



AKADÉMIAI KIADÓ

Self-perception and self-recognition while looking in the mirror on psilocybin

SAM ELIAS[†], STEPHANIE SPIVAK[†], ALEXA ALVEREZ,
ALEJANDRO GILI OLIVARES, MARIA FERROL and
JULIAN PAUL KEENAN* 

Journal of Psychedelic
Studies

7 (2023) 2, 129–134

DOI:

[10.1556/2054.2023.00251](https://doi.org/10.1556/2054.2023.00251)

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Cognitive Neuroimaging Laboratory, Montclair University, 320 Science Hall, Upper Montclair, NJ 07043, USA

Received: December 11, 2022 • Revised manuscript received: March 27, 2023 • Accepted: July 26, 2023

Published online: September 19, 2023

BRIEF REPORT



ABSTRACT

Introduction: It is not known how self-perception and self-recognition are influenced when one is highly self-focused under the influence of psilocybin. Here we examine self-reports of mirror self-recognition and self-perception during a psilocybin experience. *Methods:* Reddit posts were examined in a systematic manner. Posts that were written by individuals that ingested psilocybin and subsequently looked in a mirror were examined. After both automatic and manual filtering, a total of 89 posts with 775 post excerpts were analyzed. *Results:* It was found that it was rare to see one's own face as a different entity (e.g., an animal or other person) however people were equally likely to see themselves as they really are or distorted. People were significantly more positive than negative when perceiving their own face. *Discussion:* We found wide variation in the perception of the own-face while under the influence of psilocybin. While generally positive, the self-face appears to be an experience that varies dramatically from person to person under the influence of psilocybin.

KEYWORDS

psilocybin, self-perception, mirror, self-recognition, Reddit

INTRODUCTION

It is of scientific interest to discover the influence psilocybin has on an individual's self-awareness. As psilocybin becomes more common as a treatment for mental disorders it is critical that we understand how one's self-perception and self-recognition is affected by such treatment (De Gregorio et al., 2021; Goldberg, Pace, Nicholas, Raison, & Hutson, 2020; Johnson & Griffiths, 2017; Reiff et al., 2020; Sarparast, Thomas, Malcolm, & Stauffer, 2022; Węckiewicz, Stokłosa, Piegza, Gorczyca, & Pudło, 2021). It is also prevalent as distortions created by psychedelics in the bodily self have been suggested to be critical in their effectiveness (Ho, Preller, & Lenggenhager, 2020).

The role psychedelics play in an individual's consciousness, awareness and perception is by altering states of visual fields which can evoke a change in emotions (Winkelman, 2017). Mirror recognition is one technique involving an individual's visual field that researchers have used to study self-reflection and self-identity (Butler, Mattingley, Cunningham, & Suddendorf, 2012). Psilocybin specifically has been shown to elicit greater self-awareness (Lowe et al., 2021). Comprehending that the image reflected in the mirror is oneself likely requires the ability to understand that the self (oneself) can exist on multiple levels (Feinberg, 1997; Povinelli, Rulf, Landau, & Bierschwale, 1993; Uddin, Iacoboni, Lange, & Keenan, 2007). Distortions of self-awareness can lead to a lack of self-mirror recognition (mirror sign or self-capgras) (Feinberg & Keenan, 2005; Roane, Feinberg, & Liberta, 2019). The mere presence of a mirror increases an individual's self-awareness (Buckle & Christine, 1997). Therefore, one way to measure the role psychedelics play on self-perception and self-recognition is by having one interpret their own image through a mirror.

[†]Co-first authors.

*Corresponding author.

E-mail: keenanj@montclair.edu



Psilocybin is a psychedelic substance that has been shown to have profound effects on consciousness, perception, and self-awareness: psilocybin has been able to reduce activity in brain regions associated with self-referential processing, suggesting that psilocybin may alter self-perception and self-awareness (Carhart-Harris et al., 2012). The effect of psilocybin on the self goes beyond that, as it is suggested that psilocybin-assisted therapy may promote positive self-perception. Individuals were more engaged in the therapeutic process, more willing to confront anxiety, and less fearful of self-confrontation, which is reflective of their self-perception (Haijen et al., 2018; Richards, Rhead, Dileo, Yensen, & Kurland, 1977). The administration of psilocybin to healthy individuals produces a temporary state of introspection, which is characterized by dream-like imagery with eyes closed, remembrance of personal memories, and heightened emotional experiences which also ties to self-perception (Riba, 2001; Sampedro, 2017).

The following study bridges the gap in psychedelic research by considering the potential impacts psilocybin has on an individual's self-perception (*how* one views themselves specifically using the qualia, characteristics, and affect associated to provide insight with the reflexive process) and self-recognition (the ability or inability to correctly identify oneself). Understanding the effect a psychoactive substance has on self-perception and recognition can be used to assess an individual's tolerance and define multiple parameters (Andreae et al., 2016). Discovering these limitations will also warrant strict administration and monitoring (Yan, Costello, & Allen, 2021). While the study's data is limited, our research can further propel other researchers to explore the alterations psychedelics have on self-perception and self-recognition and gather more information. Further psychedelic research is needed in the clinical field, but this current study can be used as a foundation for future explorations.

Psilocybin clinical trials are ongoing in several countries, including the United Kingdom, the United States, Canada, Switzerland, Germany, and Denmark (Plotnik, Gibbs, & Graham, 2022). Besides the clinical trials, cultural acceptance of psilocybin for human health has increased over time, leading to amendments to policies that allow research exploration and even decriminalization of psilocybin-based therapies in some countries (Inserra, 2019). Although the growing acceptance demonstrated by decriminalization of psilocybin in places across the United States, psilocybin research remains limited and challenging to access in academic settings (Marks, 2023). This is largely due to the Controlled Substance Act proposed in 1970. With psilocybin being classified as Schedule I under this act, it is deemed to be of high hazard ratio and with no medicinal value (Johnson, Griffiths, Hendricks, & Henningfield, 2018). With this unfortunate reality in mind, we turned to self-reported user data from the online community Reddit to delve deeper into this topic. This innovative approach has enabled us to explore the connection between psilocybin and the self, and allowed us to add qualitative understanding of how psychedelic users perceive and recognize themselves.

Considering this, the goal of this study was to find relevant posts on Reddit relating back to our research question. Specifically, the aim was to use Reddit as a tool to discover the relationship between the effects of psilocybin, on both self-perception and self-recognition.

MATERIALS AND METHODS

Data source and collection

The posts utilized were all derived from various subreddits across the website [Reddit.com](https://www.reddit.com). Reddit has been available since 2005, and has been a space where users can post about common interests. Reddit users have the ability to post, share, and comment about essentially anything they choose. These characteristics make the website a fruitful platform for unsolicited discussion of psychedelic experiences. Reddit posts can be searched for by keyword in order to find posts that contain similar information to the search terms. Two search terms that were used in order to find posts relevant to the research topic. The terms used were: (1) "psilocybin mirror" and (2) "shroom mirror". These search terms were developed in order to yield a maximum amount of relevant posts that would fit the inclusion criteria discussed in the following paragraph. Both terms included "mirror" since the study is interested in what occurs when one views themselves in the mirror on psilocybin. Additionally, the term "shroom" is a common term when referring to mushrooms containing psilocybin. "Psilocybin" was included as a search term as it is the specific molecule that is found in mushrooms that produces psychoactive effects upon intake. These search terms dovetailed nicely with our inclusion parameters in order to yield posts that could be analyzed for the study.

All of the search results using these particular terms were manually screened to see if they fit the inclusion parameters. The inclusion parameters were as follows: (1) the original poster had to explicitly state that they ingested mushrooms containing psilocybin; (2) there was the exclusive consumption of said compound and no other mind-altering substance before, during, or after; (3) the poster had to provide a description of what it was like, or the phenomenal characteristics of, looking in the mirror while on psilocybin; and (4) it was a novel post, meaning repeated posts could not be used twice even if they were in different subreddits. Comments that appeared in our initial search or under a post that fit our criteria were also analyzed.

Categorization and content analysis

Posts that fit the inclusion criteria were candidates for categorization. The categories were developed with self-perception and self-recognition in mind; these will be explored in more detail in the next section. The operating definitions used in this study for self-perception and self-recognition go as follows. Self-perception is *how* one views themselves specifically using the qualia, characteristics, and affect associated with the reflexive process.



Self-recognition simply is the ability or inability to correctly identify oneself.

Posts were gone through manually in order to derive qualitative data. Excerpts from the post relating back to the descriptive experience upon looking into the mirror while under a dose of psilocybin were identified. These excerpts were isolated from the entire post in order to do qualitative analysis on them. The identified excerpts were analyzed and placed within a category. It was possible that a single excerpt could have been placed under more than one category. The same methodology was done for comments. IPA qualitative analysis was conducted in this study.

Categories

Categories were developed after an initial search using the first search term, “shroom mirror”. Common keywords, phrases, and themes were identified in these initial accounts, and categories of qualia or description were established based on them. This mixed method derivation of the categories helped derive the qualitative and quantitative approach to post analysis.

A total of 15 categories were determined to aid in categorization and content analysis. These categories were: (1) visual change; (2) cognitive change; (3) surreal; (4) positive affect; (5) negative affect; (6) neutral affect; (7) self perception; (8) real self perception; (9) positive self image; (10) aging; (11) unreal self; (12) animal/entity; (13) other face; (14) geometry/patterns; and (15) primal/ancestry. Table 1 provides the definitions for these categories.

Self-recognition

In order to assess the ability to recognize oneself in the mirror, the categories of unreal (the inability to correctly recognize oneself) and real (the ability to correctly recognize oneself) were used. The broad category of “self perception” was left out of this comparison since it encompassed both of the aforementioned categorical descriptions; instead it was used when calculating the percentages of the mentions of these two experiences. The total number of mentions within the posts between “unreal” and “real” were added up in order to derive the percentage of posts including the two categories that either were unable or able to positively recognize oneself.

Self-perception

Analysis was also done to assess the emotional quality of self-perception. In order to analyze how one might perceive oneself while under a dose of psilocybin, the categories “neutral affect”, “positive affect”, and “negative affect” were derived. Similarly to self-recognition, the sum of the number of mentions of these three categories was used in order to derive percentages and comparison between the neutral, positive, and negative affect.

RESULTS

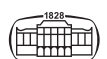
A total of 486 posts across Reddit were derived from our search terms. Upon manual screening there were 89 posts

Table 1. Categories used for analysis and corresponding definitions

Categories and their corresponding definitions	
Category	Definition
Visual change	Changes in the visual field outside of the usual; environment, self, face, etc.
Cognitive change	Changes in thoughts, beliefs, especially surreal, untrue, irrational, thought loops, etc. Notable and different.
Surreal	Includes thoughts about the self Thoughts or feelings not veridical in nature, characterized by strangeness or lack of validity
Positive affect	Characterized by language or tone that denotes thoughts or feelings of happiness, humor, and an overall well-being
Negative affect	Characterized by language or tone that denotes thoughts or feelings of pain, uneasiness, and an overall lack of well-being
Neutral affect	Characterized by an overall experience that does not describe positive or negative affect; can simply be an explanation of what occurs
Self	Discusses the self in some way without classifying the self as real, unreal, or positive self
Real self	Describing experience as seeing the self with no unrecognizable changes
Positive self image	See themselves as beautiful/attractive, suddenly have confidence, enjoying what they see, and making general positive comments on their self
Aging	Seeing oneself as younger or older specifically with visual changes
Unreal self	Not recognizing oneself; seeing oneself as an entity other than human being; seeing oneself as someone else
Animal/entity	The viewer sees themselves as an animal or some kind of non-human entity
Other face	How the face of someone else changed in the event that the face of someone else was viewed
Geometry/patterns	Geometric patterns that were physically seen on the face
Primal/ancestry	Feelings or visual changes that evoke a sense or visual experience of the past or previous evolutionary self

(18.31%) that fit our inclusion criteria. The 89 posts that were able to be utilized contained a total of 775 mentions or excerpts within the posts that fell under our identified categories (Table 2).

Excerpts that fell under real self or unreal self were included in the self-recognition analysis. The 144 mentions of self-recognition included 76 (52.78%) mentions of real self and 68 (47.22%) mentions of unreal self (see Fig. 1A). Comparing real self to unreal self, it was found that there was a significant difference ($X^2(1) = 0.44, p = 0.50$), which



indicated that real mentions were not significantly more likely than unreal mentions. Pertaining to self-perception, there were a total of 161 mentions. 82 (50.93%) of the

Table 2. Categories and total mentions in a given category. Mentions listed from most amount of mentions to least amount of mentions. Total mentions per category derived from quantitative analysis

Categories	Mentions (n, %)
Visual	121 (15.60%)
Self	103 (13.29%)
Cognitive	92 (11.87%)
Surreal	91 (11.74%)
Positive affect	82 (10.58%)
Real self	76 (9.81%)
Unreal self	68 (8.77%)
Negative affect	44 (5.67%)
Neutral affect	35 (4.52%)
Positive self image	20 (2.58%)
Temporal shift	14 (1.81%)
Animal/entity	11 (1.42%)
Geometry/patterns	10 (1.29%)
Primal/ancestry	7 (0.90%)
Other face	1 (0.13%)

mentions were of positive affect, 44 (27.33%) were of negative affect, and 35 (21.74%) were of neutral affect (see Fig. 1B). It was found that there was an overall significant difference in affective reaction ($X^2(2) = 23.19, p = 0.0000092$). Comparing positive to negative directly, it was found that there were significantly more positive mentions than negative ($X^2(1) = 11.46, p = 0.00071$) (Fig. 2).

Categories such as aging, other face, primal/ancestry, geometry/patterns, and animal/entity made up only 5.55% of the total mentions.

DISCUSSION

Overall looking in the mirror while under a dose of psilocybin will yield unique phenomenological experiences. It is true that the overall characteristics of the experience have the possibility of being the same, but the phenomenological nature of those experiences will be unique to the experiencers. That is to say it is entirely possible that two individuals looking in the mirror while on psilocybin will both experience a categorical experience such as a visual change, and yet the subjective experience and feeling of what each individual sees will vary. When the experience was broken down into its simplest component(s), the opportunity arose

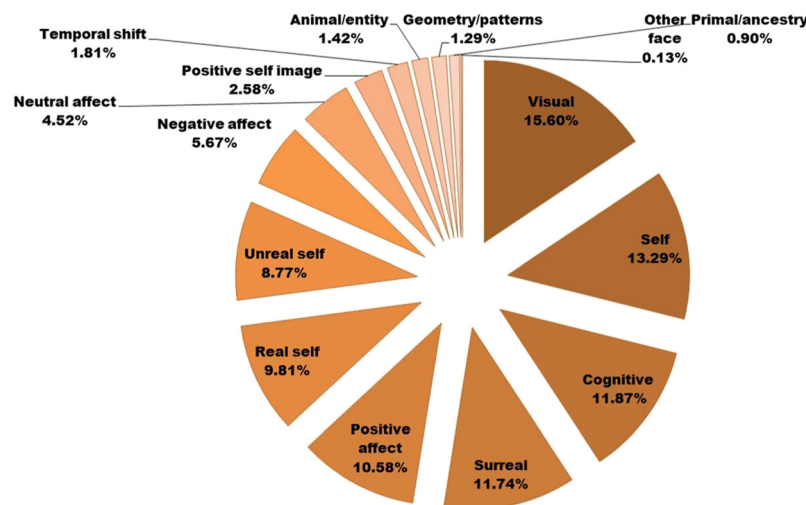


Fig. 1. All categories and their corresponding mentions (%)

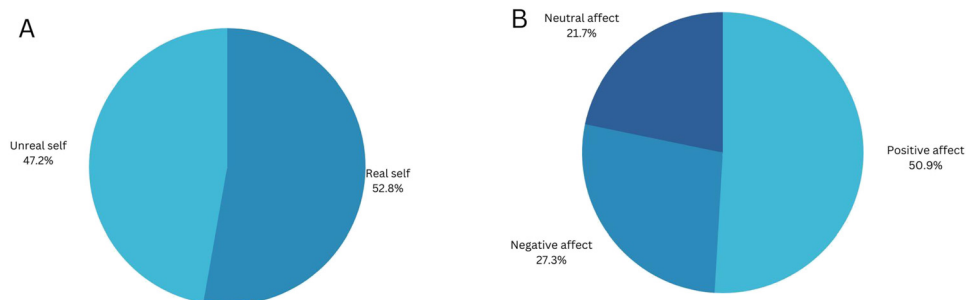


Fig. 2. Self-recognition and self-perception breakdown. (A) self-recognition; (B) self perception



to categorize the experiences into a small number of classifications. Putting any two experiences into a category together does not necessarily mean they are identical. There is a likely possibility that the variety in experience may be due to the individual's mindset and setting as they have been proposed factors that mediate the characteristics and tone of a psychedelic experience (Hartogsohn, 2017).

As it pertains to self-recognition, the split between real self and unreal self showed no statistical significance, meaning that the phenomena of not recognizing oneself in the mirror while under the influence of psilocybin is not a guaranteed characteristic of the experience. It was shown, however, that psilocybin has the potential to powerfully alter self-recognition demonstrated by the varieties of experiences and changes that individuals looking in the mirror had. The specific effect of psilocybin on self perception is variable, but there is usually some profound effect, nonetheless.

Our results hold some insights into the probable valence of the experience looked into the mirror while under the influence of psilocybin. It is a common conversation in the psychedelic space that one should be wary of looking at oneself in the mirror while under a dose of any psychedelic (Gashi, Sandberg, & Pedersen, 2021). With the results derived from the posts discussing what happened when someone looked in the mirror while on psilocybin, the positive affect to the experience was statistically significant compared to negative affect. This can suggest that the lore of not looking in the mirror while under the influence of psilocybin may not be the entire story. There has yet to be a study assessing the relationship between looking in the mirror on psilocybin to self-perception and self-recognition. Here we lay out what was discovered using self-reported posts via Reddit. It is imperative in the future that there be more controlled studies to assess self-perception and self-recognition while under a dose of psilocybin. Reddit comes with its own limitations and serves as a placeholder for more sophisticated and controlled trials to come.

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