

APPENDIX B:

INSTITUTIONAL REVIEW BOARD APPROVAL LETTERS

IRB-FY2017-126 - Initial: IRB Administrative Review

Approval Letter mgillesp@csusb.edu

Tue 3/7/2017 11:44 AM

Inbox

To: Gisela Bichler <GBichler@csusb.edu>;

March 06, 2017
CSUSB INSTITUTIONAL REVIEW BOARD
Administrative ⟨Exempt⟩ Review
IRB# FY2017-126
Status : Approved
Prof. Gisela Bichler and Criminal Justice Students
Department of Criminal Justice
California State University, San Bernardino
5500 University Parkway
San Bernardino, California 92407
Dear Prof. Bichler and Criminal Justice Students:
Your application to use human subjects, titled, “Safety and Security of Electronic Dance Music Events," has been reviewed and approved by the Chair of the Institutional Review Board ⟨IRB⟩ of California State University, San Bernardino has determined that your application meets the requirements for exemption from IRB review Federal requirements under 45 CFR 46. As the researcher under the exempt category you do not have to follow the requirements under 45 CFR 46 which requires annual renewal and documentation of written informed consent which are not required for the exempt category. However, exempt status still requires you to attain consent from participants before conducting your research.
Please note for future reference your protocol was approved under administrative ⟨exempt⟩ review though you submitted it under expedited review.
The CSUSB IRB has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval notice does not replace any departmental or additional approvals which may be required.
Your responsibilities as the researcher/investigator reporting to the IRB Committee include the following 4 requirements as mandated by the Code of Federal Regulations

45 CFR 46 listed below. Please note that the protocol change form and renewal form are located on the IRB website under the forms menu. Failure to notify the IRB of the above may result in disciplinary action. You are required to keep copies of the informed consent forms and data for at least three years. Please notify the IRB Research Compliance Officer for any of the following:

- Submit a protocol change form if any changes (no matter how minor) are proposed in your research prospectus/protocol for review and approval of the
- IRB before implemented in your research,
- If any unanticipated/adverse events are experienced by subjects during your research, and
When your project has ended by emailing the IRB Research Compliance Officer.

If you have any questions regarding the IRB decision, please contact Michael Gillespie, the Research Compliance Officer. Mr. Michael Gillespie can be reached by phone at (909) 537-7588, by fax at (909) 537-7028, or by email at mgillesp@csusb.edu. Please include your application approval identification number (listed at the top) in all correspondence.

Best of luck with your research.

Sincerely,

Caroline Vickers

https://outlook.office.com/owa/?viewmodel=ReadMessageItem&ItemID=AAMkAGMxNzEyYmVhLWZiYmUtNDJmYi05ZG

VmLWRhZWI5MTBlODAyNQBGA... 1/2 3/7/2017 IRB-FY2017-126 - Initial: IRB Administrative Review

Approv... - Gisela Bichler

Caroline Vickers, Ph.D., IRB Chair
CSUSB Institutional Review Board
CV/MG

Brandi Burns <004069220@coyote.csusb.edu>

IRB-FY2020-234 - Initial: IRB Expedited Review Approval Letter

mgillesp@csusb.edu mgillesp@csusb.edu Wed, Mar 11, 2020 at 10:15 AM
To: 004069220@coyote.csusb.edu, GBichler@csusb.edu

March 11, 2020

CSUSB INSTITUTIONAL REVIEW BOARD
Expedited Review
IRB-FY2020-234
Status: Approved

Ms. Brandi Burns, Prof. Gisela Bichler
CSBS - Criminal Justice
California State University, San Bernardino
5500 University Parkway
San Bernardino, California 92407

Dear Ms. Burns & Prof. Bichler:

Your application to use human subjects, titled “Rave Survey” has been reviewed and approved by the
Institutional Review Board (IRB). The informed consent document you submitted is the official version for your study and cannot be changed without prior IRB approval. A change in your informed consent (no matter how minor the change) requires resubmission of your protocol as amended using the IRB Cayuse system protocol change form.

Your application is approved for one year from March 11, 2020 through --.

Please note your IRB application requires an annual administrative check-in which is one year from the date of approval. To complete the administrative check-in please complete the Renewal form and submit the form through the Cayuse system. If the study is closed to enrollment, the data has been de-identified, and you're only analyzing the data you may close the study by submitting the Closure form through the Cayuse system.

Please note the Cayuse IRB system will notify you when your protocol is up for renewal and ensure you file it before your protocol study end date.

Your responsibilities as the researcher/investigator reporting to the IRB Committee include the following four requirements as mandated by the Code of Federal Regulations 45 CFR 46 listed below. Please note that the protocol change form and renewal form are located on the IRB website under the forms menu. Failure to notify the IRB of the above may result in disciplinary action. You are required to keep copies of the informed consent forms and data for at least three years.

You are required to notify the IRB of the following by submitting the appropriate form (modification, unanticipated/adverse event, renewal, study closure) through the online Cayuse IRB Submission System.

1. **If you need to make any changes/modifications to your protocol submit a modification form as the IRB must review all changes before implementing in your study to ensure the degree of risk has not changed.**
2. **If any unanticipated adverse events are experienced by subjects during your research study or project.**
3. **If your study has not been completed submit a renewal to the IRB.**
4. **If you are no longer conducting the study or project submit a study closure.**

Please ensure your CITI Human Subjects Training is kept up-to-date and current throughout the study.

The CSUSB IRB has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval notice does not replace any departmental or additional approvals which may be required. If you have any questions regarding the IRB decision, please contact Michael Gillespie, the IRB Compliance Officer. Mr. Michael Gillespie can be reached by phone at (909) 537-7588, by fax at (909) 537-7028, or by email at mgillesp@csusb.edu. Please include your application approval identification number (listed at the top) in all correspondence.

Best of luck with your research.

Sincerely,

Donna Garcia

Donna Garcia, Ph.D., IRB Chair
CSUSB Institutional Review Board
DG/MG

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