

A brief survey of drug use and other activities preceding mystical-religious experiences

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Abstract

Many people report having had mystical-religious experiences. The prevalence of these experiences has increased over time, which suggests changing cultural factors may contribute the experience. I conducted an online survey of 6,209 adults to determine how common different activities, including drug use, were before the onset of a mystical-religious experience. 19.6% (1,045) reported having had a mystical-religious experience and were asked a follow-up question on their activities before the experience. The most commonly endorsed pre-onset activity categories were: Prayer, meditation, or contemplation (37.2%); Being outdoors in nature (19.6%); and Religious ceremony, practice, or ritual (16.1%). Less commonly, respondents reported fasting (5.7%) or drug use (4.7%). A large percent (35.2%) reported not engaging in any of these activities before their experiences. Psychoactive drugs and nature are precedents to mystical-religious experience that are not selectively associated with traditional religious institutions and deserve additional study.

1 Introduction

2
3 Estimates for the prevalence of people who have had mystical-religious experiences have varied
4 from 20.5% percent to 53% (Yamane and Polzer 1994) with Spilka, Hood, and Gorusch (1985)
5 estimating an overall average of 35%. Polls using brief questions such as "Would you say that
6 you have ever had a 'religious or mystical experience' -- that is, a moment of sudden religious
7 awakening or insight?" indicate the prevalence has increased from 20.5% in 1962 to 37% in the
8 1970s to 49% in 2009 (Gallup & Newport 1990; Pew Forum on Religion & Public Life 2009).
9 This apparently changing prevalence suggests cultural factors may contribute to the tendency to
10 experience, label, or report mystical-religious experiences.

11
12 Studies have examined many correlates of mystical-religious experience. For example, Yamane
13 and Polzer (1994) analyzed data from the General Social Survey and reported that those who
14 more frequently attended services and prayed had higher probability of having experienced a
15 transcendent spiritual force. Poloma and Pendleton (1989) also found that devotional practices
16 such as frequency of prayer and reading scripture were predictors of mystical-religious
17 experiences within the Assemblies of God denomination. Hay and Morisy (1978) reported that
18 older individuals were more likely to report religious experiences.

19
20 One under-studied predictor of mystical-religious experience is drug use. A series of studies at
21 Johns Hopkins (Griffiths et al. 2006; Griffiths et al. 2008) have confirmed and extended an early
22 report (Pahnke 1966) that psychedelic drugs can occasion mystical experiences of lasting
23 meaning and significance in previously drug-naïve people. Such findings are perhaps
24 unsurprising in light of the existence of religions that use psychedelics in their religious
25 ceremonies, including the Native American Church, Santo Daime, and the União do Vegetal
26 (Labate & MacRae 2010; Stewart 1987). Moreover, traditional psychedelic use in non-Western
27 cultures often has mystical-religious aspects (Schultes & Hofmann 1992).

28
29 Given the prevalence of psychedelic drug use in Western society, drug-occasioned mystical-
30 religious experience may be common and may explain some of the increase in reported mystical-
31 religious experience. Nationwide surveys indicate that psychedelic drugs with effects similar to
32 those studied at Johns Hopkins have been used by 15.1% of the population aged 12 and older in
33 the United States, including 9.4% of the public having used LSD (SAMSA 2013). This
34 widespread drug use naturally leads to the question of how prevalent drug-occasioned mystical-
35 religious experiences are. Studies of psychedelic drug users suggest these experiences are
36 common but these studies do not represent a representative sample of the public.

37
38 To address this question, I conducted an anonymous online survey using Google Consumer
39 Surveys. Google Consumer Surveys is a tool that allows one to present brief questions to a
40 stratified sample of Internet users who visit about 80 publisher sites (including the New York
41 Daily News, Christian Science Monitor, Reader's Digest, YouTube, and Pandora). Visitors to
42 these sites can choose to answer one or more survey questions to gain access to premium,
43 otherwise paid content. Google uses algorithms to stratify and weight respondents so that they
44 reflect the Internet-using adult population in the United States. Because the surveys are brief, the
45 response rates are higher (23.1% in an initial reported) than typical for most Internet intercept
46 surveys (1% in Lavrakas 2010) and telephone surveys (7-14% in Pew 2011, Pew 2012). Similar

weighing methods are used to correct for the response bias caused by subpopulations increasingly not answering telephones. An analysis by the Pew Research Center (2012) found that the median difference between Google surveys and Pew's telephone surveys on the same topics was 3 percentage points. Silver (2012) concluded that Google's surveys in the 2012 presidential election were more accurate than many other surveys, including both telephone and online surveys.

The brief two-question survey sought to estimate how prevalent different activities, including drug use, were before the onset of a mystical-religious experience. Based on the prevalence of psychedelic drug use, I expected that drug-occasioned experience would have prevalence less than 15%, likely close to 5%.

Materials & Methods

I collected data on activities occasioning mystical/religious experience using Google Consumer Surveys, a tool developed by Google that allows one to present brief questions to a stratified sample of Internet users. The sample is stratified using real-time algorithms based on age, gender and location. These demographic features are inferred based on the types of websites the users visit, as recorded in their Google DoubleClick advertising cookie, and their computer's Internet address. Consumer Surveys also infers income and urban density by matching location to census tracts and using the census data to infer income and urban density. When possible, Consumer Surveys uses post-stratification weighting to compensate for sample deficiencies, which attempts to ensure weighted respondents are balanced to reflect all Internet users, as measured by the Census Bureau's Current Population Survey's Internet Use Supplement.

The initial survey question was based on that used by Gallup polls and asked "Have you ever had a 'religious or mystical experience'—that is a moment of sudden religious insight or awakening?" Those who endorsed a religious or mystical experience were presented with a second question: "Which of the following activities, if any, were you doing immediately before this religious or mystical experience?" Participants could check as many of the following activities as applied: Prayer, meditation, or contemplation; Being outdoors in nature; Religious ceremony, practice, or ritual; Fasting; Using sacred plants or other drugs; or None of the above. With the exception of the option 'None of the above', which was always last, possible responses were randomly ordered.

Results

The survey collected data from February 20 through 22 2015 and had a response rate of 16.3% (6,209 of 38,109). Participants were obtained from the following publisher categories: News 56.2%; Arts & Entertainment, 12.2%; Mobile Applications 11.8%; and Other 19.8%. The success of the survey in sampling the Internet-using population is shown in **Table 1**. This sampling bias was used to weight responses for the survey's first question to correct for age, gender, and regional biases, but was not used for the second question due to the small sample size. Interested readers may explore results and download the raw data at:

1 <http://www.google.com/insights/consumersurveys/view?survey=gt5qysl5lv4fk>

2
3 Those wishing to use these data are asked to cite the current manuscript.

4
5 19.6% of participants endorsed having had a religious or mystical experience; 58.3% responded
6 'No' and 22.1% responded 'I don't know'. The proportion of individuals reporting a mystical
7 experience did not significantly differ between genders (17.9 (95%CI: 16.4-19.5) % for males vs.
8 21.2 (CI: 19.3-23.3) % for females). There was some evidence of an effect of age, with younger
9 respondents more likely respond 'I don't know' (26.4 (CI: 22.9-30.3) % in 18-21 year-olds vs.
10 17.7 (CI: 14.9-20.9) % in 65+ year-olds) and older ones more likely to respond 'Yes' (21.4 (CI:
11 18.3-24.8) % in 65+ year-olds vs. 15.1(CI: 12.3-18.4) % in 18-21 year-olds).

12
13 The 1,045 individuals who endorsed a religious or mystical experience were presented with a
14 second question about activities they were doing during the experience. Given the modest sizes
15 of cells, no weighing was used to correct for sampling biases in this question. The proportions of
16 individuals endorsing each activity are shown in **Figure 1**.

17
18 Most participants (51.2%) endorsed one activity; 9.1% selected two; 3.2% endorsed three
19 activities; and fewer endorsed four (0.6%) or five (0.4%) activities. Finally, 35.1% endorsed
20 "None of the above" option. The most common pairs of activities were prayer and ceremony
21 (3.3% of all respondents) and nature and prayer (2.6% of all respondents).

22
23 **Figure 2** summarizes statistically significant associations between pairs of activities, as
24 determined using a chi-squared test of independence. Because number of mystical-religious
25 experiences was not recorded, it cannot be inferred that pairs of activities actually co-occurred:
26 reported activities may have preceded separate mystical-religious experiences.

27
28 Among those who reported prayer, meditation, or contemplation before a mystical-religious
29 experience: 16.9% of this group also reported religious ceremony, practice, or ritual; 14.7% also
30 being outside in nature; 8.8% also reported fasting, and 3.2% also reported using drugs.

31
32 Among those who reported religious ceremony, practice, or ritual before a mystical-religious
33 experience: 39.4% of this group also reported prayer, meditation, or contemplation; 17.7% also
34 being outside in nature; 10.9% also reported fasting, and 2.9% also reported using drugs.

35
36 Among those who reported being outside in nature before a mystical-religious experience 28.2%
37 also reported prayer, meditation, or contemplation; 14.6% also reported religious ceremony,
38 practice, or ritual; 10.3% also reported fasting, and 8% also reported using drugs.

39
40 Among those who reported fasting before a mystical-religious experience: 58.1% of this group
41 also reported prayer, meditation, or contemplation; 30.6% also reported religious ceremony,
42 practice, or ritual; 35.5% also reported being outdoors in nature; and 12.9% also reported drug
43 use.

44
45 Among those who reported drug-taking before a mystical-religious experience: 32.7% of this
46 group also reported being outdoors in nature; 25% also reported prayer, meditation, or

1 contemplation; 15.4% also reported fasting; and 9.6% also reported religious ceremony, practice,
2 or ritual.

3 4 5 **Discussion**

6
7 Psychedelic-occasioned mystical-religious experiences are thought to be common. Studies
8 administering psychedelics to people in a laboratory (e.g., DMT: Strassman 2001; LSD: Ditman
9 et al 1969; MDA: Baggott et al. 2010b, psilocybin: Griffiths et al. 2006 and Studerus et al. 2011;
10 Salvia divinorum: Johnson et al. 2011) or surveying users (e.g., Baggott et al. 2010a; Carthart-
11 Harris and Nutt 2010; Lyvers & Meester 2012) suggest they may be very common. However,
12 laboratory studies and surveys of psychedelic users are biased samples that are unlikely to
13 represent the general public. To address this question, I conducted an online survey, finding
14 19.6% of respondents endorsed having had a mystical-religious experience and that 4.7% of this
15 subset had experiences following drug use. In other words, approximately 8 in 1,000 Internet-
16 using adults in the United States have had mystical-religious experiences after drug use.

17
18 While not uncommon, drug-related mystical-religious experience is less common than might be
19 naively predicted from studies of psychedelic users. Mystical-religious experiences are a
20 significant motivation for using psychedelics (e.g., Hallock et al. 2013; Lyvers & Meester 2012;
21 Moro, Bárd, & Rácz 2011) and are well documented in psychedelic users. At the upper end,
22 probable or definite drug-related spiritual experiences were reported by 81% of experienced
23 psychedelic users in the sample of Carthart-Harris and Nutt (2010). This likely reflects an
24 oversampling of convenient subsets of users who actively participate in related communities.
25 The estimate of Studerus et al. (2011) that 22% of healthy volunteers receiving psilocybin in
26 their experiments had a mystical experience is likely more reflective of the general population.

27 As an informal “sanity check”, we can compare the current estimate that 0.8% adults with drug-
28 related mystical-religious experience to the annual prevalence of psychedelic use in the U.S.
29 (last-year use was 2.4% of 18-54 year-olds, according to the SAMSA’s (2013) National Survey
30 on Drug Use and Health). If the number of users in the last year is taken as an estimate of active
31 repeated users and we make the simplifying assumption that no less frequent users have
32 mystical-religious experiences, this would imply roughly 33% of active users have had mystical-
33 religious experiences. This estimate is likely inaccurate, but it indicates that the current results
34 are not implausible.

35
36 Drug-related mystical-religious experiences appear to be less common than nature-related ones.
37 Thirty-three in 1,000 Internet-using adults reported having been outdoors in nature before a
38 mystical-religious experience, while about 8 in 1,000 reported using a drug. Natural
39 environments are a common trigger for peak experiences (Davis, Lockwood, & Wright 1991;
40 Maslow 1968) and, more broadly, increase positive affect and decrease negative affect (reviewed
41 in McMahan & Estes 2015). Nature-related mystical-religious experiences represent an
42 interesting area to study because they, like psychedelic-related experiences, are not selectively
43 associated with religious tradition and represent an activity available to those who identify as
44 spiritual but not religious.

1 Relatively few (9.6%) of the respondents reporting drug use before a mystical-religious
2 experience also reported involvement in a religious ceremony, suggesting few of the participants
3 were practicing members of an organized religion that uses psychoactive sacraments. However,
4 25% reported prayer, meditation, or contemplation. Taken together, 26.9% of those reporting
5 drug use also reported either prayer or religious ritual, suggesting that as many as quarter of
6 those who had a drug-preceded mystical-religious experience may have been explicitly using
7 drugs as part of their spiritual practice.

8
9 While it is outside of the scope of this survey, it would be valuable to compare nature and drug
10 related experiences. Recent studies of psychedelic-occasioned mystical-religious experience
11 have been interpreted within a perennialist tradition that posits a core of stable transcultural
12 aspects to these experiences (Moore 1973; Stace 1960). It would be unfortunate if this
13 minimized potential differences among the phenomenologies and consequences of experiences
14 occasioned by drugs, nature, and more institutionally common religious activities. There are
15 likely profound differences between these mystical-religious experiences. For example, 31% of
16 the participants receiving psilocybin in Griffiths et al. (2006) experienced periods of significant
17 fear, which is not expected from nature-related mystical-religious experiences. Echoing
18 MacLean and colleagues' (2012) suggestion that scholars examine the structure of mystical
19 experiences in groups that differ in self-identified spirituality, I propose it would be helpful to
20 also compare nature and drug related experiences.

21
22 Limitations of this study include the brevity of the survey, the inferential nature of the sampling
23 method, and the fact that not all adults in the U.S. use the Internet. The format and pricing of
24 the survey tool encourage brief surveys, which makes it impractical to gather detailed
25 information on the respondents and their experiences. Lengthier surveys and studies should
26 attempt to address labeling and definitional issues (such as whether different groups label their
27 experiences differently) and track which specific drugs are associated with mystical-religious
28 experiences. A related limitation is that, as described above, the study used statistical modeling
29 to infer participant demographics based on census data for their location and the individual's
30 browsing history. While these inferences are likely accurate on the average, they may be less
31 reliable in categories with fewer respondents. Finally, the study attempted to sample adult
32 Internet users in the U.S. As Internet penetration in the U.S. is only 78% of adults, results may
33 not therefore generalize to these 'offline' segments of the adult U.S. population.

34 35 **Conclusions**

36
37 Mystical-religious experience is temporally associated with activities linked to religious
38 institutions and traditions, such as prayer, ritual, and fasting. However, significant subsets of
39 experiences have other precedent activities, including use of drugs and exposure to nature.
40 Approximately 8 in 1,000 Internet-using adults in the United States have had mystical-religious
41 experiences after drug use, while 33 in 1,000 Internet-using adults in the United States have had
42 mystical-religious experiences associated with nature. The relationships between these activities
43 and mystical-religious experiences deserves further study.

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Table 1: Sampling bias of survey

	Response	Non-response	Internet Population	Bias
<i>Question 1:</i>				
Male	57.7%	50.5%	48.0%	9.7%
Female	42.3%	49.5%	52.0%	-9.7%
18-24	14.2%	11.9%	14.1%	0.1%
25-34	17.1%	18.3%	19.4%	-2.3%
35-44	15.3%	17.5%	18.7%	-3.4%
45-54	19.1%	21.2%	19.4%	-0.2%
55-64	19.1%	16.1%	16.0%	3.1%
65+	15.2%	15.0%	12.3%	2.9%
Midwest	26.6%	19.5%	22.0%	4.6%
Northeast	19.6%	21.1%	18.9%	0.7%
South	29.3%	35.3%	35.3%	-6.0%
West	24.5%	24.0%	23.8%	0.7%
			RMSE score	2.2%
<i>Question 2:</i>				
Male	54.7%	57.1%	48.0%	6.7%
Female	45.3%	42.9%	52.0%	-6.7%
18-24	10.5%	15.2%	14.1%	-3.6%
25-34	16.9%	18.6%	19.4%	-2.5%
35-44	14.7%	15.8%	18.7%	-4.1%
45-54	18.6%	18.8%	19.4%	-0.7%
55-64	22.5%	16.9%	16.0%	6.4%
65+	16.8%	14.7%	12.3%	4.5%
Midwest	27.0%	26.0%	22.0%	5.1%
Northeast	15.9%	20.7%	18.9%	-3.0%
South	31.1%	28.9%	35.3%	-4.2%
West	25.9%	24.3%	23.8%	2.1%
			RMSE Score:	2.1%

Figure 1: Activities immediately preceding mystical-religious experiences

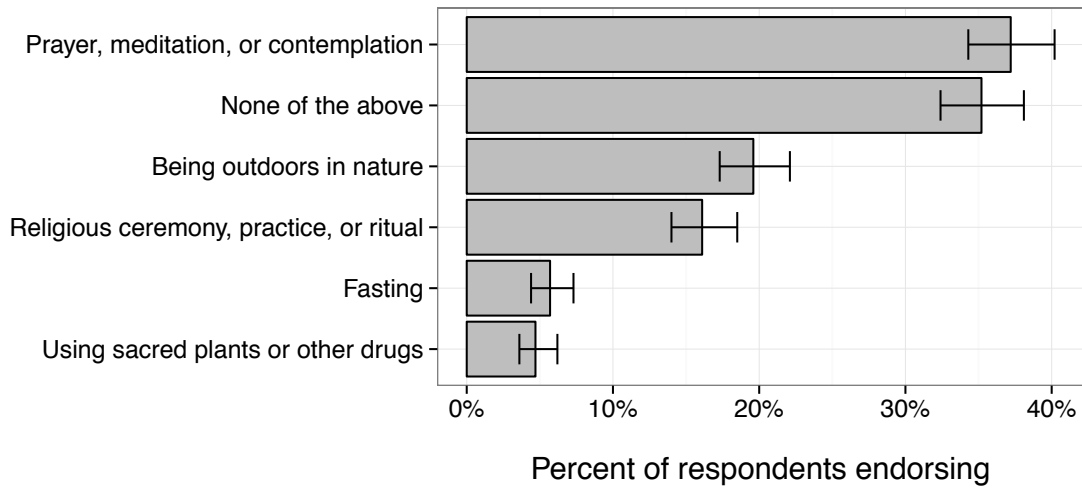


Figure 2: Significant associations between activities

