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Acute Subjective Effects of Psychedelics within and Beyond WEIRD Contexts

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ABSTRACT

Reports of psychedelic experiences may contain similarities and differences across cultural contexts, but most current characterizations and quantifications of psychedelic experiences come from Western medical and naturalistic settings. In this article, we begin with a brief history of the diversity of psychedelic use in non-Western settings. We then compare and contrast accounts of psychedelic experiences within and beyond Western, educated, industrialized, rich, and democratic (WEIRD) contexts. We focus on specific reports of direct testimony of the acute subjective effects of psychedelics experienced across these contexts. We compare themes from each of these various contexts, with special emphasis on psychometric measures such as the mystical experiences questionnaire (MEQ), the five-dimensional altered states of consciousness (5D-ASC) scale, the Survey of God Encounters, and the Survey of Entity Encounters, the Challenging Experiences Questionnaire, and the Inventory of Nonordinary Experiences (INOE). Finally, we offer recommendations for future research to quantify these similarities and differences across cultures to assess them empirically in the future.

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Introduction

Psychedelic substances have been used in various cultures for thousands of years. Despite this long history, current scientific understanding of the subjective effects of psychedelics is largely based on research conducted with Western populations. This narrower sample may limit our understanding of how these substances affect individuals and communities with different cultural expectations. Studying a broader range of accounts will provide a more comprehensive characterization of psychedelic experiences and help quantify cross-cultural differences and similarities.

To appreciate the capacity for self-report measures to capture diverse experiences, consider several examples. The following account occasioned by psilocybin would be well captured by existing psychedelic experience measures:

I had the opportunity to relax. . . Your Inner Ego gets diminished, I believe, and you are looking at the whole. . . you are indeed starting to build relations with plants or with the entire living world around. You think less about yourself, you are thinking – across borders. (Gasser, Kirchner, and Passie 2015, 62)

However, the following account occasioned by ayahuasca would likely *not* be captured by existing measures:

I moved very fast. Not my body but my eye spirit . . . I saw lots of gardens full of manioc and plantains. The storage sheds were full of corn. The peanut racks were full. . . I came down the trail to a village. There was much noise, the sound of people laughing. They were dancing kacha, the fertility dance. Everybody was laughing. (Kensinger and Harner 1973, 9–10)

The present paper aims to determine to what extent psychometric measures capture psychedelic experiences across diverse cultural contexts.

The subjective effects of psychedelics range widely, from alterations in consciousness involving intense, gestalt changes in perception, cognition, and affect (Barrett, Johnson, and Griffiths 2015; Studerus et al. 2010) to reported encounters with gods or entities (Davis et al. 2020; Griffiths et al. 2019). Yet scholarly understanding of acute subjective effects is overwhelmingly guided by research in industrialized Western societies. This focus is an example of the tendency for empirical research on human behavior to focus on subjects from Western, Educated, Industrialized, Rich, and Democratic (WEIRD) countries (Henrich, Heine, and Norenzayan 2010). Properly mapping out the effects of psychedelics, including how those effects are moderated by expectation and context, requires examining subjective experiences beyond WEIRD contexts.

The question of how psychedelic experiences compare across societies echoes a larger scholarly debate on cross-cultural similarities and differences of other extraordinary (non-ordinary) experiences, altered states of consciousness, and religious/spiritual/mystical experiences (for a review, see Yaden and Newberg 2022). So-called “perennialists” believe that these experiences are basically the same everywhere, and only differ in interpretation and the language of expression (e.g., Huxley; Hood). “Constructivists,” on the other hand, emphasize how such experiences are created entirely by cultural expectations and beliefs (Katz 1978). Cross-cultural psychedelic research provides the prospect of quantifying the degree to which various qualities of the acute subjective effects are similar or different across cultures.

In this review, we review published accounts of psychedelic experiences from a broad range of contexts and attempt to categorize them using categories from factors of psychometric scales used to measure the acute subjective effects of psychedelics. Many of the accounts of psychedelic experiences we discuss are often referred to as “indigenous” uses of psychedelics. Although individuals in these contexts often self-identify as “indigenous” or “Indígena,” psychedelic use in some of these settings is very recent, not to mention adaptable, evolving, and shaped by colonial-Indigenous interactions (de Mori 2011; Harvey and Gow 1994; Jay 2019). Moreover, the term “indigenous” has diverse meanings, including being the first inhabitants of a region, having historical experiences of displacement and disempowerment, being different from colonial administrators, or, most worryingly, exhibiting a suite of traits once attached to terms like “primitive” or “tribal” (e.g., egalitarian, technologically simple, attuned to nature) (Béteille 1998; Kuper 2003; Singh 2023).

Referring to psychedelic use as “indigenous,” especially in contrast to descriptors like “WEIRD” or “Western,” thus carries the risk of perpetuating stereotypes that such use precedes colonial contact and has remained relatively uninfluenced by forces of globalization. To avoid such misunderstandings, we eschew the term “indigenous” here as a descriptor of psychedelic use, aiming instead to contextualize different examples within their relevant cultural contexts. We use “non-WEIRD” whenever contrasting with “WEIRD,” with the understanding that such categories obscure enormous diversity.

Brief history of psychedelic use and study

A variety of psychedelics have been used throughout the Americas. These include *Anadenanthera* snuffs (Carod-Artal and Vázquez Cabrera 2007), peyote and other

mescaline-containing cacti (El-Seedi et al. 2005), ayahuasca (de Mori 2011), and psilocybin mushrooms. While these have been used for centuries, there is little conclusive evidence of pre-colonial use of classic psychedelics (defined as drugs that act primarily via 5HT-2A agonism; Nichols, Nichols, and Hendricks 2023) outside the Americas.

Diverse peoples have used psychedelics to divine, engage with spirits, and attack enemies (de Mori 2011; Kensinger and Harner 1973; Kopenawa and Albert 2013). Although specialists outside of WEIRD contexts frequently use psychedelics to heal, anthropological accounts suggest that specialists rarely administer psychedelics to patients; rather, they consume them to harness special powers and achieve supernatural contact believed necessary for diagnosis and treatment. Communal consumption, such as in collective rituals or communal healing, has been observed with peyote (Slotkin 1956), ayahuasca (Reichel-Dolmatoff 1971), and *Anadenanthera* snuffs. Although rarely discussed, some use outside of WEIRD contexts may also be frankly recreational (Hartogsohn 2020).

There have been three distinct waves of scientific research on psychedelics, the first beginning in the late 1800s with peyote/mescaline, the second with LSD in the 1950s-1970s, the third and present largely with psilocybin, beginning in the 2000s (Griffiths et al. 2006). The first wave of research largely eschewed therapeutic research. The second wave saw a wide variety of forms of administration and accompanying rationales, including studying psychedelics as a model of psychosis (Nichols and Walter 2021), creativity enhancement (Harman et al. 1966), and for several forms of therapeutic research.

It was during this wave of research that the highly-context dependent nature of psychedelic effects was first noted. For example, researchers noted the remarkable differences in the experiences of peyote on members of the Native American Church (taken in sacramental settings with an accompanying spiritual rationale) and White participants (taken in laboratory environments): “The responses described in clinical experiments on Whites are so different from the responses described by Indigenous Peyotists [...] as to fall into completely different categories. They do not seem to be talking about the same thing” (Slotkin 1956, 51). White participants experienced feelings of meaninglessness, distress, and “hallucinations largely idiosyncratic in content” (Wallace 1959, 63). In contrast, members of the Native American Church who took the cactus in a ceremonial setting with a presumption of a meaningful, beneficial experience often experienced “welcome feelings of contact with a new, more

meaningful [...] reality prefigured in doctrinal knowledge” (Wallace 1959, 63).

Models of psychedelic administration for therapeutic purposes included the psycholytic approach (several low-medium doses in conjunction with talk therapy; Passie, Guss, and Krähenmann 2022), the “chemotherapeutic approach” which involves drug administration with relatively little attention to optimizing psychosocial context (Pahnke et al. 1969), and the psychedelic therapy model, which involves several meetings to build rapport and coach the patient on how to handle the psychedelic experience, one or several high dose sessions, and follow-up sessions to further make sense of the experience (Pahnke et al. 1969). This model has been used in most modern psilocybin therapeutic studies and is historically distinct.

Defining acute psychedelic subjective effects

Psychedelic research studies typically use measures of acute subjective effects, including overall drug intensity, emotions, and changes to a variety of other subjective qualities (e.g., senses of time, self, and space), as well as psychotherapeutically relevant insights and religious/spiritual interpretations of phenomena (e.g., experiencing god or entities). Despite the variety of measures reported in scientific articles, media portrayals have often focused on mystical experience measures, due to their correlation with treatment outcomes. Emphasis on mystical experience risks reducing the subjective effects of psychedelics to one that happens to be predictive of therapeutic response. The attention on the subjective effects is important given that these effects are correlated with the therapeutic response, especially enduring beneficial effects (Nautiyal and Yaden 2023; Yaden and Griffiths 2020).

Measuring acute subjective effects

Psychedelic researchers have developed measures to capture the range of acute subjective effects of psychedelics. Several of these measures are described in what follows.

The Mystical Experience Questionnaire (MEQ-30; Barrett, Johnson, and Griffiths 2015) was designed to capture mystical experiences occasioned by psychedelics. The four factors of the MEQ30 include: 1) *Mystical*, or the subjective experience of both internal and external unity, sacredness, and noetic quality; 2) *Positive Mood*, involving positive emotions; 3) *Transcendence of time or space*, involving changes to the passage of time and one’s surroundings; and, 4) *Ineffability*, or the sense that the experience is beyond words.

Additionally, The MEQ30 is positively correlated ($r = 0.93$) with the oceanic boundlessness factor of the 5D-ASC (Liechti, Dolder, and Schmid 2017).

The Five-Dimensions of Altered States of Consciousness (5D-ASC: Dittrich 1998; Studerus et al. 2010) was designed to measure changes in mood, perception, awareness of self and others, and thought processes that occur in altered states of consciousness (defined as “a marked deviation in the subjective experience or psychological functioning of a normal individual from her/his usual waking consciousness;” Studerus et al. 2010, 1). Recent factor analysis of the original 5D-ASC identified 11 dimensions of altered states of consciousness: 1) *Experience of Unity*; 2) *Spiritual Experience*; 3) *Blissful State*; 4) *Insightfulness*; 5) *Disembodiment*; 6) *Impaired Control and Cognition*; 7) *Anxiety*; 8) *Complex Imagery*; 9) *Elementary Imagery* (e.g., geometric shapes); 10) *Audio-Visual Synesthesiae*; 11) *Changed Meaning of Percepts* (e.g., everyday objects acquire significance/meaning; Studerus et al. 2010).

The Inventory of Nonordinary Experiences (INOE; Taves et al. 2023) was created to capture nonordinary experiences cross-culturally. The INOE adopts “a subject-dependent (i.e., emic) definition in which ‘nonordinary’ refers to experiences that stand out to people or are marked by them as special relative to what they consider ordinary” (p. 9). The 36 self-report items are divided into 6 groups: *Emotion* (e.g., joy, awe, fear), *Sensory/Body* (e.g., seeing faces, out of body experience, seeing lights), *Presence* (e.g., Guidance, places (animated), *Abilities* (e.g., Lucid dreaming, déjà vu, ESP (events), ESP (minds), *Sickness/Health* (e.g., healing, near death experience), *Meaning* (e.g., Coincidence, messages, insights). While the INOE contains a greater range of experiences, it does not have the same degree of validity and reliability as the other measures mentioned (Taves et al. 2023).

The Survey of God Encounter Experiences (Barrett et al. 2016) was designed to capture experiences of encounters with God sometimes reported during psychedelic experiences (Griffiths et al. 2019). Survey items ask about a participants’ encounter with *God, a Higher Power, Ultimate Reality*, and/or any aspect of God (e.g., angel; Griffiths et al. 2019).

The Survey of Entity Encounter Experiences (Davis et al. 2020) was adapted from the God Encounter survey (Griffiths et al. 2019) to capture the experience of encountering beings or entities, commonly occasioned by DMT (Davis et al. 2020).

The Challenging Experiences Questionnaire (CEQ; Barrett et al. 2016) was designed to measure difficult and/or challenging experiences. The CEQ was found to

be reliable and valid and factor analysis demonstrated 7 factors: *Fear*, *Grief*, *Physical Distress*, *Insanity*, *Isolation*, *Death*, and *Paranoia* (Barrett et al. 2016).

Among each of these measures, several areas of overlap emerge, which we use as the framework for comparing subjective effects of psychedelics across contexts.

Acute psychedelic subjective effects across contexts

In this section, we describe several of the more common acute subjective effects of psychedelic use. For each theme, we provide direct testimony from participants collected from literature across clinical, recreational, ritual, and ethnographic contexts (additional accounts are available in Appendix A). For this study, we focus on “classic psychedelics,” or those purported to work primarily on the 5HT_{2A} receptors, such as psilocybin (Nichols, Nichols, and Hendricks 2023). Information sources for this summary are drawn from qualitative studies, as well as excerpts of direct testimony from several anthropological sources (see Table 1). We summarize commonalities and contrast differences across contexts.

Unity

Unity is characterized as experiences of oneness or connectedness, as well as the dissolution of the self or ego (Barrett, Johnson, and Griffiths 2015; Studerus et al. 2010). The MEQ30 (Barrett, Johnson, and Griffiths 2015) refers to unity as a factor called *mystical*. The original 5D-ASC (Dittrich 1998) contains factors called *oceanic boundlessness* and *anxious ego dissolution*, and the 11-dimension version (Studerus et al. 2010) contains a factor called *unity*.

In WEIRD contexts unity has been reported by participants across a range of psychedelic experiences. For instance, an individual with life-threatening cancer characterizes the experience of unity, in particular ego-dissolution, occasioned by LSD:

... Your Inner Ego gets diminished, I believe, and you are looking at the whole. . . you are indeed starting to build relations with plants or with the entire living world around. You think less about yourself, you are thinking – across borders. (Gasser, Kirchner, and Passie 2015, 62)

Transcendence

Transcendence is often involves the sense that one has gone beyond themselves, beyond time, and/or beyond space (Studerus et al. 2010). The MEQ30 (Barrett,

Johnson, and Griffiths 2015) refers to transcendence as a factor called *time/space*, which involves perceptual shifts around sense of time and space. The INOE has 2 single-item measures (out of body experience and diminished self) that assess transcendence from the *Sense of Self* grouping (Taves et al. 2023).

In a WEIRD context, the experience of transcending space and time is illustrated in an account occasioned by psilocybin for alcohol use disorder:

It was like infinity almost. Everything was kind of a sense of infinity. . . . You know it was like it was open. And I was going in and out of it. And I was in the middle of it. You know, all this space. It was kind of like looking up and a dome was over me. Or sometimes it would be below me. (Nielson et al. 2018, 7)

Transcendence appears in descriptions of the experiences of Tukanoan peoples. Some Barasana (Colombia) ayahuasca-takers reportedly experienced a “complex reversal of time” before traveling to the beginning of Creation (Reichel-Dolmatoff 1978, 13). In his attempt to summarize Desana experiences, Reichel-Dolmatoff (1971, 174) wrote that “the person not only passes from one cosmic plane to another but enters a fourth dimension, the temporal one, the one that permits the establishment of divine contact.”

Ineffability and paradoxicality

Ineffability refers to the inability to convey one’s experience using language (Barrett, Johnson, and Griffiths 2015; Studerus et al. 2010). The MEQ30 (Barrett, Johnson, and Griffiths 2015) refers to ineffability as a factor called *ineffability*. The original 5D-ASC (Dittrich 1998) does not contain a factor to assess ineffability; however, the 11-dimension version (Studerus et al. 2010) contains a factor called *impaired cognitive control and cognition*.

This non-WEIRD account of ayahuasca use for substance use disorder from a Coast Salish individual reflects the difficulty of explaining the effects of psychedelic experience:

It sort of relieved a lot of stress, a lot of negative thoughts within my body. . . opened my eyes to see where my stress and conflict is coming from. . . It is hard to explain but. . . it just brought a lot of grief up that I had inside me, it brought it out and I got rid of a lot of grief. (Argento et al. 2019, 5)

We encountered few, if any, reports of ineffability in anthropological descriptions or direct testimonies of peoples who regularly use psychedelics, such as Amazonian shamans or adult men who consume ayahuasca in communal settings.

Table 1. Information sources of direct testimony of acute subjective effects of classic psychedelics.

Ayahuasca		
<i>Setting</i>	<i>Participants/Population</i>	<i>Reference</i>
Ayahuasca-Assisted therapy for Stress and Addiction (ceremonies guided by a Shipibo Ayahuasquero)	11 members of the Coast Salish Band of First Peoples in British Columbia	Argento et al. (2019)
Retrospective Accounts of Ceremonial Use which occurred in settings mostly rooted in Amazonian (Shipibo, Ashaninka) traditions	16 individuals residing in North America previously diagnosed with Eating Disorder	Lafrance et al. (2017)
Self-report of ayahuasca in a wide variety of contexts, mostly communal settings	Author's phenomenological descriptions of personal ayahuasca use in large variety of settings [general anthropological description with some direct testimony]	Shanon (2003)
Communal consumption for healing	Harakmbut people, San José del Karene, Peruvian Amazon [general anthropological description]	Gray (1996)
Communal consumption	Kashinawa people, Curanja River area, Peruvian Amazon [general anthropological description with some direct testimony]	Kensinger and Harner (1973)
Communal consumption	Barasana people, Vaupes River area, Colombian Amazon [general anthropological description]	Reichel-Dolmatoff (1978)
DMT/5-MeO-DMT		
<i>Setting</i>	<i>Participants/Population</i>	<i>Reference</i>
Retrospective accounts of naturalistic use	19 self-selected DMT users recruited online (location not specified; PI located in Australia)	Cott & Rock, 2008
Self-report accounts of naturalistic use posted to Reddit between 2009 to 2018	3305 anonymous accounts (location not specified; PI located in USA)	Lawrence et al. (2022)
Self-administered naturalistic DMT use	47 individuals residing in the Greater London area (mainly white british sample)	Michael, Luke, and Robinson (2021)
Retrospective self-report of phenethylamines and tryptamines (only accounts 5-MeO-DMT use are included in this paper)	36 individuals; Majority white US sample	Palamar and Acosta (2020)
LSD		
<i>Setting</i>	<i>Participants/Population</i>	<i>Reference</i>
Clinical Trial for distress associated with life-threatening cancer	9 individuals diagnosed with various types of cancer of life-threatening diseases (PI located in Switzerland)	Gasser, Kirchner, and Passie (2015)
Proof of Concept Clinical Trial with healthy participants	32 majority white individuals residing in the UK	Nichols, Nichols, and Hendricks (2023)
MDMA		
<i>Setting</i>	<i>Participants/Population</i>	<i>Reference</i>
MDMA-assisted therapy for anxiety associated with life-threatening illness	6 participants white individuals diagnosed with cancer or life-threatening illness	Barone et al. (2022)
Mescaline/Peyote		
<i>Setting</i>	<i>Participants/Population</i>	<i>Reference</i>
Communal consumption	Huichol Indian Culture (Mexico), indigenous cultures of San Pedro de Atacama (Northern Chile), and Aymaras (La Paz region of Bolivia) [general anthropological description with some direct testimony]	Schaefer (2006)
Psilocybin		
<i>Setting</i>	<i>Participants/Population</i>	<i>Reference</i>
Clinical Trial for anxiety associated with cancer diagnosis	13 majority white individuals diagnosed with cancer and clinically significant anxiety	Belser et al. (2017)
Clinical Trial for distress associated with cancer diagnosis	4 white individuals diagnosed with various types of cancer	Malone et al. (2018)
Clinical Trial for Alcohol Dependence	10 participants meeting criteria for alcohol dependence (2 participants were Native American/Alaska Native, 1 African American, 4 Hispanic, and 3 non-hispanic white)	Nielson et al. (2018)
Clinical Trial for Smoking Cessation	12 individuals dependent on cigarettes residing in the US	Noorani et al. (2018)
Clinical Trial for Cancer related distress	13 mainly white individuals diagnosed with cancer	Swift et al. (2017)
Clinical Trial for Treatment-Resistant Depression	20 mainly white participants diagnosed with a clinically significant score on a depression rating scale	Watts et al. (2017)
Anadenanthera snuff		
<i>Setting</i>	<i>Participants/Population</i>	<i>Reference</i>
Snuff inhalation for healing, diagnosis, and battles with sorcerers	Piaroa (Venezuela) shaman José-Luis and US anthropologist Robin Rodd	Rodd (2006)

Sacredness and spirituality

Sacredness and Spirituality refers both to spiritual experiences occasioned by psychedelics broadly, as well as to the sense that during psychedelic experience one has contacted something sacred (Barrett, Johnson, and Griffiths 2015; Studerus et al. 2010). The MEQ30 (Barrett, Johnson, and Griffiths 2015) refers to sacredness and spirituality as a factor called *mystical*, which contains items assessing contact with some kind of ultimate reality. The 11-dimension version of the 5D-ASC (Studerus et al. 2010) contains a *spiritual experience* factor. Below is a WEIRD example illustrating contact with something sacred:

I'm sort of discovering that God in yourself, so to speak So I think that's also opened up to me tremendously—a spiritual piece. And I've never been religious; I'm not religious particularly at all. And I feel like I've really connected with a spiritual side in myself as well . . . that adds another level of contentment and happiness. (Swift et al. 2017, 504)

Psychedelic experiences are suffused with spiritual and sacred content outside of WEIRD contexts, as well. Consider Reichel-Dolmatoff's (1978, 13) description of some ayahuasca experiences among the Barasana. Following an individual's death, they are reborn in the “uterine regions of the Beyond:”

Once inside the womb and, as the Tukano say, “beyond the Milky Way,” the person believes to see all the preternatural entities of Creation; to hear their voices, see their brilliant regalia, and, what is more, witness them act out the principal scenes of the Creation of the Universe. They will reenact the Creation or, rather, the beholder will have returned in time to witness the original Creation, and so he will be able to see the birth of plant and animal life, the beginning of the institution of the yurupar ritual, the establishment of the yajé trance, and any other event mentioned in myth and tradition.

Noetic quality

Noetic Quality involves the sense that one has gained a deeper insight about themselves, a situation, or the world and their place in it (Barrett, Johnson, and Griffiths 2015; Studerus et al. 2010). The MEQ30 (Barrett, Johnson, and Griffiths 2015) assesses noetic quality as a factor called *mystical*, which involves items that measure the experience of insight and clarity. The 11-dimension 5D-ASC (Studerus et al. 2010) contains a factor called *Insightfulness*. The INOE contains 2 - items that assess for noetic quality, from the *Meaning Grouping* (Taves et al. 2023).

For a participant receiving psilocybin for cancer-related anxiety, this noetic quality is illustrated:

I knew exactly who I was, I knew exactly what I was doing here, and beyond that I was augmented . . . I was just really enthralled . . . everything was delicate and again, it was not blurry, it was not clouded. Everything was heightened. (Belser et al. 2017, 15)

Reichel-Dolmatoff (1971, 174) reported what seems like a noetic quality in his description of Desana experiences with communal ayahuasca consumption:

Taking yajé is called gahpí irí-inyári (from iri/to drink, inyári/to see), and is interpreted as a return to the cosmic uterus, to the “mine,” to the source of all things. It has the objective of reaffirming religious faith, through the personal experience of seeing with one's own eyes the origin of the Universe and of mankind, together with all the supernatural beings. On awakening from the trance, the individual remains convinced of the truth of the religious teachings. (p. 174)

Altered emotional experience

Altered emotional experience refers to emotional experiences occasioned by psychedelics including deeply felt positive mood and/or a blissful state (Barrett, Johnson, and Griffiths 2015; Studerus et al. 2010). The MEQ30 (Barrett, Johnson, and Griffiths 2015) *positive mood factor* contains items that capture awe, amazement, ecstasy, joy, tranquility, and peace. The original 5D-ASC (Dittrich 1998) does not contain a specific factor to assess altered emotional experience; however, the 11-dimension version (Studerus et al. 2010) contains two factors, *blissful state* and *anxiety*. The INOE has 10 single-item measures that assess altered emotional experience from the *emotion grouping* (Taves et al. 2023). While anxiety has often been characterized as a feature of *altered emotional experience*, we include examples of anxiety in the discussion on challenging experiences below.

Deeply felt positive mood and blissful state are described in the following account occasioned by psilocybin in the treatment of tobacco use disorder:

I was in love with everything. In love with the couch, in love with the whole room, the people in it . . . Love is a pretty big distraction from addiction and . . . my attention kept going back to it, that great feeling of love and acceptance. (Noorani et al. 2018, 5)

Altered emotional experiences feature in some non-WEIRD reports, as well. In a description of their experience with ayahuasca, a Kashinawa (Peru) person said that they traveled to a village and saw bounty: “Everybody was laughing. Many of the women were pregnant. I was happy. I knew we would be well and have plenty to eat” (Kensinger and Harner 1973, 9–10).

Altered perceptual experience

Altered perceptual experiences refer to perceptual changes occasioned by psychedelics, including disembodiment (i.e., sense that one has either lost contact with or gone beyond the physical body), impaired control or cognitions, complex imagery or visions, elementary imagery (e.g., geometric shapes), and audio-visual synesthesia (Barrett, Johnson, and Griffiths 2015; Studerus et al. 2010). The MEQ30 (Barrett, Johnson, and Griffiths 2015) contains one item from the *time/space* factor on disembodiment. The original 5D-ASC (Dittrich 1998) contains 3 factors to assess altered perceptual experiences: *visionary restructuralization*, *auditory alterations*, and *reduction of vigilance*. The 11-dimension version (Studerus et al. 2010) contains 5 factors which assess altered perceptual experiences: *disembodiment*, *impaired control/cognition*, *complex imagery*, *elementary imagery*, and *audio-visual synesthesia*. The INOE contains 6 items from the *sensory body* grouping (lights, sounds – voices, touch, faces, paralysis, and pain) and 2 items from the *sense of self* grouping (out of body experience and automaticity; Taves et al. 2023).

Several examples of *disembodiment* appear in qualitative accounts. For example, in the excerpt from a participant who received psilocybin for treatment resistant depression:

I was not here anymore; I was not with my body . . . I thought to myself that that is death, and it was scary, but I remember I said to myself, "Oh if this is death, it's not that bad—at least there is something." . . . (Swift et al. 2017, 499)

Accounts of *Elementary Imagery* (e.g., geometric shapes) have also been reported throughout qualitative accounts, as in a participant's report of naturalistic use of 5-MeO-DMT:

5-MeO-DMT made me feel very distant and spacey, almost dissociative, and there was a great pressure on the chest and some mild visuals, like closed-eye visuals like the hypnagogic imagery before going to sleep. It doesn't last very long. Open [eyes] would produce mild hallucinations if looking at a surface that didn't have any visual distractions on it so if you look at the ceiling, you would see mild waves and stuff. (Palamar and Acosta 2020, 11)

Elementary Imagery is also a feature of non-WEIRD psychedelic experiences. The Barasana described what they called *gahpi ohorí*, translated by Reichel-Dolmatoff (1978) as "yajé images" (p. 12), which appeared while consuming ayahuasca. They encompassed *nomeri* ("bright dots"), *toondari* ("sprigs" or "clusters"), and

tere (indented lines, zigzag lines, and network- or checker-patterns).

Complex Imagery is common across a variety of psychedelics and has been observed in a diversity of populations. Below is an excerpt from a WEIRD context, where ayahuasca was used to treat a participant with an eating disorder:

I saw myself as a rotting, decaying skeleton and then I saw myself as this beautiful full-bodied, just beautiful woman with this long hair, and I, like, I wanted to be that woman. I wanted to be that full, loving woman that has so much to offer my family and world. It was, and then I felt my ribs and I could feel them, they were so hollow and I was just, I was like, I can't wait to get back and just start gaining some weight. (Lafrance et al. 2017, 5)

In non-WEIRD contexts, complex imagery is also described. The Barasana reported that "three-dimensional forms, like rolling clouds, begin to fill the visual field and slowly turn into multicolored, recognizable shapes of people, animals, and monsters" (Reichel-Dolmatoff 1978, 12).

God and entity encounters

Reports of encountering God/Higher power or entities/beings during the course of a psychedelic experience are common (Davis et al. 2020; Griffiths et al. 2019). One item in the *Spiritual Experience* factor of the 11-dimension 5D-ASC (Studerus et al. 2010) asks about feeling connected to a "higher power." The INOE contains 2 items from the *presence-related* grouping (presence – non ordinary and guidance) that assess presence or guidance from a "non-ordinary power or being" (Taves et al. 2023). The *Survey of God Encounter Experiences* (Griffiths et al. 2019) and *Survey of Entity Encounter Experiences* (Davis et al. 2020) were developed to capture God/Entity Encounters more directly.

God Encounters have been described in WEIRD contexts, as in this report by an individual with cancer-related anxiety treated with psilocybin (Malone et al. 2018): "there was something on top of the mountain, call it God, call it some divine entity calling me to come up this mountain. . . it was like a spiritual calling" (p. 2).

God encounters have been reported to occur in non-WEIRD contexts as well, as in this account of a Secoya shaman (as translated by Shanon 2003, 144–145):

The angels carried me up there to the house of God. He welcomes each person speaking in the language of the newcomer. God lives with his spouse—he has a room, that is half of the house, the other half is for his wife where she prepares food for her husband. This is Nane, the God who combats with thunder, there is no other God that can exist— Afterwards, the angels say to me: "Look,

son, watch God.” Obviously, I do not approach near, for where God is one cannot come near, not as the angels and the people of the sky who live there.

In addition to God encounters, *entity encounters* are also frequently reported. Take the example of an experience occasioned by naturalistic DMT use:

... I'm paying attention to them. . . this entity was asking me to look at his toy, then another ask[ed] me “No, look at my toy, play with me!” . . . Very childish in what they were doing. . . Yeah, those entities calmed me down. . . their message somehow. . . gave me [the] impression that “everything’s ok, I’m in [a] good place, I do not need to worry, I’m too scared for nothing, and let us play with these toys!” (Michael, Luke, and Robinson 2021, 7)

Encounters with entities are common throughout the Americas. Harakmbut ayahuasca-takers, for example, met *toto*, or harmful spirits that could appear “tall, white, and thin or, more usually, short and black with long fingernails” (Gray 1996, 76). Intriguingly, the Harakmbut also encountered medical doctors in their collective ayahuasca sessions. According to Gray (1996), “they carry briefcases and have stethoscopes around their necks. They enter and carry out an examination of the sick person and then they advise the participants what to do” (p. 76)

Challenging experiences

Six items in the *Anxiety* factor of the 11-dimension 5D-ASC (Studerus et al. 2010) ask about fear, threat, and vulnerability to harm. The INOE contains 3 items from the *emotions* grouping (loss, fear, and misfortune) and 2 items from the *sensory/body items* grouping (paralysis and pain) that assess challenging experience (Taves et al. 2023).

In accounts of psychedelic experiences, challenging experiences are sometimes reported. Often, there is a sense that these challenging experiences are important for insight and self-enquiry. Take the example from a participant treated with psilocybin for alcohol use disorder (Nielson et al. 2018, 9):

Yesterday was devastating, but it was the kind of devastating that I could wake up from knowing and feeling everything as though it had happened, but I still have everything. It happened like it was supposed to happen. . . . I was super hot, I was rolling into the crack of that couch. I could have used a fan, but all that torture I felt was just part of the. . . . If I was uncomfortable, I deserved it. That’s how I looked at it. . . . I was always aware of what was going on, and I knew that this was completely not what I had planned or expected but it was happening, and I needed to take full advantage of it as gut-wrenching as it was.

Challenging experiences are common outside of Western clinical settings. Working with the Kashinawa, Kensinger

and Harner (1973) wrote: “However, the most persistent comment about ayahuasca from all informants is, ‘It is a fearsome thing, I was very much afraid.’ Few informants have ever admitted that they find it a pleasant experience” (p. 12). Reichel-Dolmatoff (1978) wrote that some Barasana experience blissful, radiant, wondrous images of the beyond. Others, however, have far more negative experiences that can start with menacing shapes:

And sometimes these shapes will turn into terrifying monsters, into jaguars and serpents that approach and threaten to devour the person who, terror stricken, will call out in anguish. . . . [Some] will be horrified by the dangers that seem to threaten them, and will be deeply disturbed by their visions. (p. 13)

Outside the domain of existing measures

Our survey of subjective experiences of psychedelic within and beyond WEIRD contexts has identified several themes which seem to be left out by current measures. These include *Extra-Sensory Perceptual (ESP) Experiences, Travel, Relative or Ancestor Encounters, Purification, and Initiation and Violence*.

Theme 1 - extra sensory perception (ESP)

Of the measures described above, only the INOE (Taves et al. 2023) contain items (lucid dreaming, déjà vu, past life, ESP – events and minds) that account for these experiences.

In a WEIRD setting, where individuals received psilocybin for treatment resistant depression (Watts et al. 2017), individuals reported enhanced visual acuity: “[After the dose] When I went outside, everything was very bright and colorful, and it felt different. I noticed things I didn’t notice usually, the leaves on the trees and the birds, small details” (p. 529).

Different forms of extra-sensory perception are common in accounts of psychedelic experiences in non-WEIRD contexts as well. Candoshi-Shapra speakers reportedly used drinks made from *caapi* “for better ‘vision,’ i.e., in order to discover the cause of death and then to recognize the perpetrator” (Tessmann 1930, p. 285, cited in Harner 1979). Similar beliefs occurred among the Sápara and Tschamikuro (Harner 1979).

Theme 2 - travel

The theme of travel seems to be omitted from current psychometric scales, with the closest theme being transcendence of time and space. However, both categories omit the participant perception that they are traveling to

some seemingly real place. Take the account from a participant involved in MDMA-assisted psychotherapy for end-of-life anxiety (Barone et al. 2022, 9):

I went through a sense of breaking through into a very warm feeling in my chest. And that was quickly an entry into the very cavernous, spiritual state. And then it was just a series of traveling. It was a physical experience. It just was like I was passing through gateway after gateway. It had the sense of going down, like sort of feeling everything deeper, but it was all centered here. And then I would enter into different realms, and I decided to call them that.

Travel features outside of WEIRD contexts. Kensinger and Harner (1973, 158) wrote that, when taking ayahuasca, Shuar people:

felt that part of the soul may leave the body, with the subject having the sensation of flying, returning when the effects of the drug wear off. This is actually referred to as a “trip” by the Jivaro [Shuar], who say that this is an experience more commonly achieved by shamans than by other takers of the brew.

Similar experiences were reported by Amahuaca, Záparo, and Siona ayahuasca-takers (cited in Kensinger and Harner 1973). While using yopo, the Piaroa (Venezuela) shaman José-Luis described flying “to the mountains” (Rodd 2006, 49).

Theme 3 - relative and ancestor encounters

According to Dole (1974), “Ayahuasca is used by the Amahuaca to help them see spirit beings, especially deceased relatives, to talk with them and to enlist their help in learning about the unknown. In some cases, these relatives become their guides” (p. 17).

Below is an example from a psilocybin trial with WEIRD participants with life-threatening cancer:

I was flying through space with the spirit guide, and I encountered three people who are dead who were very close to me. My dad’s dad, my mom’s mom, and my best friend in college who died. And they all gave me reassuring messages in space. From my friend Tim, “I’m sorry for everything that has happened. I just wanted you to know I love you, man.” My grandfather gave me a hug, and my grandmother kissed me on the cheek. That was powerful. (Belsler et al. 2017, 13)

In Andritzky’s (1989) anthropological account of ceremonies conducted by the Tukano (Columbia), there is reference to origin stories and visions of ancestors:

... the singing is accompanied by flutes, drums, and dances while the shaman (paye) recites the myths of origin- how the first woman emerges from water, how the first men are formed, how the master of jungle animals appears, the jaguars, snakes, the sources of evil,

and the jungle spirits. One hears its voices, the music of the mythical epoch, one sees the ancestors, the origin of the feather crowns, necklaces, and musical instruments. (p. 81)

Theme 4 - purification and initiation

The theme of purification is illustrated in the account below from a WEIRD context of naturalistic DMT use (Michael, Luke, and Robinson 2021, 8):

There was... a sense of being healed, a sense of [the observers] working on my physical and psychic body, eliminating toxins. Very benevolent, some curiosity from their perspective... They were curious to understand what I am, what I’m seeking...

In an account of ritual use of Peyote by a Huichol Shaman (Mexico) Rafael Pisano, this sense of being cleaned or purified is described:

... [The creatures told him] “we will clean [purify] you.” And they cleaned me with their tongues. Their tongues were enormous! They cleaned me all over. Then a light like a star appeared, it came from other there, where the sun rises. First they cleaned me, then the light fell all around me and cleaned me all over. Then I appeared like a bright light, a really beautiful light... then they took me... up to the sky. (Schaefer 2006, 153)

Theme 5 - violence and transfiguration

A theme that appears in many reports of psychedelics is violence, often against agents believed to cause illness. In communal ayahuasca sessions, Harakmbut participants fought with *toto*, spirits believed to cause illness by stealing souls. The Piaroa shaman José-Luis recounted his battle with the evil sorcerer Najaré and a *märi*, or evil spirit, which occurred during a yopo-induced vision:

I flew to the mountains where there were five other shamans [including me]. I saw Najaré there. He shot a crystal at me but it missed. I have never fought this sorcerer before, but I know of him. He wanted to kill me, but I was too powerful for him. There were two thousand märi, one of which was sent to kill me. I killed it instead, and Najaré left. (Rodd 2006, 49)

Overlapping with this theme of violence was the experience of *transfiguration* to carry out acts of violence in psychedelic states.

Conibo-Shipibo Indians of the Ucayali region of eastern Peru report that a common function of ayahuasca-taking by shamans is to permit the shaman’s soul to leave his body in the form of a bird which flies to kill a distant person at night. The bird changes back into the shaman’s human form to kill the sleeping person. (Kensinger and Harner 1973)

In his description of tukanoan shamanism, Reichel-Dolmatoff (1987) observed that shamans use virola snuffs to transform into jaguars.

Conclusion

This paper provides an analysis of the subjective effects of psychedelics within and beyond WEIRD contexts. We found that many acute subjective effects of psychedelics, including feelings of unity, sacredness, altered emotional and perceptual experiences, and encounters with gods and other agentic entities, occur across diverse settings and populations. This suggests that these experiences may be less shaped by cultural conditioning or individual predispositions, potentially reflecting more universal features of how cognitive and perceptual faculties interact with psychedelic substances.

Our review also revealed cultural variations in the interpretation and communication of psychedelic experiences, with reviewed non-WEIRD testimonies placing less emphasis on ineffability compared to medical and naturalistic use in WEIRD settings. Additionally, we identified subjective effects that are not fully captured by existing scales, such as extra-sensory perceptual (ESP) experiences, travel, relative or ancestor encounters, purification and initiation, and violence and transfiguration. These findings highlight the need for a more comprehensive and culturally-sensitive approach to studying subjective effects of psychedelics. In fact, a next step for researchers might involve creating a systematized approach to the assessment and recording of non-WEIRD subjective experiences to complement existing subjective effects measures, which would allow for comparisons to be across contexts.

Our study has several limitations, including the focus on testimonies that are readily available and in English. Future research could expand on our findings with a more systematic and diverse approach. Despite these limitations, our analysis underscores the value of examining the subjective effects of psychedelics across diverse populations and settings. It can enrich our understanding of the human psyche, promote cross-cultural dialogue, and help foster greater appreciation for the diversity of human experience. By recognizing the universality of certain experiences and the cultural variations in their interpretation, we can gain deeper insights into the nature of consciousness, the human psyche, and the role of cultural conditioning in shaping our subjective experiences. Continued research in this direction

will enable researchers to more precisely identify the effects of psychedelic experiences that are universal, while highlighting aspects of the experiences which seem to be culturally and context bound, which could inform long-standing scholarly debates, advance psychometric measurement, and contribute to more culturally sensitive clinical care.

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