

# Subjective Effects of Salvia Divinorum Use: A Retrospective Mixed Methods Approach



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## BACKGROUND

- Salvia divinorum is a powerful and unique psychedelic, with its psychoactive component salvinin acting as an agonist at the kappa opioid receptor.
- There is little scientific research on the specific subjective effects unique to salvia divinorum despite reports of profoundly consistent experiences.
- The main purpose of the current study was to investigate the subjective effects of salvia divinorum in a large online sample retrospectively using both quantitative and qualitative methodology.



## METHODS

**Participants:** 400 participants that had taken salvia divinorum in the past were recruited through Internet forums, social media, and the Multidisciplinary Association for Psychedelic Studies. The research was approved by the institutional review board of Harvard University; participants provided consent.

**Procedure:** Participants answered questions online related to their salvia use history and their most recent salvia experience, including type and strength of extract and administration method. They rated their most recent salvia experience using the Salvia Experience Checklist (SEC), a 58-item list of experiences commonly experienced with salvia use, and the Hallucinogen Rating Scale (HRS). They then described their most recent salvia experience. Participants also rated their level of mindfulness and dissociation on the Langer Mindfulness Scale (LMS) and Dissociative Experiences Scale (DES), respectively.

**Data Analysis:** Descriptive statistics, Pearson correlations, and ANOVAs were conducted using SPSS 23.0. Qualitative analysis is on going, but included identification of themes and word frequency analyses using NVivo 11.0 software.



## RESULTS

A total of N = 349 participants completed the survey and were included in the final analysis. The mean age was 29.0 years (range = 18-75); 84.2% were male and 15.8% were female. Participants were mostly Caucasian (85.7%), followed by multiracial (7.8%), Hispanic (3.9%), Asian (1.3%), Indigenous or Aboriginal (1.3%). Most participants identified as spiritual but not religious (53.5%), followed by Atheist (19.7%), Agnostic (14.1%), Buddhist (5.6%), Christian (5.6%), Jewish (1.4%), and Muslim (1.4%).

The mean number of items selected on the Salvia Experience Checklist (SEC) was 16.4 (SD = 10.8). Scores on the SEC were positively correlated with scores on all subscales of the Hallucinogen Rating Scale (HRS) ( $p < .005$ ), dissociation (DES) ( $p < .005$ ), and mindfulness (LMS) ( $p < .01$ ) (see Table 1). Participants scored higher than the general population on both dissociation and mindfulness.

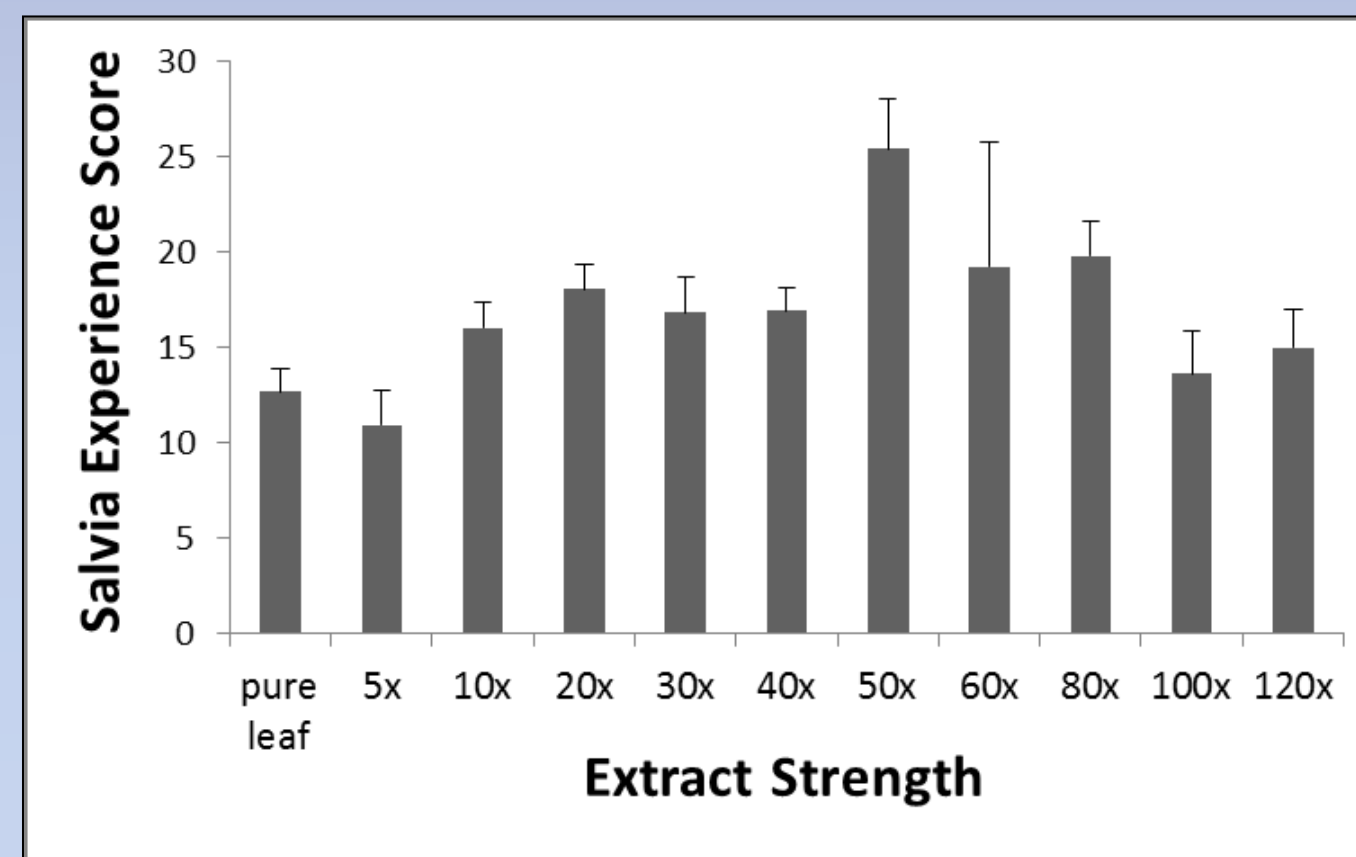


Figure 1. SEC score depends on extract strength.

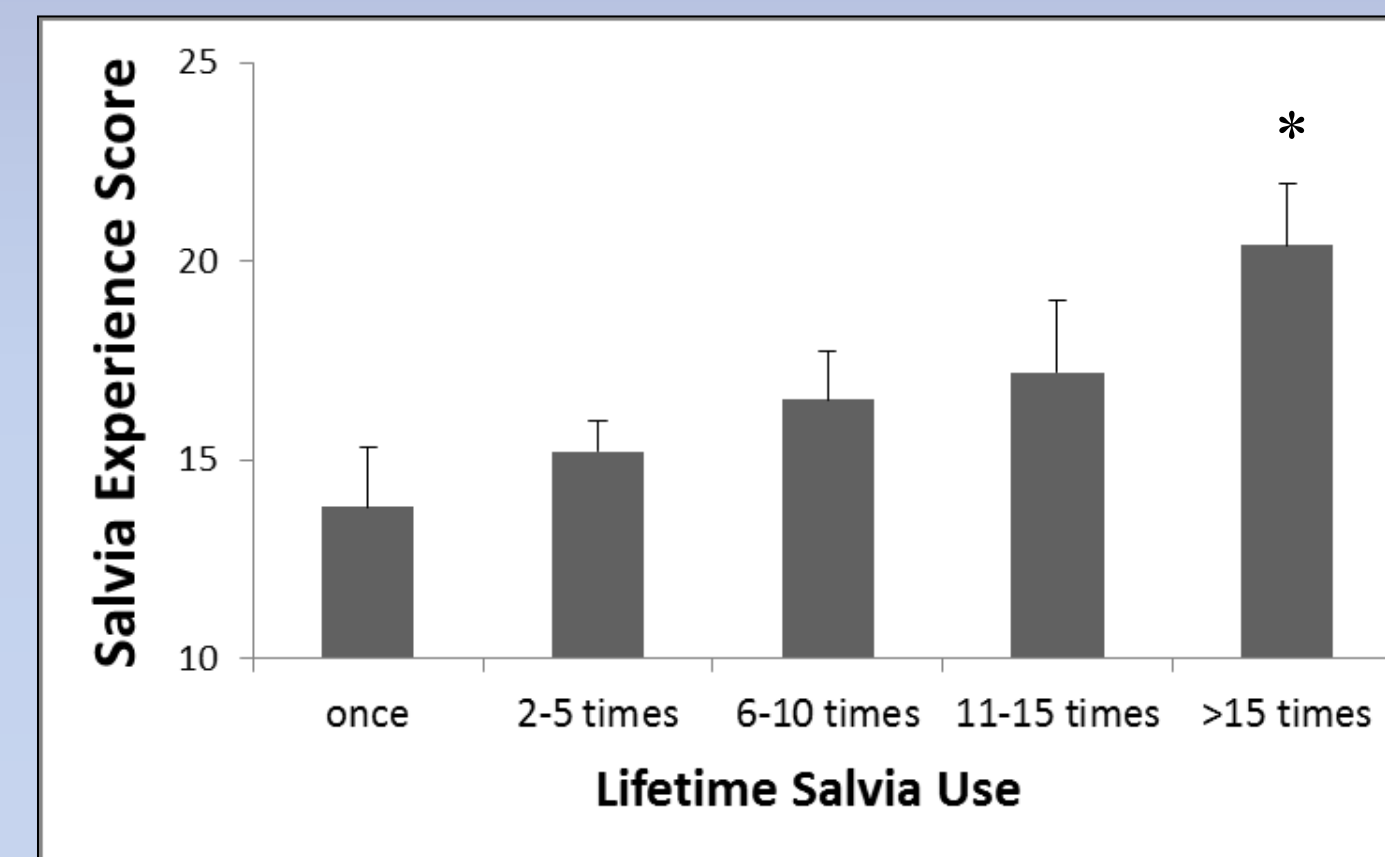


Figure 2. SEC score increases with lifetime use; \* $p < .05$ , compared to once, 2-5 times, 6-10 times.

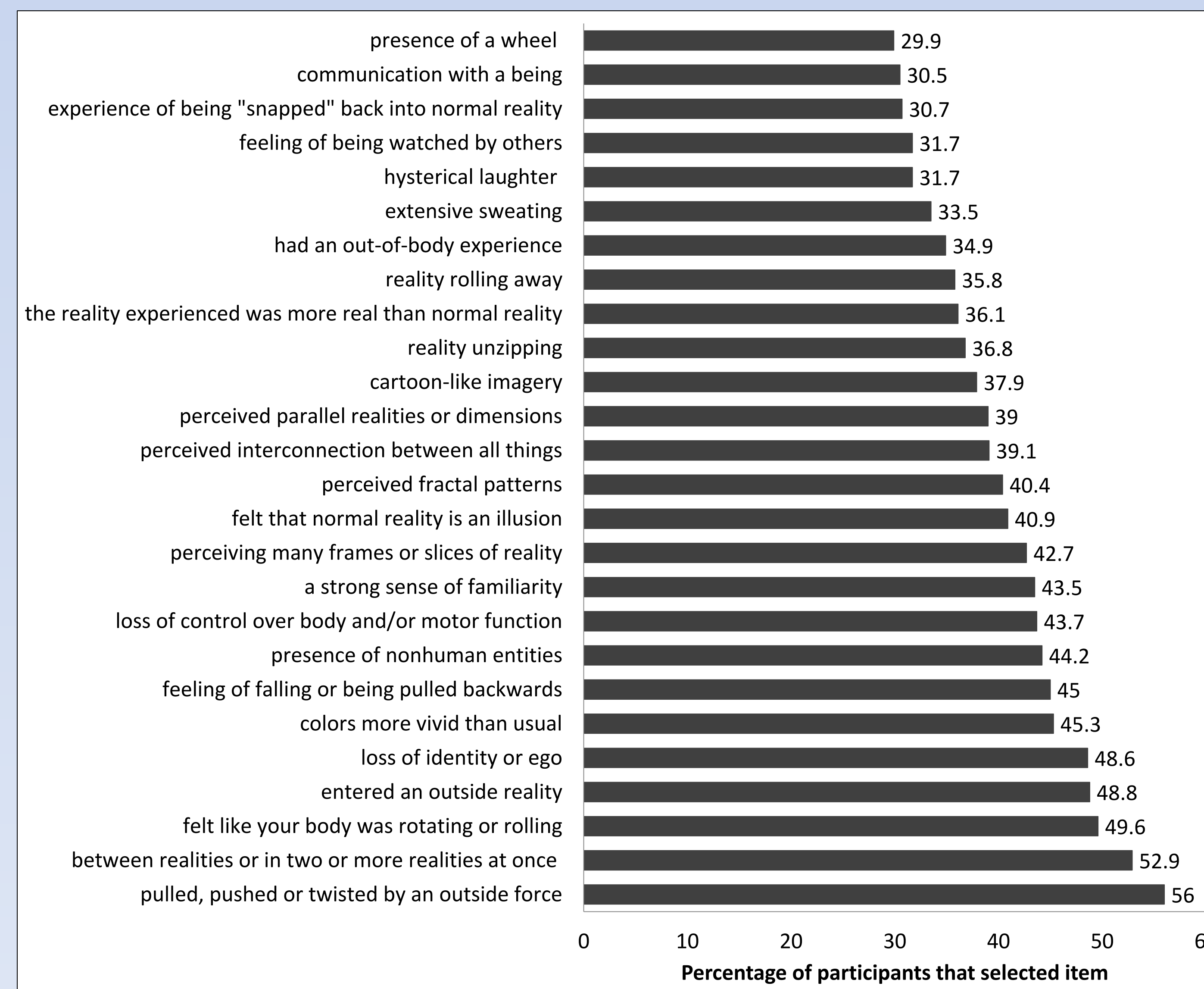


Figure 3. Items from the Salvia Experience Checklist (SEC) that a third or more of participants experienced (44.8% of SEC items).

Table 1. Means ( $\pm$ SD) and Pearson correlations between the SEC, HRS, DES, and LMS.

	SEC	HRSi	HRSs	HRSa	HRSp	HRSv	DES	LMS
SEC	16.4(10.8)							
HRSi	.38***	13.2(2.6)						
HRSs	.53***	.45***	35.4(9.5)					
HRSa	.60***	.49***	.57***	41.6(11.3)				
HRSp	.59***	.50***	.62***	.61***	48.5(15.1)			
HRSv	.59***	.51***	.59***	.71***	.62***	34.2(10.3)		
DES	.19***	-.07	.12*	.12*	-.00	.16**	13.1(5.0)	
LMS	.15**	.21***	.15**	.14*	.23**	.26**	-.03	120.5(12.5)

Note: SEC, Salvia Experience Checklist; HRS, Hallucinogen Rating Scale; i, Intensity; s, Somatosensory; a, Affect; p, Perception; v, Volition; DES, Dissociative Experiences Scale; LMS, Langer Mindfulness Scale. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .0005$ .



Figure 4. Word frequency cloud for participants' reason for taking salvia.



Figure 5. Word frequency cloud for participants' salvia experience report.

Qualitative analysis revealed prominent themes of encountering a female energy or presence, feeling loved, removal from normal reality, encountering non-human entities, experiencing laughter, perceiving reality as flat or 2 dimensional, strong visual experiences, distortions in body perception, infinite slices of reality/the environment/the self, rotating wheels or cogs, and strong sense of familiarity or deja vu.

## DISCUSSION

- Results from the Salvia Experience Checklist (SEC), theme identification, and word frequencies revealed that salvia induced a unique experiential profile with consistent effects and themes shared by a large sample of participants.
- Data from the SEC will serve as a first step (i.e. content validity) toward further developing the measures as a valid and reliable Likert scale.
- The salvia experience score was most strongly correlated with the somatosensory, affect, perception, and cognition subscales of the HRS.
- Participants who scored higher on trait mindfulness and dissociative tendencies reported a greater number of salvia experiences.
- Together, the results of this large sample, mixed method study contribute to further characterizing the unique subjective effects of salvia divinorum.

## Acknowledgements

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