

SALVIA DIVINORUM USE AMONG A COLLEGE STUDENT SAMPLE

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ABSTRACT

The recreational use of *Salvia divinorum* has received increased attention by media outlets and policy-makers in recent years. The vast absence of research to guide the dissemination of information has prompted this research note describing the use of this substance in a large public institution of higher education. The prevalence of *Salvia divinorum* is described in this context and a description of patterns of use, methods of acquisition, and a subjective estimation of continuance are proffered.

RESEARCH NOTE

One of the most prevailing rationales utilized for the prohibition of drugs is that they corrupt our youth. A contemporary example of this concept is evidenced by a group of drugs collectively referred to as “club drugs.” Drugs such as gamma-hydroxybutyric acid (GHB), 3,4-methylenedioxymethamphetamine (MDMA/ecstasy), and ketamine are frequently used at all-night dance parties known as raves. These club drugs are used within this context analogous to the manner that alcohol is consumed in bars (Drug Enforcement Administration, 2001; Gahlinger, 2004). The continued subcultural use of these party drugs in this

context has cast a dark shadow upon potential positive uses of these substances: counter to the current perceptions of drugs like GHB and MDMA, there is extant evidence that suggests these substances could be used in a clinical setting for a variety of maladies.

In the 1980s, a social movement evolved to ban the use of these substances, led by a strong paternal sentiment as displayed by the Congress and Drug Enforcement Administration (DEA). A similar movement began for *Salvia divinorum*; however, the DEA has refused to label this plant in the same class as a club drug or as a substance of serious concern based on intelligence gathered at the time. Indeed, the DEA noted that the seemingly introspective nature the drug induces would not be conducive to an environment such as a rave nor is likely to become problematic to our youth (Drug Enforcement Administration, 2003). This ideology has shifted in 2007 when *Salvia divinorum* was placed on the list of drugs of concern—a change that moves this plant into the preliminary stages of drug control.

During this period when the DEA first assessed the threat of *Salvia divinorum* and eventually placed the plant on this list of concern, there has been an unconventional movement to begin banning this plant and/or its psychoactive extract at state and local levels (Griffin, Miller, & Khey, 2008). While St. Peters, Missouri, and the state of Missouri were the first to prohibit *Salvia divinorum*, the main catalyst of its prohibitions appears to be the suicide of a Delaware teenager named Brett Chidester. Although *Salvia divinorum* use as a direct cause of suicide is most likely an oversimplification of his death, legislation was quickly passed to place this plant and its extract within Schedule I of Delaware's Controlled Substances Act (Brett's Law). Soon after, a handful of states outlawed the substance by listing it as a Schedule I drug in their respective controlled substances acts or by a statute of unique design that places restrictions on *Salvia divinorum* in a non-traditional way (e.g., outside of controlled substances acts) (Griffin et al., 2008).

Besides the media coverage of the suicide, most reports on *Salvia divinorum* have tended to focus on the legality and availability of the drug (Dennehy, Tsourounis, & Miller, 2005; Halpern & Pope, 2001). Indeed, some have argued that the legality of the substance has been the main motivation behind experimentation of the drug (Davis, 2006; Drug Enforcement Administration, 2003). Studies of user populations within peer-reviewed scholarly journals have been limited to the case study of a German teenager (Bucheler, Gleiter, Schwoerer, & Gaertner, 2005) and a study of 32 drug users (González, Riba, Bouso, Gomez-Jarabo, & Barbanjo, 2006).

Considering the proliferation of media accounts and Internet sites about its legal status, many have argued that the use of *Salvia divinorum* is bound to increase. This study aims to set a baseline in the prevalence of *Salvia divinorum* use among college students as limited data exists in the literature to date and attempts to describe its patterns of use, continuance rates, acquisition, and other relevant

information among this population. Lange, Reed, Ketchie Croff, and Clapp (2008) provide the only exception. In a study performed at a large southwestern public university in a state without legal regulations on *Salvia divinorum*, the authors found 4.4% of their sample had used the substance within the last year. Among these users, whites, males, and individuals reporting higher amounts of drug and alcohol use were more likely to have used the substance within the last year.

WHAT IS SALVIA DIVINORUM?

Salvia divinorum is a hallucinogenic plant which has received increasing attention for its recreational use, particularly among youth in the United States. *Salvia divinorum* originates from southern Mexico, where it was used by people of the Mazatecan culture by shamans. In this context, the substance is ingested orally in a variety of manners (typically brewed into a drink). Yet, recreationally, *Salvia divinorum* is typically smoked resulting in a short-lived but intense high. In recent literature, this substance has been classified as a hallucinogen, with anecdotal reports of hallucinations and dissociation from reality (Emboden, 1979).

One of the reasons for the dramatic rise in attention given to this plant by media sources and state governments is that only a handful of states have prohibited its use, possession, or sale. Indeed, it is available for sale in most “head shops” and is widely available through Internet proprietors. The inaction on the part of the DEA in controlling *Salvia divinorum*, which usually is at the forefront of drug regulation, has left the individual states with the rare option of deciding for themselves how to deal with the use, possession, and sale of this drug (Griffin et al., 2008).

METHODOLOGY

A print survey instrument was constructed in fall 2006 to be administered to undergraduates at a large public university in the State of Florida. This survey collected data on general deviance, fear of crime, victimization, and alcohol and drug use. Specific questions were included to examine the use of *Salvia divinorum* among students following the Monitoring the Future survey questionnaire format, which for 27 years has shown impressive construct validity and reliability (Johnston, O’Malley, Bachman, & Schulenberg, 2007). In particular, a section of the instrument consisting of 15 questions relating specifically to the use of the plant or products containing this plant’s derivatives was prefaced by a short description of *Salvia divinorum* as follows:

A plant in the mint family, *Salvia divinorum*, more commonly known as just *Salvia*, is known to have potent psychoactive properties—but not much is known about it. Recently, there has been an interest by researchers to better understand this plant and the substances within it. We would like to collect your knowledge of *Salvia* if you have ever heard of it or come across it.

Quite simply, the questions measuring prevalence adapted from the Monitoring the Future study consisted of the study's questions on marijuana prevalence with marijuana stricken and "*Salvia divinorum*" used in its place. The remaining questions of this section inquired about students' knowledge of the substance, patterns of use, methods of acquisition, and subjective experience of intoxication if used. These questions were exploratory in nature, and their validity and reliability are unknown.

The survey instrument was administered to a mixture of liberal arts and sciences courses in fall 2006 and early spring 2007 with the permission of the instructor on record. Both the instructor on record and the respondents were given copies of the Institutional Review Board approval documentation before proceeding with the survey administration. On the day of administration, the students were informed that the survey to be administered was anonymous and that participation was voluntary. Despite this, the vast majority of students that were present in class on that day participated. Response rates were calculated by noting the number of completed surveys relative to the total number of students enrolled in the course—58.6% of students participated. The description of the convenience sample surveyed is shown in Table 1.

On face value, this sample's alcohol and marijuana use within the past 12 months and 30 days is similar to the University's CORE survey for 2006; alcohol use within the past 12 months was 82.5% and past 30 days was 70.5% in the sample versus the University-wide CORE findings of 82.5% and 72.2% respectively. Marijuana use within the past 12 months was 34.3% and past 30 days was 19.4% in the sample versus an overall University reported 26.2% and 13.3% respectively. It should be noted that the University's CORE survey utilizes a Web-based administration with typical response rate of around 20% from year to year. The higher prevalence of marijuana use in the sample may be partially reflected in the differences in survey methodology. As another reference, Monitoring the Future reported 30.2% of college students nationally used marijuana in the past year and 16.7% used within the past 30 days in 2006 (Johnston et al., 2007). That same year, Monitoring the Future reported 82.1% use of alcohol in the past year and 65.4% use in the past 30 days among its college student sample.

WHO KNOWS ABOUT *SALVIA DIVINORUM*?

Among the sample, the current study found that 22.6% (190) of students surveyed had heard of *Salvia divinorum*. The instrument included items for these respondents regarding the various ways in which they had learned about the substance. Of these respondents, the overwhelming majority reported learning about the drug through their friends: 81.9% (154) that learned about salvia from their friends, 4.8% (9) from a class, 2.7% (5) from the Internet, 2.7% (5) from a

Table 1. Descriptive Statistics and Bivariate Correlations: *Salvia* Use by Sample Demographics

Variable	Sample (n)	Overall	% Lifetime (n)	% Past-year (n)	% Past month (n)	% Non-Users (n)
Gender						
Female	504	61.1%	3.8% (19)**	1.8% (9)*	0.2% (1)	96.2% (485)
Male	321	38.9%	10.9 (35)**	4.6% (15)*	0.9% (3)	89.1% (286)
Race						
White	501	60.7%	8.8% (44)**	4.2% (21)**	0.8% (4)	91.2% (457)
Black	127	15.4%	0.8% (1)**	0.8% (1)	0.8% (1)	99.2% (126)
Hispanic	118	14.3%	4.2% (5)	4.2% (5)	0.8% (1)	95.8% (113)
Asian	56	6.8%	1.8% (1)	1.8% (1)	1.8% (1)	98.2% (55)
Age Mean (<i>SD</i>)	19.8 (2.0)	20.2 (1.6)	19.63 (1.64)	19.0 (0.82)	19.8 (2.02)	
SES Mean (<i>SD</i>)	2.88 (1.1)	3.35 (.88)**	3.29 (.69)	3.0 (.82)	2.85 (1.11)	
GPA Mean (<i>SD</i>)	3.39 (.44)	3.37 (.41)	3.43 (.38)	3.52 (0.31)	3.39 (.44)	

Significance testing: * $p \leq .05$; ** $p \leq .01$.

family member, 1.6% (3) from the media, and 1.6% (3) from a head shop. This finding is contrary to anecdotal evidence suggesting that *Salvia divinorum* is primarily an Internet phenomenon.

WHO USES *SALVIA DIVINORUM*?

The use of *Salvia divinorum* appears to be concentrated among whites, males—in accordance with Lange et al. (2008)—and students from more affluent families. About 65% of students that reported lifetime use were male and, by far, whites reported significantly more lifetime use than any other group (see Figure 1).

METHODS OF ACQUISITION

Only 40% of *Salvia divinorum* users of the student sample purchased the substance themselves. This suggests that the majority of salvia users did not actually pay for the drug. Given the apparent social nature of the drug as depicted in YouTube videos (where one user smokes *Salvia divinorum* while others watch and then pass it along after the altered state subsides) this finding gives credence to the anecdotal evidence suggesting that *Salvia divinorum* use occurs in groups. Surprisingly, Internet sales accounted for only 9.1% of the total *Salvia divinorum* sales among the sample. The vast majority of *Salvia divinorum* users among the sample purchased the substance from head shops (77%).

QUALITATIVE ASSESSMENTS FROM USERS

Survey respondents were asked to give a self-report indicator of intoxication and to rank their experience. In addition, respondents were asked whether the user experienced a “high” after using salvia. In the sample, 81% of salvia users report that they did get high when using the substance. Respondents were also asked to give a self-report indicator of how pleasurable the experience was. A Likert-type scale was used which ranged from 1-10, where a 1 would indicate a very unpleasant experience and a 10 would indicate a very pleasant experience. The average rating for a salvia experience was 5.83 (see Figure 2).

REPEAT ACTIVITY

Prevalence rates plummet when observing lifetime use (6.7%), to use within the last year (3.0%), and to use within the last month (0.5%). This indicates that chronic users of salvia were not prevalent among our sample. Furthermore, the survey instrument inquired whether salvia users desire to use the substance again—revealing that 51% of users said no, 32% said maybe, and 17% of users said yes. This suggests that salvia has a low continuance rate.

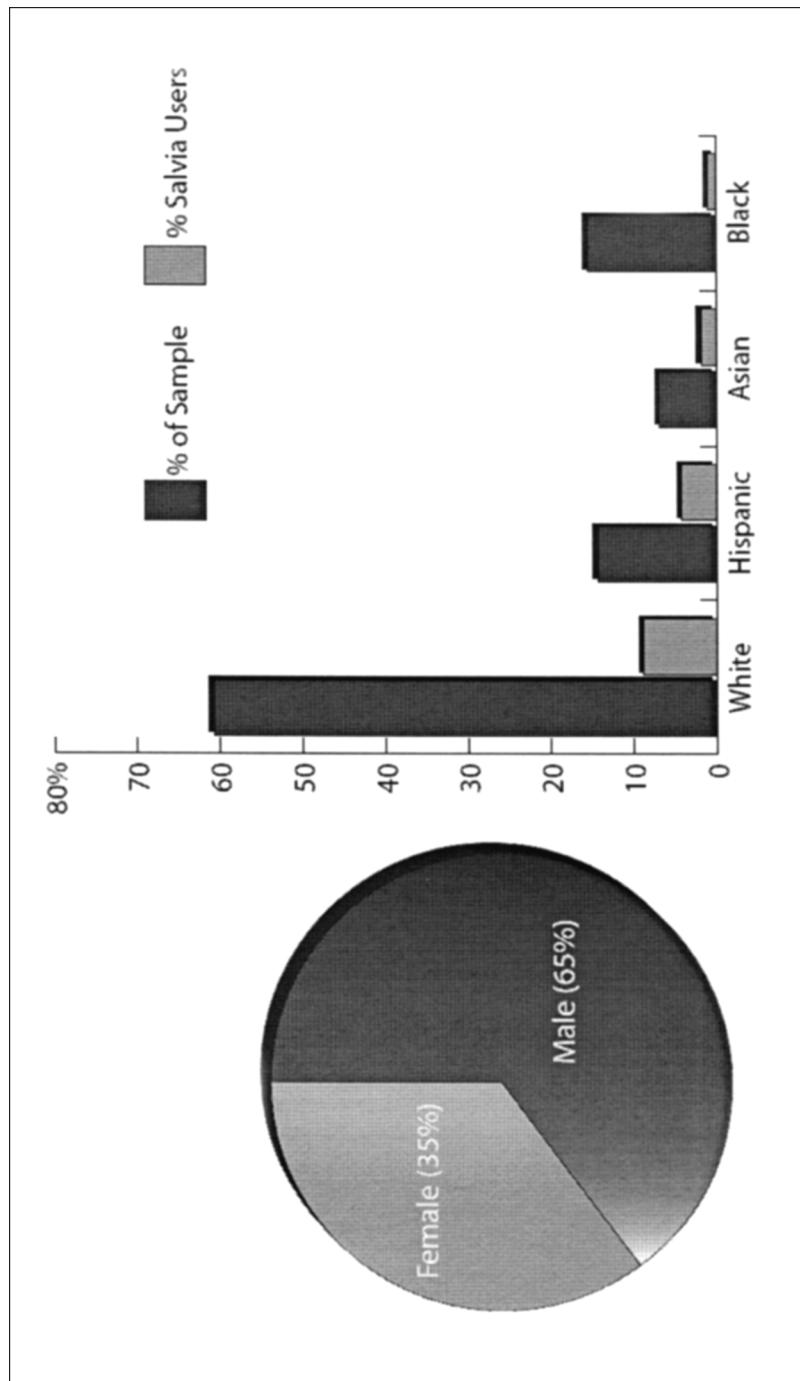


Figure 1. Use of *Salvia divinorum* by gender.

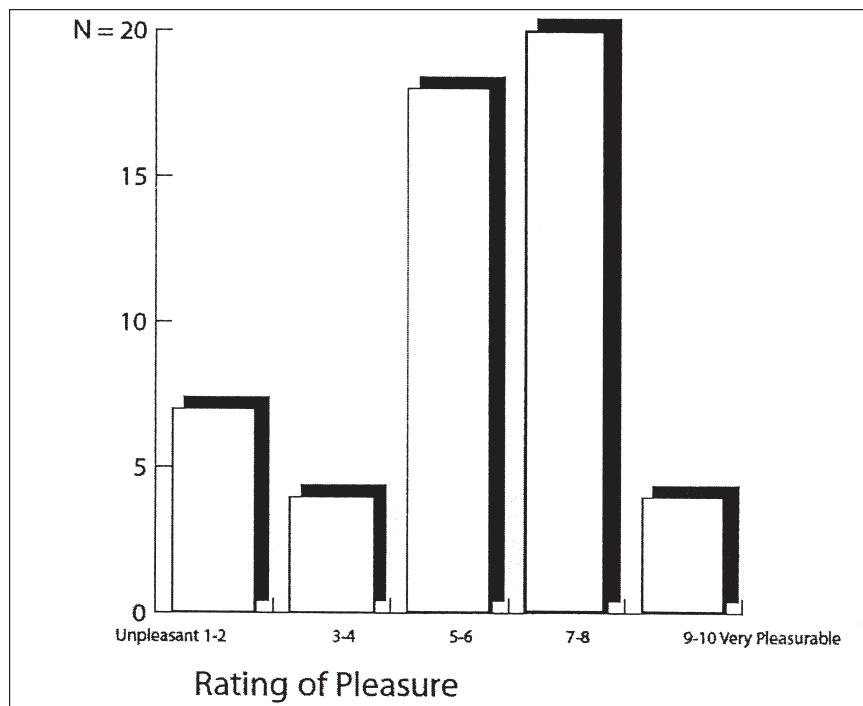


Figure 2. Subjective rating of pleasure by *Salvia* users in sample.

SALVIA AND THE INTERNET

One study revealed that drug users actually altered their behavior upon awareness of new information about drugs obtained via the Internet. This study showed that the sample population would actually alter their patterns of usage, including increased or decreased use of different drugs, based upon the information they received (Boyer, 2001; Boyer, Shannon, & Hibberd, 2005). Nevertheless, some have advocated that more Websites and information be created and/or provided to give accurate information about drugs (Halpern & Pope, 2001). In the current study, the vast majority of individuals that indicated they have used *Salvia divinorum* in their lifetime learned about the substance from their friends while only a minority discovered it online. It remains unclear, however, how Internet research plays into continuance of use or desistance, or other aspects of drug-taking behavior.

DISCUSSION AND CONCLUSIONS

The earliest recordings of psychoactive drugs date back to ancient times and have identified the use of certain drugs with specific demographics. In particular,

deviant others that are seen as threats to society were isolated and their drug using habits were constructed as evil and wrong. The Lotophagi, or Lotus-eaters, of Greek mythology are a prime example of this type of out-group. In the *Odyssey*, the Lotophagi are a North African people who, by large, are characterized by their fixation on being intoxicated on the fruits and flower of the lotus. This intoxication is constructed as foul and was casted as heinous; lotus caused its users to become lethargic and apathetic.

While *Salvia divinorum* may pose a threat to our youth, a thorough risk assessment based on sound research should be paramount in the process. To date, four states have made preemptive decisions to classify *Salvia divinorum* as a Schedule I drug before any indication of prevalence or continuance rates by extant research. Evidence proffered by the current study suggests that *Salvia divinorum* use exists within a college student setting, yet may be concentrated among whites, males, students from more affluent backgrounds, and those that regularly use marijuana. While the lifetime prevalence of *Salvia divinorum* is similar to that of other hallucinogens as noted by current data provided by national surveys that include college students (e.g., Monitoring the Future), continuance rates may be considerably less. Given the current lack of regulation in the State of Florida, this finding is particularly fascinating—whether a movement to place restrictions on *Salvia divinorum* will stem additional interest in deviant subcultures or will stamp out use is an empirical question. It also may be possible that the media attention given to this lesser-known substance may increase interest in the drug. Only a small fraction (22.6%) of the current sample have knowledge of the substance when asked, leading the authors to believe that if this were to increase, use may increase as well.

At this point in time, it is difficult to advise prevention specialists on appropriate measures of how to reduce or avert *Salvia divinorum* use. Researchers should closely monitor the states currently regulating this psychoactive plant to gauge the usage patterns of young adults. It could very well be that once salvia products are taken off of the shelves of head shops, consumption rates may drop precipitously—at least in the short term. Support for this notion arises from the finding that the vast majority of respondents acquiring salvia in the present study do so at head shops. The data also shows a substantial correlation between heavy marijuana use and experimentation with this psychoactive plant. This suggests to the authors that successful measures of marijuana prevention may also have success when applied to *Salvia divinorum*. If the substance is simply the latest fad, as suggested by some, remains to be seen.

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