Psychedelics use: Experiential characteristics and health ramifications

Dissertation for doctor philosophiae

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Articles included in this dissertation


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For the articles based on the Cannabis and Psychedelics User Survey (Johnstad, 2020b, 2021a, 2021b, 2021c, 2021e), the survey questionnaire and dataset in SPSS format are available at https://doi.org/10.6084/m9.figshare.13121846.v1
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Abstract

This dissertation presents six articles investigating experiential characteristics and perspectives on the health ramifications of psychedelics use, predominantly on a basis of interviews and data from the Cannabis and Psychedelics User Survey. The first article (Johnstad, 2015) analyzes interview data pertaining to respondent-assessed mental health consequences of psychedelics (or hallucinogen) use, finding that most interviewees regarded such use, which among other things reportedly facilitated a break from habitual substance use, as having a positive impact on their lifestyles. A few respondents ended up with mental health problems possibly resulting from their psychedelics use, however. The second article (Johnstad, 2018b) extends this investigation to the use of psychedelics in very small doses (or microdoses), which some interviewees found helpful for purposes of (self-directed) therapy or enhancement. A third article (Johnstad, 2020a) investigates the putative therapeutic potential of these drugs via a historical review of the experimental psychedelic treatment program at Modum Bad during the years 1961–76. The subsequent three articles focus on the experiential characteristics of psychedelics use, including ostensive telepathic experiences (Johnstad, 2020c), challenging experiences or “bad trips” (Johnstad, 2021a), and the impact of personality structure on different characteristics of psychedelic experiences (Johnstad, 2021e). These articles are also relevant for the question of health ramifications, especially in the sense that psychedelic “bad trips” have a reputation for triggering psychoses; one interviewee regarded his own challenging experience as a temporary form of psychosis.

The introduction to the dissertation first reviews extant literature on the putative therapeutic value of psychedelics use as well as the putative harms related especially to psychedelics use in non-clinical settings. In relation to the latter review, a methodological critique of research into drug harms under a criminalization regime is presented, tentatively concluding that there are reasons to believe criminalization policies serve to alter the composition of the drug user population as compared to its pre-criminalization counterpart, and that this effect in turn serves to exacerbate findings of negative health outcomes. The introductory chapter thereupon proceeds to a discussion of how psychedelic drugs have been received by the academic community that draws upon perspectives from the philosophy of science. Finally, it discusses methodological and ethical issues and presents some descriptive statistics of survey respondents that the economy of the article format does not leave much space for, and briefly discusses the six articles included in the dissertation in relation to each other.
Introduction

Recent years have seen what some have called a revolution in the academic and therapeutic interest in psychedelics (e.g., Cameron & Olson, 2021; Nichols, 2020; Nutt et al., 2020). Once disparaged as drugs of abuse with no recognized medical value, psychedelics now stand at the cusp of mainstream respectability as psychotherapeutic agents, subject to a large number of ongoing phase 2 trials as well as a few early phase 3 trials (Bird et al., 2021; Mitchell et al., 2021; Siegel et al., 2021). While the research on clinical applications of psychedelics appears to be approaching maturity, however, much less is known about the use of these drugs in naturalistic settings. This dissertation presents a range of articles focused on such non-clinical use of psychedelics, as assessed by the users themselves either in interviews or in the Cannabis and Psychedelics User Survey. In addition, it also offers a historical perspective on the previous phase of clinical psychedelics use back in the 1960s and 70s.

The articles included in this dissertation are part of a multidisciplinary research project into the use of psychedelic (or entheogenic) drugs in various contexts. The project started in 2012 with a bachelor thesis in the study of religions that examined archaeological, textual, and iconographic evidence indicating the use of psychoactive drugs in religious contexts in certain prehistoric communities, in ancient India, Egypt, Greece, and Scandinavia, and in early Christianity. Two years later, this line of research extended into the contemporary era with an interview study of modern westerners who used psychedelics and related drugs in self-identified spiritual contexts. This study started out as a bachelor project in psychology, which focused on the mental health consequences of psychedelics use, and then morphed into a broader investigation of what I called entheogenic spirituality as a master project in the study of religions (Johnstad, 2016). The first part of this study was later published in modified form as Johnstad (2015), which is included as the first article in this dissertation, while aspects of the second part were published as Johnstad (2018a). Soon after, an extension of this interview study focused on the use of psychedelic drugs in microdoses, or in other words in very small doses, either as a treatment for medical conditions or for cognitive enhancement purposes, which was published as Johnstad (2018b; included in this dissertation). Much at the same time, a historical investigation into the use of psychedelic drugs as an experimental treatment for psychiatric conditions at Modum Bad was conducted for a bachelor project in history, and published as Johnstad (2020a; included in this dissertation).

A new major phase of the research project started in 2019 with the initiation of a quantitative study of survey data from the Cannabis and Psychedelics User Survey. This study was developed for a bachelor project in Sociology, and resulted in a gold mine of useful data that has formed the basis for a number of articles (Johnstad 2020b, 2021a, 2021b, 2021c, 2021e). The formulation of the survey questionnaire was based on previous qualitative findings, and the resulting data has served to support, expand, and occasionally correct these previous findings. At the same time, further qualitative interviews of specific practices or experiences were conducted, and this material was used as the basis for two articles (Johnstad, 2020c, 2021d) and as supporting evidence for two others (Johnstad, 2020b, 2021a). In addition, I wrote a review and discussion of methodological challenges pertaining to the study of psychedelics use, published as Johnstad (2021f).

This dissertation collects the six articles that engage with the health ramifications of psychedelics use as well as experiential aspects that were not presented by respondents as explicitly spiritual (Johnstad, 2015, 2018b, 2020a, 2020c, 2021a, 2021e). Its overall focus is to facilitate an in-depth understanding of how psychedelics users themselves assess the characteristics of psychedelic experiences, and what benefits and possible dangers such experiences may entail. While it is now well recognized that psychedelic experiences can be transformative in a positive and therapeutic sense, there also remains a persistent worry that these drugs may transform users in a negative sense – most typically either by triggering latent mental health issues or by leading to undesirable personality changes. Each of the six articles included in this dissertation relates, explicitly or
implicitly, to this perceived potential for positive or negative psychological transformation. Historically, Gordon Johnsen at Modum Bad in Norway regarded the psychedelic induction of transformative “cosmic experiences” as having high therapeutic value for certain patient groups, but the treatment also resulted in “nightmarish hallucinations” and other disturbing experiences for some patients (Johnstad, 2020a, pp. 220–222). Respondents to my interview studies often described positive transformations in terms of their health, lifestyle, and general outlook on life resulting from either the intermittent use of psychedelics in full doses (Johnstad, 2015) or from more regular microdosing practices (Johnstad, 2018b), but a few were also tempted into periods of over-frequent use that incurred at least the worry that they might be causing harm to themselves. Furthermore, a number of these interviewees described challenging psychedelic experiences that were sometimes highly disturbing and may have occasioned temporary psychotic experiences (Johnstad, 2021a). Analyses of survey data found that 23% of the respondents regarded their most difficult psychedelic experience as one of the five most difficult experiences in their lives, although more than 67% also regarded this experience as having positive or mostly positive long-term consequences for their lives (there was no significant correlation between the two measures) (Johnstad, 2021a). Some interviewees also described ostensive psychedelic telepathy experiences, which may be interpreted as evidence of the powerful impact on consciousness these drugs can have, in the sense that they seem to bestow either temporary paranormal powers or temporary psychotic confusion in some users (Johnstad, 2020c). Finally, it was clear from analyses of survey data that respondents’ personality structure deviated substantially from norms and was associated with different experiential characteristics in multivariate regression analyses (Johnstad, 2021e). Although this study was cross-sectional, it may indicate personality changes resulting from psychedelics use; whether such changes should be understood as evidence of positive or negative transformations is open to debate.

It might be added to this overview that both interview and survey data indicate that psychedelics may induce experiences with mystical-type characteristics including ego dissolution and contact with transcendent forces (Johnstad, 2018a, 2021b, 2021c, 2021d). These articles, which may be said to pertain to the fields of the psychology of religion and/or the study of religions, have not been included in this dissertation. Nevertheless, the mystical experiences they describe may, much like the telepathic experiences discussed in Johnstad (2020c), be interpreted as evidence either of the (positively) transformative and spirituality-inducing capacity of psychedelic drugs or of their capacity to induce temporary psychotic confusion.

The question of the overall merit or demerit of psychedelics use will not be resolved here, but the articles presented and discussed in this dissertation contribute to our understanding of the experiential characteristics and health ramifications of psychedelic experiences. The overview article, which follows below as Chapter 1, reviews the extant literature on the health ramifications of psychedelic drug use both in terms of putative therapeutic value and putative harms, and adds a methodological critique of studies of drug harms under a criminalization regime. Finally, I extend these discussions into a critique of how psychedelic drugs have been received by the academic community that draws upon perspectives from the philosophy of science.

Following the introductory chapter, chapters 2–7 present the articles that are included in the dissertation in their published form. It might be noted that each chapter includes its own list of references. Although there is considerable overlap in cited works, it did not seem appropriate to excise the reference lists from published works. Consequently, in order to maintain a common standard, a separate reference section has been added to the overview article as well. The original pagination of published works has been maintained, and references to specific pages in the overview article adheres to their original pagination.
Chapter 1: Overview article
1 Literature review

This section reviews the research literature on psychedelics use, starting with a brief overview of the psychedelic or entheogenic group of drugs and their impact on the central nervous system. Part two proceeds to a review of the literature on psychedelic therapy, which is currently spearheaded by the clinical application of MDMA in the treatment of posttraumatic stress disorder (PTSD) and of psilocybin in the treatment of depression, both of which are undergoing phase 3 trials at the time of writing. Part three thereupon reviews the prospect of health outcomes at the opposite end of the spectrum, focusing in particular on the literature on health risks related to psychosis and cognitive impairment that have been associated with cannabis use; while similar risks have been suggested for classic psychedelics use, the relevant literature is very small. The discussion concludes with a comparative assessment of health harms from licit and illicit drug use, before moving into a methodological discussion of how drug criminalization policies may affect research on health outcomes for drug users. Finally, part four offers a brief overview of psychedelics research unrelated to health issues. Following each review segment, I briefly discuss relevant findings from my own research in the context of the literature.

1.1 The psychedelic group of drugs

Psychedelics are a group of drugs named after the Greek words ὑπνή (psyche), meaning soul or mind, and δηλείν (delein), to reveal or manifest. They have also been referred to in various contexts as psychotomimetics, hallucinogens, and entheogens (I reserve the latter term for spiritual use). Known for their powerful psychoactive effect, the classic psychedelics include mescaline (the active constituent of the cactus peyote), psilocybin (the active constituent of “magic mushrooms”), lysergic acid diethylamide (LSD), and N,N-dimethyltryptamine (DMT). The classic psychedelics are known to work by an agonist or partial agonist action on the serotonin 5-HT₂A receptors (Iversen et al., 2009), although LSD also acts on dopamine receptors (Holze et al., 2020). Their experiential effects are regarded as uniquely dependent on user expectations and environment, resulting in considerable unpredictability; thus “[a]t the extremes, a user might on one occasion experience ecstasy and mystical union with the cosmos, while on another they might endure a hellish nightmare, extreme paranoia, feelings of insanity, and the like” (Nichols, 2004, p. 137). Carhart-Harris et al. (2014) for their part regarded the psychedelic state as “an exemplar of a primitive or primary state of consciousness that preceded the development of modern, adult, human, normal waking consciousness” (p. 1). Psychedelics have a long history of use in religious contexts, typically for ritual and healing purposes (Devereux, 2008; Dobkin de Rios, 1990; Fuller, 2000; Hultkrantz, 1997; Labate & Cavnar, 2014; Maroukis, 2012), and have been known to induce spiritual and mystical-type experiences also in modern users (Griffiths et al., 2006, 2019; Johnstad, 2018a, 2021b; Pahnke, 1966; Strassman, 2001; Yaden et al., 2017).

Besides the classic psychedelics that constitute the core of the psychedelic class of drugs, various atypical psychedelics or quasi-psychedelics such as the phenethylamines 3,4-Methylenedioxymethamphetamine (MDMA) and 2,5-dimethoxy-4-bromophenethylamine (2C-B) are sometimes included in this class, as is cannabis. In interviews about drug use in spiritual contexts, I offered the term “entheogen” to participants without any accompanying definition, and any substances they referred to in their responding narratives as entheogens were accepted without further ado. The interviewees responded with narratives predominantly about experiences with psilocybin, LSD, and DMT, along with a variety of similar but less well-known substances, and sometimes included cannabis and MDMA. In practice, therefore, it seems that the only real disagreement when it comes to the psychedelic or entheogenic class of drugs is whether the terms should include cannabis and MDMA, which are here generally included. It should be noted, however, that in the Cannabis and Pschedelics User Survey, respondents were first queried about their use of cannabis, and
subsequently asked to pick one psychedelic drug for the remainder of the survey from a list that included the 2C family (e.g., 2C-B), 5-MeO-DMT (5-methoxy-N,N-dimethyltryptamine), ayahuasca (or analogues), smoked DMT (N,N-Dimethyltryptamine), LSD (Lysergic acid diethylamide), MDMA, mescaline/peyote, psilocybin/magic mushrooms, and *Salvia divinorum*. In this survey, therefore, cannabis was treated as separate from the group of psychedelic drugs.

MDMA has a complicated psychopharmacology that combines an affinity for serotonin receptors with the psychostimulant ability to release dopamine and norepinephrine; “[i]t has been described as an ‘empathogen’ because it can promote an extraordinary clarity of introspective self-insight, together with a love of self and a no less emotionally intense empathic love of others” (Iversen et al., 2009, p. 469). Schmid et al. (2014) found that MDMA produced “increases in happiness, openness, trust and closeness compared with placebo” (p. 851), while Kuypers et al. (2017) found that MDMA increased emotional empathy. Other drugs that affect serotonin receptors do not produce such empathogenic effects, nor do psychostimulants such as amphetamine or cocaine, and these effects are therefore thought to be linked to the release of oxytocin, which is sometimes referred to as the “love hormone” in popular media and which may enhance closeness in relationships and improve interpersonal functioning (Gorman et al., 2020). Furthermore, while classic psychedelics generally induce cross-tolerance for each other, there is no cross-tolerance between MDMA and other psychedelics, including the molecularly similar MDA (3,4-methylenedioxy-amphetamine) (Zacny et al., 1990). MDMA might therefore reasonably be regarded as a class of its own.

Finally, cannabis affects the central nervous system mainly via the compound Δ⁹-tetrahydrocannabinol (THC), which is known with reasonable confidence to activate the CB-1 receptor located with highest density in the cerebral cortex of the mammalian brain. According to Iversen et al. (2009) it heightens and sometimes distorts the senses, alters the subjective sense of time, and induces apparently profound thoughts:

> At the most intense period of the intoxication, the user finds difficulty in interacting with others and tends to withdraw into an introspective state. Thoughts tend to dwell on metaphysical or philosophical topics, and the user may experience apparently transcendental insights (p. 495).

The language used to describe these psychopharmacological effects include words such as *activation*, *release*, and *agonist action*, and indeed it has commonly been assumed that hallucinogens “enhance excitatory neurotransmission and overall brain activity” (Lee & Roth, 2012, p. 1821). Research by Carhart-Harris, Erritzoe, and collaborators (2012) challenged this assumption, finding that psilocybin “decreased activity and connectivity in the brain’s key connector hubs, enabling a state of unconstrained cognition” (p. 2138). This finding has been supported by recent research (e.g., Romeo et al., 2021; Smigielski et al., 2019). Rather than causing an upsurge of possibly frivolous brain activity, therefore, psilocybin actually reduced the activity in several key areas, including the default-mode network, which earlier research has identified as implicated in a baseline mode of brain function (Raichle et al., 2001) and which has been hypothesized to play a role in high-level constructs such as the self or ego (Carhart-Harris et al., 2008; Carhart-Harris & Friston, 2010; Gusnard et al., 2001). Thus, the colorful experiential effects that psychedelics may give rise to – the mystical unions and hellish nightmares of Nichols’ description – seem to emerge from a brain with less neural activity than normal. A relative deactivation of the default-mode network has also been discovered in experienced meditators both during the practice of meditation and in an ordinary resting state (Brewer et al., 2011; Garrison et al., 2015).

Furthermore, psilocybin has been found to have a defocusing effect on semantic networks that leads to “an increased availability of remote associations and thereby may bring cognitive contents to mind that under normal circumstances remain non-activated” (Spitzer et al., 1996, pp. 1056–1057). Consistent with this finding is Petri et al.’s (2014) discovery of significant augmentations to the brain’s correlational networks in the psilocybin state, which they described as “a less constrained and more intercommunicative mode of brain function” (p. 8). Thus, at least with psilocybin, we see
evidence of an augmented state of overall brain connectivity, which may serve to explain its sometimes beneficial effect on people with diagnoses of anxiety or depression (Carhart-Harris et al., 2018; Griffiths et al., 2016): their brains are normally “stuck in a rut” of narrow and repetitive cognitive loops, and the drug serves to remove such self-limiting restrictions for a period of time, thus enabling a reset (Romeo et al., 2021). In the words of Muthukumaraswamy et al. (2013), “the ability of serotonergic psychedelics to disrupt pathological patterns of brain activity via stimulation of 5-HT2A receptors may underlie their therapeutic potential in psychiatric settings” (p. 15181). Such therapeutic effects have also been linked to increased neuroplasticity (de Vos et al., 2021). While activity in the default-mode network is decreased, Carhart-Harris, Leech, and collaborators (2012) found that visual and other sensory regions are activated more strongly under psilocybin, which can explain subjectively experienced increases in the vividness of memories and may serve to facilitate autobiographical recollection in therapeutic sessions.

There has not been much research into prevalence rates and usage patterns of psychedelic drugs. The United Nations Office on Drugs and Crime (2019) reported an LSD prevalence of 0.9% in the United States, between 0.1% and 0.7% in European countries, and 1% in Australia, while the corresponding figures for “ecstasy” prevalence were 1.2% for the United States, 0.86% for Western and Central Europe, and 2.20% for Australia. Estimates from the United States’ Substance Abuse and Mental Health Services Administration (2019) were somewhat higher, finding that 2.0% of individuals aged 12 or older had used “any hallucinogen” in the past year, and about 0.6% had done so in the past month. The European Monitoring Centre for Drugs and Drug Addiction (2019) for its part estimated prevalence levels of LSD and “hallucinogenic mushrooms” among young adults (aged 15–34) at less than 1 % for most European countries, while the prevalence level of MDMA was estimated as 1.7% for adults (aged 15-64), though with substantial national variations. In Australia, Karlsson and Burns (2018) found that “hallucinogens” were used by six per cent of their participant sample ($N = 888$) on a median of two days over the past six months (range: 1-30 days), while “ecstasy” was used by ten per cent of the sample on a median of three days (range: 1-30 days). A survey of known stimulant users ($N = 86$) in Darwin for its part found that LSD was used on a median of two days over the past six months (range: 1-48 days), while “ecstasy” was used on a median of twelve days (range: 1-122 days) (Uporova, 2018). In Slovenia, respondents ($N = 422$) to a recent study of “hallucinogen” use found that users reported a mean of about three use occasions over the past year (range: 0-30) (Lukačovič & Masaryk, 2021). Based on these data, it seems that the typical user takes psychedelics about once every two to four months, with a high end of about once per week, while some stimulant users in Darwin take “ecstasy” as often as every two out of three days. Few would be surprised if this latter type of usage pattern, indicative of dependence and motivations of escapism, should be related to more problematic long-term consequences than the otherwise rather moderate patterns of use indicated by typical users.

Cannabis has been more intensively researched, and estimates from the United Nations Office on Drugs and Crime (2019) indicated past-year cannabis use in 15.3% of the population (aged 15-64) in the United States, 14.7% in Canada, 10% in Australia, and between 6-7% in Western and Central Europe. With regard to use frequency, Leadbeater et al. (2019) reported that in a nationally representative sample of 36,309 non-institutionalized US adults, 4% used cannabis more than once per week, 7% between once per week and a few times per year, and 89% did not use cannabis; by contrast, their study of 662 Canadian youths found that, at the final point in their time series, 16% used cannabis more than once per week, 39% between once per week and a few times per year, and 45% did not use cannabis. A study of 1,390 past-year cannabis-using students aged 18–24 in the United States found a mean past 30-day cannabis frequency of 7.75 (SD = 9.88) (Gunn et al., 2020).

Research into the socioeconomic correlates of psychedelic drug use has tended to understand the use of psychedelics within the general terms of illicit substance use. In Luthar and D’Avanzo’s (1999) study of contextual factors in substance use among suburban and inner-city adolescents, for instance, respondents were queried about their use of LSD alongside that of cocaine, crack, and
inhalants, all of which were later pooled together under the rubric “any illicit drug”. Their analysis therefore assumed that LSD, cocaine, and other illicit substances are broadly similar with regard to both the motivations for use and the consequences of use. The general tendency in such research has been to regard illicit substance use in terms of negative health behavior, delinquency, and antisocial trajectories, and psychedelics use has primarily been studied within this broader narrative of substance use as a social problem. One common approach to understanding substance use has been to investigate its relationship to social class structure, although results have been mixed. Such studies very rarely investigate the use of psychedelics, but one study by Aschengrau et al. (2021) of 1,402 participants in Massachusetts found that low maternal education was associated with a higher risk (odds ratio 1.8) for psychedelics use. In survey studies of psychedelics users, however, education levels have usually been found to be quite high for the users themselves: Carbonaro et al. (2016), Forstmann and Sagioglou (2017), and Nour et al. (2017) each reported that between 51% and 68% of their participants had a university degree (N = 1,993, 1,487, and 893, respectively). Most such studies have not reported on other variables related to socioeconomic status, but Lukačovič and Masaryk (2021) found that 61.8% of their 422 Slovenian respondents were employed.

For cannabis, Hanson and Chen (2007) found no clear relationship between socioeconomic status and cannabis use among adolescents in a review of 25 relevant studies, with six studies reporting positive associations (i.e., high SES teens using more marijuana than low SES teens), four studies reporting negative associations, and ten studies reporting null findings. However, a later review by Daniel et al. (2009) of 11 studies found evidence of an association between lower childhood SES and subsequent cannabis use. In more recent research, Thompson et al. (2018) found an association between low SES and chronic (but not occasional) cannabis use among 662 Canadian youths, and Brook et al. (2013) found that chronic cannabis use, as compared to no, low or moderate use, was associated with financial problems among 886 African Americans and Puerto Ricans from New York City. A study of 211 Hispanic/Latinx psychology students in the US southwest found no association between SES and cannabis use, however (Gette et al., 2020).

Legleye et al. (2012) suggested an explanation for these divergent findings related to different forms of cannabis use: while high-SES individuals may be equally (or more) likely to experiment with cannabis as low-SES individuals, the latter are more likely to end up with frequent, heavy use, and use disorder. In their study of 39,542 French teenagers, they found that a high-SES family background was associated with higher odds for experimentation and light use of cannabis, but lower odds for heavy use and use disorder. This is congruent with recent research from Sweden, which found that adolescents (N = 9,497) who had at least one university/college-educated parent were at higher risk (odds ratio 1.17) for lifetime cannabis use, but lower risk (odds ratio 0.72) for frequent cannabis use (Gripe et al., 2021).

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My own research supports the finding that psychedelics use tends to be relatively infrequent, while cannabis is used more frequently (see the descriptive statistics in Section 4.1 below). A majority of the respondents to the Cannabis and Psychedelics User Survey had at least some university education, although education levels varied substantially between different online communities (see Tables 4 and 5 in Section 4.1). None of my interview and survey studies are in a position to support or oppose the pharmacological and neurological dynamics identified or suggested in the above review, but on the experiential level, the findings from these studies are generally congruent with the descriptions of psychedelics-induced experiences in the research literature. Respondents to these studies were asked to characterize various aspects of their psychedelic experience, including spiritual aspects (Johnstad, 2018a, 2020b, 2021b, 2021c, 2012d). A primary characteristic of the respondents’
spirituality related to the (self-reported) contributions from their entheogenic practices for their personal growth and development. Specialists on contemporary forms of spirituality (sometimes labeled New Age spiritualities, although the people thus labeled tend to resist the label) have often emphasized the psychologization of spirituality as a prominent characteristic (e.g., Sutcliffe & Gilhus, 2013), and my research supports the identification of a tendency to blend spirituality and psychology. For some respondents, the contribution to personal growth even seemed to be a defining characteristic of spiritual experience: they (implicitly) attributed spirituality to an entheogen-induced experience on the basis of its ramifications for personal growth (see Johnstad, 2021b for further discussions of this subject).

Besides the spiritual experiences discussed in articles that have not been included in this dissertation and the therapeutic aspects of psychedelic experience discussed below, I also asked interviewees to describe psychedelics-induced challenging experiences and ostensive telepathic experiences (respectively, Johnstad, 2021a, 2020c; both included in this dissertation). Furthermore, the Cannabis and Psychedelics User Survey asked respondents to characterize a typical psychedelic experience, their most meaningful psychedelic experience, and their most challenging psychedelic experience by endorsing a set of emotional, cognitive, and relational characteristics that were based on the findings of previous interview studies. Some of the overall findings from this survey are summed up in the descriptive statistics below and in two of the articles included in this dissertation (Johnstad, 2021a, 2021e). On a general level, the results from these interview and survey studies are congruent with the descriptions of psychedelics-induced experiences in the literature reviewed above. Nichols’ (2004) state of ‘mystical union’ was identified as a characteristic especially for respondents’ most meaningful experience with classic psychedelics (Johnstad, 2021b), and his hellish nightmares, extreme paranoia, and feelings of insanity were reflected in some of the narratives of challenging experiences (Johnstad, 2021a; included in this dissertation). The self-insight and feeling of love that Iversen et al. (2009) pointed to for MDMA were reported not only for this drug, but also for classic psychedelics and cannabis (Johnstad, 2020b, 2021b, 2021c), and the transcendental insights they pointed to for cannabis were reported especially by spiritually motivated cannabis users (Johnstad, 2020b).

1.2 Psychedelics in psychotherapy

The neuropharmacological dynamics described above that have been investigated especially with psilocybin may be understood to underlie the therapeutic effects of psychedelics in general. The past two decades have seen a resurgence in research on such therapeutic effects, particularly for disorders such as depression and anxiety. This line of research goes back to the 1940s, but was curtailed in the 1970s as psychedelics were criminalized (see review in Rucker et al., 2018). My article about the psychedelic therapy program at Modum Bad (Johnstad, 2020a; included in this dissertation) provides an overview and assessment of the most important such program in Norway, which was deemed a success by those responsible for it at the time. Although promising, the pre-prohibition research into therapeutic applications of psychedelics has often been regarded as inconclusive, and lingering methodological concerns led to this literature being largely ignored during the 1980s and 1990s. In my article about the Modum Bad program, I point to Shorter’s (1997) dismissal of this line of research as a case in point: according to his history of psychiatry, pre-prohibition psychedelics research “led to no clinical payoffs” (p. 265). However, recent reviews of the pre-prohibition literature on psychedelic therapy found evidence of therapeutic effect on alcoholism (Krebs & Johansen, 2012) and mood disorder (Rucker et al., 2016), and there were numerous reports of the efficacy of MDMA in psychotherapy prior to its scheduling as a drug of abuse in 1985 (Oehen et al., 2013; Passie, 2018).
During the last decade, furthermore, clinical research with psychedelics in psychiatric patient populations has reemerged as a thriving field, with a number of publications reporting promising results from tentative phase 2 trials, and larger phase 3 trials being under way (Nichols, 2020). Rucker et al. (2018) identified the study by Moreno et al. (2006) into the safety, tolerability, and efficacy of psilocybin in 9 patients with obsessive-compulsive disorder (OCD) as the first modern clinical research on the therapeutic effect from psychedelics, and a few years later, a pilot study by Bouso et al. (2008) established the psychological and physiological safety of low doses of the semi-psychedelic (or empathogen/entactogen) MDMA. Further clinical studies of MDMA focused on its efficacy in the treatment of posttraumatic stress disorder (PTSD), which was demonstrated first in pilot studies (Mithoefer et al., 2011, 2013; Oehen et al., 2013) and later confirmed in phase 2 trials that supported expansion into phase 3 trials and resulted in ‘Breakthrough Therapy’ designation from the Food and Drug Administration (FDA) in the United States (Bird et al., 2021; Feduccia et al., 2019; Jerome et al., 2020; Mitchell et al., 2021; Mithoefer et al., 2018, 2019). The overall efficacy of MDMA-assisted therapy in the treatment of PTSD has also been confirmed in reviews and meta-analyses (Bahji et al., 2020; Tedesco et al., 2021). While the current focus of psychotherapeutic applications of MDMA is predominantly PTSD, there has also been a successful pilot study of MDMA in the treatment of alcohol use disorder (Sessa et al., 2021).

Clinical research into therapeutic applications of psilocybin has focused on the effects on depression, anxiety, and substance use disorder. One early study by Moreno et al. (2006) also investigated the effects of psilocybin on obsessive-compulsive disorder (OCD), and according to Nichols (2020), a follow-up study is currently underway at Yale. Grob et al. (2011) conducted the first modern pilot trial of psilocybin for anxiety in patients with advanced-stage cancer, finding a significant improvement of mood at 6 months. Later studies of the same patient population identified positive effects from psilocybin treatment on both anxiety and depression (Griffiths et al., 2016; Ross et al., 2016), while Gasser et al. (2013) found similar positive effects on anxiety from treatment with LSD. Different teams of researchers have also found positive effect from psilocybin treatment on general depression (Carhart-Harris et al., 2016, 2018; Davis et al., 2021; Roseman et al., 2018), and a recent meta-analysis identified a large, significant effect from psilocybin treatment on anxiety and depression (Goldberg et al., 2020). There is also evidence for the therapeutic value of psilocybin in the treatment of existential distress associated with cancer (review in Grob et al., 2022). With regard to substance use disorder, two trials have found positive effect from psilocybin treatment on nicotine addiction (Johnson et al., 2014) and alcohol use disorder (Bogenschutz et al., 2015). There are also tentative indications of a therapeutic effect of psilocybin on migraine (Schindler et al., 2021).

Psilocybin-assisted psychotherapy for the treatment of depression has received ‘Breakthrough Therapy’ designation from the FDA in the United States (Bird et al., 2021; Nichols, 2020).

Research into the therapeutic value of the Amazonian psychedelic brew ayahuasca, which is typically prepared from Banisteriopsis caapi, which contains harmala alkaloids, in combination with the DMT-containing Psychotria viridis, is at a more preliminary stage. Tentative findings are promising, however, with early research indicating reductions in the intensity of minor psychiatric symptoms (Barbosa et al., 2005, 2009) and reductions in problematic cocaine use (Thomas et al., 2013) among first-time ayahuasca users. More recently, open-label clinical trials have found evidence of positive effect from ayahuasca treatment on general depression (Osório et al., 2015; Sanches et al., 2016; Uthaug et al., 2021; Zeifman et al., 2021), and the first double-blind randomized placebo-controlled trial has supported this finding (Palhano-Fontes et al., 2019).

Reviews have confirmed the efficacy, tolerability, and safety of ayahuasca, psilocybin, and LSD in therapeutic applications for mood, anxiety, and substance-use disorders (Andersen et al., 2020; Bogenschutz & Johnson, 2016; Castro Santos & Gama Marques, 2021; Dos Santos et al., 2018; Gill et al., 2020; Muttoni et al., 2019; Psiuk et al., 2021). There is also tentative evidence indicating the therapeutic value of ibogaine for substance use disorder (Camlin et al., 2018; Schenberg et al., 2014,
2017), and for ayahuasca and other psychedelics for eating disorder and related complications (Foldi et al., 2020; Lafrance et al., 2017; Renelli et al., 2020; Spriggs et al., 2021; see review in Breeksema et al., 2020). Furthermore, there is evidence for the value of cannabis in alleviating somatic conditions such as chronic pain, nausea, and muscle spasms (Ebbert et al., 2018; Erridge et al., 2021; Kawka et al., 2021; Nutt et al., 2021; Schlag et al., 2021) as well as for its anti-cancer potential (Tomko et al., 2020). Furthermore, cannabis has been found therapeutically valuable for the treatment of epilepsy (Ben-Zeev, 2020; Huntsman et al., 2020; Zafar et al., 2021) and for protecting against neurocognitive decline in people with HIV (Watson et al., 2021), and there is tentative evidence of therapeutic effect for some mental disorders including anxiety, depression, PTSD, anorexia nervosa, and Tourette’s disorder (Erridge et al., 2021; reviews in Haney & Evins, 2016; Hoch et al., 2019; Sarris et al., 2020).

These therapeutic applications of psychedelics are reflected in the emphasis on healing among nonmedical psychedelics users. The use of psychedelics in religious contexts, which has a long history especially among indigenous peoples, often involve what may be loosely termed shamanistic practices and, as mentioned above, typically focus on healing (Dobkin de Rios 1990; Hultkrantz 1997; Labate & Cavnar, 2014; Maroukis, 2012). Nonclinical psychedelics use among modern westerners commonly draw inspiration from such ethnopharmacological practices, and researchers have identified what they termed ‘medical subcultures’ that engage with psychedelics in nonmedical settings because of their perceived therapeutic effect, one example being the use of ibogaine for opioid withdrawal (Alper et al., 2008). One survey of nonmedical psychedelics users found that respondents reported beneficial effects on a range of conditions including mood disorders, addictions, and migraine (Carhart-Harris & Nutt, 2010), and another found substantial improvement of alcohol use disorder (Garcia-Romeu et al., 2019). Studies based on the United States’ National Survey on Drug Use and Health (NSDUH) database, furthermore, have found that classic psychedelic use is associated with reduced psychological distress and suicidality (Hendricks et al., 2015; Krebs & Johansen, 2013) as well as with reduced risk of heart disease and cancer (Simonsson, Osika et al., 2021; Simonsson, Sexton et al., 2021).

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My own modest contributions to this burgeoning field of psychotherapeutic use of psychedelics include two interview studies of psychedelics users in noninstitutional settings who described the perceived mental health benefits from such use (Johnstad, 2015, 2018b; both included in this dissertation). In the first study, psychedelics users in spiritual contexts were interviewed about the mental health consequences of such drug use, which they regarded as largely positive. Psychedelics use, according to these interviewees, contributed to a more healthy lifestyle, a more positive outlook on life, deeper levels of introspection and psychological understanding, less non-psychedelic drug use, and a newfound interest in meditation practice. Although none of these interviewees reported using psychedelics as a (self-administered) treatment for clinical depression or anxiety, it is not difficult to see their reports of general increases in wellbeing and mood as congruent with the anxiolytic and antidepressant effects reported from clinical trials. Furthermore, some interviewees reported positive therapeutic effect on conditions such as chronic fatigue syndrome and fibromyalgia that, to my knowledge, have not yet been investigated clinically. While this interview study of a small number of psychedelics users, which predates the boom in clinical psychedelics research over the past five years, has limited value compared to the now abundant randomized controlled trials, it offers some perspective on why psychedelics may have therapeutic effect on a range of mental health conditions. Respondents acknowledged a pharmacologic effect that may resemble the effects from more traditional psychotherapeutic drugs, but also emphasized the importance of an
experiential dynamic that seems unique to psychedelics, where the drugs provide access to new forms of experience that inspire users, at least according to their reports, to engage with life in new and more meaningful ways. This experiential dynamic that links the therapeutic effects from psychedelics to their capacity to induce transformative mystical-type experiences has been recognized by some other researchers (Majić et al., 2015; Roseman et al., 2018), but is not the kind of effect one would normally pay attention to in pharmacological research. As the interviewees in this study were not generally suffering from clinical depression or similar conditions, the inspiration and encouragement they claimed to draw from the psychedelic experience might be understood more as an enhancement effect than a therapeutic effect, although there is probably no clear line of distinction between these two types of effect.

The second study (Johnstad, 2018b) extended this line of research into the use of psychedelics in very small doses, or in other words microdoses. Such doses produce no intoxication, but have been reported to provide good therapeutic effect especially for depression and anxiety, as well as enhancement effect on a variety of levels. When this study was initiated, there were no peer-reviewed publications reporting investigations of psychedelic microdosing, but such microdosing practices have since become the subject of increasing academic scrutiny (e.g., Anderson, Petranker, Christopher et al., 2019; Anderson, Petranker, Rosenbaum et al., 2019; Hutten et al., 2019; Kuypers et al., 2019; Polito & Stevenson, 2019). As in my previous interview study (Johnstad, 2015), the enhancement and therapeutic effects here reported were not easily separated, and are perhaps best understood as one general effect that is labeled therapeutic if it relates to a health condition identified with a specific diagnosis and enhancement if not. Unlike the reports from the previous study, however, this effect was not linked to transformative spiritual experiences, which psychedelic microdosing does not normally induce, and must therefore be seen as a more straightforward pharmacological effect (or placebo).

Finally, the Cannabis and Psychedelics User Survey queried respondents about how they would characterize the consequences of their drug use with regard to their physical and psychological health, their ability to get along with other people, and their overall state of happiness. As reported in the descriptive statistics below (Section 4.1), a small majority of 51% found that their psychedelics use had not affected (positively or negatively) their physical health, while 47% saw some degree of health improvement. With regard to their psychological health, however, 85% saw some degree of improvement, and majorities of respondents also found moderate improvement to their ability to get along with other people and to their overall state of happiness. Respondents’ assessments of the corresponding consequences of their cannabis use were somewhat weaker, although still positive on average (Johnstad, 2020b). Furthermore, it should be noted that respondents who reported having a spiritual motivation for their cannabis and psychedelics use also tended to report more positive consequences from use (Johnstad, 2020b, 2021c).

1.3 Psychedelics and health risks

While there is a long line of research investigating the potential role for psychedelics in psychotherapy, researchers have also studied the associations between psychedelics use and health risks or neurocognitive impairment. In this review, I will discuss classic psychedelics, MDMA, and cannabis separately, with an emphasis on the latter, which has been more intensely researched. The discussion will include a comparative analysis of health risks associated with intoxicant use, and end up with a discussion of methodological concerns.

Classic psychedelics are not regarded as reinforcing substances and are not toxic to mammalian organ systems in normal dosage, although some newer phenylethylamines have higher toxicity (Nichols, 2004, 2016). However, it has long been maintained that psychedelics can lead to mental health problems, including drug-induced psychosis. This research is mostly several decades old
(Strassman, 1984; Vardy & Kay, 1983), although there are also a few more recent studies (Kuzenko et al., 2011; Sami et al., 2015). Conversely, population studies based on the NSDUH database found either no association between psychedelics and mental health problems or, as discussed above, evidence of reduced psychological distress among psychedelics users (Hendricks et al., 2015; Johansen & Krebs, 2015; Krebs & Johansen, 2013). There have also been smaller studies reaching similar results (e.g., Da Silveira et al., 2005). In the literature on psychedelics in psychotherapy reviewed above, there have been no reports of serious adverse events resulting from clinical administrations of classic psychedelics (Rucker et al., 2018).

One recent study by Lebedev et al. (2021) found no significant associations between psychedelic use and schizotypal traits when controlling for concomitant drug use, and the authors explained the discrepancy between their findings and those by Kuzenko et al. (2011) as possibly resulting from the latter study failing to adjust for stimulant use, which was associated with schizotypy in both studies. While some modern researchers continue to regard the association between classic psychedelics use and psychosis as strong (Iversen et al., 2009; Paparelli et al., 2011), these assessments either lacked explicit reference to sources, relied on studies dating back to the 1970s and 80s or, in one case, supported the proposition that LSD is associated with psychosis-like hallucinations with reference to a study by Smith et al. (2009) that reported results only for amphetamines, cannabis, cocaine, and opioids (Paparelli et al., 2011, p. 6). In light of recent research that has found psychedelics use to have either no association with mental health problems or an association with reduced psychological distress (Hendricks et al., 2015; Johansen & Krebs, 2015; Krebs & Johansen, 2013; Lebedev et al., 2021), the assessments of an association between classic psychedelics use and psychosis do not appear to be strongly founded.

With regard to MDMA, recreational use especially in party settings has led to a number of deaths due to factors such as hyperthermia, dehydration, and drug interactions (Rigg & Sharp, 2018). Polydrug use involving MDMA in party settings has also been associated with cognitive dysfunction and psychopathology (Morgan, 1999; Schifano et al., 1998), although other researchers found only modest and transient negative effects (Huxster et al., 2006). In studies that controlled for polydrug use, furthermore, it appeared that MDMA use in itself did not cause significant cognitive or health complications beyond those incurred through polydrug use (Halpern et al., 2011; Hanson & Luciana, 2010; Hoshi et al., 2007). There are also indications that MDMA does not cause persistent serotonin neurotoxicity (Selvaraj et al., 2009), and there have been no reports of long-term neurotoxicity or neurocognitive impairment resulting from the clinical use of pure MDMA (Mithoefer et al., 2013; review in Sessa et al., 2021). It should be noted, however, that there have been numerous health complications because of adulterants or other substances being sold as MDMA, especially with regard to the highly toxic paramethoxymethamphetamine (PMMA) (Saleemi et al., 2017; Vevelstad et al., 2012).

The research on the associations between cannabis use and health risks is more comprehensive. Since cannabis is usually smoked, regular use “can lead to extensive airway injury” (Tashkin, 2001, p. 43), but research obtaining such results has often been based on very heavy use. In one study by Aldington et al. (2007) that found evidence of reduced lung capacity in cannabis smokers, the cannabis-only participants had a mean age of 43 years, but a mean “joint-years” of 54, where a joint-year was defined as smoking one joint per day for 1 year. Another study by Beshay et al. (2007) found evidence of emphysema and secondary pneumothorax in young cannabis users who had smoked a median of 6 joints/day over a mean period of 8.8 years, and who were also chronic tobacco smokers. By contrast, some other studies (reviews in Gracie & Hancox, 2021; Iversen, 2008; Zhang et al., 2015) have found that cannabis smokers did not have higher prevalence of emphysema than the general population.

Another major concern to cannabis researchers is the putative association between cannabis use and psychosis, which I will discuss in some detail. Researchers have investigated this issue for decades,
with one early study of male Swedish conscripts finding that cannabis users were up to six times as likely as non-users to develop schizophrenia (Andréasson et al., 1987). Among the respondents this study regarded as high cannabis users, however, there was also an increased risk for schizophrenia associated with cigarette smoking (relative risk 6.1) and alcohol consumption (relative risk 6.5). This points to a challenge for such epidemiological studies, namely that it is difficult to separate the effects from cannabis, tobacco, and alcohol because of extensive overlaps in use. In one study by Goodwin et al. (2018), for instance, it was found that not only is cannabis use more common among people who smoke cigarettes, but daily cannabis users also predominantly tend to be cigarette smokers. As we will see in the following review, epidemiological studies of drug-related psychosis risk that provided odds ratios for both cannabis and tobacco have tended to find that the risk from tobacco use is at least as high as the risk from cannabis use. In this review, I have included all recent studies (from 2000 onwards) in relevant review articles (Gage et al., 2016; Large et al., 2011; Marconi et al., 2016; Murray et al., 2017; Patel et al., 2020; Ragazzi et al., 2018; van der Steur et al., 2020; van Winkel & Kuepper, 2014; Zammit et al., 2008) that reported separate risk or odds ratios for both

| Table 1: Risk for psychosis associated with cannabis and tobacco use |
|-----------------------|-------|-------|
|                       | Cannabis | Tobacco |
| Degenhardt & Hall (2001) | 4.15  | 3.97  |
| Wiles et al. (2006)     | 0.72 / 1.47 | 1.67 |
| Compton et al. (2009)   | 1.14  | 1.03  |
| Saha et al. (2011)a     | 1.13 / 1.35 | 1.39 / 1.66 |
| Auther et al. (2012)d    | 3.94  | 6.09  |
| Rössler et al. (2012)   | 1.59  | 1.52  |
| Buchy et al. (2014)d    | 0.54  | 0.42  |
| Gage et al. (2014)      | 1.48  | 1.61  |
| Hartz et al. (2014)     | 3.47  | 5.11  |
| Buchy et al. (2015)d    | 2.96  | 4.00  |
| Carney et al. (2017)    | 1.4   | 1.5   |
| Mustonen, Ahokas et al. (2018) | 1.53 | 2.00 |
| Mustonen, Niemelä et al. (2018) | 2.85 | 2.17 |
| Bhavasar et al. (2018)  | 3.00  | 1.89  |
| Di Forti et al. (2019)d | 2.5   | 3.73  |
| Ferraro et al. (2020)   | 1.61  | 3.47  |
| Corsi-Zuelli et al. (2021)d | 0.70 / 4.15 | 3.02 |
| Quattrone et al. (2021)d | 0.27 / 2.35 | 3.48 |
| Moore et al. (2007)f    | 1.41  |       |
| Myles et al. (2012)f    |       | 6.04  |
| Linscott & van Os (2013)f | 2.51 / 1.77 |       |
| Gurillo et al. (2015)f  |       | 2.18 / 3.22 |
| Gage et al. (2016)f     | 1.8   |       |
| Kraan et al. (2016)f    | 1.14 / 1.75 |       |
| Marconi et al. (2016)f  | 1.97  |       |
| Farris et al. (2020)f   | 1.11  |       |
| Hunter et al. (2020)f   |       | 1.99  |
| Kiburi et al. (2021)f   | 1.71  |       |

Note: Figures represent odds ratios or risk ratios, but are not necessarily comparable across studies. aOdds for cannabis use reflect non-dependent and dependent use. bFigures reflect daily tobacco use versus cannabis use disorder. cOdds for cannabis and tobacco use reflect screen and probe items. dUnadjusted odds ratios calculated by me based on information supplied in the original article. eOdds for cannabis use reflect lifetime use of cannabis but no other illicit drugs and current use of cannabis. fOdds for cannabis use reflect less than daily use and current use. gOverall or median values in review articles. hOdds for cannabis use reflect prevalence and incidence of psychotic experience. iOdds for tobacco reflect prospective studies and case-control studies. jOdds for cannabis use reflect use and abuse/dependence.
cannabis and tobacco, as well as all newer studies I have been able to find, excluding only studies related to age of onset for psychosis. See the discussion below for an overview of studies that either did not include tobacco use in the analysis at all, or controlled for tobacco but did not report comparable figures for it.

Table 1 provides an overview of odds ratios for psychosis related to tobacco and cannabis use. In this overview, I have focused on comparing moderate patterns of cannabis and tobacco use. With regard to tobacco, light to moderate use could be defined as daily use of about 5-10 cigarettes (Boulos et al., 2009; Schane et al., 2010). Daily use of cannabis would constitute heavy use, however, whereas a moderate pattern of cannabis might be defined as one or two use occasions per week (Ellingson et al., 2021; Watson et al., 2021). However, different studies report divergent statistics, and I have used the figures available, noting in the text what forms of use patterns they refer to. Some studies (e.g., Di Forti et al., 2019) found higher risk from more intensive cannabis use, but it should be noted that while these results may indicate that heavy cannabis use incurs increased risk for psychosis, there may also be a selection effect at play related to being the sort of person who opts for near-constant intoxication, as discussed in more detail below. Furthermore, some studies (e.g., Saha et al., 2011) found that even cannabis use disorder had a weaker association with psychosis than daily tobacco use. Note that the figures in Table 1 are not necessarily directly comparable across studies.

An early study by Degenhardt and Hall (2001) found that regular tobacco use was associated with psychosis at an unadjusted odds ratio of 3.97, whereas (any) cannabis use, weekly cannabis use, and cannabis use disorder had odds ratios of 3.98, 4.15, and 5.86, respectively. This indicates that regular tobacco use has a slightly weaker association with psychosis than regular cannabis use. They also reported odds ratios of 1.71 and 3.93 for daily alcohol use and alcohol use disorder. Wiles et al. (2006) found that, after controlling for confounding variables, non-dependent cannabis had a reduced risk for psychosis (odds ratio 0.72), while cannabis-dependent users had increased risk (odds ratio 1.47); by comparison, current cigarette smoking had an odds ratio of 1.67 for psychosis, and heavy alcohol use had an odds ratio of 2.21. Compton et al. (2009) found non-significant hazard ratios for onset of psychosis at 1.14 and 1.25 for weekly/daily use of cannabis and 1.06 and 1.03 for weekly/daily use of tobacco; they also reported significantly reduced hazard ratios for weekly/daily alcohol use. The fully adjusted models by Saha et al. (2011) found that daily cigarette smoking was significantly associated with delusional-like experiences with odds ratios of 1.39 for screen items and 1.66 for probe items. They provided no directly comparable figures for regular cannabis use, but cannabis use disorder had non-significant odds ratios of 1.13 for screen items and 1.35 for probe items, while cannabis dependence disorder had significant odds ratios of 1.76 and 2.39. This study therefore indicated that cannabis use disorder seems to be associated with lower risk for psychosis-like symptoms than daily cigarette smoking. The odds ratios for alcohol use disorder were both non-significant at 1.01 and 1.09, while alcohol dependence disorder was associated with odds ratios of 1.85 and 1.93, only the former of which was significant. Aurther et al. (2012) reported that conversion to psychosis was not significantly related to lifetime cannabis use or abuse in their sample, as adjusted for potential confounders, but unadjusted odds ratios for lifetime use of cannabis and tobacco could be calculated on the basis of their sample overview (Aurther et al., 2012, Table 2, p. 2490). These figures indicated a stronger association for tobacco (odds ratio 6.09) than for cannabis (odds ratio 3.94). The findings by Rössler et al. (2012), on the other hand, indicated that casual cannabis use in adulthood had an odds ratio of 1.59 and for schizophrenia nuclear symptoms, while the corresponding odds ratios for alcohol misuse and cigarette use (measured as lifetime use of 20+ cigarettes) were 1.53 and 1.52. Regular cannabis use had odds ratios of 1.77 in adulthood and 2.29 in adolescence, but there was no corresponding figures for regular or adolescent tobacco use. A study by van Gastel et al. (2013; not shown in Table 1) declared that “[c]igarette smoking and cannabis use are equally strongly associated with psychotic-like experiences” (p. 2393), although their figures
especially for the level of distress from such experiences were substantially higher for daily cigarette use than for monthly cannabis use. Reporting only standardized regression coefficients, the fully adjusted model obtained a non-significant $\beta = 0.034$ for the association between monthly cannabis use and distress, whereas the association for daily tobacco use remained significant at $\beta = 0.107$. The figures for associations with the frequency of psychotic-like experiences were more similar, with $\beta = 0.079$ for cannabis and $\beta = 0.098$ for tobacco (both significant). A previous study by van Gastel et al. (2012; not shown in Table 1) trended in the opposite direction.

The findings obtained by Buchy et al. (2014) were somewhat anomalous, as unadjusted odds ratios for lifetime use of cannabis and tobacco calculated on the basis of their sample overview indicated reduced odds for conversion to psychosis (Buchy et al., 2014, Table 2, p. 279). The odds ratios were 0.54 for cannabis and 0.42 for tobacco. A comorbidity study by Hartz et al. (2014) found that cannabis use (>21 times per year) had an odds ratio of 3.47 for psychosis, whereas daily cigarette smoking had an odds ratio of 5.11 and heavy alcohol use a ratio of 3.96. Gage et al. (2014) did not examine the odds ratio for alcohol, but their odds ratios for psychosis were 1.48 for cannabis and 1.61 for cigarettes, with frequency of use measured with four-level categorical variables. The effect from cannabis become non-significant when controlled for cigarettes, while the effect from cigarettes was attenuated but remained significant when controlled for cannabis. In the study by Buchy et al. (2015), no controls had abuse or dependence of either cannabis or tobacco, but by compiling all forms of use of either drug based on data from their Table 2 (p. 2279), I calculated unadjusted odds ratios of 2.96 for cannabis and 4.00 for tobacco associated with risk of developing psychosis. Carney et al. (2017) found odds ratios for psychosis risk at 1.5 for daily tobacco use, 1.5 for daily alcohol use, and 1.2 for daily cannabis use, of which only the association for tobacco was significant. However, they also found significant associations for current and lifetime cannabis use, with odds ratios of 1.4 and 1.5, respectively. The study by Mustonen, Niemelä et al. (2018) is an exception, however, with odds ratios for psychosis at 2.17 for daily tobacco use and 2.85 for any cannabis use. On the other hand, the fully adjusted model by Mustonen, Ahokas et al. (2018) found that smoking ten or more cigarettes per day was associated with a significant risk for psychosis (odds ratio 2.00), while the odds ratio for lifetime cannabis use was non-significant at 1.53. Bhavsar et al. (2018) found odds ratios for psychotic experience of 1.76 for daily tobacco use and 1.89, 3.00, and 3.49 for less than weekly, between weekly and daily, and daily cannabis use, respectively, thus (arguably) constituting another exception. Di Forti et al. (2019) did not report odds ratios for cigarette use, but my calculation of unadjusted odds ratios from the numbers provided in their article (Di Forti et al., 2019, Table 1) gives a ratio of 2.19 for lifetime cannabis use and a ratio of 3.73 for smoking more than ten cigarettes per day compared to not smoking at all. They also reported unadjusted odds ratios of 2.5 for cannabis use more than once per week and 6.2 for daily use.

More recent studies have also tended to find similar or higher psychosis-related risks from tobacco use than from cannabis use. Ferraro et al. (2020) found that first-episode psychosis patients had odds ratios of 1.61 for current cannabis use and 3.47 for current tobacco use. Quattrone et al. (2021) did not report odds ratios for cigarette use, but I calculated unadjusted odds ratios based on the data provided in the supplementary online appendix. The odds ratios for their outcome variable (first-episode psychosis) were 2.18 for lifetime cannabis use, 2.35 for current cannabis use, and 3.48 for smoking more than ten cigarettes per day compared to non-smoking combined with moderate smoking. Cannabis use at a frequency of less than daily use was associated with substantially reduced risk (odds ratio 0.27), whereas daily use incurred an odds ratio of 3.96. The odds ratio for the use of potent cannabis (more than 10% THC) was 2.82. I also calculated unadjusted odds ratios based on the data in Corsi-Zuelli et al. (2021, Table 1), where any use of tobacco was associated with first-episode psychosis at an odds ratio of 3.02. Lifetime use of cannabis only (no other illicit drugs) had an odds ratio of 0.70, whereas the odds ratio for current cannabis use was 4.15.
It is also worth mentioning that a small study by Kristensen and Cadenhead (2007; not shown in Table 1) found a more strongly significant association between tobacco use and conversion to psychosis ($p = 0.005$) than between cannabis abuse and conversion to psychosis ($p = 0.012$). Thus, the overall picture that emerges is that cannabis users may have increased risk for psychosis-related disorders, but the risk appears to be either at about the same level as the corresponding risk from tobacco use, as found by seven studies (Buchy et al., 2014; Carney et al., 2017; Compton et al., 2009; Corsi-Zuelli et al., 2021; Degenhardt & Hall, 2001; Gage et al., 2014; Rössler et al., 2012), or substantially lower, as found by nine studies (Auther et al., 2012; Buchy et al., 2015; Di Forti et al., 2019; Ferraro et al., 2020; Hartz et al., 2014; Mustonen, Ahokas et al., 2018; Quattrone et al., 2021; Saha et al., 2011; Wiles et al., 2006). Contrariwise, two studies found a substantially higher odds ratio for cannabis (Bhavsar et al., 2018; Mustonen, Niemelä et al., 2018).

In reviews and meta-analyses, Moore et al. (2007) found that the pooled adjusted odds ratios for the risk of any psychotic outcome in individuals who had ever used cannabis was 1.41. Linscott & van Os (2013) obtained odds ratios for the association of cannabis use and the prevalence and incidence of psychotic experience at 2.51 and 1.77, respectively, but warned that the effect from cannabis use was driven by a single study (Binbay et al., 2012) “which yielded unusually high odds” (Linscott & van Os, 2013, p. 1137). Without the inclusion of this study, the $I^2$ for cannabis decreased from 65% to 18%. The review by Gage et al. (2016) of longitudinal studies on cannabis and psychotic outcomes found a median odds ratio of 1.8 (disregarding one unadjusted odds ratio of 1.77), and a meta-analysis by Kraan et al. (2016) found that lifetime cannabis use had a non-significant odds ratio of 1.14 for transition to psychosis in individuals at ultra-high risk, while the odds ratio for cannabis abuse or dependence was significant at 1.75. Marconi et al. (2016) calculated an odds ratio of 3.90 for the risk of schizophrenia and psychosis among the most severe cannabis users, corresponding to a median odds ratio for any cannabis use at 1.97. Farris et al. (2020) obtained a non-significant pooled relative risk for the association between cannabis use and transition to psychosis among individuals at clinical high-risk of 1.11. Gage et al. (2017; not shown in Table 1) reported “some evidence in support of the hypothesis that cannabis initiation increases the risk of schizophrenia, although the size of the causal estimate is small” (pp. 975–976); their odds ratio was 1.04 per doubling odds of cannabis initiation. Finally, Kiburi et al. (2021) calculated an odds ratio for adolescent cannabis use for risk for psychosis at 1.71.

Correspondingly, a meta-analysis by Myles et al. (2012) found that tobacco use incurred an odds ratio of 6.04 for first-episode psychosis, and a meta-analysis by Gurillo et al. (2015) found that the odds ratios for psychosis in cigarette smokers had an overall value of 2.18 in prospective studies and 3.22 in case-control studies. In a meta-analysis of tobacco use and the risk of schizophrenia, Hunter et al. (2020) found that smokers had a significantly higher risk than nonsmokers (odds ratio 1.99). In sum, the risks from tobacco use appear to be at least as high as the risks from cannabis use, and especially if we ignore the anomalous results from Binbay et al. (2012) that strongly affected the meta-analysis by Linscott and van Os (2013). Taking the median values of these meta-analyses (counting both values where two are provided in Table 1) gives an odds ratio of 1.75 for cannabis and 2.70 for tobacco, while the mean values are 1.69 for cannabis and 3.36 for tobacco. We should not infer from these figures that the risk from cannabis use is negligible, but they do seem to indicate that we can be somewhat less concerned with the risk for psychosis related to cannabis than we are with the apparently more serious risk for psychosis related to the more prevalent tobacco use.

However, many studies into the association between cannabis and psychosis-related disorders did not report separate results for alcohol and tobacco. A number of these studies also did not report that they have controlled for tobacco use (Addington, & Addington, 2007; Alemany et al., 2014; Arsenault et al., 2002; Author et al., 2015; Brañas et al., 2016, 2017; Callaghan et al., 2012; Corcoran et al., 2008; Di Forti et al, 2014; Dragt et al., 2012; Ferdinand et al., 2005; Foti et al., 2010; Freeman et al., 2018; Grech et al., 2005; Harley et al., 2010; Houston et al., 2008; Konings et al., 2008, 2012;
Kuepper et al., 2011; Levy & Weitzman, 2019; McGrath et al., 2010; Phillips et al., 2002; Ringen et al., 2011; Rognli et al., 2020; Schubart et al., 2011; Scott et al., 2009; Seddon et al., 2016; Skinner et al., 2011; Smith et al., 2009; Stefanis et al., 2004; Tien & Anthony, 1990; Tosato et al., 2013; Valmaggia et al., 2014; van Os et al., 2002; Verdoux et al., 2003; Vinkers et al., 2013; Wainberg et al., 2021; Weiser et al., 2002), while others did explicitly apply such controls, but did not report odds or risk ratios for tobacco (Arranz et al., 2020; Baea et al., 2009; Bechtold et al., 2016; Binbay et al. 2012; Di Forti et al., 2009; D’Souza et al., 2020; Fergusson et al., 2003, 2005; Fonseca-Pedrero et al., 2020; Henquet et al., 2005; Hides et al., 2009; Karcher et al., 2019; Leadbeater et al., 2019; Mackie et al., 2013; Manrique-Garcia et al., 2012; McHugh et al., 2017; Miettunen et al., 2008; Sami, Cole et al., 2020; Sami, Quattrone et al., 2020; Setién-Suero et al., 2019; Spriggens & Hides, 2015; Zammit et al., 2002, 2011). Given that there is sufficient evidence for an association between tobacco use and psychosis (as per the above discussion and Beratis et al., 2001; Dickerson et al., 2013; Kelly & McCreadie, 1999; Mallet et al., 2017; Manzella et al., 2015; Quigley & MacCabe, 1999; Sørensen et al., 2011; Weiser et al., 2004) to allow Alderson and Lawrie (2015) to hypothesize that “the association of cannabis with psychosis could be attributable to the tobacco with which most cannabis is consumed” (p. 673), the lack of statistical control for tobacco use in analyses of associations between cannabis use and psychoses does not inspire confidence in their validity.

It should also be remembered that tobacco and cannabis use are strongly correlated even when the latter is consumed separately from the former (Gage et al., 2014; Goodwin et al., 2018), so that the chain of causality posited by Alderson and Lawrie (2015) is only one of at least two possibilities. Furthermore, for those studies that have indicated that the use of stronger “skunk” variants of cannabis incurs an increased risk for psychosis (e.g., Di Forti et al., 2019; Freeman et al., 2018), it should be noted that such potent cannabis varieties are more commonly mixed with tobacco because they may be too potent to smoke undiluted. In addition, chronic cannabis use may be more prevalent among individuals from underprivileged backgrounds (Gripe et al., 2021; Legleye et al., 2012), and some studies that controlled for demographic and clinical variables found no significant association between cannabis use and various psychosis measures that was not accounted for by such variables (Barrowclough et al., 2015; Dragt et al., 2012; Proal et al., 2014; Sevy et al., 2010). Using the data presented in the article by Di Forti et al. (2019, Table 1), I calculated unadjusted odds ratios for psychotic disorder at 2.92 for unemployment and 3.80 for their lowest education level (school with no qualifications), both of which are substantially higher than their ratios for cannabis use. If we consider the fact that tobacco use (more than ten cigarettes per day) is also strongly associated with psychotic disorder in these data, the overall picture might seem to indicate that such disorder is most importantly associated with factors such as underprivilege, marginalization, and distress, which are in turn associated with the use of both tobacco, cannabis, and many other drugs (Barros et al., 2018; Borges et al., 2019; Cho & Kogan, 2016; Coley et al., 2018; Cooper et al., 2013; Gage et al., 2020). Di Forti et al. (2019) seem to have controlled for education and unemployment in their analysis, but not for other causes of distress such as poverty, childhood abuse, living in a community with high levels of violent crime, social exclusion, general psychological trauma, and so forth; other researchers were even less rigorous.

Reviews and reviews of reviews (Campeny et al., 2020; Gage et al., 2016; Large et al., 2011; Marconi et al., 2016; Murray et al., 2017; Patel et al., 2020; Ragazzi et al., 2018; Sideli et al., 2020; van der Steur et al., 2020; van Winkel & Kuepper, 2014; Zammit et al., 2008) of the research on the association between cannabis and psychosis have sometimes concluded that the relationship is robust, but these conclusions are based on individual studies that have not always taken the possibly confounding effects from tobacco or demographics into account. Furthermore, other reviewers have found that the causal connection may point as much from psychosis to cannabis use as in the
opposite direction (Haney & Evins, 2016; Hill, 2015; Ksir & Hart, 2016). Thus, while people who use cannabis may be at increased risk for psychosis-related disorders, people with vulnerability to such disorder may also be at increased risk for cannabis use.

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Besides these issues with lung disease and psychosis, cannabis is sometimes found to be associated with cognitive impairment. In one study by Becker et al. (2014), participants who smoked an average of 10 cannabis hits per day 333 days per year experienced “numerous cognitive deficits, most notably in verbal memory, engagement, and use of efficient strategies with complex tasks, and motivated decision making” (p. 395). Similar findings of cognitive impairment have been reached in other studies of cannabis users (review in Broyd et al., 2016), although moderate cannabis use has not been associated with the same impairments (Schweinsburg et al., 2008). As with the question of psychosis, however, it seems likely that besides whatever impairing effect chronic cannabis use may have in and of itself, there is also a selection effect at play here, which I will discuss in more detail below.

Some twin studies have found that cannabis-using twins did not show greater impairment in cognitive functioning than their abstinent siblings (Jackson et al., 2016; Meier et al., 2017; Ross et al., 2020; Schaefer et al., 2021), and the same has been found for educational attainment (Verweij et al., 2013). Jackson et al. (2016) concluded that “observed declines in measured IQ may not be a direct result of marijuana exposure but rather attributable to familial factors that underlie both marijuana initiation and low intellectual attainment” (p. E500). At least one other study disagreed, but did not control for tobacco use (Ellingson et al., 2021). It should also be noted that cotwin control models do not account for nongenetic differences between twins.

Furthermore, in several studies of cognitive impairment that controlled for cigarette smoking, the effect from cannabis was strongly attenuated, often to the point of becoming statistically insignificant, while the effect from tobacco use remained significantly negative even when controlled for cannabis use (McCaffrey et al., 2010; Mokrysz et al., 2016; Stiby et al., 2015). Stiby et al. (2015) noted that the effect from cigarettes was consistently stronger than the effect from cannabis, with daily cigarette smoking being associated with a negative effect on grades that was more than double the magnitude from the effect from an indicator of cannabis abuse. However, some studies showing negative effects from cannabis use did not control for cigarette or alcohol use, even when their sample characteristics show that the cannabis users included in their study had consistent and significant higher use of cigarettes and alcohol than controls (Becker et al., 2014; Wadsworth et al., 2006). At least one other study that found a negative effect from cannabis did not offer any data on cigarette or alcohol use (Tait et al., 2011), which is unfortunate given the repeated findings of an association between cigarette use and cognitive impairment (Chamberlain et al., 2012; Weiser et al., 2010). It is also noteworthy that the cognitive impairment that may result from cannabis use seems to disappear after a month-long period of abstinence (Curran et al., 2016; Iversen, 2008).

Recent reviews of the relationship between cannabis use and cognitive impairment have found that there was sufficient evidence for an impairment effect in current heavy users, but insufficient evidence for a lasting effect after abstinence; however, these reviews did not discuss the possible confounding effect from tobacco use (Bourque & Potvin, 2021; Kroen et al., 2021; Scott et al., 2018). Scott et al. (2018) concluded that “[a]ssociations between cannabis use and cognitive functioning in
cross-sectional studies of adolescents and young adults are small and may be of questionable clinical importance for most individuals” (p. 585).

Finally, while there are some indications that cannabis use is associated with alterations of brain morphology, studies indicating such effects are not consistent in controlling for tobacco use (e.g., Crane et al., 2013; Jacobus et al., 2019), which Rocchetti et al. (2013) noted as a likely confounder. However, Gilman et al. (2014) did control for tobacco and alcohol use to find greater gray matter density in cannabis users, while a large-scale MRI study by Scott et al. (2019) found “no significant differences by cannabis group in global or regional brain volumes, cortical thickness, or gray matter density” (p. 1362). Furthermore, brain damage possibly resulting from cannabis use appears to be less extensive than the damage from alcohol use (Thayer et al., 2017). In sum, while the issue is not closed, it seems far from clear that there is an impairment effect from cannabis use beyond the effects from tobacco use, and if there is an independent effect from cannabis, it appears to be smaller in magnitude than the effect from tobacco.

A different (but related) approach to the question of relative harmfulness is to examine the associations between drug use and traffic accidents. There is almost no data available on such associations for classic psychedelics and MDMA, although Drummer et al. (2020) noted that their groups of “any illicit drug” and “any impairing drug” included some cases of MDMA and possibly LSD (their text on p. 3 does not exactly correspond to the information given in their notes to Table 2 on p. 5). Some other studies followed similar classification practices (Lowenstein & Koziol-McLain, 2001) or grouped MDMA with amphetamines (Hels et al., 2013; Kuypers et al., 2012), but neither approach is helpful for our purposes, as the grouping of psychedelics with heroin, cocaine, and other drugs obviously does not allow for an estimation of the risk specifically from psychedelics. As with other issues, however, the research on the more widely used cannabis is more comprehensive, and a number of studies have found a significant increase in traffic accidents associated with cannabis use (Brubacher et al., 2019; Drummer et al., 2020; Hels et al., 2013; Kuypers et al., 2012; Li et al., 2017; Martin et al., 2017; reviews by Asbridge et al., 2012; Li et al., 2012; McCartney et al., 2021; Rogeberg & Elvik, 2016; Rogeberg, 2019), while some others have found no significant association (Longo et al., 2000; Lowenstein & Koziol-McLain, 2001; reviews by Elvik, 2013; White & Burns, 2021). The recent review by White & Burns (2021) provided interesting methodological perspectives on the risk of traffic accident related to cannabis use, observing that individual studies of this association tended to be biased in an inflationary direction. Their meta-analysis found an overall odds ratio of 1.37 for culpability studies, but after adjustment for bias this figure dropped to 0.68. The authors concluded that the ‘best estimate’ bias-adjusted cannabis-crash odds ratio equals 1.0, indicating a null effect (White & Burns, 2021, p. 17).

At any rate, as with the issues of psychoses and cognitive impairments discussed above, the risk from legal drug use was at least as high as the risk from cannabis use. In this case, the risk from alcohol use was substantially larger than the risk from cannabis use in most of the studies that provided separate results for alcohol and cannabis. An overview of these results is presented in Table 2. Note that the figures from different studies cannot necessarily be directly compared because of varying methodologies. With the exception of the study by Kuypers et al. (2012), all studies found substantially lower odds ratios for cannabis than for alcohol, with median values indicating odds ratios of 1.74 for cannabis and 6.77 for alcohol. To understand Kuypers et al.’s divergent results, we should note that their analysis was based on a total of 5 cannabis cases and 9 controls, compared to 325 cannabis users in Martin et al. (2017), 34 in Lowenstein & Koziol-McLain (2001), 44 in Longo et al.
Table 2: Risk for traffic accident associated with cannabis and alcohol use

<table>
<thead>
<tr>
<th></th>
<th>Cannabis</th>
<th>Alcohol</th>
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<tbody>
<tr>
<td>Longo et al. (2000)</td>
<td>0.82</td>
<td>8.0</td>
</tr>
<tr>
<td>Lowenstein &amp; Koziol-McLain (2001)</td>
<td>1.1</td>
<td>3.2</td>
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<td>Mura et al. (2003)</td>
<td>2.5</td>
<td>3.8</td>
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<tr>
<td>Drummer et al. (2004)</td>
<td>2.7</td>
<td>6.0</td>
</tr>
<tr>
<td>Kuyper et al. (2012)</td>
<td>13.40</td>
<td>6.77</td>
</tr>
<tr>
<td>Hels et al. (2013)</td>
<td>1.91</td>
<td>9.79</td>
</tr>
<tr>
<td>Poulsen et al. (2014)</td>
<td>1.3</td>
<td>13.7</td>
</tr>
<tr>
<td>Li et al. (2017)</td>
<td>1.62</td>
<td>5.37</td>
</tr>
<tr>
<td>Martin et al. (2017)</td>
<td>1.65</td>
<td>17.8</td>
</tr>
<tr>
<td>Brubacher et al. (2019)</td>
<td>1.74 a</td>
<td>6.00 b</td>
</tr>
<tr>
<td>Drummer et al. (2020)</td>
<td>1.9</td>
<td>16</td>
</tr>
</tbody>
</table>

Note: Numbers represent adjusted odds ratios combined for all dosage levels, if provided in the original publications. Figures are not necessarily directly comparable across studies. *Non-significant odds ratio for drivers with THC of at least 5 ng/ml; the study found no increased risk of crash responsibility in drivers with THC below 5 ng/ml. *Odds for blood alcohol concentrations of at least 0.08 %.

(2000), 24 in Hels et al. (2013), and 98 in Drummer et al. (2020); thus, the study by Kuyper et al. is an outlier both in terms of the number of included cases and in the obtained odds ratios, and the inclusion of a few more individuals in their study might have changed the odds ratios substantially.

By contrast, Kuyper et al.’s odds ratio for alcohol use was based on 99 cases and 176 controls, resulting in a more robust analysis. The relatively low increase in the risk for motor vehicle accident from cannabis use as compared to the more substantial risk from alcohol use has been confirmed in reviews (Biecheler et al., 2008; Rogeberg & Elvik, 2016; Sewell et al., 2009). In sum, the harmfulness of cannabis use in traffic appears to be substantially lower than the risk from alcohol use. According to Arkell, McCartney et al. (2021), “[t]he effects of THC on driving are generally modest and appear similar to the effects of low-dose alcohol” (p. 361). This does not mean that we should neglect to warn against cannabis-intoxicated driving, but it seems clear that alcohol-intoxicated driving is a more important social problem, and there is no apparent scientific basis for punishing the former more severely than the latter.

Furthermore, research into the association between tobacco use and risk for traffic accident have found significant increases in risk. This line of research extends back at least to Liddell (1982), who found that people who often smoke while driving have a risk ratio of 1.73 for motor vehicle accident, and an early review concluded that “smokers appear 1.5 times more likely to have a motor vehicle crash” (Sacks & Nelson, 1994, p. 515). Similar figures have been obtained in more recent research.

Wen et al. (2005) adjusted for age and alcohol use to find that tobacco users had a risk ratio of 1.88 for motor vehicle accidents, while the fully adjusted model by Lonczak et al. (2007) indicated a significant odds ratio of 1.55 for traffic-related injuries. In the fully adjusted model by Hutchens et al. (2008), being a current smoker incurred an odds ratio of 2.08 for crash involvement, while Vingilis et al. (2018) found that after adjusting for demographics, driving exposure, and risky alcohol use, current smokers faced a significant odds ratio of 1.27 for collision involvement. With a significant odds ratio of 2.45, tobacco use was the variable with the highest impact in Luht et al.’s (2018) fully adjusted model for high-risk traffic behavior, while Igarashi et al. (2019) adjusted for age and alcohol use to find a non-significant hazard ratio of 1.54 for traffic accident death among current (male) smokers of more than 20 cigarettes per day. Finally, Obadeji et al. (2020) found a non-significant unadjusted odds ratio of 1.45 for accident among motorcyclists with a history of tobacco use, and Talukder et al.’s (2021) study of heavy vehicle drivers found a significant unadjusted odds ratio of 2.09 for accident among people who smoke during driving. While the outcome variables in these studies are somewhat divergent, the median odds ratio of 1.64 may seem to indicate that tobacco use is almost as strongly associated with risk of traffic accident as is cannabis use. Some of the effect
seems to be related to being distracted because of smoking while driving, however, although this may be true for cannabis as well. In the study by Hutchens et al. (2008), both current tobacco users and current alcohol users had higher odds ratios than current cannabis users for collision involvement, whereas the opposite was true in the study by Obadeji et al. (2020). Unfortunately, most studies have not analyzed the risk from tobacco use and cannabis use in the same participant samples.

Researchers have expressed concern over the relatively high and increasing numbers of drivers involved in accidents who test positive for cannabis, however (Brubacher et al., 2019; Pearlson et al., 2021). In the study by Brubacher et al. (2019) of non-fatally injured drivers in Canada, for instance, alcohol was detected in 14.4% of drivers and THC in 8.3% (it is also noteworthy that sedating medications were detected in 19.8%). While the figure for THC was well below that for alcohol, it might seem to indicate that cannabis use is becoming a major factor in road traffic incidents. However, this interpretation is complicated by the fact that THC and its metabolites are detectable in blood samples for as much as 30 days after the last use occasion in chronic users (Bergamaschi et al., 2013; Peng et al., 2020). Thus, detection of THC in blood samples is not a reliable indicator for recent cannabis use, and the substantial figures for THC detection in relation to traffic accidents may reflect a large number of frequent users who were not driving under the effect of acute intoxication (Bergamaschi et al., 2013; Brubacher et al., 2019; Grotenhermen et al., 2007; Karschner et al., 2016; Peng et al., 2020).

Nevertheless, there remains a persistent concern among some researchers that cannabis use may impair driving even in the absence of acute intoxication (Dahlgren et al., 2020). This concern is related to the identification of cognitive impairment in chronic cannabis users reviewed above, as such impairment may translate into increased risk for traffic accidents. As discussed previously, however, the long-term impairment from cannabis use appears to be smaller in magnitude than a similar impairment from tobacco use, and the effect from cannabis was often strongly attenuated when controlled for tobacco use (McCaffrey et al., 2010; Mokrysz et al., 2016; Stiby et al., 2015). This indicates that the impairment may be due to a selection effect related to the demographic characteristics of both cannabis and tobacco users; at any rate, the long-term impairment from cannabis use does appear to be a greater concern than the impairment from tobacco use.

On this basis, it has been argued that there is scant evidence to support per se limits of THC for drivers, and particularly for limits below 5 ng/mL, which may not indicate any impairment at all (Arkell, Spindle et al., 2021; Brubacher et al., 2019; Grotenhermen et al., 2007; Pearlson et al., 2021; Peng et al., 2020). Unlike the more straightforward pharmacokinetics of ethanol, the diffusion of fat-soluble THC in biological material is complex and non-linear, so that THC concentration in blood samples is not linearly correlated with concentrations in the brain (Hartman et al., 2016). Thus, “[t]here appears to be a poor and inconsistent relationship between magnitude of impairment and THC concentrations in biological samples” (Arkell, Spindle et al., 2021, p. 102), and especially so for frequent users, for whom there is evidence of tolerance to psychomotor impairment (Desrosiers et al., 2015). Per se limits for THC are therefore likely to produce a number of false positive cases, “resulting in conviction for driving under the influence of drugs (DUID) based on cannabis that the subject may have consumed days to weeks ago, when they are now completely unimpaired” (Pearlson et al., 2021, p. 10). In addition, per se limits are likely to result in many false negative cases among moderate cannabis users, because the time period between driving under cannabis intoxication and the acquisition of the driver’s blood sample is often sufficient to let the THC drop below the legal limit, and extrapolation backwards in time is not possible (Hartman et al., 2016). Thus, the reliance on per se limits very likely punishes chronic cannabis users for driving while sober at the same time as it fails to punish occasional cannabis users for driving while intoxicated.
The contributions from my own studies to the accumulation of knowledge about psychedelics and psychopathology are very modest, but it is worthwhile to note some points of intersection. In interview studies, the majority of participants reported being in good health and having stable jobs and living conditions, but one interviewee had been admitted to a short-term psychiatric ward with a diagnosis of psychosis and was at the time of the interview on anti-psychotic medication (Johnstad, 2015; included in this dissertation). Furthermore, as reported in Johnstad (2021a; included in this dissertation), challenging psychedelic experiences or “bad trips” are sometimes very dramatic, and one interviewee described going through what he referred to as a psychotic episode after combining psilocybin mushrooms with cannabis. In the Cannabis and Psychedelics User Survey, substantial minorities of between 10% and 20% of respondents reported that their cannabis use had resulted in moderate or serious worsening of their physical and psychological health, their ability to get along with other people, and their overall state of happiness. The self-assessed consequences were much better for non-cannabis psychedelics, for which less than 1% reported a serious worsening of the corresponding domains, and 1-3% reported a moderate worsening (these figures are not reported in any publication, but comparative analyses of consequences from cannabis and psychedelics use are available in Johnstad, 2020b).

Before we move on, a comparison of the relative harms from cannabis, MDMA, and classic psychedelics to the corresponding harms from alcohol and tobacco will help us understand the putative psychopathological consequences of psychedelics use in a broader context. Some comparisons of this kind were already made in the discussion about cannabis, allowing for the tentative conclusion that while cannabis use may be associated with increased risk for psychosis-related disorders and cognitive impairments, these effects from cannabis do not appear to be larger than the corresponding effects from tobacco. For the issue of acute lethal toxicity, Gable (2004) found that alcohol had a safety ratio of 10, comparing unfavorably to the safety ratios of MDMA (16), mescaline (24), DMT (50), LSD (1000), psilocybin (1000), and cannabis (>1000). Thus, the psychedelic drugs discussed in this dissertation were all safer than alcohol in terms of acute lethal toxicity. As summarized in Table 3, this tendency toward relative low harm extends also to the tendency for dependence formation for these drugs, both in the classic assessment by Anthony et al. (1994) and, for cannabis, in a more recent assessment by Lopez-Quintero et al. (2011). Similarly, Schlag (2020)

| Table 3: Overview of drug harms and addictiveness |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
|                            | Dependence formation        | Harm to users                 |                            |                            |
| Alcohol (ethanol)          | 15.4                        | 22.7                        | 26                          | 22                          | 36                          |
| Cannabis                   | 9.1                         | 8.9                         | 11                          | 17                          | 11                          |
| MDMA ("ecstasy")          | -                           | -                           | 8                           | 8                           | 5                           |
| Psychedelics (LSD & psilocybin) | 4.9                          | -                           | 7b                          | 7c                          | 5                           |
| Tobacco (nicotine)         | 31.9                        | 67.5                        | 16                          | 19                          | 18                          |

Note: Some numbers based on visual inspection of graphically presented information. Score for LSD; corresponding score for psilocybin is 6. Score for LSD; corresponding score for psilocybin is 3.
recently noted that the United States’ Substance Abuse and Mental Health Services Administration survey from 2016 obtained results that broadly mirrored those by Anthony et al. Nevertheless, it might be noted that some assessments have diverged substantially from these figures, with Hasin et al. (2015) finding that as many as 31% of cannabis users fulfilled criteria for use disorder. However, this study was based on DSM-IV (“Diagnostic and Statistical Manual of Mental Disorders, 4th edition”; American Psychiatric Association, 1994) criteria that counted “legal problems” as a sufficient indicator for abuse. This inclusion of legal problems entails that localities with a higher police presence will tend to see higher prevalence of cannabis use disorder, which seems problematic from a mental health perspective that is concerned with health harms irrespective of varying law enforcement regimes. This indicator for legal problems is also problematic for a number other reasons (Hasin et al., 2013), and was dropped from the 5th edition of the DSM (American Psychiatric Association, 2013). It should also be noted that the assessment by Hasin et al. (2015) did not comparatively assess the prevalence of use disorders for other drugs with the same methodology.

Furthermore, overall assessments of the harmfulness of these drugs both in the UK (Nutt et al., 2010), in Europe (van Amsterdam et al., 2015), and in Australia (Bonomo et al., 2019) uniformly found alcohol and tobacco to be more harmful to users than cannabis, MDMA, and the classic psychedelics LSD and psilocybin (Table 3), and Sellman (2020) reached the same conclusion for alcohol and cannabis. The assessments by Nutt et al. (2010), van Amstredam et al. (2015), and Bonomo et al. (2019) also agreed that both alcohol and tobacco were more harmful to others than any psychedelic was (not shown). With regard to violent behavior, there is broad agreement in research literature that although some forms of illicit drug use may be associated with violence, the association is much stronger for alcohol use. A review by Parker and Auerhahn (1998) found no significant evidence for an association between drug use and violence, but strong evidence for an association between alcohol use and violence: “when violent behavior is associated with a substance, that substance is, overwhelmingly, alcohol” (pp. 306–307). Comparing the effects of alcohol and cocaine on violent behavior, Chermack and Blow (2002) found that although there was an effect from both, that from alcohol was by far the strongest. Sacks et al. (2009) found a stronger effect on violence from alcohol (odds ratio: 1.33) than from illicit drugs (odds ratio: 1.10) in a sample of people in substance abuse treatment programs, and a study of violence at ambulance attendances in Australia found that “[a]lcohol intoxication was involved in more than half of attendances where aggression/violence was recorded, and was almost twice as prevalent as those involving illicit drug use where aggression/violence was recorded” (Coomber et al., 2019, p. 1). A recent review by White et al. (2019) found clear evidence of an association between alcohol use and violence, but no clear evidence from illicit drugs. Most of these studies and reviews did not investigate the effect specifically from classic psychedelics, MDMA, or cannabis, but a few that did found that acute intoxication from these psychedelic drugs tended not to increase, or even to reduce, violent behavior (Boles & Miotto, 2003; Hoaken & Stewart, 2003).

In conclusion, the literature reviews in this section indicate that the health risks associated with the use of classic psychedelics, MDMA, and cannabis are generally modest. While cannabis users in particular appear to be susceptible to psychosis-related disorder, cognitive impairment, and traffic accidents, the risks involved seem to be lower than the corresponding risks from alcohol and tobacco use. Psychedelics use is not without risk, but in terms of mental health problems, addictiveness, acute lethal toxicity, violent behavior, traffic-related injury, and overall harm, psychedelics (including MDMA and cannabis) appear to be at least as safe as the legal drugs alcohol and tobacco. Researchers wishing to study the health consequences of illegal drug use are advised to assess the corresponding health consequences of alcohol and tobacco use in the same participant samples, thus
providing readers with an opportunity to contextualize the relative health risks of different legal and illegal drugs. It would be interesting to include tobacco use alongside alcohol and various illicit drugs in studies of risk for traffic accidents, for instance, as this might allow us to approach an understanding of how much of the identified risk from drug use for traffic accidents is due to actual (acute, subacute, or long-term) cognitive debilitation, and how much is a selection effect related to demographics or to personality structure and the propensity for risk taking. My study of the personality structure of psychedelics users found that their risk taking score was substantially higher than the scores obtained in a sample of the general population (Johnstad, 2021e; included in this dissertation), and it would not be surprising if such propensity for risk taking impacts upon one’s style and manner of driving, resulting in an increased risk for traffic accidents that is unrelated to any debilitating effect (acute or otherwise) from drug use itself. Tobacco use, which is related to a number of serious medical conditions, may also be indicative of an increased propensity for risk taking, and more generally seems to be associated with many of the same demographic and socioeconomic factors as illicit drug use. It is therefore quite possible that the inclusion of tobacco as an independent risk factor in studies of traffic accidents would allow researchers to identify the use of this licit and non-intoxicating drug as being associated with an increased risk for accidents, thereby indicating the magnitude of the putative selection effect.

1.3.1 Methodological critique

The above review suggested that selection effects might explain some of the effect in the associations identified between cannabis use and psychopathology. This section explicates two points of methodological critique against studies into drug harms related to the effects from general escapism and from criminalization. With regard to the first point, it is suggested that chronic heavy drug use should be understood as a form of high escapism, and that such escapism is generally associated with underlying problems and life issues that are, in and of themselves, associated with psychopathology. Research into the harms from heavy drug use therefore tends to conflate two separate effects, one being the effect from the drug use itself, and the other being the selection effect from belonging to the population segment who chooses high escapist lifestyles. The second point of critique argues that drug criminalization changes the composition of the population of drug users in the direction of people with a higher extent of underlying problems and life issues, and that this dynamic makes illicit drug use appear more harmful than what would be the case if the drugs in question were legally available.

In the above discussion of cognitive impairment, a study by Becker et al. (2014) found evidence of numerous cognitive deficits among people who smoked an average of 10 cannabis hits per day 333 days per year. While it is possible that some of this impairment effect is caused by cannabis use, a selection effect also seems to be in play. If we divide the general population into two groups, with the first group being the people who has the time to smoke ten cannabis hits (almost) every day of the year and the other group being the people who do not have time for that, it does not seem difficult to estimate which group is likely to be better educated and have the most successful careers. I would make the same point about the group of people who watch television for ten hours every day: while it is possible that constant bingeing on light entertainment has negative health consequences in and of itself, it is also obvious that the population of heavy TV users who has the time for daily ten-hour binges does not contain many hard-working professionals or people deeply invested in their families and friends. Conversely, this population clearly contains many people with long-term health conditions and people who are otherwise socially marginalized for various reasons. Evidence of a dose-response decline in cognitive capacity associated with television viewing (e.g., Fancourt & Steptoe, 2019; Lindstrom et al., 2005) is therefore unsurprising, because heavy TV use, like heavy drug use, is effectively an indicator of life not going well. The reason why life is not going
well may have as strong an association with cognitive impairment as bingeing on TV does. Controlling for demographic, socioeconomic, and health-related confounders will remove some of the effect from such underlying reasons, but unemployment, poverty, and health conditions are just a few of many reasons why people feel miserable and see their lives as failures. Statistical control removes the effect from these specific sources of misery and will thereby generally attenuate results, but leaves the corresponding effects from childhood trauma, loneliness, abusive relationships, undiagnosed depression, and a whole range of other issues to masquerade as effects from the high-escapist behavior.

Besides ignoring the impact from a range of underlying problems, statistical models generally also ignore the likely interaction effects between such problems. Being poor and having a debilitating health issue are both examples of underlying problems that might lead to high-escapist activities, but the misery-inducing effect of both in combination is likely higher than the separate effect from each added together. The same probably goes for every pair of such underlying risk factors for high escapism. You cannot control for the fact that practically everybody who watches television for ten hours every day, smokes ten cannabis hits every day, or is otherwise near-constantly occupied by escapist activities over long periods of time is perpetually dissatisfied with their lives and, for the most part, with themselves. High escapism is always related to living a life one feels a need to escape from.

Thus, one basic point of methodological critique against the type of studies that associate heavy drug use with cognitive impairment or psychosis is that they measure not only the effect from cannabis use, but also the selection effect from being the type of person who settles into a life of near-constant intoxication. There is a reason why people end up in high-escapism lifestyles, and this reason is also generally associated with relative cognitive impairment and negative health outcomes. These are the people who feel that they did not succeed in life, and more often than not, their lack of success reflects underlying problems and incapacities. Fancourt and Steptoe (2019) sought to establish a threshold for recommended levels of television viewing below what might pose risks for cognitive decline, and identified 3.5 hours per day as a limit. However, while it may be true that people put themselves at risk by viewing television for more than 3.5 hours per day, I believe it is also true that only people with high escapist tendencies, reflecting a high level of underlying problems and life dissatisfaction, would choose to watch so much television. The same point holds for drug use: for the most part, only very miserable people choose to get intoxicated every day over long periods of time. These people are, to borrow a phrase from Frantz Fanon, the wretched of the earth, and when you study the health ramifications of a given behavior whose prevalence is practically confined to this group of wretched people, you will measure first of all their wretchedness. High escapism is, for practical purposes, an indicator of life dissatisfaction and misery.

In the study of the negative consequences of one specific high-escapist activity, therefore, we will end up measuring the effect from this activity itself combined with the effect from high escapism in general, which always reflects underlying life issues. As such, negative consequences of specific high-escapist activities will be tangled up in selection effects related to membership in the population of people with major life issues, and such membership is generally associated with a range of negative outcomes. To avoid being entangled in the effects from general escapism, research on putative negative consequences from drug use should preferably focus on moderate patterns of drug use. Moderate drug use is not associated with a constant need to escape from one’s miserable life, and if such drug use incurs negative consequences for health or functionality, these consequences are more likely related to the drug use itself.
While the above assessments indicate that the harms associated with the use of classic psychedelics, MDMA, and cannabis are lower than corresponding harms associated with alcohol and tobacco use, there is also reason to believe that harms related to illicit drug use may be exaggerated as a consequence of the fact that these drugs have generally been criminalized for decades. This section will discuss the possibility that some of the health risk identified for illicit drug use may be a consequence of criminalization and its complex impact on usage patterns in different population segments. In effect, empirical research into the health consequences of illicit drug use may have been blindsided by the fact that such drug use is criminalized and stigmatized in our societies.

The basis for this methodological critique is the underlying hypothesis that any criminalized behavior will appear to be associated with more health problems than a corresponding non-criminalized behavior, because the fact of criminalization impacts the diffusion of this behavior in society. Specifically, I think there is reason to believe that the criminalization of psychedelics has served to shift the center of gravity in the group of psychedelics users towards segments of the overall population that have less than average concern about getting in trouble with the law, and these population segments are probably at higher risk for non-moderate drug use and, therefore, for worse health outcomes than psychedelics users from other segments of the overall population.

Before we continue into the discussion of how criminalization may affect the user population, I wish to note that there is also a second reason to suspect that drug criminalization may affect the perception of health outcomes for drug users. This second reason is that criminalization may serve to increase the harms from drug use because it leads to a situation of poor quality control. Unscrupulous drug dealers may add harmful adulterants in order to increase bulk or may sell illicit substances under false labels. This has been a problem especially for MDMA, where we have seen PMMA being sold as MDMA (Saleemi et al., 2017; Vevelstad et al., 2012). If the resulting health harms are identified as MDMA-related in subsequent research, MDMA will thereby appear to be more harmful than it would have been under a policy regime allowing for better quality control.

The dynamic I will focus on in the rest of this discussion is more methodologically complex, and is related to the possibility that the criminalization policy serves to change the composition of the user population. While the intention behind the criminalization regime is to reduce drug user overall, it is not obvious that this is what the policy actually achieves (Hughes et al., 2018; Kotlaja & Carson, 2019; Scheim et al., 2020; Stevens, 2019). What may seem likely, however, is that criminalization serves to reduce drug use among certain population segments, while possibly increasing use among other segments (or at least not reducing it to the same extent). To take two obvious points, there will be little post-criminalization drug use among people who work in occupations with frequent mandatory drug tests or among people who are strictly law-abiding. More generally, criminalization means that drug users are at risk of getting in legal trouble, and the prospect of legal trouble is more worrisome to some people than to others. It would be reasonable to assume that people who are happy with their lives and optimistic about the future may feel that they have a lot to lose from getting in legal trouble, while unhappy and pessimistic people may feel they do not have as much to lose and may, therefore, not be deterred to the same extent by the criminalization regime. In addition, it seems reasonable to believe that generally unhappy people may value drug effects more highly than happy people, because unhappy people presumably have fewer sources of happiness in their lives. If drug use offers such people a temporary escape into a state of chemically induced happiness, they may therefore be inclined to value it more highly, which probably also means that they are willing to take greater risks to keep it as a source of happiness in their lives. I would connect this point with my earlier discussion of heavy drug use as a product of the desire for escape from one’s miserable life, and observe that people who are driven by such escapist desires are probably less averse to the legal risks associated with illicit drug use. The prospect of legal problems – or of health problems relating to drug use disorder – may not deter such people to the same extent as these factors would deter generally happy (or non-miserable) people.
Arguably, therefore, drug criminalization shifts drug use towards population segments who are less than averagely concerned about getting into legal trouble. While there may be any number of rationales underlying such sentiments, it seems likely that feeling one has little to lose is associated with what I earlier called wretchedness, which is in turn related to factors such as poverty, unemployment, childhood trauma, low education, etc. If we have very good data, we can control for some of these factors, but not for all of them, and not for the interaction effects between such factors. Unemployment is probably misery-inducing for most people, but for people who lived in poverty even when they had a job, losing that job may be a disaster. And even if it is possible to control for all the main sources of wretchedness in principle, the research into drug harms does not do so in practice.

Thus, according to this analysis, drug criminalization serves to shift drug use towards population segments at increased risk for drug use disorder and related health problems. In the argument so far, it does so by removing moderate users from the group, because these moderate users are deterred to a greater extent by the prospect of legal trouble and have less need for drug use as a source of temporary happiness. In addition to this effect, however, it is possible to argue that drug criminalization actually increases drug abuse in underprivileged communities. The basis for such an argument is that criminalization causes the growth of a lucrative illicit drug market where criminal gangs will fight for market access and thereby cause violence to many communities. Children growing up in communities marred by gang violence are at risk for being traumatized by seeing friends and family members get hurt or killed, or from being hurt themselves, and people with childhood trauma are at risk for drug use disorder in adolescence or adulthood. Furthermore, when criminal groups gain wealth from controlling the profitable illicit drug trade, they also gain power to affect communities beyond serving as drug suppliers. A community under mafia dominion will probably see increased unemployment and social misery, and unhappy people are at increased risk for drug use disorder. There may also be an effect on the extent of drug use caused by criminal entrepreneurship: adolescents in mafia-controlled communities may have few career prospects outside the mafia organization, and whatever entrepreneurial talents they possess are more likely to be channeled into criminal activity. By finding clever new ways to market and distribute illicit drugs, such entrepreneurs probably contribute to increased drug use. From the perspective of drug-supplying criminal gangs, furthermore, drug use disorder is more profitable than moderate drug use, since people characterized by the former are more frequent customers.

While this is not the place for an in-depth analysis of the costs and benefits of drug criminalization, the above sketch has at least pointed to a range of social mechanisms whereby drug criminalization can contribute to increased drug abuse. In sum, the hypothesis here being presented is that drug criminalization alters the composition of the group of drug users by removing users at low risk for drug use disorder and adding users at high risk for such disorder. After criminalization, therefore, a society will tend to see a higher proportion of non-moderate drug use among its drug users, because people at low risk for drug abuse are more likely to be deterred by criminalization than people at high risk for drug abuse.

If this argument is correct, the health risks associated with illicit drug use are probably overstated since these analyses have generally been based on societies that criminalize the relevant drugs. This would imply that harms associated with drug use should decrease after decriminalization, for which there is some support in recent research. After cannabis decriminalization in the United States, Williams et al. (2017) and Mauro et al. (2019) found a significant increase in past-month cannabis use, but not a significant increase in cannabis use disorder. Similarly, Compton et al. (2016) found no increase in cannabis use disorder between 2002 and 2014, and the United Nations Office on Drugs and Crime (2019) reported that while cannabis use increased in the United States in the period 2002–2017, the number of cannabis use disorders remained stable or declined (among those aged 12–17, cannabis use disorder was nearly halved). A study on the impact of state-level policy liberalism on
cannabis use and use disorder found that liberal states had higher use, but lower prevalence of use disorder among users (Philbin et al., 2019).

We can understand the effect from criminalization as a selection effect, but at the societal level rather than the level of the individual study. Under a criminalization regime, the group of people who use drugs will include a higher proportion of individuals who live troubled lives, and since troubled people are at risk for drug use disorder, the harms associated with drug use will therefore appear to be greater. While it is not presently possible to estimate the magnitude of this putative effect, it seems likely that some of the health risk identified for drug use is actually a consequence of the drug criminalization regime itself.

It may be objected to the discussion in this section that several points have been made on a basis of conjecture. There is not much empirical research into the issue of how criminalization affects different patterns of drug use, and my suggestion that a drug criminalization policy changes the composition of the drug user population by removing light and moderate users while adding heavy users is not in any meaningful sense a proven fact. I would contend, however, that since this point is intended to serve as a methodological objection to other studies indicating harms from drug use, it is not my responsibility to prove the point so much as these other researchers’ responsibility to disprove it. As the case stands at present, I have presented grounds for the reasonable suspicion that findings about health harms from illicit drug use have been unduly affected by the fact that these drugs are criminalized, which seems likely to change the composition of the drug-using population in the direction of the types of people who are at risk for ending up in patterns of drug abuse.

1.4 Other aspects of psychedelics use

As established above, there are now extensive research literatures on the psychotherapeutic applications especially of classic psychedelics and MDMA, and on the associations with psychopathology especially for cannabis use. Both of these research programs build on growing neuropsychopharmacological insights into how these drugs affect the functioning – and perhaps the structure – of the brain, the literature on which was also briefly reviewed above. Beyond these strands of medical and neuroscientific research, there are also several smaller literatures on other aspects of psychedelic drug use.

The most established of these research literatures relate to the apparent capacity of psychedelics to induce spiritual or mystical-type experiences. This research goes back at least to Pahnke (1966, 1969) and has continued up to the present day (Griffiths et al., 2006, 2008, 2011, 2019; Johnstad, 2018a, 2020b, 2021b, 2021c; Lerner & Lyvers, 2006; Lyvers & Meester, 2012; Shanon, 2010; Strassman, 2001; Timmermann et al., 2018; Yaden et al., 2017). Psychedelics have also been found to produce enhancement effects both acutely and over the long term on a variety of measures. Kiraga et al. (2021) found enhancement of subjective well-being, decentering, and the ability to recognize emotions in others after a single ayahuasca session, while Mason et al. (2021) found that psilocybin enhanced creative cognition. A review by Jungaberle et al. (2018) identified general psychedelics use to be associated with enhancement of “mood, well-being, prosocial behaviours, empathy, cognitive flexibility, creativity, personality factors like openness, value orientations, nature-relatedness, spirituality, self-transcendence and mindfulness-related capabilities” (p. 179).

Related to the several of the above-mentioned research interests is the fairly well-developed literature on associations between psychedelics use and personality structure (Bouso et al., 2012, 2015, 2018; Erritzoe et al., 2018; Griffiths et al., 2018; MacLean et al, 2011; Nour et al., 2017; Schmid & Liechti, 2018; Studerus et al., 2012). However, I review this literature in my related article (Johnstad, 2021e; included in this dissertation) and discuss my findings in context of it; as such, I see no reason to repeat such a review here. Similarly, I also review the smaller literatures on challenging
psychedelic experiences (Barrett et al., 2016; Carbonaro et al., 2016; Lucas, 2005; Ona, 2018; Studerus et al., 2012), on the connections with parapsychological phenomena (Luke, 2012, 2015), and on the capacity of psychedelic drugs to dissolve the user’s sense of a separate ego or self (Grof, 1976; Lebedev et al., 2016; Millière et al., 2018; Nour et al., 2016), in my related articles (respectively, Johnstad, 2021a, 2020c, 2021d; all included in this dissertation).

However, the literature on psychedelic microdosing has grown substantially in recent years, and the review performed in my article on the subject (Johnstad, 2018b; included in this dissertation) is now out of date. Early explorative studies of microdosing practices include Andersson and Kjellgren’s (2019) analysis of self-disclosure reports in YouTube videos, which found that LSD and psilocybin were used for therapy and enhancement, providing (user-perceived) beneficial effects especially for depression. Based on 278 qualitative reports, Anderson, Petranker, Christopher et al. (2019) developed a codebook of microdosing benefits and challenges, finding evidence of both beneficial and challenging outcomes. The most noteworthy benefits included improved mood (26.6%) and focus (14.8%), while challenges included physiological discomfort (18.0%) and increased anxiety (6.7%). Furthermore, in a survey of 909 included respondents, Anderson, Petranker, Rosenbaum et al. (2019) found that microdosers scored lower on dysfunctional attitudes and negative emotionality and higher on wisdom, open-mindedness, and creativity than controls. A survey by Hutten et al. (2019) of 1,116 respondents found that performance enhancement, mood enhancement, and symptom relief were the main motivations for psychedelic microdosing, but about 20% experienced acute physical or psychological side effects that often caused respondents to discontinue the practice. Polito and Stevenson’s (2019) systematic six-week observational study of 98 microdosing participants found evidence of reductions in depression and stress, but cautioned against possible impact from expectancy bias. Cross-sectional data from 4,050 microdosers and 4,653 controls in a study by Rootman et al. (2021) for their part indicate that motivations for psychedelic microdosing relate to either enhancement or therapy and tend to result in lower levels of anxiety and depression. Supporting the caution against the impact from expectancy effects, the few placebo-controlled studies of microdosing that have been performed have generally failed to obtain significant results. Yanakieva et al. (2019) investigated the effects of LSD microdoses on time perception in 48 healthy participants, finding no robust impact, while Bershad et al. (2019) studied acute subjective and behavioral effects in 20 healthy volunteers, finding only minor effects on measures of mood and cognition. Similarly, Family et al. (2020) found that microdoses of LSD were well tolerated in 48 healthy volunteers, but did not affect measures of cognition. Finally, Kuypers et al. (2021) did not demonstrate LSD effects on creative thinking in 24 healthy volunteers in a placebo-controlled setting. Since the effects from very small doses are necessarily subtle, it is possible that these studies were underpowered, however, and Yanakieva et al.’s (2019) null finding with regard to time perception is unsurprising since psychedelic microdosing has not previously been found to affect time perception. Nevertheless, it is true to say that researchers have not been successful in identifying an effect from psychedelic microdosing under placebo-controlled conditions.

An early review of research into psychedelic microdosing found that explorative studies converged on identifying improvements in mood, focus, and creativity, but emphasized the methodological limitations inherent to these preliminary studies (Bornemann, 2020). More recent studies have supported the notion that an expectancy effect may affect the subjective benefits of microdosing (Kaertner et al., 2021; van Elk et al., 2021). Psychedelic microdosing is probably best understood in the context of enhancement drug use (Liokaftos, 2021), and its study may be subject to a similar range of methodological challenges: outcome variables related to mood and cognition are (arguably) conceptually nebulous, may be constantly changing, and are hard to measure with precision, the putative enhancement effect is (at best) subtle and therefore hard to identify, and there is a large field of potential confounding variables that may also be hard to measure with precision.
In light of the above reviews of research on psychedelic drugs and their potential for healing or harm, it is instructive to examine the ‘curveball’ trajectory in academic standing these drugs have followed in further detail. This assessment will provide perspectives on how academic endeavors may be affected by broader societal trends, which is interesting in a philosophy of science perspective.

The starting observation is that psychedelics have gone through major revisions in academic standing that do not always seem related to the empirical evidence base. On the question of therapeutic value, psychedelics went from being regarded as very promising in the 1950s and 60s to being largely dismissed or ignored in the 1980s and 90s, before going back to being regarded as very promising in the 2000s and 2010s. In the early 20s, with final results from phase 3 trials involving both psilocybin and MDMA expected soon, we find ourselves (probably) facing an era when psychedelic-assisted psychotherapy is no longer just promising, but an established practice. With such a convoluted path towards what now seems to be their likely acceptance as psychotherapeutic medicines, it is clear that the conventional wisdom about these drugs has been substantially wrong at least at one stage along the way.

Is it conceivable that the period of being substantially wrong is today? While it remains possible that some of the tantalizing but tentative findings reviewed above will eventually disappear in larger trials, I believe the overall assessment of therapeutic value is no longer in serious doubt. As the review in Section 1.2 indicated, there is now a large literature of recent studies identifying therapeutic effect from psychedelics, and this literature has largely corroborated more tentative findings in the pre-prohibition literature from the 1950s and 60s, which is also large. Furthermore, the latest information from MAPS is that their first Phase 3 study for MDMA-assisted psychotherapy for PTSD is statistically significant, and that they are on track to submit final applications to regulatory authorities in the USA, Canada, and Israel (Doblin, 2020; Mitchell et al., 2021).

In the following discussion, therefore, I will work from the (reasonable) assumption that the dismissal of the therapeutic value of psychedelic drugs in the 1980s and 90s was the substantial mistake in the conventional wisdom about these drugs. One expression of the prevalent attitude during these decades was Shorter’s (1997) two-sentence treatment of psychedelic therapy in his work on the history of psychiatry that dismissed the whole approach as clinically worthless, as discussed above. While such sentiments seem outdated in light of recent research, they remain surprisingly persistent among some contemporary observers who are otherwise in good academic standing, and it seems pertinent to engage with these opinions more closely in order to better understand their characteristics and etiology, as it were.

As a contemporary exemplar of this strangely persistent attitude of dismissal towards psychedelic therapy, I have picked a recent opinion piece in the popular news media entitled, in my translation, “Why insist that illicit drugs have therapeutic effects?” The piece was written by Bramness (2019), who works as a senior researcher in the Department of Alcohol, Tobacco and Drugs at the Norwegian Institute of Public Health. Before we attempt to understand Bramness’ text and the sentiment it exemplifies in a broader context, I will engage with what I identify as Bramness’ main points in some detail.

His first such point was that even a generous reading of the research literature must conclude that the therapeutic effect from illicit drugs is quite limited (Bramness, 2019, para. 4). To this declaration it might be objected that Krebs and Johansen’s (2012) meta-analysis of pre-prohibition research on LSD for alcoholism found that the effect from a single dose of LSD had a stronger effect than that from daily administration of the commonly used naltrexone, acamprosate or disulfiram. Carhart-Harris et al. (2018) for their part reported “marked reductions in depressive symptoms” (p. 399) after clinical administrations of psilocybin, and Johnson et al. (2014) observed rates of cessation in cigarette smoking after psilocybin treatment that “substantially exceeds rates commonly reported
for other behavioral and/or pharmacological therapies” (p. 983). Similarly, Mithoefer et al. (2018) reported large effect sizes for MDMA-assisted therapy for PTSD, and Bogenschutz et al. (2015) found that the intensity of the effects from psilocybin strongly predicted subsequent change in alcohol consumption. While these findings may be regarded as tentative, they are not indicative of a limited or moderate therapeutic effect. Subsequent research has supported these findings of substantial therapeutic effects, but I am focusing here on findings that would have been available to Bramness when he wrote his text.

To understand the issue in context, we could go back to the classic study by Griffiths et al. (2006) on the association between psilocybin and mystical-type experiences, which found that “67% of the volunteers rated the experience with psilocybin to be either the single most meaningful experience of his or her life or among the top five most meaningful experiences of his or her life” (p. 276). It is easy to agree with the authors that this is a remarkable figure, indicating that participants in the study placed the psilocybin experience in the extremely select company of major life experiences such as getting married or giving birth to a child. (In my own attempt at revisiting this assessment, as reported in the descriptive statistics in Section 4.1 below, I asked participants in the Cannabis and Psychedelics User Survey how meaningful they would rate their most meaningful psychedelic experience, and 71% rated it as the single most meaningful or among the top five most meaningful life experiences). While the study by Griffiths et al. was not therapeutic in nature, it is not difficult to imagine that such a highly meaningful experience might hold transformative capacity for people suffering from depression, alcohol use disorder, or similar conditions. Bramness’ assessment of limited therapeutic effect seems strangely incongruent with my reading of a broad range of recent publications on psychedelic therapy, and it is difficult to believe that we have actually read the same literature.

Bramness nevertheless continued on this path towards a statement that is even less comprehensible: “Many people are convinced that psychedelics and other illicit drugs can be good medicines, but a review of the literature shows that the strong convictions are not reflected in scientific evidence” (para. 6; my translation). Considering the fact that other people have found the present literature on psychedelic therapy indicative of a fast-approaching “psychedelic revolution in psychiatry” (Nutt et al., 2020, p. 24), it is not easy to understand what Bramness meant with this statement. In a generous reading, he can perhaps be understood as saying that although tentative findings are promising, we cannot finally conclude that psychedelics have therapeutic effects until we have the results from broader trials. This is true as far as we understand the final conclusion as implying the integration of psychedelics into the general repertoire of medical practice, but as my earlier reviews have hopefully demonstrated, Bramness was not correct if he meant to say that the proposition that psychedelics have therapeutic value currently has little scientific support.

As a foundation for his skepticism about the therapeutic value of psychedelics and other illicit drugs, Bramness referred to searches he performed in scientific databases that led to thousands of extant publications on the medicinal uses of psychedelics, which to his mind indicated that it is not obvious that more research is needed (para. 9). Instead, he found, we may simply have to accept that these drugs have little therapeutic value. This is a remarkable statement on several levels. First of all, we could observe that even when there are many tentative studies indicating therapeutic effect from a given chemical compound on a given medical condition, contemporary pharmacological approval procedures require replications of tentative findings in larger participant samples. Thus, even when there are many extant studies, more (and larger) studies may still be needed for approval and integration into therapeutic practice. Secondly, it is now hard to avoid the interpretation that Bramness has read the literature on psychedelics in psychotherapy and reached the conclusion that these drugs have little therapeutic effect. With regard to pre-prohibition research, this conclusion would stand in stark contrast with reviews by Rucker et al. (2016, 2018), Passie (2018), Krebs and Johansen (2012), and Nichols (2004, 2016). Nevertheless, it should be noted that pre-prohibition studies were not unanimous in their identification of a therapeutic effect. There may be a number of
reasons for the divergent results, but in some studies the absence of an effect can probably be contributed to poor study design. Rucker et al. (2018) discussed a study by Smart et al. (1966) where patients were tied to the bed before being administered a very large dose of 800 mcg. LSD. This was intended as a safety procedure, but probably also served to make the participant feel powerless and uncomfortable, thus breaking both contemporary and present guidelines for good practices for clinical use of psychedelics (Cohen, 1960; Johnson et al., 2008). (In passing, it should be noted that one of the patients involved in pre-prohibition psychedelic therapy at Modum Bad in Norway who later complained of enduring psychological problems resulting from this therapy was also allegedly held in bed with force (Johnstad, 2020a).) Furthermore, lingering methodological concerns about the pre-prohibition literature on psychedelic therapy has sometimes led to the assessment that this research was generally inconclusive (Mangini, 1998). However, if such concerns are regarded as sufficient to set positive research findings in doubt, this is a reason to ask for more research, not less.

With regard to psychedelics research after the year 2000, furthermore, I am not aware that anyone has voiced serious methodological concerns, guidelines for good practices appear to have been scrupulously adhered to, and published results are, as far as I can determine, unanimously positive. Perhaps Bramness found this unanimity suspect, but unless he had access to an entirely different range of publications than those I have discussed in my above revoiew, his conclusion that the research literature clearly indicates that psychedelics have no therapeutic value – so clearly, in fact, that further research is probably unnecessary – is not only wrong, but so far off the mark that it is hard to imagine what it might be based on.

As a general reply to Bramness’ question of why people believe that illicit drugs have therapeutic effects, we can state the following on behalf of the psychedelic group of drugs:

1. Psychedelics have a history of religious use dating back several millennia and spanning the globe, with the healing of various afflictions being a major reason for use (e.g., Devereux, 2008; Dobkin de Rios, 1990; Fuller, 2000; review in Johnstad, 2016).
2. People who use psychedelics in nonmedical settings in the modern western world often cite their therapeutic value as an important reason for use (e.g., Carhart-Harris & Nutt, 2010; Johnstad, 2015, 2018a, 2018b).
3. Pre-prohibition clinical research going back to the 1950s, 60s, and 70s identified therapeutic effect from clinical administrations of psychedelics on a number of medical conditions (e.g., Johnstad, 2020a; Krebs and Johansen, 2012; Passie, 2018; Rucker et al., 2016, 2018).
4. A broad range of tentative clinical studies over the past two decades have identified therapeutic effect from administrations of psychedelics on several medical conditions (see reviews above).
5. Phase 3 clinical trials for MDMA-assisted therapy for the treatment of PTSD have reported partial positive results (Mitchell et al., 2021).

It is true that only items 4 and 5 have a formal role in securing approval from regulatory authorities, and the process currently awaits the completion of ongoing Phase 3 trials (and the possible completion of similar trials for other psychedelics and/or medical conditions). Nevertheless, I believe it should be clear that there is good reason, on several different levels, to posit that psychedelics may have therapeutic effect, and that their efficacy as therapeutic agents may be considerable.

Like Shorter (1997) before him, Bramness (2019) was therefore wrong, and even spectacularly wrong, in dismissing the therapeutic value of psychedelics. The fact that people make mistakes is not in itself especially interesting, but what makes these two mistaken assessments worthy of further analysis is that, in my judgment, they are not simply individual errors. Instead, I would see these two erroneous statements as giving expression to an underlying fallacy that has been widely shared among members of the academy, while at the same time having a very tenuous connection to the actual findings from empirical research.
How could Shorter and Bramness dismiss the therapeutic value of psychedelics in defiance of a whole literature of positive results? The only plausible explanation I can see is that they read this literature primarily through the lens of the consensus view that formed on the subject of psychedelic therapy during the 1970s and 80s. Instead of reading individual publications on the matter for themselves, they seem to have relied on an indirect reading that allowed the prevailing academic view to summarize the literature on their behalf. In an academic world overflowing with information, such an indirect reading is probably how academics often approach various fields and subfields that they have not specialized in, so as to avoid being overwhelmed by the ever-increasing glut of publications. Thus, in my reading of the situation, Shorter and Bramness understood their dismissive statements to be in conformity with the prevailing academic view, and did not feel a need to question the verity of this view; consequently, they did not see a need for reading (much of) the literature for themselves, because they believed they already knew its merits and demerits via the consensus opinion of it. In other words, they perceived the prevailing academic view as being so clear on the matter that further scientific or intellectual support was unnecessary. For Shorter in the 1990s, this understanding of the prevailing view was quite correct, whereas Bramness by 2019 seemed strangely stuck in the past.

Perhaps there are other explanations. The bottom line, in any case, is that Shorter and Bramness perceived themselves to be in position to pass negative judgment on the value of psychedelic therapy without actually engaging with an entire literature that, on the whole, served to contradict their views. To understand this social dynamic and its impact on research with psychedelics, I will employ or appropriate parts of Kuhn’s (1970) work on scientific paradigms. In what he called its sociological sense, Kuhn understood a paradigm to represent “the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community” (p. 175). Especially in the postscript to the second edition, he emphasized the importance of values in guiding scientific judgment, and particularly so when the community faces a crisis of conflicting paradigms.

In the history of psychedelics research, the only major crisis to occur related to the prohibition of psychedelics use in the early 1970s, with the passing of the United Nations’ Convention on Psychotropic Substances and the listing of psychedelics as Schedule I controlled substances in the United States. By law, psychedelics were now officially regarded as having high abuse potential and no accepted medical use. As we have seen in the above reviews, these assessments were not exactly aligned with findings from the relevant research, but it is also true to say that studies with psychedelics sometimes reached divergent conclusions, and as research methodologies in general were refined over subsequent decades, some methodological weaknesses in the pre-prohibition studies were identified.

A researcher wanting to study the therapeutic potential of psychedelic drugs in the 1980s and 90s therefore faced almost insurmountable obstacles, not only because prohibition had made it very difficult to get approval for studies aiming to expand upon the insights gained in the 60s and 70s (Strassman, 1991), but also because the prospect of securing funding for studies into the (putative) positive aspects of a class of drugs that had been thoroughly demonized by governmental information (or “information”) campaigns over a period of many years might have appeared less than promising. Consequently, when Shorter wrote his history of psychiatry in the mid-1990s, there was in fact (almost) no contemporary clinical use of psychedelics. From a perspective of researchers working in other fields, with no particular knowledge into psychedelics research, the situation could thus be summed up by the following three factors: i) there was a range of (arguably) inconclusive pre-prohibition psychedelic studies with divergent findings; ii) the law states that psychedelics have no medical value; and iii) there is an almost complete lack of contemporary psychedelics studies. It is not difficult to understand that many psychologists and psychiatrists from this era ended up with the belief that psychedelics have been proven medically worthless and represent a dead end.
Adapting Kuhn’s terminology to our purposes, we can say that during the 1980s and 90s, a paradigm for psychedelics research formed around these lines. Its basis was the negative value judgment on illicit drugs, among which the psychedelics now belonged, coupled with the belief that such drugs were so harmful that any positive aspects of their use that may be identified would be entirely overwhelmed by their massive harm potential, and were therefore not worth identifying. From this basis followed values and beliefs related to the validity of pre-prohibition research. Importantly, these beliefs and values did not originally spring out from the academic community itself, but were introduced by political authorities; their authority rested not on empirical science, but on laws and social norms. By guiding researchers away from further investigations of psychedelics through strict approval mechanisms and guidelines for funding, they nevertheless succeeded in creating new realities on the academic ground. Over the years, partly as a response to this new reality on the ground, the academic community seems to have internalized these beliefs and values almost entirely.

Thus, we can understand Shorter’s (1997) summary dismissal of psychedelic therapy as giving expression to a social reality guided by beliefs and values with the force of a paradigm. At his time of writing, almost nothing had been added to the literature on clinical psychedelics research for the past decade, and he probably did not feel the need to revisit the older literature before commenting upon it, because his assessment was entirely in line with the prevailing view. With Bramness (2019), the situation is somewhat more complex, because at his time of writing there was more than a decade’s worth of new clinical psychedelics studies showing a broad range of positive effects, and it is therefore hard to understand how he could maintain his dismissive attitude. However, Kuhn (1970) can at least point us towards an explanation. If we see the post-Nixonian system of beliefs and values about the clinical use of psychedelics as one scientific paradigm and the ‘psychedelic revolution’ of the 2010s as an upstart paradigmatic competitor, this will help us understand the resistance to the new paradigm among the adherents to the old. For Kuhn, the act of converting from one paradigm to another was not a simple matter of judging the merits and demerits of new empirical data, but something much deeper and more personal that should be understood as akin to a religious conversion, and especially so for people who have worked and prospered for many years under the old paradigm:

The transfer of allegiance from paradigm to paradigm is a conversion experience that cannot be forced. Lifelong resistance, particularly from those whose productive careers have committed them to an older tradition of normal science, is not a violation of scientific standards but an index to the nature of scientific research itself (p. 151).

Kuhn, therefore, can help us understand not only Shorter’s position in the mid-1990s, working under the newly formed and hitherto unchallenged paradigm of his era, but also Bramness’ position in the late 2010s, resisting the new paradigmatic contender with assurances from a bygone age. Kuhn’s theory of scientific paradigms and revolutions affords us with a widened perspective on the ‘curveball’ trajectory of psychedelics research, allowing us a better view of how the academic community was directed by political forces into a self-reinforcing embrace of beliefs and values that were actually, but often unnoticeably, in a state of deep tension with the empirical findings produced by the academic community itself. This is ironic, because Kuhn (1970) himself, who drew most of his examples from the discipline of physics, emphasized “the insulation of the scientific community from society” (p. 164), and what we are seeing here is, of course, the opposite. We should also note that Kuhn did not regard the lifelong resistance to new paradigmatic contenders as a violation of scientific standards, but rather as a dynamic that is to be expected and which is, therefore, condonable.
This was not the first time the community of psychologists and psychiatrists has ended up, partly as directed by broader social and political forces, in positions lacking in empirical support. The development of the field of eugenics in the first half of the 20th century (e.g., Sfera, 2013) is one unfortunate example, as is the practice of diagnosing homosexuals as sexual deviants, which continued well into the second half of that century (e.g., Carr & Spandler, 2019). The issue I first want to pursue further here, though, is a less settled and therefore perhaps more controversial one, namely the academic stature of parapsychological research. This relates directly to one of the articles included in this dissertation that presents an interview study of psychedelics users claiming to have experienced various states of telepathy while under the influence particularly of LSD (Johnstad, 2020c).

One textbook I have used to teach my introductory course in psychology for students in upper secondary education briefly reviewed what it called scientific parapsychology before concluding that “[s]cientifically documented evidence for the existence of paranormal abilities and qualities does not seem to exist” (Larsen & Flood, 2010, p. 28; my translation). I understand this to be a generally mainstream assessment, or in other words a statement with a high degree of conformity to the prevailing academic view. As it happens, however, I read up on the literature on parapsychological research into telepathy while preparing my study, and was confronted with the fact that there exists not only a broad range of individual studies indicating telepathic effects, but also a number of meta-analyses supporting this conclusion (Bem & Honorton, 1994; Storm et al., 2010; Williams, 2011). However, there is also at least one published meta-analysis that failed to find a significant effect (Milton & Wiseman, 1999), and plenty of criticism, methodological or otherwise, passed back and forth between the parapsychologists and their opponents (e.g., Alcock, 2003; Hyman, 2010; Storm & Ertel, 2001).

While the issue is clearly not resolved, it is hard to escape the impression that there is substantial empirical evidence supporting the parapsychologist position that telepathy is a real effect. According to a recent review by one parapsychologist, “[t]he evidence for psi is comparable to that for established phenomena in psychology and other disciplines” (Cardeña, 2018, p. 663). It may also be worthwhile to note that several of these parapsychological publications have appeared in prominent mainstream journals such as the Psychological Bulletin (Bem & Honorton, 1994; Storm et al., 2010) and the American Psychologist (Cardeña, 2018), which would seem to render it difficult to dismiss them out of hand as marginal, methodologically frivolous works.

On the other hand, it is perhaps understandable that some observers might require a higher evidential burden for parapsychological phenomena than for more mainstream psychological phenomena. Arguably, the intellectual stakes could not be higher, since it has been contended that no strictly mechanistic theory (in a physicalist or materialist sense) can possibly explain the semantic properties of telepathic communication (Braude, 1978). Thus, as far as Braude’s argumentation is valid, the acceptance of telepathic phenomena would entail the demise of the materialist position that understands physical matter as the only fundamental reality.

Such high intellectual stakes may explain why some commentators, including Larsen and Flood (2010) above, have preferred to sum up the state of parapsychological research without engaging with the apparently substantial amount of empirical evidence speaking in its favor. We can understand the materialist position as constituting a higher-order paradigm of academic thought (call it perhaps a meta-paradigm or an umbrella paradigm), and see the dismissive attitude towards parapsychological research as stemming from the fact that this literature is positioned outside the perimeter of the paradigm. This adaptation of Kuhn’s terminology is admittedly not in particular conformity with his original use of it, but it may help us to understand the strong emotions involved: by describing the movement between paradigms – and, by implication, the adherence to a paradigm – in religious terms, Kuhn reminded us that there are very strong psychological forces at play here. Thus, with Kuhn in mind it is perhaps less surprising that when academics are presented with
counter-paradigmatic research findings – in other words, findings whose acceptance would threaten the paradigm under which we work and thrive – we tend to respond with something not unlike a defense mechanism that will allow us to ignore these results. The dismissive attitude characterizing Larsen and Flood’s summary echoes that previously seen in Shorter and Bramness, all of whom pass judgment on a phenomenon without actually taking notice of the research literature related to this phenomenon. If the phenomenon in question were mainstream, or in other words placed inside the paradigmatic perimeter, such judgment without a hearing would be unacceptable and unacademic, but when the phenomenon is counter-paradigmatic, these rules of engagement seem not to apply.

In the case of telepathy and other parapsychological phenomena, it is possible that the skeptics will eventually prevail – and not because they have overpowered the parapsychologists with institutional might and funding restrictions, but because the evidence for paranormal phenomena eventually dries out. My own study, which simply recounts and analyzes unverifiable narratives from people who claim to have experienced telepathy, provides no substantial evidence for the phenomenon, since it is possible that the respondents were confused, deluded, psychotic, or lying, among other things. However, I did perceive them as being truthful and sincere, and their communication did not generally resemble that of the patients I worked with for twelve years as an assistant in a psychosis ward. Furthermore, I find it hard to escape the fact that the world of psychedelic trip reports is full of telepathic experiences, and some people seem to treat such experiences almost like routine phenomena (e.g., Heinrich, 2002; Pendell, 2010). On the other hand, these respondents were literally on acid (that is, LSD, which seems to be the most common psychedelic drug involved in telepathic experiences), which fact is perhaps sufficient for some people to dismiss their reports as unreliable. Then again, as per the above discussion, it is to be expected that academics will readily embrace anything that allows them to discredit and ignore counter-paradigmatic evidence.

Whichever way this issue eventually plays out, the important thing to note is that there is more uncertainty about it than what dismissive statements such as that by Larsen and Flood allow for. The possibility that they may turn out to be right about paranormal phenomena in an overall sense does not justify having disregarded evidence to the contrary along the way. If I declare that I am absolutely certain that it will rain on a certain location next Wednesday, my declaration is not justified by the simple fact that it turns out to rain that day: I must also explain why I was so certain about my prediction that I could completely disregard the possibility that it might not rain. As far as I can ascertain, there is currently substantial evidence for the existence of telepathy and similar phenomena, and it will not do to pretend otherwise.

Obviously, no resolution will be obtained here. To me, at least, this analysis and discussion is of interest no matter where the chips may fall with regard to parapsychological phenomena, because I believe we should be more aware of how we tend to respond, as academics and scientists, to phenomena that challenge our belief systems. When it comes to the earlier discussion about the merits of psychedelic therapy, I believe the issue is much closer to a resolution, and the possibility that we can return to the old understanding of psychedelic drugs as therapeutically worthless seems very small. Of course, the lesson from the almost-certainly unjustified dismissal of psychedelic therapy is not that every other case of academic dismissal is similarly unjustified, although it does remind us that we should take the time to read the literature before we pass judgment.

To approach a conclusion, I believe that the issues discussed in this section share a common thread in that academicians’ allegiance to belief systems was given priority over the critical engagement with the relevant research literature. With regard to the field of eugenics, it is clear that in the early 20th century, the idea of white superiority was popular throughout the western world, and influenced some psychologists and psychiatrists into the kind of intellectual work that today seems regrettable and devoid of empirical support. However, it might very well have been possible at the time to produce empirical data that appeared to support the idea of white superiority, for instance by performing comparative IQ tests on white and non-white populations. This was an age when many
non-white people languished under suppressive colonial regimes and institutionalized racial segregation, and this political reality obviously entailed that many were not given the opportunity to develop their cognitive potential, causing them to underperform for instance on IQ tests. From today’s perspective, however, it is easy to recognize that the resulting (putative) appearance of white cognitive superiority did not spring out from any inherent racial superiority as such, but was rather a consequence of racist suppression, which was itself a consequence of the idea of white superiority. The idea created a reality in its image.

Similarly, there was widespread prejudice against homosexuals throughout the 20th century, and psychologists and psychiatrists generally deferred to this prejudice and participated in labeling homosexuals as deviants suffering from a mental disorder. It is quite possible that homosexuals were actually at extra risk for mental health complications during much of this period, but not because homosexuality is by itself related to or embedded in such disorder. Instead, we can easily understand today that living under the yoke of prejudice and social condemnation might wreak havoc on people’s mental health. Homophobia (probably) created a reality of mental disorder among homosexuals.

I believe that this trend of prejudiced ideas creating a reality in their image holds also for illicit drug use. As discussed earlier, some of the psychopathology that has been associated with drug use in empirical studies may not be inherent to drug use in and of itself, but is rather a consequence of the criminalization of drug use in our societies. Admittedly, the picture here is somewhat more opaque, since some patterns of drug use are clearly, in and of themselves, detrimental to health, whereas the same cannot be said for some forms of homosexuality. (It is perhaps possible to be addicted to sexual activity in a way that is generally harmful to one’s health, but this is as true for heterosexuals as it may be for homosexuals.) Nevertheless, I believe that much empirical science into the consequences of illicit drug use is blindsided by the fact that such drug use is criminalized and stigmatized in our societies, and attempts to compensate for these effects through measures of statistical control obtained from demographic and socioeconomic variables are, in the fundamental sense, as futile as trying to control for racism and homophobia in the 1930s. When an idea or social practice is so widespread that it effectively permeates a whole society, it is not possible to delineate and quantify its impact and calculate what things would look like without this idea or practice: when it is everywhere, there is nowhere else to stand. Only if (or when) the western world moves towards some form for drug decriminalization, so that users of presently illicit drugs are no longer stigmatized to the same extent, will it be possible to identify how much of the association between drug use and psychopathology was actually caused by the criminalization regime itself.

I have argued in this section that the acceptance of a scientific hypothesis among the academic community is not always closely related to the research literature related to this hypothesis. When the hypothesis is in line with a generally accepted system of beliefs, such as the beliefs about white superiority or the depravity of homosexuality in the first half of the 20th century, it tends to see a higher level of academic acceptance than what would be merited by the empirical evidence speaking in its favor. On the other hand, when the hypothesis is in tension with a generally accepted system of beliefs, as has been and to some extent remains the case for psychedelic therapy and parapsychological phenomena, it tends to see a lower level of academic acceptance than what would be merited by the evidence speaking in its favor. Presented in such terms, this impact from the broader social realities on matters of academic standing will probably surprise no one, and yet I believe that its explication specifically for the issues at hand serves as a useful reminder about the power dynamics at work. The scientific endeavor is not simply a matter of following the data wherever they lead, but also a matter of being guided, often invisibly, by shared beliefs and values that have the potential to carry us into empirically unsupported territory and leave us covered in mud.
3 Methods

This section discusses methodological issues pertaining to the studies that the articles in this dissertation are based on. Of course, each of these articles includes its own discussion of methodological approaches and dilemmas, often with considerable overlap since the articles are based on the same studies, and I see no reason to repeat most of this information here. Nevertheless, I have included an overview of the measures used in the Cannabis and Psychedelics User Survey, although much of this information is already available in the articles presenting analyses of this survey data. The discussion in this section also includes a review of the extent to which my statistical analyses conform to the assumptions underlying such analyses, and a discussion of relevant ethical issues. It should be emphasized that the studies included in this dissertation had an explorative approach, their main purpose being to make a foray into a generally uncharted (or at least not well characterized) terrain. Consequently, all findings should be regarded as tentative until confirmed by future research.

A brief overview of the methods used in the studies included in this dissertation is as follows. Interviews were conducted anonymously in several stages from 2014 to 2019 via email or instant messaging (see Appendices B and C for the Participation consent form and Interview guide). Interview data was subsequently categorized into subject topics and various themes within such topics, and themes identified as important were reported in publications. The basis for designating importance or relevance to a particular theme was usually the frequency of its occurrence, but it would sometimes also happen that I regarded a theme as important even when it was very uncommon. The single (respondent-assessed) psychotic episode reported in Johnstad (2021a) is an example of such a rare but important theme. Survey data was for its part collected anonymously during the spring and summer of 2019 via SurveyXact. The survey questionnaire (available in Appendix D) was designed based on information previously gained from interviews, and recruitment posts were published on a variety of internet communities related to psychedelics use. Participants were obtained from seven communities: www.shroomery.org, www.dmt-nexus.me, www.bluelight.org, the Facebook page for Portland Psychedelic Society, the Reddit group r/Psychedelics, the Association for Safer Drug Policy (ASDP), and an informal group of psychedelics users in Bergen, Norway, reached via a snowballing e-mail invitation. Data was subsequently analyzed with IBM SPSS Statistics 25.

3.1 Measures

The Cannabis and Psychedelics User Survey included basic demographic questions relating to age, gender, education, work status, relationship status, and current geographical location. Gender was measured with three categories (female, male, and other), but when the gender variable has been used as a control in multiple regression analyses, participants that indicated a third gender \( (N = 7) \) were excluded. Education was quantified from 1 = “Have not completed high school” to 6 = “PhD”. In order to allow for overlapping activities, employment status was measured on a range of dichotomous variables (student, unemployed, part-time job, full-time job, pensioner, and other), with 0 indicating non-endorsement and 1 indicating endorsement of such status. Relationship status was measured as a nominal variable with the values single, partner, married, and widow(er). Geographical location was measured as a nominal variable with the values Africa, America (North), America (South), Asia, Europe (East), Europe (West), Middle East, and Oceania. Participants were also asked about their religious or spiritual background and their present religious or spiritual affiliations, as well as their current spiritual practice.

In order to measure the personality of the participants, the survey included a version of Gosling et al.’s (2003) Ten-Item Personality Inventory (TIPI), measured on a five-level Likert scale from “disagree
“strongly” to “agree strongly”. Furthermore, the survey included a version of Nicholson et al.’s (2005) Risk Taking Index (RTI), measured on a five-level scale from “never” to “very often”. See the methods section of Johnstad (2021e) for a more detailed discussion of how these indices were adapted to the Cannabis and Psychedelics User Survey.

Participants were also asked about their present use of nonpsychedelic drugs ranging from coffee, tobacco, and alcohol to cocaine and opiates, as well as their usage history and/or present use of cannabis and the psychedelic drugs of the 2C family (e.g., 2C-B), 5-MeO-DMT, Ayahuasca (or analogues), DMT (smoked), LSD, MDMA, Mescaline/Peyote, Psilocybin/Magic mushrooms, and *Salvia divinorum*. The survey asked participants to choose one psychedelic drug from this list that they had experience with, and they were queried about their motivations for the use of this drug and asked to characterize emotional, cognitive and relational aspects of their experiences with this drug. Motivations and experiential characteristics were measured on a range of dichotomous variables, with 1 indicating endorsement. For an overview of the specific items, see the survey questionnaire in Appendix D. Finally, respondents were asked to characterize the consequences of their use of this drug for their physical health, psychological health, personal happiness, ability to get along with other people, and spiritual practice. For those respondents who had experience with cannabis (95% of the sample), the same range of questions were asked about motivations and experiential characteristics for this drug.

Usage patterns for cannabis and psychedelic were measured with three variables quantifying usage frequency over the previous 12 months (from 0 to 101+ occasions), social environment (1 = “Alone”, 2 = “With a single partner”, 3 = “With a small group of close friends”, 4 = “With a group of friends and acquaintances”, 5 = “At a party, night club, concert, festival or other public event”), and the extent of advance planning for psychedelic sessions (from 1 = “One day or less” to 5 = “One year”). Finally, respondents were asked to assess the long-term consequences of their use of cannabis and the psychedelic drug they chose for the survey for their physical and psychological health, their personal happiness, their ability to relate to other people, and their spiritual practice. Each item was measured on a five-level Likert scale from “serious worsening” (or similar language) to “serious improvement” (or similar language). For psychedelics, there was also a question about flashback experiences, with the options “No”, “Yes, and they were mainly positive experiences”, and “Yes, and they were mainly negative experiences”.

The range of motivational and experiential characteristics offered for endorsement in the Cannabis and Psychedelics User Survey was based on previous qualitative findings, but must still be regarded as explorative. As far as I know, there have been no previous attempts to measure the characteristics of a general psychedelic experiences (as opposed to a specifically mystical-type or challenging experience), and the dichotomous measurement performed in this survey was intended as an explorative tool. In terms of construct validity, the situation is thus unsettled, and more work is needed to obtain properly validated measurements.

With regard to the qualitative studies that formed the basis for the quantitative survey, I would acknowledge that there is no accepted consensus about how to assess reliability and validity of qualitative research (Noble & Smith, 2015). At any rate, my presentations of these studies have endeavored to acknowledge possible biases in sampling, to ensure the representation of different perspectives, and to include thick verbatim descriptions of participants’ accounts. Interpretations were validated via a procedure of respondent validation that allowed participants to comment upon the use of their data. Finally, data triangulation via the combination of qualitative and quantitative methods supports the overall validity of the findings.
3.2 Assumptions for statistical analyses

Two of the articles in this dissertation (Johnstad, 2021a, 2021e) are based on statistical analyses, and the validity of such analyses rest on certain assumptions about the variables in the data set and the relations between them (Hair et al., 2006; Mulhern & Greer, 2011). In Johnstad (2021a) and in the supplementary or introductory analyses performed in section 4.1 below, paired or independent t-tests were used to provide an overview of the phenomenon under scrutiny. The main statistical analysis performed in Johnstad (2021a) was an ordinal regression, while the analyses in Johnstad (2021e) were logistic regressions. The main purpose behind these exploratory analyses was to obtain an indication of the impact of a given independent variable when controlled for the other variables in the model. Thus, while the characteristics of the overall models in terms especially of the variance they explain are also taken note of, these models were developed not for the purpose of predicting overall responses on the dependent variable, but to test the impact of given independent variables in an environment of statistical control.

The assumptions underlying paired and independent t-tests are that variables are interval or ratio-scaled, that they are approximately normally distributed, and that there is homogeneity of variance; for paired t-tests, the latter criterion is met by default (Mulhern & Greer, 2011). Deviations from the homogeneity assumption for independent t-tests are handled by running analyses without assuming equal variances (SPSS runs analyses both with and without this assumption by default). The two other criteria are somewhat more complicated, however, since a number of the variables included in these analysis were either dichotomous or at the ordinal level. While the inclusion of ordinal variables in parametric tests are not unheard of, it does in principle constitute a break of assumptions. The normality assumption is also challenged by the inclusion of such variables, several of which did deviate somewhat from the normal distribution. As a sensitivity test, therefore, I ran nonparametric tests – Wilcoxon’s W for paired t-tests and Mann-Whitney U for independent t-tests – on the same data. Wilcoxon’s W produced exactly convergent results to those reported from the paired t-test in Table 2 in Johnstad (2021a, p. 9), in the sense that each analysis was significant at the same level. The results from the independent t-tests summarized in Table 5 below (Section 4.1) did also generally converge to the results from the Mann-Whitney U test, although in this case hundreds of tests were performed, and it did occasionally happen that minor discrepancies pushed the p-value up or down a level of significance. Fortunately, as explained in the discussion of these results below, in this case the individual analyses are not particularly important, as the matter of interest is rather the overall picture that emerges when we see the individual exploratory analyses in context of each other.

Logistic regression was used in Johnstad (2021e) to assess the impact of personality structure on characteristics of the psychedelic experience. The assumptions underlying logistic regression include independence of errors, linearity, absence of multicollinearity, and lack of strongly influential outliers (Stoltzfus, 2011). The independence of errors assumption is violated when the data include repeated measures or duplicates, which is not an issue here. With regard to multicollinearity, the highest variance inflation factor for these variables were 1.221, indicating that multicollinearity was not an issue. Linearity between the predictors and the logit (or log odds) was tested with the Box-Tidwell procedure of adding interaction terms between the variable and its natural logarithm to the regression analysis. This procedure returned a significant interaction term for the age variable in the model for the experience of love and for the extraversion variable in the model for the experience of inner visions. Neither of the original variables were significant in the first place, however, so the possibility that they had a non-linear impact does not seem to be a major concern. Residual plots (Figures A1-A8 in Appendix A) indicate some gaps and outliers, and the eight different logistic regressions identified between 1 and 11 cases with studentized residuals greater than 2. This seems to indicate some influence from outliers. Removing these cases from the dataset invariably improved the resulting models, both in terms of explained variance and significance level of individual independent variables. However, there was not substantial overlap between outliers for different
regression models – each model tended to identify a separate and distinct set of outliers – and removing these cases would therefore have reduced the number of cases in the dataset substantially. Since these outliers were clearly not driving the analyses, but were rather reducing effect sizes, and since it is not entirely clear to me when it is legitimate to remove evidence that contradicts one’s hypothesis, the outliers were retained. Finally, as a sensitivity test, the same set of dependent and independent variables was entered into a linear regression model, which produced convergent results with 19 of the original 19 significant variables (Tables 4 and 5 in Johnstad, 2021e, pp. 100–101) remaining significant in the second model.

Ordinal regression was used in Johnstad (2021a) to assess the impact of a range of variables related to personality structure, spiritual practice, and drug use on the number of difficult characteristics in respondents’ most difficult psychedelic experience. Since the dependent variable for this analysis was a construct with a range of 0-9, it would have been acceptable to run this analysis as a linear regression, but in order to identify a possible impact from each different category of the “psychedelic use social environment” variable, an ordinal regression analysis was chosen. According to Liu & Koirala (2012), the key assumption underlying ordinal regression is the proportional odds (or parallel lines) assumption, where the effect of each predictor should be the same across the categories of the dependent variable. In the present case, however, the overall regression model was not of particular interest to the explorative analysis, as the purpose of the analysis was to identify the impact of individual variables while under statistical control of the other variables in the model, and the proportional odds assumption therefore lost much of its relevance. As it happened, SPSS declared that it was unable to perform the test of parallel lines for this ordinal regression model, and thus a violation of the proportional odds assumption could be ruled out. We should therefore be careful in the interpretation of specific effect sizes, since they may potentially vary across different values of the dependent variable. Such variation should not affect its overall level of significance, however, which was the main point of interest for this exploratory analysis of challenging psychedelic experiences. The highest variance inflation factor for these variables were 1.8, indicating that multicollinearity was not an issue. As a sensitivity test, the same set of dependent and independent variables was entered into a linear regression model, which produced generally convergent results, although discrepancies shifted the “gender” and “years of cannabis experience” variables out of significance at the .05 level, and also shifted the “practice: energy work” variable into significance.

It may also be noted here that the explorations of community variation reported in Section 4.1 were post hoc analyses of a large set of variables. Such post hoc analyses are often regarded as unreliable, since a 95% significance threshold will result in a false positive finding in one of twenty cases, possibly resulting in a substantial number of false positives in a study with many variables. Although the presentation focused on differences that could be understood as part of an overall trend involving several variables, the tentative and explorative nature of these community comparisons should be emphasized.

Furthermore, I would like to note that I have not applied Bonferroni corrections to any set of analyses. On principle, I believe such corrections should not be applied to explorative studies, as they can serve to suppress interesting findings that may merit closer investigation. Arguably, the purpose of explorative analyses is to move into a not well-mapped terrain and identify points of possible interest. Further studies will be needed before we can say anything about the features of this terrain with a high level of confidence, but initially we should not (in my view) be very strict in dismissing points of possible interest, since dismissal at an early time will tend to block the road for subsequent analysis. Bonferroni correction essentially means that if we look at many different points of interest, we should increase the strictness with which we dismiss such points by a factor of how many of them we look at. This is appropriate for subsequent analyses that aim to produce insights we can have high confidence in, since the fact of investigating many points of interest at the same time increases the risk of obtaining false positive results. At the time of early exploration, however, we are often
surveying a large stretch of territory in order to produce a sketch indicating its features, and the application of Bonferroni correction is, arguably, overly conservative.

3.3 Ethics

A basic ethical requirement for any kind of research is that its participants should not come to harm. In interview and survey studies of illegal drug use, this could be taken to have a range of different implications, with one obvious point relating to privacy: if the information respondents divulge can later be traced to their person, this could be detrimental for them on a number of levels. One prominent challenge for these studies was, therefore, to maintain the anonymity of the participants. Measures implemented to obstruct the identification of participants are here referred to as anonymization protocols. According to the Norwegian Social Science Data Services (2020), data may be regarded as anonymous when it is free from informational content that might lead to the direct or indirect identification of sources. Direct identification takes place via names, addresses, ID numbers, email addresses and so forth, while indirect identification might occur especially via a combination of information relating to background, geographical location, and narratives about recognizable events.

In order to preserve the anonymity of the participants in interview studies, interviewees were encouraged to construct new email addresses, under pseudonyms, that were used solely for communication relating to the study, or to use anonymized private messaging at specific discussion fora. Furthermore, they were encouraged not to reveal any specific information about their location, background or circumstances that might indirectly reveal their identities. To minimize the chance that participants accidentally revealed de-anonymizing information, the encouragement to speak in general terms was repeated with every question relating to background and life circumstances; in cases where sensitive information was nevertheless transmitted I rewrote their statements in a re-anonymized form for my records and immediately deleted their email (and again deleted it from the trash folder). In accordance with the (Norwegian) guidelines for Internet research from the National Committee for Research Ethics in the Social Sciences and the Humanities (2014), I have not employed any participant pseudonym in published reports, as these are often traceable across a variety of Internet sites. Instead, each respondent has been given a unique ID number. Furthermore, quotations obtained from publicly available discussion threads were rephrased in order to confound Internet search procedures, and the presentation of demographic information about interviewees was delinked from the presentation of narratives. I also organized the presentation of informant narratives according to shared topics and themes, so that the quotations from each interviewee appear as fragments scattered throughout the text. This approach discourages the reader from becoming familiar with any informant, in the sense of being able to see how his or her views and experiences relate to each other. Doing so, at any rate, requires a close reading of the material. The use of ID numbers rather than pseudonyms strengthens this tendency towards fragmentation and anonymization. Thus, the overall effect from this method of presentation is to protect participant anonymity, as a casual reading of the material will fail to divulge any obvious links between narrative fragments that are not recognizable on their own but might be so when juxtaposed. Of course, this approach also carries a cost, since it makes it more difficult for the reader to understand a given statement in the context of other statements from the same individual. Before publication, participants were asked to read through and verify the use of their quotes, and on some occasions, inconsequential details in potentially recognizable narratives were changed to preserve anonymity.

Securing participant privacy was somewhat more straightforward for the Cannabis and Psychedelics User Survey. The survey was conducted via SurveyXact, which has an agreement with the University of Bergen guaranteeing General Data Protection Regulation (GDPR) compliance and participant privacy. The SurveyXact platform allows for fully anonymous surveys that record no identifying participant information, including IP addresses, thus minimizing privacy concerns. It might be noted
that SurveyXact itself has the technical capability to record IP addresses, but their agreement with the University of Bergen specifically prohibits abuse of such information. There are also a few loopholes (or trapdoors) in this system, especially when the number of respondents remains small. In a presentation of average data stratified according to gender, for instance, a small dataset might include only a single respondent with non-binary gender, and the average responses for this gender would therefore be equal to the responses from this individual. When I published descriptive data summaries for different communities, I therefore had to check that these did not inadvertently reveal individual (or small-group) responses.

In combination, these anonymization protocols probably sufficed to provide an acceptable degree of participant privacy at least in the sense of allowing for communication between researcher and participants without the former knowing the identity of the latter. They did not, however, ensure protection from eavesdroppers: email service providers probably know and store the participants’ Internet Protocol (IP) addresses, which can be used to trace their identities, and also have the capability to read emails passing through their servers. To protect one’s identity in this regard might require the use of The Onion Router (Tor) Internet browser and Virtual Private Network (VPN) services for IP scrambling and encryption software for scrambling of email content. I encouraged the use of Tor and published a public encryption key at the website for the initial interview study, but communication at this level of privacy demands a high level of technical competence and was therefore not insisted upon.

The emphasis on anonymity furthermore entailed a number of negative consequences. One practical complication was that the need for special email accounts used only for the purpose of taking part in the study raised the cost of participation, since constructing and maintaining a separate account requires a fair bit of time and effort. The insistence on anonymization therefore probably had a negative effect on recruitment. Another negative consequence was the inability to obtain properly signed informed consent letters. Since a personal signature would compromise privacy, participants were asked to “sign” the letter using only their email address. This approach was presented by Meho (2006) as a useful way of acquiring informed consent for email interviews, and was approved by the Data Protection Official for Research / NSD. It does obviously result in a signature with no juridical validity, but still serves to express the participant’s declaration that they have read and accepted the letter of consent. Furthermore, anonymization made it impossible, both in the interviews and survey, to ensure that minors did not enroll in the study under false pretenses. Segadal (2015) warned that “when obtaining consent online, it might be a challenge to be certain of the actual age of the person granting consent,” (p. 44) and this challenge was exacerbated in this study as participant anonymity at least vis-à-vis the researcher made it impossible to check the identities of interviewees. This opened for the prospect of minors passing off as adults and thus gaining access to a study discussing the use of illegal drugs.

A different kind of ethical complication with the kinds of studies included in this dissertation is that such studies may serve to legitimize illegal drug use. As Alver and Øyen (1997) pointed out, the very act of placing a phenomenon under a scientific or academic lens serves to legitimize and perhaps create an interest for it. A study of drug use in spiritual contexts will entail that the researcher exhibits an interest for a behavior that many regard as being entirely destructive, and this may be perceived as an implicit normative judgment that may reinforce such behavior both among respondents and the general public.

On the other hand, said Alver and Øyen, there may exist a different narrative behind the conventionally accepted one that deserves more attention. If, indeed, the literature reviewed earlier gives a valid view on psychedelic drugs, then we may have to open up to the possibility that they are not exclusively destructive after all. Perhaps the conventional pre-judgment is in fact oversimplified and blind to the nuances and complexities surrounding psychedelics use. That prospect, at any rate,
would seem to legitimize the search for more knowledge about these drugs and their uses even in the face of the abovementioned risks.
4 Overview of findings

In the same way that the textual economy required by the article format does not allow for extended methodological discussions, it also does not allow for extended presentations of general findings, for instance in the form of descriptive statistics. This issue was especially pertinent for the Cannabis and Psychedelics User Survey, which generated much interesting data providing valuable perspectives on psychedelics use that it was not possible to include in any of the articles based on this study. Therefore, the first part of this section presents some descriptive statistics and simple analyses that can serve as a general introduction to the more specific and in-depth analyses presented in the articles based on the survey data. The second part of this section thereupon provides an overview of the articles included in this dissertation and discusses how they relate to each other and to extant published research.

4.1 Introductory statistical analyses

4.1.1 Participant characteristics

The articles that present analyses of the Cannabis and Psychedelics User Survey data started out with an overview of participant characteristics, but had no room for more detailed analyses. However, some aspects of the participant sample deserve a closer look. Since the survey was distributed via a unique link for each community, it was possible to compare the participants from different communities, and these analyses show that there were substantial differences between them. A simple overview of participant characteristics, grouped according to the community they were recruited from, is provided in Table 4, while a summary of explorative analyses of differences between the communities is provided in Table 5. This presentation of community comparisons was based on post hoc analyses, but focused on differences that could be understood as part of an overall trend involving several variables. Furthermore, the number of respondents from some communities was fairly low, and the extent to which these participants were representative of the community they were recruited from is unknown. It should also be noted that these analyses involved a number of ordinal-level variables that were not necessarily very close to a normal distribution. As mentioned in Section 3.3, however, separate analyses with the Mann-Whitney U test were carried out as a sensitivity test and produced generally convergent results.

At any rate, the purpose of these analyses is not to identify specific differences between specific internet communities, which are not in themselves of any particular importance, but rather to gain an overall picture of the extent of variation between different communities. As we can see from Table 4, there was in fact a substantial range of differences between these communities: mean age varied from about 30 to 45 years, and the proportion of female respondents ranged from 3% to 33%. From 29% to 63% of respondents reported being single, and between 50% and 83% were childless. The proportion of respondents who had a Master’s degree ranged from 4% to 41%, and between 29% and 78% reported working a full-time job.

The Shroomery and DMT Nexus were the only traditional Internet discussion fora that yielded substantial numbers of participants. They were also the most geographically widespread communities in the study, with 5% and 16% of their respective participants saying they were located in Africa, Asia, the Middle East, or South America. At the same time, they were also the least diverse communities in gender terms, with 86% and 95% male respondents, respectively. As we can see in Table 5, respondents from the Shroomery unsurprisingly reported higher use of psilocybin, and respondents from DMT Nexus reported higher use of smoked DMT and DMT-containing ayahuasca. The latter group was also more spiritually oriented than the rest, especially in their connection to Buddhism, and they were more likely to be motivated by a wish for spiritual experience and personal
<table>
<thead>
<tr>
<th></th>
<th>The Shroomery (N = 164)</th>
<th>ASDP (N = 51)</th>
<th>DMT Nexus (N = 39)</th>
<th>PPS (N = 30)</th>
<th>Other (N = 35)</th>
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</thead>
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<td>M = 36.3 years (SD = 10.5)</td>
<td>M = 35.0 years (SD = 12.1)</td>
<td>M = 45.0 years (SD = 12.7)</td>
<td>M = 29.7 years (SD = 9.0)</td>
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<td>0% widow(er)</td>
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</table>

Note: *Sums may differ from 100% because of rounding. **Sums to more than 100% because respondents could choose several alternatives. ASDP = Association for Safer Drug Policy. PPS = Portland Psychedelic Society. M = mean. SD = standard deviation."
<table>
<thead>
<tr>
<th></th>
<th>The Shroomery (N = 164)</th>
<th>DMT Nexus (N = 39)</th>
<th>ASDP (N = 51)</th>
<th>PPS (N = 30)</th>
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</thead>
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<tr>
<td>Gender</td>
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<td>More male***</td>
<td>More female*</td>
<td>More female*</td>
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<tr>
<td></td>
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<td>t = 2.1, df = 62</td>
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<td>Older***</td>
</tr>
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<td></td>
<td></td>
<td>t = 5.1, df = 317</td>
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<td>More educated***</td>
<td>More educated*</td>
<td>More educated*</td>
</tr>
<tr>
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<td>t = 4.3, df = 317</td>
<td>t = 2.1, df = 317</td>
<td></td>
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<td></td>
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<td></td>
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<tr>
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<tr>
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<td>High DMT**</td>
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<tr>
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<td>t = 3.0, df = 36</td>
<td></td>
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<tr>
<td>Motivation for</td>
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<td>More</td>
<td>More</td>
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<td>psychedelics use</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>t = 2.3, df = 226</td>
<td></td>
</tr>
<tr>
<td>Social environment</td>
<td>More solitary***</td>
<td></td>
<td>More</td>
<td></td>
</tr>
<tr>
<td>for psychedelics use</td>
<td>t = 3.3, df = 202</td>
<td></td>
<td>connection</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>to nature***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>t = 3.6, df = 33</td>
<td></td>
</tr>
<tr>
<td>Characteristics of</td>
<td>More spiritual***</td>
<td></td>
<td>More connection</td>
<td></td>
</tr>
<tr>
<td>psychedelic</td>
<td>t = 4.8, df = 38</td>
<td></td>
<td>to nature***</td>
<td></td>
</tr>
<tr>
<td>experience</td>
<td></td>
<td></td>
<td>t = 3.6, df = 33</td>
<td></td>
</tr>
<tr>
<td>Assessment of</td>
<td>More health improvement*</td>
<td></td>
<td>More</td>
<td></td>
</tr>
<tr>
<td>psychedelics</td>
<td>t = 2.1, df = 211</td>
<td></td>
<td>meaningful**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>t = 2.8, df = 33</td>
<td></td>
</tr>
</tbody>
</table>

Note: Stars indicate significant difference on the independent t-test between the specific community and the rest of the study sample:
* p < .05, ** p < .01, *** p < .001. 'Other gender (N = 7) excluded. ASDP = Association for Safer Drug Policy. PPS = Portland Psychedelic Society.

In terms of spirituality, this group contrasted with the respondents from the Association for Safer Drug Policy [ASDP], who were the least spiritually oriented group of the sample, and instead more likely to report a connection to secular/humanist perspectives. They were also more educated and more likely to work a full-time job. Finally, respondents from Portland Psychedelic Society [PPS] were older, more female, and somewhat higher educated than the rest of the sample. They were more likely to emphasize a psychedelic experience as one of the most meaningful experiences of their life, and more likely to report an improved connection with nature as characteristic of a typical psychedelic experience.
As mentioned before, these were all explorative post hoc analyses, and we should not place much emphasis on any given finding. What is important, however, is that in sum, these analyses indicate that internet communities of psychedelics users seem to attract quite different people. If this study had recruited from only one such community, it seems clear that findings would have been affected, and perhaps substantially so. The implication for future surveys of psychedelics users is to recruit widely in order to minimize the risk that one’s sample is biased towards a specific type of psychedelics user.

Table 6 shows the participants’ current non-psychedelic drug use. The survey question did not distinguish between medical and non-medical use, and the 4% who used amphetamines or opiates on a daily basis probably included several medical users. This possibility is supported by the relatively low use of alcohol and cocaine among daily amphetamine and opiate users, indicating that the use did not take place in a party context. A minority of participants used stimulants and opiates, for the most part infrequently, in what appeared to be recreational settings. The typical psychedelics user was a daily user of coffee or tea, and used alcohol and tobacco a few times per month, but had no present use of any of the common recreational drugs such as amphetamines, opiates, or cocaine.

4.1.2 Psychedelic usage pattern

Participants were asked to choose one psychedelic drug that they had experience with for the purpose of the questions in the survey. In addition, all participants who had experience with cannabis (95%) were asked the same range of questions about their cannabis experience. The most commonly chosen psychedelic drug was psilocybin (49%), followed by LSD (22%) and DMT (12%). Participants reported a generally moderate usage pattern for their chosen psychedelic drug, with the median participant having had between 1-10 use occasions over the past 12 months (Figure 1). A minority of 7% reported 11-50 use occasions over the last 12 months, indicating a range of use from between once per month to about once per week. Two percent of participants reported use up to twice per week or more. This usage pattern with a median of 1-10 use occasions per year agrees reasonably well with Karlsson & Burns’ (2018) study of psychedelics use in Australia, which identified a median pattern of two use occasions over the past six months. Only 2% of the sample reported more than 50 use occasions over the past year, which supports the low capture rates for psychedelics found by Anthony et al. (1994). The usage pattern of cannabis was quite different, with a median of 51-100 use occasions over the last 12 months and a large minority of 45% reporting 101+ use occasions.

Table 6. Current non-psychedelic drug use.

<table>
<thead>
<tr>
<th></th>
<th>Daily</th>
<th>A few times per week</th>
<th>A few times per month</th>
<th>A few times per year</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>6%</td>
<td>18%</td>
<td>29%</td>
<td>30%</td>
<td>17%</td>
</tr>
<tr>
<td>Amphetamines</td>
<td>4%</td>
<td>2%</td>
<td>5%</td>
<td>16%</td>
<td>73%</td>
</tr>
<tr>
<td>Cocaine</td>
<td>-</td>
<td>1%</td>
<td>3%</td>
<td>20%</td>
<td>78%</td>
</tr>
<tr>
<td>Coffee/tea</td>
<td>62%</td>
<td>15%</td>
<td>11%</td>
<td>5%</td>
<td>7%</td>
</tr>
<tr>
<td>GHB</td>
<td>-</td>
<td>&lt; 1%</td>
<td>&lt; 1%</td>
<td>6%</td>
<td>93%</td>
</tr>
<tr>
<td>Ketamine</td>
<td>-</td>
<td>-</td>
<td>2%</td>
<td>13%</td>
<td>85%</td>
</tr>
<tr>
<td>Nootropics</td>
<td>4%</td>
<td>3%</td>
<td>5%</td>
<td>10%</td>
<td>78%</td>
</tr>
<tr>
<td>Opiates</td>
<td>4%</td>
<td>1%</td>
<td>2%</td>
<td>14%</td>
<td>79%</td>
</tr>
<tr>
<td>Tobacco</td>
<td>30%</td>
<td>5%</td>
<td>6%</td>
<td>10%</td>
<td>48%</td>
</tr>
</tbody>
</table>

Note: N = 279. *Row sums may differ from 100% because of rounding.
Respondents most commonly used psychedelics alone (43%), with a single partner (21%), or with a small group of close friends (27%). The same general tendency held for cannabis use, but with somewhat less solitary use (34%) and more use with a group of friends (34%). Psychedelics use was most commonly planned either a few days (47%) or a few weeks (29%) in advance, with 15% reporting one day or less of advance planning. This contrasts with cannabis, for which 83% reported that they planned their use one day or less in advance.

4.1.3 Motivations for use

As shown in Figure 2, large majorities of the respondents reported to be motivated for using psychedelics by psychological self-exploration (84%), personal growth (84%), and to have a spiritual experience (69%). Only 21% of respondents were concerned with the therapeutic potential of psychedelics for a medical condition, but 44% reported using their chosen psychedelic drug as a means of working on personal problems. The picture was very different for cannabis (not shown), where fun/party/recreation (67%) and socializing (56%) were the most common motivations. Using cannabis for medical conditions was somewhat more widespread (30%). In addition, 37% reported using cannabis for self-exploration and personal growth, and 25% were motivated by the prospect of a spiritual experience.

There is not much previous research into the motivations underlying classic psychedelics use, but the influential model by Simons et al. (1998) counted enhancement, conformity, expansion, coping, and social motives for cannabis use. Their social motive is reflected in the fun/party/recreation and socializing items, which were widely endorsed for cannabis in the present sample, and their coping motive corresponds to the escape item (“To forget or escape from personal problems”). Simons et al.
did not recognize a therapeutic motive, but their expansion motive relates, among other things, to psychological insight and to the “cure or heal personal problems” item. Expansion and enhancement motives were generally prominent in this sample, for instance in the widely endorsed self-exploration and personal growth items. There were no specific conformity items included in the Cannabis and Psychedelics User Survey.

Further analyses of reported motivations for cannabis and psychedelics use are available in Johnstad (2020b, 2021b, 2021c). Johnstad (2020b) focused on cannabis use, and used logistic regression to analyze the impact of being motivated by a wish for spiritual experience on other items of motivation. In addition, it analyzed the impact of spiritual motivation on the experiential characteristics of cannabis experiences, as well as the impact of spiritual and escapist motivations for respondent-reported consequences of use. Johnstad (2021c) similarly investigated the impact from spiritual motivation on the motivations, characteristics, and consequences of psychedelics use. Finally, Johnstad (2021b) analyzed the impact from spiritual motivation and other factors on two different types of spiritual experience. The two articles based on the Cannabis and Psychedelics User Survey that are included in this dissertation primarily investigated the experiential characteristics of psychedelics use, with Johnstad (2021e) investigating effects from personality structure on a typical psychedelic experience, and Johnstad (2021a) comparing such a typical experience to the respondents’ worst experience and further analyzing the latter.

### 4.1.4 Consequences of use

Participants were asked to assess the consequences of the use of their chosen psychedelic drug. A small majority (51%) found that their use had not had any significant consequences for their physical health, while 47% saw some degree of improvement. Conversely, 85% regarded their psychological health as improved because of their psychedelics use. The typical psychedelics user also found moderate improvement in their ability to get along with other people, in the intensity of their spiritual practice, and in their overall state of happiness as a consequence of their psychedelics use.

**Figure 2. Motivations for psychedelics use (N = 228).**

<table>
<thead>
<tr>
<th>Motivation</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological self-exploration</td>
<td>50</td>
</tr>
<tr>
<td>Insight and understanding for personal growth</td>
<td>45</td>
</tr>
<tr>
<td>Spiritual experience</td>
<td>30</td>
</tr>
<tr>
<td>Adventure</td>
<td>25</td>
</tr>
<tr>
<td>Curiosity</td>
<td>20</td>
</tr>
<tr>
<td>To cure or heal personal problems</td>
<td>15</td>
</tr>
<tr>
<td>Ego death experience</td>
<td>10</td>
</tr>
<tr>
<td>Fun/party/recreation</td>
<td>5</td>
</tr>
<tr>
<td>Socializing</td>
<td>5</td>
</tr>
<tr>
<td>To cure or heal medical conditions</td>
<td>0</td>
</tr>
<tr>
<td>To forget or escape from personal problems</td>
<td>0</td>
</tr>
</tbody>
</table>
Some 32% reported having flashback experiences, but only 10% of those who had such experiences regarded them as mainly negative.

When asked to characterize the meaningfulness of their most meaningful experience with their chosen psychedelic drug, 71% of the participants rated the experience to be either the single most meaningful experience or among the top five most meaningful experiences of their life (Figure 3). By comparison, 11% rated their most meaningful cannabis experience to be among the top five most meaningful experiences. Griffiths et al. (2006) reported that 67% of their participants who received clinically administered psilocybin rated the experience as one of the five most meaningful in their life, and it seems appropriate that this study should reach a somewhat higher figure of 71%, as respondents were asked to consider specifically their most meaningful psychedelic experience.

As shown in Table 4, the typical respondent had at least some university education, and to the extent that education can be seen as a proxy variable for social class, this finding indicates that psychedelics use is a middle-class phenomenon. Participants also reported high employment levels, and there is no support in this study for the idea that psychedelics use is related to negative health behavior, delinquency, and antisocial life trajectories. Instead, the level of psychedelics-related harm appears very low, in line with recent evaluations by drug researchers (Bonomo et al., 2019; Nutt et al., 2010; van Amsterdam et al., 2015). As mentioned above, further analyses of respondent-assessed consequences of cannabis and psychedelics use are available in Johnstad (2020b, 2021c). In addition, Johnstad (2021a; included in this dissertation) investigated the consequences of the respondents’ worst psychedelic experience.
4.2 Overview of the articles in the dissertation

This section provides a summary of the articles in the dissertation and a discussion of how they relate to each other conceptually and methodologically. The question of how the respective findings relate to extant literature is discussed in each individual article, and the subject is only mentioned in passing here. The findings presented in these articles should generally be regarded as tentative until confirmed by future research.

4.2.1 Mental health consequences of hallucinogen use (Johnstad, 2015)

This was the first article to emerge from my interview study of psychedelics (or hallucinogen) users, and focused on exploring their perspectives on how psychedelics use have affected mental health issues. It was originally written as a bachelor thesis in psychology under the supervision of Dr. Geir Scott Brunborg, who advised me to publish the manuscript because it was probably the first study of psychedelics use performed in a Nordic context. Back in 2015, the use of psychedelics in psychotherapy was still a relatively unplowed field in terms of contemporary research, as there were only a few small-scale pilot studies available, and the study was intended as a modest contribution to this fledgling literature that also served the purpose of allowing a group of illicit drug users to present their own perspectives on the putative merits of psychedelics use. In addition, the study also investigated possible mental health complications resulting from psychedelics use, which is still a somewhat unplowed field.

Interviewees reported use of a wide variety of psychedelic drugs, but generally limited themselves to one use occasion per month or less. They planned psychedelic sessions a while in advance and took care to establish an appropriate social and physical setting. As the respondents were recruited specifically on a basis of their use of psychedelics in spiritual contexts, they all had a variety of psychedelics-induced spiritual experiences to report.

With regard to health issues, most interviewees regarded their psychedelics use as having a positive impact. They spoke of personal growth and self-development, of finding a more positive outlook on life, and of overcoming old fears. Several claimed to have broken out of addictions to substances such as alcohol, cannabis, and Klonopin because of their psychedelic experiences, and others described benefits for a range of conditions including depression and chronic fatigue syndrome. Challenging psychedelic experiences (known colloquially as “bad trips”, although that term was not favored by my respondents) were commonly regarded as learning experiences with a positive long-term impact, although it should be noted that some respondents described quite harrowing experiences (for more on this subject see Johnstad, 2021a). There were a few reports about periods of over-frequent psychedelics use, although a tolerance effect seemed to render such high-frequency use rather pointless. Two respondents experienced long-term mental health problems that may have resulted from their psychedelics use.

4.2.2 Powerful substances in tiny amounts (Johnstad, 2018b)

After the completion of the interview study about psychedelics use in spiritual practice, which served as the basis for Johnstad (2015) as described above, as well as Johnstad (2018a), a second, more narrowly scoped interview study into the use of psychedelics in very small doses – often described as microdoses – was initiated. This study followed the same general methodological approach as its predecessor, but its limited scope allowed for much faster completion. As one of the first peer-reviewed studies of the psychedelic microdosing phenomenon, this small study has received outsized attention, with, at the time of writing, 97 citations on Google Scholar, an Altmetric score of 159, and
more than 53,000 views and downloads according to the Nordic Studies on Alcohol and Drugs’ webpage for the article.

The study found that psychedelic microdoses induce no intoxication, but were sometimes regarded as helpful for purposes of therapy or enhancement. Anxiety and depression were the most common conditions targeted for such user-guided therapeutic intervention, while enhancement use tended to focus on mood, cognition, and creativity. It was not clear that microdosing motivated by mood enhancement could be meaningfully delineated from microdosing motivated by therapeutic concerns. Not everybody who experimented with microdosing obtained any effects at all, and for those who did experience effects, it should be noted that there was no attempt here to control for placebo. Nevertheless, it was interesting to note that a number of respondents had experimented with various substances and doses until they found a regimen that seemed to work for them.

Some respondents also reported various challenges with their microdosing practices, the most common of which were insomnia and complications with identifying a proper dose. However, no one reported anything resembling the very intense and frightening experiences characteristic of so-called “bad trips” (see Johnstad, 2021a below). As reviewed in Section 1.4, a number of publications on psychedelic microdosing have been published in recent years, and although no clear therapeutic or enhancement effects have been identified in placebo-controlled studies, the tentative benefits identified for microdosing practices in this burgeoning literature are generally congruent with those identified in my small, qualitative interview study.

4.2.3 A dangerous method? (Johnstad, 2020a)

The third article included in this dissertation continues the emphasis on therapeutic use, but in this case from a historical perspective. Originally written as a bachelor thesis in history under the supervision of Professor Svein Atle Skålevåg, this study reviews the experiences with psychedelic therapy at Modum Bad during the years 1961–76. Under the leadership of Gordon Johnsen, this experimental treatment program involved 379 inpatients with a wide range of diagnoses, and the psychiatrists regarded it as an efficacious psychotherapeutic procedure. In retrospect, however, several reports of patients claiming long-term harm from the treatment have surfaced.

It is interesting to compare target diagnoses and treatment procedures at Modum Bad with those of the present era. At Modum Bad, psychedelic therapy was applied to a much broader range of diagnoses than what is currently the case, and seemed to include even psychosis and schizophrenia. However, although the details are not entirely clear, it appears that patients with psychosis-like symptoms were administered only very small doses of psychedelics, and that this was intended as a diagnostic procedure used to screen out such patients from further psychedelic treatment. In any case, the patient groups targeted by psychedelic treatment extended well beyond the current focus on depression, anxiety, and substance use disorder to include diagnoses such as hysterical neuroses, obsessional neuroses, and character neuroses, as well as ‘psychopaths’ and ‘perverts’ (probably for the most part homosexuals). Treatment was generally initiated with very small doses down to 25 mcg LSD, corresponding to what is currently known as a microdose (see Johnstad, 2018b above). At the other end of the scale, doses of 300 mcg or more were used to induce ‘cosmic experiences’, which Johnsen (1964) found particularly valuable for diagnoses including character neuroses, psychopathology, perversion and alcoholism. None of these patient groups are in the focus of contemporary psychedelic therapy, although there have been recent trials for alcoholism and other forms of substance use disorder, but the recognition of the transformative and thereby therapeutic value of psychedelically induced mystical-type experiences has continued into the current era (Majić et al., 2015; Roseman et al., 2018).
Application of such high doses of psychedelics also carry some risk, however, as there is a well-established connection between high doses and overwhelming experiences (see Johnstad, 2021a below). Therefore, the attempted induction of ‘cosmic’ or mystical-type experiences via heavy doses may be regarded as a high-risk, high-yield form of therapeutic practice that is not necessarily well adapted to present times. There were some adverse reactions to the psychedelic therapy at Modum Bad over the years, and although it is not clear whether these episodes were connected to any attempt of inducing ‘cosmic experiences’ with high doses, it would not be surprising if such a therapeutic practice did result in occasional adverse reactions.

4.2.4 Psychedelic telepathy (Johnstad, 2020c)

The fourth article in this dissertation breaks with the focus on therapeutic use, and instead investigates ostensive telepathic experiences elicited by psychedelics use. Taking the form of a new interview study based on the same general methodological approaches as its predecessors, this study from 2019 recruited participants based on their previous reports about telepathic experiences at various internet fora. In the interviews, I asked respondents to describe their experiences in further detail, with a specific focus on the transition into the experience and their evaluation of which factors may have contributed to the induction of the telepathic state. Furthermore, I asked each respondent whether they had spoken to their (ostensive) telepathic partner subsequently to the experience, and whether both parties agreed that telepathic communication had taken place.

Narratives of telepathic contact could be sorted into three different groups: one claiming the telepathic exchange of ideas and communication, another claiming the exchange of feeling-states, and a third claiming to have melded with their telepathic partner to the extent that they could not differentiate their own thoughts and feelings from those of the partner. While this latter state is reminiscent of mystical-type experiences, interviewees did not claim any explicit spiritual dimension to their telepathic connections. The transition into the state was sometimes described as a very noticeable event, while other interviewees described a gradual transition that often went unnoticed for a considerable length of time. The telepathic state was sometimes characterized as rather intrusive and threatening to one’s mental privacy, and this was especially problematic when the partner made unwanted romantic or erotic advances. Some respondents were uncomfortable with this lack of privacy and made it clear that they were not interested in repeating the experience.

These challenging aspects of ostensive telepathic experiences remind us that psychedelics have the capacity to induce very powerful and potentially overwhelming experiences, and the administration especially of high doses of these drugs in clinical settings is therefore not without risk. Some of the experiences described in this article could probably have been included in my study of challenging psychedelic experiences or “bad trips” (see Johnstad, 2021a below), and the reports about identity-dissolving telepathic melding were also used in my study of psychedelics-induced ego-dissolution experiences (Johnstad, 2021d).

As mentioned previously, the article makes no claims about the veracity of these ostensive telepathy experiences, except by noting that the researcher did not see any evidence of dishonesty or psychosis in his communications with interviewees. Nevertheless, it is possible that we should understand these reports as evidence of the psychotomimetic aspects of psychedelic experiences, and thus connect this whole study to the subject of psychedelics and health risks. Although most interviewees found that they could not induce the telepathic state at will – it was something that happened to them in psychedelic sessions rather than something they could make happen – there were scattered reports of people claiming to have found ways to repeat the experience. The article suggests that parapsychologists or others with an interest in the subject might attempt to recruit such individuals into a controlled study.
While (mainstream) academics have generally ignored this article, it has received a lot of attention from non-academics. The article is available with open access at both the Journal of Scientific Exploration’s webpage and via my own ResearchGate profile, and although I do not have access statistics for the former, this article is by far my most accessed work on ResearchGate. The total number of readers for both the preprint and the published article on this platform is currently above 21,000, which compares favorably to the article on microdosing (Johnstad, 2018b above), otherwise my most popular work, but with only 4,500 readers on ResearchGate. It would seem possible to conclude that while the general academic interest in telepathy and similar phenomena is slim to none, the public interest is quite robust.

4.2.5 Day trip to hell (Johnstad, 2021a)

While psychedelics may induce transformative mystical-type experiences in users, they can also lead to very challenging experiences. This article combines interview and survey data in a study of such challenging psychedelic experiences, known colloquially as ‘bad trips’. Interviews were conducted simultaneously with those for the studies described in Johnstad (2020c) above and Johnstad (2021d), using partly overlapping respondent samples. The survey data was taken from the Cannabis and Psychedelics User Survey, one section of which asked participants to characterize their worst psychedelic experience. For some respondents, this worst experience was merely uninteresting and unremarkable, but most others endorsed several negative characteristics for this experience, giving the impression that it was a genuinely challenging and disagreeable affair.

The study analyzed the causes and consequences of challenging psychedelic experiences, which most respondents (both in interviews and in the survey) regarded as having a positive long-term influence on their lives. Some experiences were quite devastating in the short to medium term, however, and 23% of the survey respondents regarded their worst psychedelic experience as one of the five worst experiences in their lives. Taken together, the two studies indicate that challenging psychedelic experiences have a greater thematic range than what has been identified in previous research into the matter. Thus, what may be challenging or difficult about psychedelic experiences is not narrowly constrained for instance to ego dissolution or any other such individual factor, but encompasses a broad range of experiential characteristics.

The takeaway lesson for clinical applications of psychedelics is that one should be prepared for the occasional challenging experience and develop procedures to assist people when they encounter challenges. This may include chemically aborting the psychedelic trip, although it should be noted that my respondents sometimes regarded challenging experiences as being the most valuable and transformative (and thus, perhaps, therapeutic) over the long run. In other words, the act of confronting and overcoming difficulties in psychedelic experiences may hold therapeutic value in and of itself, and it is possible that this potential will be lost if the experience is chemically aborted before the integration process is completed.

4.2.6 The psychedelic personality (Johnstad, 2021e)

Finally, the sixth article included in this dissertation presents data and analyses related to the personality structure of the respondents to the Cannabis and Psychedelics User Survey. Measuring Big Five traits with the Ten-Item Personality Inventory (Gosling et al., 2003) and propensity for risk taking with a simplified version of the Risk Taking Index (Nicholson et al., 2005), I found that my respondents reported higher scores especially for the Openness and Emotional stability traits, as well as for risk taking, than norms. In logistic regression models, personality scores were found to predict mystical-type characteristics of psychedelic experiences, with the traits openness and risk taking standing out as positive predictors, and extraversion and agreeableness negatively predicting
mystical-type characteristics. Risk taking predicted experiences of fear and ego death, possibly because high risk-takers are inclined to take higher doses, resulting in more intense and challenging experiences (see Johnstad, 2021a, 2021d above).

The article discusses these explorative findings in the context of previous research, and although the findings are necessarily tentative, the overall picture indicates that personality structure has a powerful impact on psychedelic experiences. However, it may also be true to say that psychedelic experiences have a powerful impact on personality structure, and the two effects cannot be differentiated in this cross-sectional study. Thus, it is not clear from these data whether the respondents started experimenting with psychedelics because of their relatively high scores on openness and risk taking, or if their experiments with these drugs have changed their personality structure in the direction of higher openness and risk taking, or both.

4.2.7 Works not included in the dissertation

This final section will briefly review other published works of mine that have investigated various aspects of psychedelics use, especially in spiritual contexts. The first article (Johnstad, 2018a) was based on an extended version of the study described in Johnstad (2015), and describes a qualitative exploration of spiritual use of psychedelics (here called entheogens, which is the term I prefer to use for spiritually motivated use). Interviewees predominantly portrayed entheogens as a positive force in their lives, describing a spiritual life centered on personal growth, which encompassed in particular the healing of psychological issues including depression and anxiety, the discontinuation of habitual non-entheogenic drug use, and improved emotional, relational, aesthetic, and cognitive capacities. Entheogen sessions, which ranged in frequency from a few times per year to once per month, served as periodic focus points or anchors for these growth processes.

The second article (Johnstad, 2020b) used both on qualitative and quantitative data to investigate the use of cannabis in spiritual contexts. Distinct from classic psychedelics in its neuropharmacological dynamics, cannabis is sometimes labeled a semi-psychedelic, but it is also common to distinguish cannabis from the psychedelic group of drugs. In this study of cannabis use in a sample of psychedelics users, 25% of survey respondents reported having a spiritual motivation for their cannabis use, which is a substantially lower figure than the 69% who reported having a spiritual motivation for psychedelics use. Although the discrepancy is certainly noteworthy, I believe it is also important to take note of the fact that one in four respondents reported using cannabis for spiritual purposes.

The third article (Johnstad, 2021f) was methodologically oriented, asking whether, or to which extent, we can be confident that the results obtained from studies based on samples of psychedelics users are representative of tendencies in the overall population of psychedelics users. In a review of a selection of published studies, it was found that participant samples tend to skew in either a positive or a negative direction. Positive skew was found in clinical pilot studies investigating the spiritual and therapeutic effects of psilocybin, which employ strict exclusion criteria for psychiatric conditions and drug abuse, and which also tend to enroll middle-aged individuals who are not inclined toward youthful excess. These studies have obtained very promising results, but it is necessary to understand these results in light of the fact that the participants were mature and responsible individuals without psychiatric conditions and unstable lifestyles. This does not mean that these studies are erroneous in identifying positive effect from psilocybin, but there is a possibility that the inclusion of younger and less stable individuals in these studies would have led to a higher frequency of adverse events. Negative skew was found in studies into drug harms, which tended to recruit participants from the (presumably) least well-functioning segments of the drug user population, and which were therefore likely to find stronger evidence of harm than what would
probably have been the case if their study samples were more representative of the overall population of drug users.

The fourth article (Johnstad, 2021b) used data from the Cannabis and Psychedelics User Survey to identify and analyze different types of entheogen-induced spiritual experiences. Observing that the spirituality of the entheogenic experience has generally been equated with mystical experience in previous research – which has predominantly been performed by psychologists rather than scholars of religion – the article proceeds to challenge this assumed equivalence. In an analysis of the characteristics of entheogenic experience, the study found evidence of two different types of such experience. The first type involved mystical-type characteristics such as ego dissolution and contact or unity with transcendent forces. In multivariate regression models, this type of experience was predicted by three factors indicating the spirituality of the participants: i) a spiritual affiliation, meaning that the participants reported feeling a connection to one or more spiritual traditions; ii) a spiritual motivation for entheogen use; and iii) a wide-ranging spiritual practice involving meditation, prayer, etc. These experiences were strongly connected to established models of spiritual and mystical experience. The second type of entheogenic experience identified in this study involved characteristics representing insight, positive feelings, and improved connections to other people and to nature. This type of entheogenic experience was predicted by spiritual motivation, but not by spiritual affiliation or practices. In other words, respondents who reported this type of experience also tended to report that their entheogen use was spiritually motivated, but did not tend to report that they felt connected to any spiritual tradition or that they had a wide-ranging spiritual practice. Thus, these experiences were connected to spirituality in terms of personal motivation, but not to spirituality in terms of cultural practices and institutions, and they were only tenuously connected to established models of spiritual and mystical experience.

Finally, the fifth and sixth articles exist only as unpublished manuscripts at the time of writing. The former (Johnstad, 2021d) describes interviews with psychedelics users about their experiences of self-dissolution or ego death, and analyzes these narratives according to a model of ego death experience by Millière et al. (2018). It finds that while this model is generally successful at accounting for the various forms of ego-dissolution experiences reported by my interviewees, the more spiritually inclined experiences tended to challenge the model’s framework. This article also compares the telepathic melding experiences described in Johnstad (2020c) with other forms of ego-dissolution experience and with the framework established by Millière et al. (2018). The sixth article uses data from the Cannabis and Psychedelics User Survey to investigate the impact from spirituality on psychedelic experiences, and the impact of psychedelics use on spirituality (Johnstad, 2021c). Findings indicate that psychedelics use tends to affect the individual’s interests in terms of spiritual or religious pursuits, while having a spiritual motivation for psychedelics use also has a powerful impact on resulting experiences.
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Chapter 2 - User perceptions of the mental health consequences of hallucinogen use in self-identified spiritual contexts
User perceptions of mental health consequences of hallucinogen use in self-identified spiritual contexts

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ABSTRACT
AIMS – The article aims to gain insight into the private worlds of users of hallucinogenic drugs in spiritual contexts, with a focus on the self-perceived mental health implications of their practices. This will help us understand the rationale behind and consequences of hallucinogenic drug use. METHOD – Respondents were recruited at several internet fora for individual email-mediated interviews (n = 5) or group interviews in public discussion threads (n = 11). They were predominantly males in their 30s or 40s with stable jobs and living conditions and extensive hallucinogen experience. RESULTS – Both positive and adverse consequences were assessed, and respondents emphasised the capacity of hallucinogenic drugs for healing and personal growth; even adverse experiences (“bad trips”) were regarded as valuable for these purposes. The dependence potential of these drugs was regarded as low because of an inherent self-regulatory mechanism whereby positive effects disappear with overuse. A minority of participants reported mental health problems that may result from their hallucinogen use, but the majority have experienced no significant adverse reactions after many years of use. This should be seen in light of the low frequency of their hallucinogen use. CONCLUSION – The study obtained evidence of a predominantly male group of mature users taking hallucinogens in carefully prepared sessions for the purpose of personal spiritual growth, acknowledging some risks but also several benefits from this practice.
KEYWORDS – hallucinogens, psychedelics, spirituality, dependence, adverse effects, qualitative, interview

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Introduction
Hallucinogens are a controversial group of drugs to which a broad range of conflicting health effects have been attributed. They started out as promising candidates for psychiatric research in the late 1940s, and by 1965 over 2000 papers on the subject had been published (Sessa, 2005). Although methodologies were sometimes unpolished and results varied, lysergic acid diethylamide (LSD) therapy and similar techniques were applied to largely positive effect to a variety of psychological disorders. Particularly interesting were the results on treatment of addictions, with brief psychedelic therapy sessions often leading to consistent long-term recovery from alcoholism (Abramson, 1967).

However, the widespread recreational use of these drugs in the 1960s resulted in a number of highly publicised adverse health reactions, and further research on the hallucinogen class of drugs was prohibited. This situation lasted until restrictions were gradually eased especially from the 1990s onwards, and the appearance of a landmark study in 2006 inves-
tigating the psychological and spiritual effects of psilocybin (the active ingredient of “magic mushrooms”) gave a new impetus to research in the field (Griffiths, Richards, McCann, & Jesse, 2006; Griffiths, Richards, Johnson, McCann, & Jesse, 2008; MacLean, Johnson, & Griffiths, 2011). In this study, thirty hallucinogen-naïve volunteers received psilocybin or methylphenidate hydrochloride as an active control in individual eight-hour sessions. Results were overwhelmingly positive, with participants returning high scores on a mysticism scale developed to assess primary mystical experiences, and with two-thirds furthermore scoring the psilocybin session as being among the top five most personally meaningful experiences of their lifetime. Since then a number of studies have taken place in what now appears to be a healthy field of scientific endeavour.

The present interview study explores how users of hallucinogens in spiritual contexts perceive the consequences of their drug use, and seeks to understand the reasons why people choose to engage with these very powerful drugs and what changes such use incurs for their lives. This will allow us to see positive and adverse consequences in the light of usage patterns, and to understand how users themselves seek to minimise adverse conditions. Hellman (2012) has called for qualitative studies into the life worlds of drug users as an important means of customising solutions to recovery from such use, and in a broader sense such contextualised insight can serve to inform customised solutions to drug use on every societal level. Thus by providing in-depth perspectives on the mental health consequences of hallucinogen use this paper aims to increase our understanding of the inherent complexity and ambiguity of these drugs, and thereby encourage more nuanced responses to their use.

**Literature review**

Clinical trials of hallucinogens in substance dependence are now once more being performed, although currently for the most part as pilot or proof-of-concept studies. Recently, such studies have suggested the value of psilocybin in treating nicotine dependence (Johnson, Garcia-Romeu, Cosimano, & Griffiths, 2014) and alcohol dependence (Bogenschutz et al., 2015), the value of ibogaine in the treatment of alcohol, cannabis, cocaine and crack dependence (Schenberg, de Castro Comis, Chaves, & da Silveira, 2014) and also the value of ayahuasca in treating alcohol, tobacco and cocaine dependence (Thomas, Lucas, Capler, Tupper, & Martin, 2013). None of the studies discovered any clinically significant adverse reactions to the hallucinogenic treatment.

While larger controlled trials are necessary to confirm these preliminary results, they are congruent with early findings on the therapeutic use of hallucinogens in the treatment of substance use disorders. A recent meta-analysis of single-dose LSD treatment of alcoholism in the 1960s revealed significant therapeutic effect at short (two to three months) and medium (six months) periods post-treatment, but no significant effect in the long term (twelve months) (Krebs & Johansen, 2012).

Recent research has also obtained preliminary evidence for the therapeutic effect of psilocybin (Grob et al., 2011) and LSD (Gasser et al., 2013) for anxiety in patients with life-threatening diseases. Both
studies discovered significant improvements without serious adverse reactions after one or two hallucinogenic sessions.

It is difficult to understand how a few doses of hallucinogenic substances could have such positive therapeutic effect, and some have suggested that the efficacy of hallucinogens in the treatment of substance abuse stems from their reliable capacity of delivering transformative “peak experiences” that are similar in some ways to religious epiphanies (Strassman, 1995). In a recent review article, Majić, Schmidt and Gallinat (2015) see evidence for therapeutic effect on both biological and experiential levels, suggesting that the specifically hallucinogenic aspect of these drugs cannot be ignored in their administration as treatment.

With the rise of modern brain imaging techniques it has become possible to obtain more specific knowledge of how hallucinogenic drugs act on the brain. It has been known for quite a while that the classic hallucinogens mescaline, psilocybin and LSD all work by an agonist or partial agonist action on the serotonin 5-HT\textsubscript{2A} receptors (Iversen, Iversen, Bloom, & Roth, 2009; Nichols, 2004), but it has also been commonly assumed that they “enhance excitatory neurotransmission and overall brain activity” (Lee & Roth, 2012, p. 1821). Research by Carhart-Harris, Erritzoe, and collaborators (2012) challenges this assumption, finding that psilocybin caused “decreased activity and connectivity in the brain’s key connector hubs, enabling a state of unconstrained cognition” (p. 2138). Rather than causing the expected upsurge of possibly frivolous activity, psilocybin reduced activity in the default-mode network, which earlier research has identified as implicated in a baseline mode of brain function (Raichle et al., 2001). It is worth mentioning that a relative deactivation of the default-mode network has also been discovered in experienced meditators both during the practice of meditation and in an ordinary resting state (Brewer et al., 2011).

Consistent with the finding by Carhart-Harris, Erritzoe et al. (2012) is the discovery that psilocybin can have a defocusing effect on semantic networks that leads to “an increased availability of remote associations and thereby may bring cognitive contents to mind that under normal circumstances remain non-activated” (Spitzer et al., 1996, pp. 1056–1057). Similarly, Petri et al. (2014) discovered significant augmentations to the brain’s correlational networks in the psilocybin state, which they described as “a less constrained and more intercommunicative mode of brain function” (p. 8). This defocusing and altered state of connectivity may serve to explain some of psilocybin’s beneficial effect on people with diagnoses of alcoholism or depression: their brains are normally “stuck in a rut” of narrow and repetitive cognitive loops, and the drugs serve to remove such self-limiting restrictions for a period of time, thus enabling new perspectives. Some brain regions are activated more strongly under psilocybin, however, and Carhart-Harris, Leech, and collaborators (2012) found that this applies in particular to visual and other sensory regions, which can explain subjectively experienced increases in the vividness of memories and may serve to facilitate autobiographical recollection in therapeutic sessions.

In recent years there has also appeared survey data on the users of hallucinogenic drugs outside of the laboratory. Carhart-
Harris and Nutt (2010) obtained 600 responses which described LSD and psilocybin as having a largely positive influence on the users’ well-being. Reported benefits included alleviating depression, anxiety and insomnia, as well as “improved insight, perspective, self-understanding and acceptance, resolution of existential anxieties, help with mourning and a reduced fear of death, improved optimism, self-esteem and an increased sense of spirituality” (p. 291). A large majority affirmed that they had had a spiritual experience while under the influence of a hallucinogen, and also felt that these drugs enabled them to access their “unconscious mind”. Minorities of 14% (LSD) and 12% (psilocybin) of respondents commented on adverse effects and health risks, which included paranoia, panic attacks, psychotic symptoms, anxiety, and depression. A roughly simultaneous study with 667 respondents sought to investigate the differences between users of psychedelic drugs, users of other drugs and nonusers, and found that “the use of psychedelic drugs with a purpose to enhance self-knowledge is less associated with problems, and correlates positively with coping and spirituality” (Móró, Simon, Bárd, & Rácz, 2011, p. 188); it concludes with a call for further qualitative investigations into these effects.

The field of qualitative studies remains however sparsely populated, and especially so with regard to hallucinogenic drugs, although some work on general drug use has implications also for users of hallucinogens. One important study in this regard is Aaslid’s (2007) in-depth interviews with Norwegian drug users, through which she identified three usage patterns that she labelled experimental, recreational and problematic. In explicit disagreement with official narratives on illegal drug use, she emphasised the importance of distinguishing between these patterns of use, maintaining that neither experimental nor recreational users tended to end up as problem cases. Her perspective on distinct usage patterns is congruent with the findings of Kronbæk and Frank (2013), who interviewed adult cannabis users in Denmark and obtained evidence both of problematic and unproblematic use, with the latter taking a recreational form that did not interfere with social and economic life.

In attempting to comprehend the reasons behind drug use, qualitative analyses sometimes perceive motivations relating to ritual and, at least implicitly, to religion. Sande (2000) has argued that the use of alcohol among youth can be understood as a rite of passage into adulthood, and Gauthier (2004) interprets drug-fuelled rave parties as displaced religious festivals. Such displacement of religious sentiment is central also to Aaslid’s (2008) understanding of intoxication as a celebration of subjectivity and inner experience serving as a countercultural defiance of the rigidity and mechanicalness of modern life: it is a turn from outward-looking materialism to the inward realm of the soul. Indeed, one of Aaslid’s (2009, p. 93) informants described her drug use as an aspect of a “deep spiritual quest”. In a similar vein, Sandberg and Tutenges (2015) interpret drug use as an encounter with the Djinn and dragons that live on the edges of our civilised worlds, outside the boundaries of sanity, reason, and other normative values. “The excessively intoxicated character is both an anti-hero, a loser incapable of doing anything right, and a hero, a Ni-
etzschean Übermensch, who has the nerve and fortitude to stand up to established norms and rules” (Tutenges & Rod 2009, p. 361; emphasis in original).

As is apparent from the above studies, the use of hallucinogenic drugs is predominantly related to positive effects at least by the users themselves. A minority of users also experienced various difficulties as a consequence of their drug use, however, which is a result corroborated by a number of anecdotal reports especially in news media; a review of clinical cases of post-LSD psychosis is provided in Abraham, Aldridge, and Gogia (1996). In terms of brain damage and other forms of physiological damage, a review of 1960s and 1970s research on long-term adverse consequences of hallucinogen use discovered no clear effects, although there were several reports of possible impairments that other studies failed to replicate. The review concluded that “the literature tentatively suggests that there are few, if any, long-term neurophysiological deficits attributable to hallucinogen use” (Halpern & Pope, 1999, p. 247). More recently, Nichols (2004) has maintained that “[t]here is no evidence that any of the hallucinogens, even the very powerful semisynthetic LSD, causes damage to any human body organ” (p. 134). It might however be noted that hallucinogenic compounds that include monoamine oxidase inhibitors (MAOI) – particularly ayahuasca – may interact dangerously with some other drugs and foods (dos Santos, 2013). Furthermore it is frequently a problem that illegally produced drugs obtained on the black market are fake or impure and sometimes contain toxic substances. While hallucinogenic drugs do seem to interact with dopaminergic neurotransmission to some degree, thus potentially sharing dependence-forming mechanisms with drugs such as cocaine and amphetamine, “there is no evidence of a withdrawal syndrome, and users do not appear to develop dependence” (Iversen et al., 2009, p. 488).

The picture is somewhat less clear for adverse psychological effects. LSD has in some cases been found to induce both acute panic reactions and toxic psychoses (Iversen et al., 2009). Even with the very positive results reported by participants in the study by Griffiths et al. (2006), about one third of the participants nonetheless experienced periods of “significant fear” (p. 282). Psilocybin mushrooms have otherwise been found to result in “only few and relatively mild adverse effects” in the Netherlands (van Amsterdam, Opperhuizen, & van den Brink, 2011, p. 423), although the authors caution against occasional panic attacks and flashbacks. Participants in ayahuasca ceremonies under the auspices of the Santo Daime Church in Oregon (Halpern, Sherwood, Passie, Blackwell, & Rutzenber, 2008) and in Brazil (Bouso et al., 2012) scored significantly lower on psychopathology measures than control groups or the general population. A recent population study by Krebs and Johansen (2013) investigated a sample of 130,152 adults from a United States National Survey on Drug Use and Health (NSDUH) that was considered representative of the general adult population, and of which 21,967 (16.9%) reported any lifetime prevalence of psychedelic drug use. They found “no relation between lifetime use of psychedelics and any undesirable past year mental health outcomes, including serious psychological distress, mental health treatment […]., or
symptoms of panic disorder, major depressive episode, mania, social phobia, generalized anxiety disorder, agoraphobia, post-traumatic stress disorder, or non-affective psychosis” (p. 5). Indeed the effects tended toward the opposite, as psychedelic drug use correlated weakly with a low rate of mental health problems. The authors caution that these are effects at the population level, and may possibly mask adverse consequences for some individuals counterbalanced by benign effects on others. Finally, in a study of over 190,000 adults from the same NSDUH database, Hendricks, Thorne, Clark, Coombs, and Johnson (2015) found that the use of classic psychedelics was associated with reduced psychological distress and suicidality.

While the above review indicates that hallucinogen use is not without psychological health risk, it does appear from aggregated data that the benign consequences in this regard outweigh the adverse consequences. This would seem to support the finding by Nutt, King, and Phillips (2010) that hallucinogens are, on a societal basis, the least harmful of all recreational drugs. As a variety of non-pharmacological variables have been found to play an important role in the effects at least of psilocybin (Studerus, Gamma, Kometer, & Vollenweider, 2012), it might be suggested that careful attention particularly to the setting of hallucinogen use could reduce anxiety reactions.

Method
Design
Users of hallucinogenic drugs in spiritual contexts were interviewed either individually or in groups about the mental health consequences of their use. All communication was internet-mediated, and participants were encouraged to interact with the interviewer via anonymised email addresses constructed specially for this purpose. Participants therefore had the option of remaining unidentifiable even to the author of the study, which served to minimise privacy concerns. Ethical approval was obtained from the Norwegian Social Science Data Services (reference 40281/3/KH). Kvale and Brinkmann’s (2009) seven stages of interviewing – thematisation, planning, interviewing, transcription, analysis, verification, and reporting – were used as a structural basis for the study.

Recruitment
Participants were recruited from three different internet fora – one Norwegian, one frequented mainly by Europeans, and one American – devoted to the sharing and discussion of hallucinogenic drug experiences, as well as one English-language forum concerned mainly with New Age-type spirituality. Because of the varying emphases and membership groups, this set of fora allowed for a broad selection of hallucinogen users. Criteria for selection were adulthood and current or past hallucinogen use in self-identified spiritual contexts. Participation was based on voluntary response to recruitment letters, and took the form of individual (n = 5) or group (n = 11) interviews according to participant preferences.

Basic demographic data were collected from participants in individual interviews and, where possible, from participants in group interviews. Participants in individual interviews were all in their 30s or 40s, and all male. Two were married with children, four held steady jobs in retailing,
education, music teaching and industrial services, and one was unemployed. All reported stable living conditions in Western European or North American countries, with backgrounds in Christian or secular families. Participants in group interviews did not for the most part wish to volunteer any information of this kind; about half indicated their age and gender, and these were all male and between the age of early 20s to middle 50s.

It should be noted that the recruitment process did not aim at obtaining a representative set of participants reflecting the general population of hallucinogen users. Participants were required to volunteer for participation in response to recruitment letters posted on the internet, and users with some enthusiasm for hallucinogens were probably more likely to self-select for the study; it is certainly the case that users living on the streets or confined to hospital wards or prisons did not have the opportunity to participate. In addition, every participant who indicated gender was male. The study should therefore be taken to reflect the “best practices” of a generally resourceful and predominantly male group of hallucinogen users.

Data collection
Interviews were conducted on a semi-structured basis, with the aim of obtaining a naturally flowing conversation relating to a number of specific research questions. Participants in group interviews respond to a more restricted line of questions pertaining mainly to one specific topic.

Typical questions used to guide the interview.
- Why do you use hallucinogenic drugs?
- Can you describe some hallucinogenic experiences that were important to you?
- How do you feel your hallucinogen use has influenced your life for better or worse?
- Have you ever felt that you were overdosing or abusing drugs?
- Have you ever experienced healing of physical or psychological issues as a result of using hallucinogenic drugs?

Transcription and analysis
As interviews took the form of written communication, no transcription from oral records into writing was necessary. The obtained data were analysed using thematic analysis and Kvale & Brinkmann’s (2009) procedure for meaning condensation. Themes were constructed on a basis of open-ended, exploratory and data-driven comparative analyses of interview responses pertaining to all major research questions.

Due to the sensitive nature of the information, conversations on public fora are paraphrased in this report rather than quoted directly; this is intended to make testimonies less transparent to internet search procedures. Two interviews were conducted in Norwegian and are reported in translation. Statements have been edited for brevity and relevance to specific topics.

Results
Drug use
Participants reported use of a variety of psychoactive drugs. Most commonly reported were the classic hallucinogens LSD and psilocybin (“magic mushrooms”), as well as cannabis, 3,4-methylenedioxymethamphetamine (MDMA, also known as “empathy” and “ecstasy”), ayahuasca,
and N,N-dimethyltryptamine (DMT). Several participants also used a wide variety of more obscure drugs.

I prefer ayahuasca and kambo, without forgetting psilocybin, LSA and the teacher San Pedro (ID1).

Many had passed through a period of excessive drug use in their youth, but were currently more careful with their use of hallucinogens. Most regarded about one trip per month as an acceptable frequency, although some were more restrictive. One participant quit all hallucinogens several years ago; all others were current users. None reported current usage of opiates or psychostimulants such as amphetamine and cocaine, but several had past experience with such drugs.

In the beginning I would use DMT at least once a week. Now 9 years into this I don’t have to go so often (ID15).

I use MDMA 3–4 times a year and psilocybin mushrooms every autumn after a few days of picking – after a few trips one is satisfied till next year. LSD once a year or maybe a few times if I can get it, mescaline once or twice. 2-CB 4–5 times a year on its own or with MDMA. At times I have a trip or two a month (ID17).

Most respondents were very careful about the setting for their hallucinogen session. Several have had experiences that turned bad because of a poor choice of setting, and emphasised in particular the need for a safe social environment consisting of people they know and trust. A common theme especially for those participants who described their past usage patterns as excessive was that they used hallucinogens at parties. While some said they still enjoyed an occasional party, most preferred the company of close friends or solitude when using hallucinogenic drugs. Drug sessions took place in people’s homes or in nature.

Mostly I do mushrooms with a close friend who I have shared many experiences with, so we don’t have to worry about each other when the trip peaks. Sometimes with a few beginners, but this is not my preference (ID12).

Before I would sometimes be at parties, but now I’m almost always alone – in my home, or in nature (ID9).

Hallucinogenic drug sessions were not taken lightly. Some prepared their sessions weeks or even months in advance. Practical details were described as important, but so were the emotions and state of mind that one enters the session with. For this reason, many participants reported a cultivation of positive mind-states in the period leading up to the trip. This emphasis on set and setting has been part of the hallucinogen subculture since the 1960s, and respondents often spoke about these matters with an almost pedagogical overtone: it appeared important to them to make others understand that careful preparations are vital for a successful trip.

I usually plan my sessions in advance. I pick a day and make sure I am free that day and the next day. The best mood for hallucinogenic exploration is to be relaxed and to have a clear mind.
Make sure you do not have all kinds of worries on your mind. Also make sure that your physical surroundings reflect this calm state of mind. So not only clean out the junk in your head, but also the junk in your room where you are going to have your session (ID8).

Drug sessions are a kind of spiritual festival that I spend much time and energy preparing for, and afterwards contemplating and interpreting. I use especially the last week before the session to practice meditation and be extra attentive to my dreams, sorting out my life, taking it easy. Actually my whole life is a preparation for the next session – I try to be good, positive, helpful to others, avoiding negativity. By cultivating positive feelings in my daily life I make myself ready for a good session. For the session itself I set up a magic circle of protection, play some of my favourite music, burn incense. Sometimes reading spiritual literature is good to get in the mood (ID9).

I often get this feeling 1–3 months before the trip that “on that day I am going to trip, and I will take this much of this hallucinogen”. I’ve noticed that the times for my trips are usually when there has been a big change in my life – for example when I broke up with my boyfriend, or when I came back home after a long trip abroad (ID10).

Varieties of spiritual experience

Participants reported a wide range of spiritual experiences in their hallucinogenic drug sessions. Some rare sessions were described as truly transformative, with overwhelming emotions and a long-term impact on behaviour:

I experienced what we call ego death, an experience of my true self or soul. “Me” in its purest form, clear from all influence, learning and thought. I was who I always have been and always will be (ID12).

I was overwhelmed with a series of very deep psychedelic experiences, and was totally at a loss as to what I was supposed to do with all I had received. At that point words began to form deep in my mind feeling like a message coming from outside myself as if the mushroom or nature was speaking directly to me. The message was: “Lead, be an example to others...” I broke down and cried like a baby, it was so beautiful I was completely overwhelmed with emotion. I will remember this for the rest of my life (ID15).

Other important sessions brought insight and understanding, and many supplied inner visions of strange events or worlds:

It is like to climb the mountain or contemplate heaven, and there you have the wisdom of the universe before your eyes... (ID1).

I perceive a “more real” level of reality underlying what we normally think of as “the” reality (ID9).

I came into a world of brilliant colours and shapes, and insect-like, very strange beings (ID12).
Meditation helps me get into a visionary state when I am on mushrooms. I was trying to get into this state and I saw my spine turn into a tree. I became very calm. I felt my muscles relax and I felt very peaceful and in balance. This experience made me practise meditation even more because I wanted to have such calmness in everyday life (ID8).

Spiritual experiences were also connected to feelings of love and friendship:

Mushrooms make me feel more empathic and more understanding of the feelings and motivations of others. (ID8)

I took MDMA with some good friends, and we lay closely together in a bed. There was a moment when we all realised that the love and warmth we felt for each other was real, and that we had chosen each other for this interaction. We are all very good friends today, 12–13 years later (ID17).

Positive consequences
Respondents described a number of positive consequences of hallucinogen use for their lives. Many saw themselves as having changed for the better because of the new perspectives the hallucinogen experiences have afforded them. Some had taken up more healthy and ethical lifestyles that may include regular spiritual practice. They spoke of growth and self-development, of dealing with fears and of renewing their self-respect.

Hallucinogens have helped me to see the wonder in life, and I have felt renewed energy in my overall attitude and my studies. I feel very grateful for my family and for all those close to me. Life is good! (ID16).

One of the things these journeys have provided me with is a very deep level of self-introspection. I learned how to be with myself on a profound level and to understand myself in ways I never thought possible. This insight spreads outward like ripples in a pond: insight into the self becomes insight into other people which becomes insight into nature and the world. It has eventually become an integral piece of a larger spiritual journey of self-improvement and growth (ID15).

I stopped drinking and smoking, and still do not drink and smoke. I started doing more workouts and eating more healthy food. The mushrooms made me feel more in tune with my body and that’s why I started living a more healthy life (ID8).

I now lead a full, healthy and meditative life, and still use hallucinogens (ID14).

Mushrooms helped me to start seeing things “as they really are”, and to know myself. I feel more at one with the universe, the world and nature, and live more in the present. In connection with my increased feeling of oneness with nature I have also become more conscious of what I eat, particularly in relation to animal ethics (ID12).
Hallucinogens have made me a calmer, more pleasant and more empathic human being (ID17).

Indeed, for some people these changes to their lives were the main purpose of engaging with hallucinogenic drugs:

The time after the trip is the most important. It is more important than the time you spend tripping. Once you understand how the hallucinogens work, you will realise that the best time to make changes in your life is right after the trip. And then you just have to keep doing things in a new way. If you trip too often and change nothing, it is pointless (ID10).

It is sometimes hard to integrate these experiences, because they are so otherworldly. Still they do have some clear implications for ordinary life. When you experience limitless, divine love then that says something about how you would like to live your life – although it’s not so easy to express that love in the everyday world (ID9).

Among the most important changes to the participants’ lifestyles was the breaking out of addictions or habitual use of various substances.

Thanks to ayahuasca I’ve stopped drinking every day, and thanks to kambo and LSA I stopped smoking (ID1).

Recently I decided to take a much-needed break from cannabis, which I attribute mostly to my use of hallucinogens (ID16).

With DMT and psilocybin there is, aside from the psychological “cleansing”, a concrete physical feeling that accompanies spiritually transformative experiences. It feels like a menthol sensation all over my body. When I get this feeling, it is always accompanied by a major healing of my body and mind. For example, after a breakthrough dose of smoked DMT, I was no longer addicted to Klonopin (ID20).

Hallucinogens were also experienced as a major contribution to the healing of other psychological and somatic illness:

I have been struggling with chronic fatigue syndrome and fibromyalgia since my mid-twenties, for about fifteen years, to eventually end up in bed for five years. I lost everything: my career, many friends and my family. I only got better three years ago thanks to kambo and pharmahuasca [an ayahuasca variation]. The symptoms included low grade fevers that disappeared completely after few treatments; chronic sore throat and sinus congestion that are mostly gone; sleep problems that are significantly reduced; generalised body pain that is completely gone, and blurry vision and fog that are gone. I have tried almost all alternative methods over many years, but none gave me close to the success as did pharmahuasca (ID18).

While none of the participants claimed to understand exactly how this healing effect takes place, they indicated two possible healing mechanisms: one physiological, and one related to the experience itself of intense joy and spiritual connection.
DMT and psilocybin are the reason I stopped taking antidepressants. The medication attaches itself to the same receptors as DMT does, so I skipped a dose deliberately in order to take DMT unaffected by it. The next night I did the same thing, and by the third day I no longer felt the need to take antidepressants, and haven’t since. The problems have never returned. I started to feel like a human being again, and with semi-regular DMT and psilocybin use, both my opiate and alcohol abuse rapidly declined and vanished. It was more than just transformative on a personal level – there must also have been a physiological effect (ID14).

I believe it has something to do with the serotonin that is released, but also with how positive the experience is, and with that feeling of total freedom from worry that one can experience and carry into daily life. It is also helpful to have shared a moment of complete joy with close friends (ID17).

Adverse consequences
One of the potential dangers of using hallucinogenic drugs is that one can have difficult, scary and perhaps damaging experiences. Many participants had been through such “bad trips”, but most of these tended to think of them as difficult learning experiences that have valuable long-term impact:

I have had challenging experiences and I learnt a lot from them. Not only did I learn how to avoid mistakes that can lead to a bad trip, but most of all I started to know more about myself. When you have a hard time on hallucinogens it can feel like you are dying, and when you think you are dying you may discover aspects of yourself that you never paid attention to. You discover what is important in your life. For me a successful mushroom experience is one where I say to myself: “this is so intense, why do I do this to myself. I am never going to do this again.” Of course I always do it again at some point (ID8).

It should be noted however that some of these learning experiences were experienced as truly hellish, causing difficulties for several years. This is one reason why users of hallucinogenic drugs advised that sessions are carefully prepared, as described above. When bad situations did arise, many participants attempted to deal with them through the use of various spiritual techniques such as deep breathing, meditation and chanting:

How do I deal with bad trips? With calmness, with breathing, with the knowledge that they are already exceeded situations (ID1).

Accept what you get. Observe it. Good or bad, whatever it is. Have you got negative emotions? Observe them. How do they feel? Take them as tools to learn something. Be grateful for every difficult trip because they are the ones that teach you the most (ID10).

Several participants acknowledged a potential for overdoing hallucinogens, and some cautioned against the spiritual and psychological consequences of overuse:
Possible consequences of overdoing hallucinogens are to feel the ego spiritualised, omnipotent, or enlightened, or to go crazy, or live in fear. Such overuse doesn’t destroy egoism but rather increases it (ID1).

Many also pointed out that there is something of a fail-safe mechanism in the use of hallucinogens, as the positive drug effects tend to diminish with repeated use. Hallucinogens are for this reason subject to a natural self-regulation that counteracts long-term abuse:

I was tripping on LSD 4–5 times a week for 3–4 months. What happened was that I lost the trips – I no longer got into the psychedelic mind state (ID10).

It is possible to develop a kind of dependency, but MDMA is very self-regulating in that if you take it more than a few days in a row, it simply doesn’t work like it used to. For this reason use tends to limit itself, which is one of the reasons why I think MDMA is among the safest drugs of all (ID17).

Probably the greatest danger with hallucinogen use is that it could lead to lasting mental health problems. While several participants reported temporary experiences of mental chaos and confusion while under the effect of hallucinogens – something that might be termed a “bad trip” – only a few described long-term consequences of this kind.

Ayahuasca was beautiful to me. Opened my mind – but led to mental disorders. I had trouble closing down my third eye and staying grounded when I came down from it (ID2).

One respondent ended up in a short-term psychiatric ward with what his doctors thought was a toxic psychosis. He accepted that he sometimes had difficulties with remaining grounded, but was agnostic as to whether this is because he has a mental illness or if it is simply a natural but unfortunate consequence of his shamanistic practice:

If I were a member of a more open-minded culture, where the ancient art of Shamanism is accepted, I would probably have been congratulated for becoming the tribe’s latest Shaman. If I had this experience whilst living with people who are highly experienced with altered states-of-consciousness, then the outcome may well have been quite different, and I would probably not have ended up a prisoner of the system (ID5).

Discussion
We have explored how some users of hallucinogenic drugs describe the characteristics of, reasons behind and consequences of their drug use. What has emerged is a picture of mature males with stable homes and jobs using hallucinogens in occasional, well-prepared spiritual settings for the purpose of gaining insight into themselves and their worlds. Some have a past of quite unrestrained drug use at parties, but have since moved away from excessive use. We see here evidence of a learning curve or career for hallucinogen users, starting with youthful experimentation and ending with more conscious, moderate and carefully
planned use as an integrated aspect of a stable adult life. The respondents’ descriptions of intoxication in spiritual terms is unsurprising since such a context was presented as a criterion for participation, but does suffice to demonstrate that spiritually-inclined hallucinogen users do exist and are available to researchers. Whether the usage pattern here reported can be termed “recreational” in line with Aaslid’s (2007) terminology is perhaps debatable, but it certainly seems well removed from what she labels a “problematic” pattern of use. Several participants describe their intoxication experiences as journeys or other cognates of adventure, thus framing their drug use in mythological terms reminiscent of “the hero’s journey” or “the journey to the underworld”. These archetypal terms support the perceived transformative potential of these practices, and is understood by researchers such as Aaslid (2007) and Sandberg and Tutenges (2015) to reveal an important motivation for drug use: in an otherwise sanitised and commoditised modern world, drugs may be the last remaining resort for would-be explorers of wild and unknown lands.

Like most people, the participants carry with them a variety of mental health issues, and they use hallucinogens partly in order to work on themselves and perhaps heal these personal problems. From their perspective, hallucinogen use has resulted in a broad range of positive personality and lifestyle changes, including a newfound or strengthened interest in spiritual ideas and practices. They confirm the possibility of temporary adverse effects such as acute panic reactions (van Amsterdam et al., 2011), but are generally not afraid to encounter problematic psychological material in their drug sessions. Indeed, they often regard such sessions as challenging and valuable learning experiences. We can probably understand their openness to the value of “bad trips” in terms of their maturity: most participants now have long experience with hallucinogens and have learnt to deal with and profit from challenging situations. This knowledge also includes how to plan their drug sessions so as to minimise problems.

Because hallucinogenic drugs tend to lose their most valued effects with over-intensive use, participants regard the dependence potential of these drugs as fairly slight, which supports earlier research on the low dependence-forming potential of hallucinogens (Iversen et al., 2009). On the other hand, they claim that their use of hallucinogens has facilitated the breaking out of habitual use of other drugs. The promising effects of hallucinogens especially on substance dependence that is indicated both by older research from the 1960s and several recent clinical trials (Bogenschutz et al., 2015; Johnson et al., 2014; Schenberg et al., 2014; Thomas et al., 2013) are thus corroborated by the participants of this study, who furthermore perceive both biological and transformative-experiential aspects to these healing processes.

As in the study by Carhart-Harris and Nutt (2010), participants generally report a broad range of health benefits from their hallucinogen use, although with a minority of 10–15% having incurred significant adverse mental health effects. Two of sixteen participants have experienced serious mental health problems that may result from their drug use, although one of these maintains that the real problem is that the psychiatric establishment tends to
misdiagnose spiritual or shamanic experiences as psychotic. Based on the information received in the interviews, there is no easy way to explain why their trajectories diverge from those of the majority. It might however be significant that both were recruited from a web forum devoted primarily to the discussion of New Age spirituality rather than hallucinogen use.

With their narratives of difficulty and hospitalisation, these two participants remind us that hallucinogen use can never be considered a safe practice. Described commonly as a journey into the unknown, a hallucinogen session seems to involve frequent confrontations with dragons and other denizens of the dark, and it should not surprise us that not everybody will emerge unscathed from such encounters. Yet as the majority of the participants in this study have insisted, such adventures have a number of positive consequences as well, even if they are at times overly intense; indeed, for experienced and adaptable adventurers, these challenging confrontations might be the most valuable of all.

We cannot generalise from these results, and must remember that the narratives here have emerged from predominantly male respondents who self-selected for participation. It would not be surprising if their motivation was based in large part on an enthusiasm for hallucinogen use. The aim of qualitative research is in any case not to be generalisable, but to obtain insight into individual experiences (Wright et al., 2015). As far as the interview reports are broadly congruent with more representative studies, which here seems to be the case, a probable relation to a broader segment of the population is indicated. Thus the qualitative study can be used to contextualise and deepen the more representative but less intensive findings provided by quantitative survey data and similar methodologies.

The strength of qualitative studies is therefore to provide thick descriptions of participant life worlds that allows us to understand more clearly why and through what mechanisms given effects take place. Thus we have gained from this study a perspective on why hallucinogen addiction is not a significant problem, and we have learnt to understand bad trips as learning experiences. We have seen an outline of a hallucinogen career path and at least a perceived relation between hallucinogen-induced spiritual experiences, changes in personality and lifestyle, and the healing of long-standing health issues.

In sum, this study has obtained evidence of a group of hallucinogen users that rarely feature in the news media. While their reports are not representative of hallucinogen users in general, they do exemplify an important segment of such users that is otherwise largely invisible in Western societies – in Fuller’s (2000, p. 7) terminology, a “religious underground”. It should probably be worthwhile to obtain further insight into this clandestine spiritual subculture that most Western societies have outlawed without first taking the effort to understand.

Declaration of interest None.

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communion with deities and nature, for obtaining insights into themselves and their worlds, and for certain forms of personal development related especially to an increased capacity for empathy and love in interpersonal relations.

NOTES

1 I wish to thank Geir Scott Brunborg, Håkan Rydving and two anonymous reviewers for helpful suggestions on how to improve this article.

2 The precise meaning of the term “spiritual” is left for the respondents to decide; they have tended to employ it broadly for communion with deities and nature, for obtaining insights into themselves and their worlds, and for certain forms of personal development related especially to an increased capacity for empathy and love in interpersonal relations.

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Chapter 3 - Powerful substances in tiny amounts: An interview study of psychedelic microdosing
Powerful substances in tiny amounts: An interview study of psychedelic microdosing

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Abstract
Aims: This article presents a qualitative interview study of people who microdose with psychedelic drugs, which means that the user takes about one tenth of an ordinary recreational dose. Design: Respondents (n = 21) were recruited at several Internet fora for individual interviews via private messaging. Every participant was male, and the median respondent was in his 30s with a stable job and relationship and extensive entheogen experience. Results: Respondents tended to experiment with microdosing in phases, reporting mostly positive consequences from this form of drug use. Reported effects included improved mood, cognition, and creativity, which often served to counteract symptoms especially from conditions of anxiety and depression. There were also reports of various challenges with psychedelic microdosing, and some did not find the practice worth continuing. Conclusion: The study obtained evidence of a group of users taking small doses of psychedelics not for the purpose of intoxication but to enhance everyday functioning. While the study’s findings are not generalisable, they may inform subsequent investigations with research questions and hypotheses.

Keywords
enhancement, health effects, interview, microdose, psychedelic, qualitative

To microdose with a psychedelic drug means to take a dose small enough to provide no intoxication or significant alteration of consciousness. Microdosing has been growing in popularity and visibility since James Fadiman recounted some self-experiment reports in his 2011 book The...
psychedelic explorer’s guide, but has roots going back to 1970s psycholytic therapy and, according to Fadiman (2011), to indigenous healers and shamans who have “systematically and fully explored every dose level” (pp. 198–199). The microdosing phenomenon has spread most recently over the Internet, where discussion fora enable users to share experiences and exchange information in ways that make new practices accessible for others. Its growing visibility has been reflected in substantial recent media coverage, with a number of reports especially about students and professionals microdosing with LSD in order to improve their concentration and problem solving (Nørgaard, 2017; Solon, 2016; Tande & Fliflet, 2017; Tollefsrud, 2017; Williams, 2017). The overall impression from these reports is that microdosing affects mood, health, and cognition in generally positive ways, while allowing the user to carry on with everyday activities.

Searches through PubMed, ProQuest and Google Scholar databases confirmed that there was at the time of writing no published research on psychedelic microdosing to corroborate these anecdotal findings. However, much attention was given to the effects of larger doses of psychedelic substances by psychiatric researchers in the 1950s and 1960s, and one noteworthy finding was that psychedelic therapy sessions often resulted in long-term recovery from alcoholism (Abramson, 1967; for a recent meta-study see Krebs & Johansen, 2012). Clinical effect was also observed for a range of conditions including anxiety in terminal cancer patients and obsessive-compulsive disorder (see review in Nichols, 2004). These lines of research were curtailed by political developments, but have reemerged in recent years after a decades-long hiatus (Sessa, 2005). Recent preliminary results have indicated therapeutic effects from full doses of psychedelic drugs on depression and anxiety around life-threatening disease (Gasser et al., 2013; Griffiths et al., 2016; Grob et al., 2011; Ross et al., 2016), on substance dependence (Bogenschutz et al., 2015; Johnson, Garcia-Romeu, Cosimano, & Griffiths, 2014; Schenberg, de Castro Comis, Chaves, & da Silveira, 2014; Thomas, Lucas, Capler, Tupper, & Martin, 2013), and on various other somatic and psychological conditions (Carhart-Harris & Nutt, 2010; Johnstad, 2015). However, full doses of psychedelic drugs lead to experiences that are often very intense, and which have been reported to induce both acute panic reactions and toxic psychoses (Iversen, Iversen, Bloom, & Roth, 2009). While the notion of a direct relation between psychedelics use and mental health complications is subject to dispute (Hendricks, Thorne, Clark, Coombs, & Johnson, 2015; Krebs & Johansen, 2013), it would seem prudent to conclude that full doses of psychedelics have a potential to incur non-trivial adverse effects.

Microdosing, on the other hand, is not experientially intense, and has not been reported to result in negative health reactions in anyone. We must acknowledge that this use of psychedelics has not yet been described in academic literature beyond basic reports of its existence (Savulich et al., 2017; Sweat, Bates, & Hendricks, 2016), and that the current lack of information about adverse reactions is subject to change. Nevertheless, the anecdotal evidence currently available indicates that microdosing seems to be a promising candidate for some of the health benefits claimed for psychedelics while incurring minimal risk for mental health complications. The aim of this study was therefore to explore psychedelic microdose use by interviewing users about their experiences. Common patterns or themes in their responses could serve as hypotheses or research questions for subsequent investigations.

One way to understand the microdosing phenomenon is to see it in light of the literature on human enhancement techniques. Researchers have identified the growing use of enhancement drugs such as piracetam (Corazza et al., 2014), methylphenidate and modafinil (Hupli, Didžiokaitė, & Ydema, 2016), especially among university students, and performance-enhancing drugs have long been regarded as a problem in sports. Hogle (2005) analysed such
enhancement drugs as an aspect of a broader range of enhancement technologies including cosmetic procedures, cyborg prosthetics, and genetic enhancement, and observed that humans have a long history of voluntary bodily modification. She argued that enhancement technologies differ from therapeutic interventions in that they may not have a starting point in deficiency, but found it difficult to distinguish precisely between the two. In a definition by Coveney, Gabe, and Williams (2011),

A therapeutic intervention will restore normal or typical functioning with the aim of returning an unhealthy person back to a healthy state whereas an enhancement will improve or extend the abilities or capacities of a healthy individual (who is already functioning normally) outside of this normal or typical range. (p. 384)

They found the therapy–enhancement dichotomy to be a useful heuristic, but warned that it may also be limiting because of the ambiguity inherent in concepts such as health and normality.

Normative characterisations of enhancement drug use varied substantially between these researchers. Whereas Corazza et al. (2014) spoke of “abuse”, Hupli et al. (2016) found that enhancement drug use by healthy individuals could best be understood as “functional drug use”. Coveney et al. (2011) observed that the social acceptance of enhancement drugs rests in large part on the cultural authority of medical experts and may be subject to change. In an assessment of the need to regulate cognitive enhancement drugs, Ragan, Bard, and Singh (2013) found that regulation “would have to aim at minimizing the risks and harms of cognitive enhancement while maximizing the benefits” (p. 593).

Some researchers have also noted that media reports about enhancement drugs tend to exaggerate how widespread their use is and to over-emphasise their benefits (Partridge, Bell, Lucke, Yeates, & Hall, 2011). While I am not aware of any analysis specifically of media reports on psychedelic microdosing, it is possible that media coverage of this phenomenon conforms to the same pattern.

Method

Terminology

In this article, the term “microdosing” is used exclusively in the context of psychedelic drugs. However, the definition of the term “psychedelic” was unspecified in communication with respondents, and some mentioned microdosing experiments with drugs such as cannabis, which are not usually classified as psychedelics. These reports are noted briefly in the results section. Experiences of perceived therapeutic or enhancement effect are referred to as “positive”, whereas unwanted effects are labelled “negative”.

Study design

Using purposive sampling, current or former microdose users of psychedelic drugs were recruited for interviews via a variety of Internet fora dedicated to discussions of various psychedelic experiences. Only one of these fora was dedicated especially to microdosing, but there were usually at least a few discussion threads about the subject on each forum. Recruitment efforts used two separate strategies: one was to post a new thread describing the purpose of the study and asking for input, and then to contact individual users by private message for further questions; the other was to search the forum for previous entries relating to microdosing practices and then to contact eligible participants by private message. This two-pronged recruitment strategy was employed on seven different user fora, of which The Shroomery, DMT-Nexus, NorShroom, and Reddit produced a range of responses, while The Hip Forums, Psychonaut, and Bluelight did not produce substantial numbers of responses. Forum members who responded to initial recruitment efforts or had made noteworthy contributions to old
discussions ($N = 24$) were contacted via private message. Some users who had tried microdosing only once or a few times without any noteworthy effect were not contacted for further interviews as I had nothing further to ask of them, but their experience of no effect is nevertheless noted in the results section. Three of the 24 eligible participants did not respond to the private message, while the remaining 21 gave their informed consent to participate. The study was designed in conformity with Norwegian Social Science Data Services ethical guidelines. A few quotations have been translated from Norwegian, and statements have been edited for brevity and relevance.

Because psychedelics are generally illegal, not all respondents were willing to provide demographic information. In order to reduce participation stress, only a minimum of such information was requested. Every respondent was male. Of the 17 who listed their age, the median age was early 30s. Four were single, five in a relationship, and eight engaged or married (three with children). Five participants were students, while nine were in full-time employment variously as a factory worker, a biologist, a hospital worker, a teacher, a cook, a plant scientist, and in IT security; one was self-employed and two were unemployed/disabled. Five, including one of the unemployed, held master’s degrees or PhDs. They had from one year to 25 years of experience with psychedelic drug use, with the median length of experience amounting to about 10 years. Thirteen had extensive microdosing experience and eight had experimented on a more sporadic basis.

In their discussion of Internet recruitment for qualitative studies, Hamilton and Bowers (2006) found that one of the strengths of this recruitment strategy was the potential to increase the appropriateness of each participant. This was indeed the case in this study, as each of the 21 interviewees made valuable contributions and must be regarded as highly appropriate for the study. It is difficult to imagine any non-Internet recruitment arena that could have provided the same level of access specifically to psychedelic microdose users. However, Hamilton and Bowers (2006) also found that participants recruited on the Internet probably have more education and higher incomes, thus potentially skewing findings. While the Internet is probably more accessible today to those with lower education and income levels than it was in 2006, it may very well be the case that Internet recruitment in this study served to exclude some drug users. Furthermore, users with some enthusiasm for psychedelic drugs were probably more likely to self-select for the study. The recruitment process therefore did not obtain a representative set of participants reflecting the general population of psychedelic microdose users.

Interviews were asynchronous and Internet-mediated, and conducted on a semi-structured basis. Such forms of interviewing have been validated by Meho (2006), who discovered a broad range of medium effects from using email to convey interviews. Advantageous effects included a possible increase in honesty and self-disclosure, as well as the elimination of transcription errors, while disadvantages included the loss of visual and nonverbal cues from facial expressions and body language. In conclusion, Meho found no overall negative impact on data quality. Consistent with Meho’s finding of an increase in self-disclosure, Bargh, McKenna, and Fitzsimons (2002) discovered that the relative anonymity available on the Internet afforded users increased opportunities for expressing aspects of themselves that they would be inclined to hide from others in face-to-face communication. By allowing for a high degree of participant anonymity, email interviews for this study probably served to facilitate participation from interviewees who would otherwise have balked at describing illegal activities to an unfamiliar researcher. According to Hamilton and Bowers (2006), another benefit of asynchronous email interviewing is that it affords the researcher the opportunity to reflect on previous responses from the interviewee and, on this basis, to pose more thoughtful follow-up questions than might be possible in
a face-to-face conversation. I found this feature to be beneficial for the interviewing process. Typical questions used to guide the interview were:

1. Which psychedelics have you microdosed?
2. How much experience do you have with microdosing?
3. Do you microdose in cycles or continuously? How often do you do it?
4. What effects do you get from microdosing?
5. Have you noticed any negative effects?
6. How do you feel the day after a microdose?

Recruitment for the study was continued until new responses consistently conformed to patterns identified from earlier responses, at which point significant new information was deemed unlikely to emerge. Most interviews were completed within a few weeks, but some were extended for several months in order to obtain information about ongoing microdosing practices. As interviews took the form of written communication, transcription was unnecessary. Data were analysed using thematic analysis and Kvale and Brinkmann’s (2015) procedure for meaning condensation. Statements from interviewees were shortened and categorised according to topic, and themes were thereupon constructed on this basis in an open-ended, exploratory, and data-driven comparative analysis. Topics were a priori areas of interest such as usage patterns, therapeutic effects, and negative side effects, while themes represented areas of agreement related to a given topic among a group of interviewees. Participant statements were accepted at face value, and there was no theoretical interpretative framework informing the analysis. However, the interview process allowed for critical perspectives and for the resolution of ambiguities through follow-up questions. Participants were asked to read through and verify the use of their quotations.

The study emphasised the preservation of participant anonymity, and aimed to ensure that no participant would be identifiable either to the researcher or to readers of publicised material. Participants communicated via anonymous messaging that protected their identity at least from the researcher. Unless they were using camouflage technology such as The Onion Router (Tor), their IP addresses would have been accessible to the forum service provider, but this would not have served as a privacy concern beyond the risk they were already incurring through their normal use of this forum. Participants were encouraged not to reveal information about their location, background or circumstances that might indirectly reveal their identities. Their pseudonyms are not reported, as these are often traceable across a variety of Internet sites, and demographic information has been delinked from narratives. While full Internet anonymity is elusive, I believe that participation in the study did not compromise privacy to any significant extent.

The emphasis on anonymity entailed that signed consent letters could not be obtained, and incurred the risk that minors might pass themselves off as adults and gain access to a study discussing the use of illegal drugs. However, it is my impression that microdoses are of little interest to minors, and I believe that no attempts at such subterfuge were made. Recruitment letters and later communication with respondents were carefully phrased so as to not give the impression that the author condoned illegal drug use.

Results

Microdose regimen

Respondents generally regarded microdosing as being compatible with most everyday activities. Some would microdose in the mornings of workdays, while others preferred to limit this activity to afternoons and non-working days. The most commonly used psychedelics for microdosing were psilocybin-containing “magic
mushrooms” and lysergic acid diethylamide (LSD). There were also reports of microdosing experiences with *Salvia divinorum*, *Amanita muscaria*, *Peganum harmala* (Syrian rue), *Echinopsis pachanoi* (San Pedro cactus), N,N-dimethyltryptamine (DMT), 2,5-Dimethoxy-4-methylamphetamine (DOM), and cannabis. Some users had experimented with a broad range of psychedelic substances, while others had limited this use to one specific psychedelic:

The only traditional psychedelic I have microdosed is mushrooms. I find this to be extremely beneficial spiritually, physically, and mentally but have no experience with other traditional psychedelics as a basis for comparison. (ID14)

I’ve had good success with Amanita as a daily tonic for wintertime blues. (ID13)

Doses were usually constrained to about a tenth of a full dose. For LSD, this amounted to somewhere between 10 and 25 mcg, and for *Psilocybe cubensis* mushrooms to 0.1–0.3 g. Some reported taking up to a quarter of a full dose, but this was usually regarded as a mini-dose rather than a microdose, and was not found to be compatible with work and everyday activities. Respondents sometimes found it difficult to specify the exact dose they were taking. Some indicated that their microdose regimen was informed by extant literature on psychedelic microdosing. These were some typical statements about dosage:

I normally cut up a single blotter of 100 or 150 mcg into 8 pieces, giving microdoses in the range of 12.5 to 18.75 mcg. (ID38)

I have microdosed frequently, generally following Fadiman’s recommendation of 1/10th of a dose every four days. (ID33)

I dose 10 mcg LSD twice per week. I came to this amount by administering doses at 5 mcg intervals within the following range [5–25]. I have found that 10 mcg is the most beneficial. Any more and I’m a little too impressionable to distraction, any less and there’s no benefit. (ID39)

For experienced microdosers, the practice was usually regarded as a cyclic activity, with microdosing periods lasting from a few weeks to a few months. Within such a period, the respondents typically dosed one to three times per week, although some reported dosing on a daily basis. Less experienced users reported occasional experiments without any stable regimen. Dosing a few times a week did not seem to result in significant build up of tolerance (abatement of positive effects), although with one reported exception for DOM. There were conflicting reports on tolerance build up from daily microdosing and about the impact of microdose tolerance on full doses. Some frequent microdose users experienced a build up of tolerance, while others found no such effect:

In the last year, I have been experimenting with LSD microdoses quite frequently. But in the past two months, I have gone from taking it every third day to every day. What amazes me is the fact that I don’t seem to feel any tolerance build up at all. (ID38)

Surprisingly, a one-day break is sufficient for avoiding tolerance. This went against the conventional wisdom online suggesting that a few days in between was necessary. Dosing on consecutive days saw tolerance, then headaches. (ID39)

**Experienced therapeutic effects**

Respondents generally agreed that proper microdoses (about a tenth of a full dose) of LSD and psilocybin did not result in any intoxication. Some respondents experienced no effect at all from microdosing, and therefore abandoned the practice after a few attempts, but the majority reported some effect that they regarded as positive. The most commonly described effects were health related, with a benign influence noted especially on states of depression and anxiety:

I have had very positive results from infrequent psilocybin microdosing. I have found fast and relatively long-lasting relief from depression and social anxiety doing this, as compared to other pharmaceutical options I’ve been offered such as SSRIs [selective serotonin reuptake inhibitors],
and without the intolerable (for me) side effects. (ID29)

The best relief I ever had was in the 0.1 g to 0.2 g range of *Psilocybe azurescens*. This helped immensely with my manic bipolar depression and suicidal ideations. (ID17)

Therapeutic effect was also reported for pain management and for a range of conditions including obsessive-compulsive disorder (OCD), post-traumatic stress disorder (PTSD), narcolepsy, and migraines. A *Peganum harmala* microdose regimen was celebrated by some for its help in quitting cigarette smoking. Several respondents reported that they had discovered some psychedelics to work better for their condition than others, but there was no agreement on which psychedelic was most effective.

I have been dealing with symptoms of narcolepsy for some years now. I would nod off at meetings, telephone calls, and mundane task at the PC. LSD microdoses have really been a game changer. The amount of energy I feel is profound. In terms of quality of life, it is the difference between being a walking zombie, barely keeping eyes open and looking at every daily mundane task as a struggle, and being a normal functioning person with an extra energy boost and creative tendencies. (ID38)

My wife and I had great success in pain management using mushrooms rich in baeocystin and norbaeocystin (*Psilocybe cyanescens* and *Psilocybe azurescens*). Cubensis don’t do the same. (ID17)

I have microdosed with psilocybin mushrooms and DMT, both to prevent oncoming migraines from playing out. I cannot say if the tiny amount of mushrooms helped quash the migraine, but the small amounts of vaporised freebase DMT definitely stopped some migraines from playing out to their full extent. (ID34)

**Experienced enhancement effects**

Besides the effects on health issues, respondents commonly reported what they regarded as a positive influence from microdosing on energy, mood, and cognition. This allowed them to function better in everyday life even when they had no specific health issues. However, the distinction between treatment and enhancement was not always clear. A few respondents microdosed specifically in order to enhance their capacity for academic study or to increase their efficiency in the workplace. These were some typical descriptions of enhancement effect:

Since microdosing mushrooms, I definitely feel as though a “mental fog” has been lifted and this allows me to be much more productive and functional. (ID14)

I had a great day! Very calm mind, emotionally in balance. (ID23)

I think microdoses can transpire a subtle alpha aura as one navigates the day with fluidity. And you’re smoothly infusing your environment with that pure trippy energy that this plasticised world silently begs for. (ID13)

Before microdosing I would have never said I have mental health issues, but I am forced to reconsider as when microdosing I feel I’m living in the brain of an incredibly mentally healthy person. (ID39)

The enhancement of everyday functioning sometimes resulted in an improved capacity to relate to other people. Some respondents claimed that microdosing psychedelics increased their openness and extraversion:

I feel more open to other people. At home with my family, I feel better equipped to deal with disagreement, and my emotional reactions are less automatic. My mood improves, and I have better contact with my feelings and less restlessness. I more often take the initiative to talk. (ID27)

A few respondents utilised the perceived energy and mood enhancement for spiritual practice, and found microdosing to be helpful in these pursuits:
I get bright moods, good introspection in meditation, and a generally meditative, contemplative mood. (ID21)

There were also a few reports about combining psychedelic microdoses with full doses of alcohol, cannabis or 3,4-Methylenedioxymethamphetamine (MDMA). These drug combinations were mostly taken for recreational purposes.

My experience is that a microdose of LSD taken a few hours before a dose of MDMA opens me up, in a sense, so that I feel the MDMA more strongly and intimately. (ID36)

My kids were away, so I spent the day with my wife lounging in the back yard, swimming in the pool. We had some drinks, got high, and I threw back a microdose of mushrooms. We got cozy in the pool, then I took her inside and we made love. Then we made burgers on the grill, smoked more weed and drank more. What a great day. A microdose on a lazy summer day – awesome! (ID10)

Cannabis is known to intensify the effects of psychedelics, however, and one respondent reported a “bad trip” experience resulting from this combination. There were also conflicting reports about the aftereffects of microdosing, with some users finding themselves back to normal the day after dosing and others experiencing a slight change in their energy level. One respondent reported of a sustained relief from anxiety lasting up to a week after a cycle of microdosing. These were some typical responses about aftereffects:

Today everything is back to normal, I don’t notice any improvement or worsening. I have a weak headache, but that may be because I slept longer than usual. (ID26)

I definitely felt an afterglow just like if you dose high enough for an actual psychedelic experience. (ID3)

There was also broad agreement among the respondents that the two most commonly microdosed psychedelics – psilocybin and LSD – were quite different in their effects, and some had developed a clear preference for one or the other. Respondents agreed that LSD had a more stimulating effect than psilocybin, which some welcomed and others found uncomfortable:

It’s weird: I like mushrooms more than LSD, but favour LSD microdoses over mushroom microdoses. LSD is just more practical for work and play, bounding energy and on target mentality. Mushroom microdoses are more of a personal and “fresh” interaction with the universe. (ID13)

I find that microdosing mushrooms works fine, but LSD microdoses are very uncomfortable as they are too stimulating for me. (ID19)

**Reported challenges**

Despite the general emphasis on subtle benign effects, the respondents in this study also pointed to a number of challenges associated with microdosing practices. Most commonly reported was the problem of overdosing. Psychedelic drugs are well known for their powerful psychoactive effects, and the resulting state of consciousness is not regarded as compatible with everyday social activities. While there were no reports of accidentally taking a full dose when attempting to microdose, several respondents had unintentionally verged into the terrain of a mini-dose that led to uncomfortable situations:

I experimented with microdosing mushrooms, but went a bit too far with 0.25 g while at work. I don’t know if it was because of the situation, my empty stomach or because I was extra sensitive during that period – but I started tripping quite noticeably! Fortunately it turned out alright. At this level of dosage the peak only lasts for about an hour. (ID25)

I was feeling very tired and had a martial arts class to attend for the first time, so I didn’t want to make a bad impression. This was my second time microdosing shrooms, and I dosed around 0.25–0.35 g a few hours before in an attempt to peak well before the class and still just be stimulated and in a good positive mood for it. This backfired massively as I had a large meal around the time of
dosing and it only really kicked in once I got to the class. I found it very hard to follow instructions and had a huge body load. (ID5)

Some respondents also found that microdosing could exacerbate certain conditions or symptoms. Benign health effects that users experienced in the early phase of microdosing did in some cases disappear or even reverse themselves after a long period of use.

One note of caution: if you drink alcohol, don’t microdose if you are feeling even slightly hung-over, it will get worse, not better. Other than that, be sure to take your first dose on a day where you don’t have too much going on as overshooting the mark can be less than productive. (ID33)

I noticed that after a certain point, the benefits fade, and microdosing instead serves to exacerbate my mental health problems. (ID17)

Even when no such adverse effects have been identified, some expressed uneasiness over the fact that the impact of long-term psychedelics microdoses on the brain remains unstudied and unknown:

Honestly I must admit that it is a bit unnerving to be on the forefront of microdose experimentation. I haven’t yet talked to or met anyone who has taken this for as long as I have. (ID38)

A few respondents also mentioned insomnia as a problem, especially if they microdosed late in the day. This was connected to the feeling of overstimulation from LSD microdoses that was reported by several respondents, and both overstimulation and insomnia contributed to a “bad trip” experience reported by one participant who mixed a microdose of LSD with a full dose of cannabis. Another respondent reported that the feeling after taking a microdose reminded him of the early build-up stage of a full trip, which for him was often accompanied by tension.

Discussion

The purpose of this study was to explore how “ordinary” users of psychedelics approach psychedelic microdosing. The selection of users included in this study was not, however, representative of the population of psychedelics users, and the findings of the study therefore have no claim to general validity. Despite this shortcoming, the findings may serve to acquaint researchers with the, as of yet, understudied phenomenon of psychedelic microdosing.

The microdosing practices reported in this study generally conformed in regimen and dose to the recommendations published by Fadiman (2011), although some users experimented with daily microdoses. LSD and psilocybin-containing mushrooms were most commonly used, but some respondents also microdosed a wide range of lesser-known psychedelics and other psychoactive drugs. Respondents for the most part reported what they regarded as positive effects from microdosing, with few side effects. Microdoses most commonly served as mood and cognitive enhancers, allowing people to function at what they felt was a higher level than usual. There are clear parallels between psychedelic microdosing and the use of cognitive enhancement drugs among healthy individuals for performance improvements described by Corazza et al. (2014) and Hupli et al. (2016), as both forms of drug use can be motivated by a wish for enhanced performance in the workplace or in academic study.

However, there was also a therapeutic motivation for psychedelic microdosing among some of the respondents in this study who suffered from conditions such as anxiety or depression. These findings are congruent with reported effects from full doses of psychedelic drugs on conditions of depression and anxiety (Carhart-Harris & Nutt, 2010; Gasser et al., 2013; Griffiths et al., 2016; Grob et al., 2011; Johnstad, 2015; Ross et al., 2016). Reports about the efficacy of microdosing practices for conditions such as substance dependence, OCD, and PTSD also have parallels in research on therapeutic effects from psychedelics in full doses (Abramson, 1967; Bogenschutz et al., 2015; Johnson et al., 2014; Krebs & Johansen, 2012; Nichols, 2004; Schenberg et al., 2014;
Thomas et al., 2013). It should be noted, however, that in the present study these observations were limited to one or a few individuals. Clinical research on microdosing should probably first look into putative anxiolytic and antidepressive effects, but need not end there.

The lack of a clear distinction between therapy and enhancement that has been pointed to by anthropologists and sociologists who study enhancement technologies (Coveney et al., 2011; Hogle, 2005) is echoed in this study. Some respondents pointed to specific deficiencies that their use of psychedelic microdoses was intended to address, but there was an overlap between the use motivated by such therapeutic effects and the use motivated by an effect of enhancement. In either case, the desired effect from microdosing was to be lifted out of a state of relative limitation into a state of higher functioning. The difference was that in therapeutic use, the state of limitation corresponded with a specific medical diagnosis. One respondent explicitly challenged the notion that his “normal” or pre-microdosing state of being deserved the designation “healthy”, even though he had not been diagnosed with any specific ailment.

Some respondents experienced no effects from microdosing at all, however, and several others emphasised that, despite their positive experience, microdosing is no miracle cure. There were some indications that psychedelic microdoses might not retain their perceived beneficial effects over longer stretches of time, and that the use should therefore be constrained to phases, which was indeed the most common approach to microdosing among respondents with extensive experience. This reduction of effect over time might limit the medical value of microdosing psychedelics, and would seem to be an important area of investigation for subsequent clinical research of microdosing.

The most commonly reported challenges with microdosing were overdosing and insomnia. Overdosing in this case means going beyond microdose territory into a mini-dose that has some intoxicating effect. Such mini-doses are not by themselves overly problematic for experienced psychedelics users, but might have serious negative consequences for users who combine microdosing with work, driving a car, and other activities not compatible with drug intoxication. The overdosing problem applies both to LSD and to psilocybin-containing mushrooms. The former is fully active in doses of a hundred micrograms, and a microdose is often obtained, rather inexacty, by cutting a blotter into separate pieces. Mushrooms for their part may be subject to a natural variation in psilocybin content (Rätsch, 2005). Clinical applications of microdosing could solve this problem by supplying standardised microdoses, but would have to trust their clients not to take several doses at the same time.

The few negative reports about microdosing in this study were not apparently a result of overdosing, nor is there any other obvious explanation for their occurrence. While these negative experiences constitute a minority, it is important to note that some people may experience distinctly unpleasant effects as a result of microdosing. The reported “bad trip” might appear to be a product more of cannabis use than of the LSD microdose, but damage-reduction publications such as tripsafe.org often warn that cannabis might potentiate psychedelic drugs.

The question of whether microdosing of psychedelic drugs should be characterised as “abuse”, which was Corazza et al.’s (2014) label for piracetam use among healthy individuals, or as “functional drug use”, which Hupli et al. (2016) argued is the best way to understand the use of cognitive enhancement drugs, is not easily answered. Psychodelics are designated as drugs of abuse in most of the world, but there is a substantial research literature that indicates that their use may have therapeutic effect. It is possible that microdosing may allow users to procure some of the perceived positive effects of these drugs while avoiding the problems that may follow from taking them in full doses.

As a social phenomenon, we can perhaps understand psychedelic microdosing in light
of Coveney et al.’s (2011) observation that the cultural authority of medical experts may be subject to change. Much medical knowledge is now readily available on the Internet, and electronic fora for psychedelic users serve as knowledge repositories that integrate shared user experiences with medical and neuroscientific information. This has resulted in increased knowledge availability (or at least in the perception of increased knowledge availability), which may have caused a corresponding decrease in the cultural authority of medical experts. The growth of microdosing may therefore reflect a social development in which ordinary people use the Internet for medical advice and feel empowered to take personal responsibility for their medication needs, pursuing therapy and enhancement through means that the medical establishment does not recognise and would perhaps frown upon.

There are no published studies on microdosing with which the findings of this study may be compared. The reports of therapy and enhancement, which constitute the majority here, conform to the findings of previously published anecdotal reports (Fadiman, 2011; Solon, 2016; Waldman, 2017), while the reports of no effect or negative effect are, as far as I can determine, without counterpart. This may reflect a bias towards beneficial effects in anecdotal reports, which Partridge et al. (2011) found to be a problem for media reports about enhancement drugs, or perhaps it may be that the method used in this study has been more conducive to obtaining balanced information.

There is no way to differentiate between drug effects and positive or negative expectation effects (placebo/nocebo) in these data, but the study affords an understanding of how “ordinary” users of psychedelics approach psychedelic microdosing. Several respondents expressed nuanced views about the relative benefits and disadvantages of microdosing that were not in any obvious manner indebted to placebo or nocebo effects. They also reported discovering specific practices that have worked well for them, compared to others that were found to be ineffectual or subject to negative side effects. Confidence in the reports is therefore increased by their high degree of specificity, as curative or symptom-abating effect was often reported only for one of several drugs that respondents used.

Another overall finding from this study is the value of tapping the psychedelic Internet community for academic studies. It is unknown whether this segment of Internet-active users is representative of the general psychedelic-using population, but the discussion fora frequented by these users are probably among the best recruitment arenas available to researchers. The respondents in this study were reflective, knowledgeable, and fully capable of expressing their views, and their participation would be an asset to any study of psychedelic drug use. It is possible, however, that a less erudite group of psychedelics users would have a less constructive and self-reflective approach to microdosing, and the study has nothing to say about the attractions of microdosing to women. The findings from this study should therefore be taken to reflect the microdosing experiences of a resourceful group of male psychedelic users, and have value primarily to the extent that they may provide subsequent investigations with research questions and hypotheses.

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Chapter 4 - A dangerous method? Psychedelic therapy at Modum Bad, Norway, 1961–76
A dangerous method? Psychedelic therapy at Modum Bad, Norway, 1961–76

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Abstract
After many years of disregard, the use of psychedelic drugs in psychiatric treatment has re-emerged in recent years. The prospect that psychedelics may again be integrated into mainstream psychiatry has aroused interest in long-forgotten research and experience from the previous phase of psychedelic therapy, which lasted from the late 1940s to the 1970s. This article will discuss one large-scale psychedelic therapy programme at Modum Bad Nervesanatorium, a psychiatric clinic which treated 379 inpatients with psychedelic drugs during the years 1961–76. The psychiatrists there initially regarded the psychedelic treatment as efficacious and without serious negative reactions, but reports of long-term harm have since surfaced. This article discusses how insights from Modum Bad might benefit the new generation of psychedelic treatment efforts.

Keywords
Biological psychiatry, Norway, psychedelic drugs, therapeutic usage, 20th century

Introduction
Psychedelics are a group of drugs named after the Greek words ψυχή (psyche), meaning soul or mind, and δηλείν (delein), to reveal or manifest. They have also been referred to in various contexts as psychotomimetics, hallucinogens and entheogens. Known for their powerful psychoactive effect, the classical psychedelics include mescaline (the active constituent of the cactus peyote), psilocybin (the active constituent of ‘magic mushrooms’), lysergic acid diethylamide (LSD) and N,N-dimethyltryptamine (DMT). Plant-based psychedelics have a long history of use for ritual and healing purposes, especially on the American continent (Dobkin de Rios, 1990; Hultkrantz, 1997; Labate and Cavnar, 2014; Maroukis, 2012), and the synthesization, particularly of LSD in the mid-twentieth century, opened the door for experimental psychedelic treatment in Western psychiatry. The Swiss pharmaceutical company Sandoz, which owned the patent for LSD until 1963, marketed the drug by making it freely available to psychiatrists interested in researching its effects (Hofmann, 2009).

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Early research in the late 1940s and 1950s investigated psychedelic treatment, especially for schizophrenia (Busch and Johnson, 1950; Hoch, Cattell and Pennes, 1952; Liddell and Weil-Malherbe, 1953; Pennes, 1954) and various kinds of neurosis (Chandler and Hartman, 1960; Sandison, Spencer and Whitelaw, 1954). The effect on the schizophrenic patient group was generally poor, sometimes leading to a worsening of the condition, but the psychoneurotic population was often found to respond well to psychedelic treatment. Research on this group therefore continued into the 1960s and early 1970s. In one notable study, which according to Rucker, Iliff and Nutt (2018) was probably the largest study of therapeutic utility of psychedelics in the pre-prohibition era, 81% of 243 non-psychotic patients were rated by clinicians as improved after treatment with LSD (Savage, Hughes and Mogar, 1967). There was also some research on using psychedelics as a treatment for alcoholism, with promising but mixed results (Ludwig et al., 1969; Maclean et al., 1961). A later meta-analysis with pooled data from these studies found significant improvement in abstinence 1–3 months after treatment, but not at 6 months (Krebs and Johansen, 2012).

Researchers soon realized that pharmacological treatment with drugs that cause ‘profound alterations of ego structure, awareness, cognition and affect might be occasionally expected to induce adverse reactions’ (Cohen, 1960: 30). Reports of such adverse reactions were, however, infrequent. In his early review study, Cohen (1960) had distributed questionnaires to 62 clinical psychedelics researchers, and received 44 replies representing data on almost 5000 individuals who on average had received LSD or mescaline five times each. He found no instances of serious physical side effects, and only a handful of reports of suicide or prolonged psychotic reactions, in a patient population that included schizophrenics and where the incidence rate of untoward events is generally high. There were also a number of reports about more temporary complications, including delusory and paranoid ideation and panic reaction, during the psychedelic state itself. Cohen (1960) concluded that psychedelic treatment is contraindicated for schizophrenics, but is otherwise safe when administered with proper care: the patient should be observed at all times during the session, and may require therapeutic support by psychiatrists who should themselves ‘probably have experienced the LSD state’ (p. 39). Although Cohen’s (1960) review indicated low risk of toxicity, researchers were later concerned about possible genetic damage from the use of psychedelics. These concerns were eventually put to rest (Dishotsky et al., 1971), but caused significant controversy at the time. After many years of research, there is no evidence that classical psychedelics are toxic to mammalian organ systems in normal dosage (Nichols, 2004: 134), although some newer phenethylamines have higher levels of toxicity (Nichols, 2016: 273).

Although promising, the clinical psychedelics research from this era is inconclusive. Studies were often experimental in nature, with small study groups and tentative findings. Furthermore, some lines of research pursued during this era were clearly dead ends, such as the attempted psychedelic treatment of schizophrenics and homosexuals (‘sexual deviants’). Most damaging of all, clinical studies from this period – with or without psychedelics – were often methodologically inadequate with regard to control groups, blind testing, statistical analysis and other issues (Nichols, 2004; Rucker et al., 2018). This methodological critique extends also to Cohen’s (1960) review. With time, these issues could perhaps have been redressed, but by the mid-1960s, time was no longer on the researchers’ side. Mounting fears of psychedelic drug abuse led to new prohibition laws in the USA, and within a few years psychedelics were classified under Schedule 1 of the 1971 United Nations Convention on Psychotropic Substances. The convention did not prohibit clinical research, but the restrictive Schedule 1 classification entailed that psychedelics were now legally defined as having no accepted medical use, and it also introduced a range of practical complications related to permits and safety regulations. By the 1980s, clinical psychedelics research had almost disappeared from view.
The 1990s saw a renewed interest in psychedelics research, and in 2006 the first ‘modern’ clinical psychedelics study in a psychiatric patient population found marked decreases in symptoms in nine patients with obsessive-compulsive disorder and observed no adverse reactions (Moreno et al., 2006). By the 2010s, clinical research with psychedelics in psychiatric patient populations was again a thriving field, with a number of publications reporting promising results from tentative phase 2 trials, and larger phase 3 trials being carried out. Preliminary results from this research have indicated a therapeutic effect from psychedelics on a range of conditions, including depression (Carhart-Harris et al., 2016, 2018; Griffiths et al., 2016; Roseman, Nutt and Carhart-Harris, 2018; Ross et al., 2016), anxiety (Gasser et al., 2013; Griffiths et al., 2016; Grob et al., 2011; Ross et al., 2016) and substance dependence (Bogenschutz et al., 2015; Johnson et al., 2014). So far, no serious adverse reactions have been reported, although studies have been criticized for not reporting adverse events data systematically (Rucker et al., 2018).

Psychedelic treatment has an interesting position in the history of psychiatry. As we have seen, LSD was introduced to psychiatrists in the late 1940s, predating chlorpromazine by a few years. Psychedelic treatment thus appears on the psychiatric scene right at the very cusp of the pharmacological revolution. As pharmacological agents, psychedelics are indeed part of this revolution, yet it seems that psychedelic treatment is quite different from ordinary psychopharmacological treatment. Unlike other forms of medication, psychedelics do not provide a therapeutic effect via straightforward biochemical mechanisms, but rather serve as something like a psychological microscope:

These substances function as unspecified amplifiers that increase the cathexis (energetic charge) associated with the deep unconscious contents of the psyche and make them available for conscious processing. This unique property of psychedelics makes it possible to study psychological undercurrents that govern our experiences and behaviors to a depth that cannot be matched by any other method or tool available in modern mainstream psychiatry and psychology. (Grof, 2009: 14)

Psychedelic drugs are therefore not to be regarded as a psychiatric treatment in and of itself, but rather as an integral element in what Carhart-Harris et al. (2018: 399) called ‘psychedelic drug-assisted psychotherapy’. If we follow Shorter (1997) in seeing the history of psychiatry as the longstanding competition between the biological and psychosocial paradigms, psychedelic therapy has a unique position as an intermediary bridging the gap, its efficacy dependent on both pharmacological agents and verbal therapy. Psychedelic therapy was at the nadir of influence during the 1990s, which may explain why Shorter’s very brief examination of pre-prohibition psychedelics research concluded that it ‘led to no clinical payoffs’ (p. 265). Today, however, psychedelic therapy is regarded as a promising field, and Shorter’s dismissal may be seen to reflect a tendency in the psychiatric establishment during the 1980s and 1990s to ignore the earlier literature on clinical applications of psychedelics. Conversely, the 1990s may have been a high point for the influence of ordinary psychopharmacological medication, allowing Shorter to claim that ‘[i]f there is one central intellectual reality at the end of the twentieth century, it is that the biological approach to psychiatry . . . has been a smashing success’ (p. vii). During the subsequent decades, assessments of therapeutic efficacy for psychopharmacological medication have been lowered, and Shorter’s declaration of victory now seems premature. Today, the tables have turned, with Johnson (2018) suggesting that ‘Psychiatry might need some psychedelic therapy’.

**Psychedelic therapy at Modum Bad Nervesanatorium, 1961–76**

While institutions in the USA dominated the field of pre-prohibition psychedelics research, studies were also performed in a number of European countries. One influential study in the UK has
already been mentioned (Sandison et al., 1954), and researchers were also active in West Germany (Leuner, 1962), Denmark (Geert-Jörgensen et al., 1964), Sweden (Kaij, 1963), and other countries. In Norway, several institutions initiated experimental psychedelic treatment programmes during the 1960s, with the most extensive programme involving 379 inpatients under the supervision of Gordon Johnsen at Modum Bad during the years 1961–76 (Madsen and Hoffart, 1996). With the majority of treatments taking place during the years 1963–6, this programme was comparable in scale to the largest studies in the USA during this period.

The use of psychedelics at Modum Bad was not so much a scientific study as an open-ended experimental treatment programme, however. It has been described in several publications. Johnsen (1964) himself published a preliminary report of his experience with ‘LSD as an aid in psychotherapy’ three years after the first psychedelic treatments were initiated. Two decades later, Madsen and Hoffart (1996) published a retrospective overview of the programme, and Madsen, Øyslebø and Hoffart (1996) completed a follow-up study that Johnson initiated in 1968 but never finished. During the 1990s and early 2000s, furthermore, controversy around the psychedelic treatment programme at Modum Bad stirred in the Norwegian news media, with reports that patients had been used as guinea pigs in military experiments under the supervision of the US Central Intelligence Agency (CIA), resulting in several deaths. The reports were based on an investigation by psychologist and criminologist Joar Tranøy (1995), as well as later claims by lawyer Randi Hagen Spydevold on behalf of several clients. A public commission was appointed to investigate these claims, and published a report stating that they were unsubstantiated (NOU, 2003).

In 1964, Johnsen regarded ‘treatment with psycholytica’ – or in other words the use of psychedelics as an aid in psychotherapy – as valuable, especially for patients who had been resistant to other forms of treatment, and ‘not dangerous if carried out in a clinic with trained staff, and given under the correct indications’ (Johnsen, 1964: 388). The first 112 participants included patients with anxiety, various forms of neurosis, sexual perversion, alcoholism and, in eight cases, psychosis. The indications for treatment with psycholytica were four-fold: (1) as an explorative aid for diagnosis; (2) to break through resistance and facilitate emotional insight during therapy; (3) to induce ‘cosmic experiences’ in certain patient groups; and (4) to terminate ordinary treatment. Patients with psychosis or schizophrenia were only mentioned in relation to the use of psychedelics as an explorative aid, so it appears that Johnsen screened out such patients from further treatment based on their reactions to these early diagnostic explorations. The use of psychedelics as an aid in therapeutic interviews was not explicitly contraindicated for any patient group, however, but Johnsen reserved this procedure for patients who had already undergone 10–20 ordinary interviews, and he proceeded cautiously with ‘extremely small initial doses’ (p. 385). When it came to the induction of what he calls ‘cosmic experiences’, however, Johnsen observed that this is only possible for certain patient groups, as patients with anxiety neuroses, hysterical neuroses and obsessional neuroses ‘dare not break through their own protective casements’ and tend to regress only to childhood memories and traumas (pp. 385–6). Patients with ‘severe character neuroses, psychopaths, perverts and alcoholics’, on the other hand, responded well to such cosmic experiences:

The cosmic experiences give them a strength which is the point of departure for a new behavior pattern: they achieve emotional contact with their own Egos, they are able to discover new facets in themselves and to recognise powers in themselves which they have formerly ignored or denied the existence of. (p. 386)

Johnsen also briefly described the use of psychedelics to ‘underline’ understanding achieved through dream analysis and thereby terminate such treatment. He did not indicate which patient groups were appropriate for this type of treatment. Dosages for these four indications were also left unspecified, but Madsen and Hoffart (1996) reviewed patient files from the Modum Bad archives...
and found that LSD dosage was normally 25–100 mcg and rarely above 300 mcg. The lower end of this range corresponds to what is today known as a microdose (Anderson et al., 2019; Johnstad, 2018; Polito and Stevenson, 2019) and is probably what Johnsen referred to as ‘extremely small initial doses’, while the top doses were apparently reserved for attempts to induce ‘cosmic experiences’, or ‘existential shifts’ in Madsen and Hoffart’s (1996) terminology. Patients were given an average of 5.8 psycholytic treatments (range 1–74), with psychosis (average 2.8, range 1–12) and alcoholism (average 2.3, range 1–6) at the low end and obsessive neurosis (average 7.0, range 1–48) at the high end (Madsen and Hoffart, 1996). There were no reports of serious adverse reactions. In a follow-up study, 63% of respondents reported that the treatment with psychedelics had been helpful, while 10% reported that symptoms had worsened, at least for a short time (Madsen et al., 1996). The authors regarded these results as remarkable, but cautioned that, because of the methodological limitations of this follow-up study, they could not ‘decisively conclude that the LSD psychotherapy had a treatment effect’ (p. 487).

The main outcome from the experimental psychedelic treatment programme at Modum Bad was therefore much the same as for pre-prohibition psychedelics research in general: results were promising, but methodological concerns make it difficult to draw firm conclusions. While the clinical use of psychedelics was at a low ebb in the 1980s and 1990s, however, a wave of public controversy around these earlier treatment practices started to form. In order to understand this controversy, it is instructive to look into an earlier controversy in Denmark that served as a backdrop to developments in Norway.

The use of psychedelics in psychiatric treatment in Denmark started in 1960 and continued until 1973, by which time almost 400 patients with a wide range of diagnoses had been treated with LSD (Geert-Jörgensen et al., 1964; Larsen, 2016, 2017). As in Norway, psychedelic treatment was initially regarded as promising and without major complications, but reports of negative events possibly related to the treatments were of a more serious nature and included two suicides, four attempted suicides and one homicide (Geert-Jörgensen et al., 1964). Furthermore, one patient experienced a psychotic reaction with intense anxiety during the administration of 180 mcg LSD, and later developed chronic psychosis (Larsen, 2016: 175). This patient eventually sued for damages, and his case led the Danish Parliament to pass the 1986 LSD Damages Law, which stipulated that anyone who suffered long-term psychological harm from being subjected to LSD treatment had a right to compensation. A reversed burden of proof meant that harm would be considered to be caused by the LSD treatment unless it was probably due to another cause. Of the almost 400 patients treated with LSD, 151 applied for compensation. In a study of these 151 compensation-seekers, Larsen (2016, 2017) analysed the acute and long-term efficacy of the LSD treatment, finding that in the short term 39% improved, 25% were unchanged and 36% worsened, while almost all had long-term psychological complications that were attributed to the treatment. However, as Larsen himself acknowledged and critics of the study have emphasized, the context of financial compensation is a major confounder to these findings (Erritzoe and Richards, 2017; Erritzoe, Nutt and Carhart-Harris, 2017). To explain the discrepancy with the findings at Modum Bad, Larsen (2017) suggested that stricter selection criteria for inclusion, closer follow-up and lower dosage might explain why the Norwegian patients generally seemed to fare better. Erritzoe et al. (2017) also pointed to the Danish treatment regime’s non-conformity with what are today regarded as good practices for clinical use of psychedelics (Johnson, Richards and Griffiths, 2008).

The controversy over psychedelic treatments in Norway started in the early 1990s, in the aftermath of the Danish controversy, but took a very different form. Allegations first centred on the role of the CIA in initiating and financing LSD research for developing tools for mind-control (Tranøy, 1995). This was supported by general references to the MKUltra programme, and by the supposition that the CIA had a monopoly on LSD because of its alleged control over Sandoz, the Swiss
pharmaceutical company who owned the patent for LSD. Later allegations expanded on these claims, maintaining that the subjects for military LSD experiments included war children born to German fathers during the Nazi occupation of Norway (Spydevold, in NOU, 2003: 28). The allegations were covered somewhat uncritically in Norwegian and international media (Anon., 2000a, 2000b, 2002c; Isherwood, 2002; Malone, 2009). In one egregious example, Verdens Gang, under the heading ‘Norwegian war children died in LSD experiments’, informed its readers that ‘Ten war children were in the 1950s and 60s used as guinea pigs in military experiments with LSD. Three or four of the children died’ (Anon., 2000c; my translation). These and other claims of unethical medical research led to the establishment of a national truth commission in 2001, which eventually concluded that the allegations were unfounded (NOU, 2003). While there is little doubt that the CIA conducted unethical LSD experiments (Marks, 1979; Price, 2007), their interest in the compound peaked in the early 1950s. Marks (1979: 50–1) noted that by 1953, the CIA was well into the last stage of their research, which involved exposing unwitting non-patient subjects to LSD in an attempt to mimic realistic operational conditions. Thus, it would seem surprising that the CIA should have invested resources in psychiatric applications of LSD in foreign countries as late as the 1960s, by which time they had had many years to pursue the ultimately fruitless investigation of how to weaponize LSD for intelligence operations. Furthermore, the suggestion that the CIA had a monopoly on LSD, besides being based on no evidence, is belied by the fact that Sandoz famously distributed the compound freely to any psychiatrist interested in experimenting with it. According to Marks (1979: 46–7), CIA officials at one point feared that Sandoz would supply the Soviets with large quantities of LSD, and decided to secure a reliable supply source for themselves by encouraging the US pharmaceutical company Eli Lilly to produce the drug as early as 1953. The structural formula of LSD had been publicly available since 1951 (Hofmann, 2009: 60).

While the commission’s report makes for fascinating reading as it meticulously tracks the allegations through layers of anonymous informants and classified archives, its exposition of darkly imagined clandestine operations and unethical experiments on humans is not of direct relevance here. However, the controversy substantially increased public awareness of the psychedelic treatment programme at Modum Bad and, in its aftermath, several personal accounts from participants in the programme have come to light. The NOU (2003) report itself mentions that several former patients at Modum Bad contacted the commission about their response to the follow-up study that Johnsen initiated in 1968 (Madsen et al., 1996), claiming that they had answered Johnsen’s letters more positively than their experience actually warranted. Some have also complained about lasting psychological harm from the LSD treatment. The most publicized case involved Gerd Kalløevig Knutsen, who at the age of 19 was admitted as a patient at Modum Bad for anxiety and hysteria and administered six LSD treatments in 1964 (Sandvig, 2011; Størksen, 2011). According to Knutsen, she was left alone for four hours after being dosed with LSD, which gave her nightmarish hallucinations. She claimed that since the treatment, she has had daily flashback experiences lasting 30–60 minutes, and that Johnsen threatened her and told her to keep quiet about this (Størksen, 2011). Knutsen is the only Norwegian patient who has received public compensation for long-term harm resulting from LSD treatment. Another case involved an anonymous former patient at Modum Bad who reported that she went through a difficult ‘bad trip’ during her second LSD treatment (Ravn, 2014). This patient claimed that she begged her doctor, who apparently was one of a few doctors at Modum Bad without personal experience of LSD, to terminate the treatment, but she said that he refused and held her down in bed with force. This allegedly led to many years of psychological problems.

Given the wild range of unsubstantiated allegations about the psychedelic treatment programme at Modum Bad, it is difficult to know how far one can trust these latter claims by former patients. Suffice to say that, if true, the above reports indicate that the psychedelic treatment at Modum Bad
did not always conform to guidelines for good practice (Cohen, 1960; Johnson et al., 2008). However, there have also been some positive reports, especially from the authors Agnar Mykle and Alfred Hauge. Mykle reported ‘fabulous visions’ that included an experience where he relived his birth (Fyllingsnes, 2014), while the Christian existentialist writer Hauge claimed that the LSD treatment afforded him insight into his psyche, and he later drew upon these experiences in his literary work (Sørbo, 2015).

A dangerous method?

It is difficult to assess long-term consequences from the psychedelic therapy programme at Modum Bad. We have reports of both positive and negative developments after the treatment, but it is uncertain how much these developments can truly be attributed to the psychedelic therapy. Cohen observed as early as 1960 that patients may have a tendency to blame psychedelic therapy sessions for subsequent problems:

The hallucinogenic experience is so striking that many subsequent disturbances may be attributed to it without further justification. The highly suggestible or hysterical individual would tend to focus on his LSD experience to explain subsequent illness. (Cohen, 1960: 38)

He also referred to several patients who attributed various conditions to LSD exposure during therapeutic sessions, but who had actually received only tap water as an inactive placebo. This problem of misattribution is probably especially relevant for psychedelic ‘bad trips’, however, since such experiences are known to be particularly difficult and might therefore serve as easy targets for long-suffering psychiatric patients in search of an explanation for their illness. Even if an impressive 84% of participants in a recent survey of ‘bad trips’ claimed to have benefited from the experience in the long run (Carbonaro et al., 2016), it should probably not surprise us if psychiatric patients find it extra difficult to integrate such experiences. The two complaints against Modum Bad both involved ‘bad trips’ caused, at least according to the patients, by doctors’ non-conformity with good practice guidelines (one patient was allegedly left alone for hours, another held down with force), and the obvious lesson for today’s generation of psychedelic therapists is to take no chances with such breaches of clinical protocol. As noted before, Cohen (1960) insisted that because the LSD state is a highly suggestive one, clinical personnel should always be sympathetic and keep the patient under continuous observation. He also noticed that complications seemed to be more likely when the therapist was personally unfamiliar with the psychedelic state.

One central aspect of the clinical practice at Modum Bad was to regard psychedelic sessions as an adjunct to other forms of psychotherapy, rather than as a treatment in itself. Each of Johnsen’s (1964) four indications for psychedelic treatment had a clear relation to a broader psychotherapeutic programme, and patients were only introduced to the use of psychedelics as an aid in therapeutic interviews after going through 10–20 ordinary interviews. This is congruent with the present-day paradigm of ‘psychedelic drug-assisted psychotherapy’ (Carhart-Harris et al., 2018: 399).

Grof’s (2009) model of the therapeutic efficacy for psychedelic treatment, which regards psychedelics as a tool for psychological insight, might help us understand the polarized response to psychedelic treatment, with some patients praising the therapeutic effect and others reporting a worsening of their condition. If psychedelics are tools that must be wielded skilfully – perhaps not only by the therapist overseeing the session, but also by the person undergoing it – in order to manifest their therapeutic potential, incompetent use might lead to negative effects: ‘Naturally, the tools of this power carry with them greater risks than more conservative and far less effective
tools currently accepted and used by mainstream psychiatry, such as verbal psychotherapy or tranquilizing medication’ (p. 14).

Seen through the lens of Grof’s model, the complaints of malpractice during psychedelic sessions at Modum Bad are especially problematic. It also seems clear that selection criteria for patients included in such treatment should be stricter than they were at Modum Bad, since the therapeutic effect may depend upon patients’ willingness and ability to utilize the psychedelic state for personal insight. Patients who are not well positioned to wield the powerful psychedelic tool could end up harming themselves, which may have been what happened to Knutsen when she was left alone in her LSD-induced nightmare at Modum Bad.

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Chapter 5 - Psychedelic telepathy: An interview study
Psychedelic Telepathy: An Interview Study

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Abstract—This article presents an interview study of ostensible telepathy experiences induced by psychedelic drugs, with the aim of broadening our understanding of the nature and characteristics of such experiences. Of 40 anonymous psychedelics users interviewed about their experiences, 16 reported some form of psychedelic telepathy. Respondents were recruited at various online fora for individual interviews via private messaging. They reported three main types of telepathic communication: 1) an information-exchange type of telepathy that often enabled people to communicate in images as well as in words; 2) a state sometimes referred to as telempathy that allowed for the direct exchange of feeling-states; and 3) a state of self-dissolution and telepathic unity where one could not differentiate one’s own thoughts and feelings from those of the friend or partner. Some participants complained about the lack of privacy especially in the more intense forms of telepathic states, and were hesitant to repeat the experience, while others claimed they had become accustomed to such states and experienced them regularly. The article concludes that further studies are warranted, and suggests a strategy for an experimental study of psychedelic telepathy.

Keywords: psychedelic; interview; qualitative; telepathy; self-dissolution

INTRODUCTION

The term telepathy was coined by the early psychological researcher Frederic W. H. Myers from the Greek τῆλε (tele), meaning distant, and πάθος (pathos), which in this context means feeling or experience.
Myers defined his neologism as “the communication of impressions of any kind from one mind to another, independently of the recognized channels of sense” (1896–1897, p. 174). Psychedelics for their part are a group of drugs named by psychiatrist Humphry Osmond after the Greek ψυχή (psyche), meaning soul or mind, and δηλαείν (delein), to reveal or manifest, and are known for their powerful effects on feelings, thoughts, and perceptions (Nichols, 2004, 2016). The classical serotonergic psychedelics include mescaline (the active constituent of peyote), psilocybin (the active constituent of “magic mushrooms”), lysergic acid diethylamide (LSD), and N,N-dimethyltryptamine (DMT).

Telepathic communication between research subjects in experimental settings is documented in parapsychological literature, although this literature has not found much acceptance in the mainstream academic world. In the past decades, most telepathy research has taken the form of so-called ganzfeld (a German word meaning ‘total field’) studies, where research subjects are flooded with unpatterned sensory stimuli in order to achieve an effect analogous to sensory deprivation (Cardeña, 2018). The state of mind that results from ganzfeld stimuli has been found particularly conducive to telepathic receptivity, and the most recent and comprehensive meta-analyses of such studies found support for a telepathic effect (Storm et al., 2010; Williams, 2011), although skeptics have challenged these findings (Alcock, 2010; Hyman, 2010).

These ganzfeld studies indicate that an altered state of consciousness may be supportive of telepathic receptivity, and perhaps of paranormal experiences in general. As psychedelics are known for inducing powerful alterations in consciousness, with effects that include increases in mental imagery, empathy, alertness, awareness, attention, spontaneity, suggestibility, openness, intuitive thinking, and emotional flexibility (see review in Luke, 2012), there is reason to believe that the psychedelic state could be conducive of telepathic experience. Neuropharmacological research has demonstrated that, perhaps counterintuitively, these psychedelics-induced alterations in consciousness correlate with general decreases in brain activity (Carhart-Harris et al., 2012), while also increasing the number of long-range cortical connections (Petri et al., 2014). Thus, a human brain affected by classical psychedelics will be both relatively quieter and more integrated,
with an increase in topologically long-range functional connections. Carhart-Harris et al. regarded their finding of a psilocybin-induced decrease in overall brain activity as being consistent with the reducing-valve model of the brain that Aldous Huxley (1954/1994) developed on the basis of Henri Bergson’s work (1896/1990), which posits that the brain has an active filtering mechanism constraining our experience of the world to that which has value for immediate survival. The observed reduction in brain activity during psychedelic influence may therefore involve a reduction also in filtering activity, enabling a state of unconstrained cognition that is perhaps beneficial for experiences of telepathy and other psi phenomena.

In support of the view that psychedelics could be beneficial for telepathy, there is a substantial anthropological literature on indigenous psychedelics use resulting in ostensible psi phenomena (Luke, 2010), as well as a number of surveys on psi experiences among modern psychedelics users. One review of surveys of paranormal experience in relation to psychedelics use found that “of those reporting the use of psychedelics, between 18 and 83 percent reported ESP experiences—most commonly telepathy but also precognition—actually occurring during drug use, with heavier users reporting more experiences” (Luke, 2015, p. 156). On a more anecdotal basis, an Internet search will obtain a number of trip reports from modern psychedelics users describing telepathic experiences as one of the effects of psychedelics use.

Despite this promising foundation, parapsychologists have not been very successful in demonstrating telepathy and other psi phenomena with psychedelics under controlled conditions (see overview in Luke, 2012). Most of this research took place in the psychedelic pre-prohibition era, but when parapsychologists picked up this line of research during the 1990s findings remained generally unconvincing (Bierman, 1998; Don et al., 1996; Tinoco, 1994; Wezelman & Bierman, 1997). It has been suggested that the traditional symbol-guessing procedure employed in some telepathy studies is too dull a task for psychedelics-affected participants, and that dosage may have been too low to induce telepathic effects (Luke, 2012). Furthermore, it appears that most ganzfeld studies have been set up without consideration of the sender–receiver relationship (Roe et al., 2003), although at least one study by Honorton et al. (1990) reported improved hit rates when
participants brought their own senders. Finally, Luke’s (2012) review of psychedelic telepathy studies found that most such studies were set up with a sober sender together with a psychedelics-affected receiver. By contrast, the reportedly very successful psychedelic telepathy experiences discussed in this article took place between friends and partners who were simultaneously affected by (generally) high doses of psychedelics.

The purpose of this interview study of psychedelic telepathy experiences was to gain insight into how psychedelics users themselves describe the state of telepathic contact. The study aimed for a deeper understanding of the characteristics of such experiences that might allow for a tentative categorization of different types of psychedelics-induced telepathic communication. It also asked participants to describe the transition into the telepathic state, and to suggest factors that might facilitate or abet a telepathic connection. Finally, the study aimed to identify challenges or difficulties with psychedelic telepathy.

METHOD

Current or past psychedelics users were interviewed about their experiences in two phases of the study. In the first phase, 26 users of psychedelic drugs in spiritual contexts were interviewed either individually or in groups about a broad range of aspects relating to their psychedelics use. These interviews dealt with psychedelic experiences in general, and only two of the participants had a telepathic experience to report. In order to gain more insight, a second phase of the study recruited 14 users specifically on the basis of their reports of psychedelic telepathy experiences posted on Internet discussion fora. These prospective interviewees were approached with a private message stating the following:

Hello [username]! I read your post from [date] about your telepathic experience. This is interesting to me as I am starting up an academic interview study of telepathic experiences with psychedelics. Would you allow me to quote your post anonymously in my study and answer a few follow-up questions?
Follow-up questions engaged with matters such as dosage and setting, the transition into the telepathic state, whether their recollection of the experience agreed with that of their partner, and the long-term consequences of the experience, all of which were asked as open-ended questions in a non-judgmental manner. In addition, the study was informed by a number of reports posted on discussion fora by users who were either currently unreachable or who did not reply to recruitment attempts. These reports were often of considerable value to the study. In order to preserve privacy, however, only reports from authors who signed (anonymous) informed consent forms have been quoted from in this article (with ID numbers after the quotes).

Interviews were asynchronous and Internet-mediated, and participants were encouraged to interact with the interviewer via anonymized email or messaging that protected their identity from the researcher. The study was designed in conformity with Norwegian Social Science Data Services ethical guidelines. It emphasized the preservation of participant anonymity, and aimed to ensure that no participant would be identifiable either to the researcher or to readers of published material. Statements have been edited for brevity and relevance, and insignificant details have sometimes been altered to preserve anonymity. Participants were asked to read through and verify the use of their narratives. As interviews took the form of written communication, transcription was unnecessary. Data were analyzed using thematic analysis and Brinkmann and Kvale’s (2015) procedure for meaning condensation, and themes were constructed in an open-ended, exploratory, and data-driven comparative analysis of participant narratives. The interview process allowed for the resolution of ambiguities through follow-up questions. No attempt was made to verify that the participants’ narratives were truthful, with the one exception that interviewees were asked about how their telepathic partner later talked about the experience. This question was asked with the intent to identify non-reciprocal and possibly imagined telepathy experiences, but none of the participants indicated that there was a disagreement between themselves and their alleged telepathic partner about the nature of the experience.

Because psychedelics use is generally illegal, not all respondents were willing to provide demographic information. In order to reduce
participation stress, only a minimum of such information was requested. Of the 27 participants who provided their gender, 24 were male and three female. The median participant was in their early 30s, with an age range from 18 to late 50s. Four were married (two with children), six were in stable relationships (one with children), seven were single, and one was in the middle of a break-up. Twelve held steady jobs in retailing, education, music teaching, journalism, industrial services, IT consulting, carpentry, investment client support, and as a hospital worker, five were students, one was unemployed, and one used to work as a kindergarten assistant but was recently disabled because of an inherited condition.

RESULTS

Setting and Dosage

In all the reports available to this study, psychedelic telepathy experiences took place between friends or partners who were tripping together in the same room or area. None of the reports described experiences of telepathic contact with news presenters on television, strangers in the streets, or anyone else external to the group of trippers. With a few exceptions, the telepathy experiences were all reciprocal, involving two or more people who both felt that they were in telepathic contact with each other. Of 20 reports that mentioned which drug was taken, 15 involved LSD as the main psychedelic drug, while two involved psilocybin, two 3,4-Methylenedioxymethamphetamine (MDMA), and one d-lysergic acid amide (LSA). Doses were generally described as strong, although we should note that it is difficult to ascertain the amount of LSD in a blotter without access to a chemical lab. Nevertheless, about 300 mcg of LSD seemed to be a median dose for telepathic experiences, with a reported range from 100 mcg to 8 blotters. Some reported combining LSD with cannabis, which is often said to intensify the psychedelic effects.

Most of the reported psychedelic telepathy experiences took place with a single friend, often described as a close friend or a partner or spouse. In some reports, however, the telepathic pair was among a group of 3–5 friends, the rest of whom were not involved in the telepathic experience. A few other reports described telepathic communication
between three or more people, but none of the authors behind these reports was available for follow-up questions.

When interviews did allow for follow-up questions, I always asked whether the interviewee had talked to his or her friend about the telepathic experience, and whether this friend confirmed that it was a shared experience. With a few exceptions, everybody confirmed that they had talked about their telepathic experience over the days and weeks—sometimes for years—after it happened, and that they both agreed it was a telepathic experience. The most noteworthy exception was one interviewee who first described the experience as involving telepathy in a Reddit post, but who later changed his mind about it and now considered it an experience of communication via face reading and body language rather than telepathy. When I asked this interviewee about how the friend he shared the experience with thought about the experience today, I did not receive a reply. Another participant also failed to respond to such a question at the start of the interview, and was not heard from again.

Transition

With one exception, the telepathy experiences in this study all occurred spontaneously. The transition into the telepathic state was sometimes a noticeable event, where the trippers suddenly discovered that they could communicate telepathically, and sometimes a more gradual process that they did not recognize until it was well-established. One participant was on a heavy dose of LSD combined with cannabis, tripping with a single friend around a bonfire at an isolated cabin, and suddenly found his mind behaving in unexpected ways:

My mind started to say things that I didn’t expect, things that were in my voice and had my tone quality, but were not what I was expecting myself to say. So I said to the voice: Is that you talking to me, or is that me talking to myself? And the voice said: I think you’re talking to me, dude. (ID06)

He responded with astonishment and resistance, jumping up and running away. Then he heard the sound of something like a firecracker going off:
I felt my head crack, like something gave way. The crack happened at the height of my astonishment when I ran to the other side of the bonfire to get away from my friend. It was like a pressure-release valve blowing. It seemed to be in the very center of the head, and as soon as it happened I felt different and I accepted what was happening. It was like my worldview had expanded. (IDo6)

Others described a more gradual transition. In some cases, they reported being engaged in conversations that gradually changed from vocalized to telepathic without anyone noticing. In other cases, the conversation seemed to be fully telepathic from the start, but for a while the trippers believed they were talking in the usual way:

My girlfriend and I were talking to each other. After about a 20-minute conversation, I said something out loud, and only then did I realize that during the entire conversation I hadn’t ever actually said a word. To put it simply, my girlfriend was actually reading my mind and responding to my thoughts as if they were words I spoke. She noticed at the same time that I did. We were both amazed by it and ran to the living room to tell our other roommates about it. (IDo8)

A similar telepathy narrative involved two friends who were using LSD together. During the trip, one of them entered the room where the other was sitting with some friends, and the two had a long conversation. After the first one left again, it occurred to the second that they actually had not opened their mouths during this exchange. He asked the other people in the room about this, one of whom was sober, and they said that from their perspective the first person had entered the room, stood there quietly for a while, and then left again. Another interviewee described a different form of unconscious transition, where he was lying on the floor sleeping or passed out after taking 300 mcg of LSD, and then woke up in a state of telepathic contact with his friend. While all of these experiences occurred spontaneously, without any conscious intention to explore telepathy during the psychedelic trip, there was also one report of a telepathic experiment. This proto-parapsychologist
had taken MDMA and amphetamines, and suddenly felt inspired to do a little experiment in telepathy:

We sat down in a room and I said to my friend something along the lines of ‘let’s see if I can telepathically send a word’, and he was up for the experiment. Always willing to challenge my own perception of reality, I looked deep into his eyes, but rather than send a word I chose to ‘send’ a noise rather than a word, and that was a sort of nya sound. I then asked him what word I had ‘sent’ and he replied: ‘it wasn’t a word, but a sort of nya sound’. (ID27)

Other participants who had experienced telepathy sometimes tried to recreate the experience, but found that these intentional attempts to make telepathy happen failed to work. Several participants did describe having further spontaneous telepathy experiences, however, which usually took place with the same person as their first experience. Furthermore, a few reported that telepathic experiences were something they had come to expect from deep psychedelic trips. Having learnt from their first experience how to enter the telepathic state, they found it possible to repeat this maneuver in later psychedelic trips. Unfortunately, the skills involved in this task were not easily communicated. One described it as becoming aware of a subtle “sliver” that it was possible to slip through, and having once recognized this subtle mental phenomenon spontaneously, his awareness became attuned to it and this made subsequent recognition easier. On a somewhat more practical level, others recommended that trippers hoping for a telepathic experience should look deeply into one another’s eyes, which they claimed serve as a gateway into other people’s consciousness. Another participant whose intentional attempts at recreating the telepathic experience always failed, found that his three occasions of spontaneous psychedelic telepathy with the same friend had the following in common:

We were completely absorbed in something else, relaxed, distracted, and in sync. I believe a personal relationship is very helpful to the process. (ID06)
Telepathy and Telempathy

Several different forms of telepathic contact were described by the participants in this study. In its most common form, telepathy was about a direct, two-way exchange of information. As we saw above, participants sometimes reported that they were engaged in a telepathic conversation for a long time before they noticed that they were not talking in the usual sense, and in these experiences the telepathic conversation clearly resembled an ordinary conversation. Such states of telepathic contact typically lasted for several hours.

For the rest of the night we talked telepathically, and it was effortless and instantaneous. When he went to pee outside, we were still talking to each other through the walls. (IDo6)

The experience lasted about 3–4 hours. I was blown away by how long it was. When I realized it at first and confirmed it with my roommate, I burst into tears for the gratitude of being able to experience such a wonderful thing. We went outside and smoked a cigarette, thinking that was the end of that. Then we went back inside and continued to talk telepathically for the next few hours. (IDo5)

One important difference between this type of telepathic conversation and ordinary conversations, however, was that participants often found they could communicate in images rather than words. This was usually found to improve the information exchange, since trippers who struggled to find words could convey their ideas in pictorial form:

When I was explaining what I believed to my friend, I was doing it telepathically until I came to something I couldn’t describe. When this happened I could picture what I was trying to say and I would ask, ‘do you see the circle with the point in the middle?’ etc., and my friend would say, ‘yea I see it’ and finish saying what I was trying to say. He could find the words to explain what I couldn’t. (IDo5)
We could talk without words, transmitting feelings and picture-ideas directly. (ID19)

Furthermore, as indicated in the last quotation above, the telepathic exchange sometimes extended beyond thoughts and ideas into the realm of feelings. Reports of such experiences sometimes referred to them as ‘telempathy’ in order to differentiate this direct exchange of feelings from the more ordinary exchange of ideas. One described such telempathic exchanges as communication on the soul level, taking place on a level beyond words. Another person similarly found telepathy to be too mild a word for such communication, which was described as being able to know at a deep level what the other person means.

Finally, three interviewees described telempathy experiences that were of such intensity that they felt themselves dissolving into a state of unity with their partner. In these experiences, participants allegedly shared their feelings so intimately that it was difficult or impossible to identify which feelings belonged to whom.

Our consciousness, our thoughts, our feelings merged into one. This might be hard to visualize if you haven’t experienced it, but it gives the effect that you literally ARE the other person. That they may be a projection of your own mind. I had melded into this person, and he was effectively a projection of my own mind. (ID13)

The difficulty was when some shadow stuff started coming up, as there was absolutely no boundary and no way to close myself off from my friend. He experienced all that was coming up for me directly and I experienced his stuff. Frankly, I don’t know whose stuff it was, because there was one mind only. (ID10)

Differentiating actually became really difficult. In the early part of the experience it was easy, as the thoughts I would ‘think’ I recognized as my own and the thoughts that I ‘knew’ I recognized as being my roommate’s. But as the night wore on it became increasingly difficult to differentiate my separate identity from my roommate’s. (ID05)
Such states of telempathic unity were sometimes described as frightening. Psychedelics users who had experienced telempathic states cautioned against taking high doses of psychedelics with people one has unresolved issues with, claiming that relationships that are not ready for such a radical state of emotional openness might be harmed by it.

Privacy Issues

This piece of advice with regard to emotional readiness for telempathic experiences brings us to the main challenge reported for psychedelic experiences, namely the lack of privacy. One participant described how this feature of psychedelic telepathy made him uncomfortable with the experience:

You can’t hide anything when you are telepathic with someone, and that I didn’t like. Understanding how easily a person can know what you are thinking and infiltrate your mind really made me uneasy and really really really appreciate sobriety. People want to know everything, and they want to know how to be telepathic and that is great, but everything has a dark side. Ignorance is bliss. Having privacy is awesome. (ID05)

What was the most difficult for this participant was that his roommate, with whom he shared three telepathic experiences, turned out to be gay, and in the last experience this roommate started pressuring the interviewee for homosexual relations. Their earlier telepathic experiences had convinced the two that, one some level, all humans are in truth ‘One’, and this became an argument used to try to persuade the interviewee to agree to having sex. The interviewee did not appreciate being pressured by this argument, and the telepathic connection between the two made the situation especially uncomfortable, since there was no way to escape from the roommate’s pressure.

The last time was a negative time for me though because he was gay and I am not, although I’ve played around with the idea. The entire time he was pressuring me into being gay. I
repeatedly told him that I did not want to, I did not find the male body attractive and just did not want to. And he said things like ‘well you know we are all One so what is the big deal?’ I replied ‘it isn’t a big deal except for the fact that I don’t find men attractive and I don’t want to, I don’t care how One we all are, right now we are not one and I prefer women.’ That night was awful because I had no way to escape his peer pressure and wanted it to end. (ID05)

Another participant had a similar story. He shared three telepathic experiences with a friend who was a closeted homosexual and, as it turned out, interested in the interviewee. In their last telepathic experience, the interviewee could overhear his friend’s romantic scheming telepathically, which the interviewee found to be dishonest and not forthright. He nevertheless maintained that the fear of losing one’s mental privacy during telepathy experiences is overstated, because you would always pick up people’s thoughts from a place of understanding and acceptance:

You may worry when you speak telepathically that maybe they will hear thoughts you don’t want them to hear. But you feel everything in the context of their history and personality. It is very difficult to judge someone’s thoughts when you experience that thought as if you are them. (ID06)

A third interviewee experienced a similar dynamic from the opposite perspective. He went into a state of telepathic communication with his tripping friend, but this turned out to be a challenge when unexpected sexual desires rose up:

At some point I told him that I love him. He refused, but quickly realized that yes this was actually real love. We admitted love to each other (in no homosexual way at this point, mind you). But a little later, I started associating the whole thing with sexuality, started projecting my own sexuality onto it. Everything seemed very erotic, and I told my friend what I saw and that I did not want this. At this point, I
was getting really confused and our connection was broken. He stayed grounded and kept reminding me that these are only my thoughts, but I was really afraid. For days or even weeks afterwards I had this slight paranoia that everyone can hear my thoughts and feelings. I didn’t feel safe in my own mind. (ID10)

Some others, however, did not regard the resultant mental nakedness of the telepathy experience as a problem. These people felt they had nothing to hide, and sometimes appreciated the increased openness:

I never felt threatened by the lack of privacy. In fact, it was a very nice feeling being able to be vulnerable around those I care about since I’m always so closed up. (ID08)

**DISCUSSION**

This study has explored psychedelic telepathy experiences among participants recruited from online discussion fora. Taking no stand on the veracity of the reports, the aim of the study was simply to explore how the psychedelic users themselves describe states of telepathy, and to categorize and compare the main elements of their narratives. All the narratives of telepathic communication involved communication between two or more partners or friends—often described as close friends or best friends—who were tripping on psychedelics together in the same room. All except two of the experiences were described as reciprocal. If telepathy is a real effect, it seems reasonable to expect it to run parallel to other forms of connections between people, which implies that it should be stronger and more easily identifiable between people who are emotionally close; this is congruent with tentative findings by Honorton et al. (1990) and with Roe et al.’s (2003) analysis. Indeed, one factor that seemed to facilitate telepathy in the reports available to this study was the wish or desire for a closer connection. There were several reports of telepathy with one’s partner or spouse, and the three narratives that involved unrequited homosexual love stood out as noteworthy. Although there are not enough reports included in this
study to draw valid inferences, future telepathy researchers seem well-advised to study the role of romantic or erotic desire in establishing a telepathic connection.

The study identified two main forms for transition into a telepathic state and three main types of telepathic communication. Some experienced the transition as abrupt and somewhat challenging, while others described a transition so smooth as to be unnoticeable. It should be remembered that all the reports in this study were from people who experienced telepathy while tripping on, for the most part, heavy doses of psychedelic drugs, and the temporary inability to differentiate between spoken conversations and telepathic conversations that some reported should be understood in this context. It was not possible to identify any explanation for why interviewees experienced the transition phase so differently.

The three types of telepathic communication were not discrete states, but rather appeared to lie on a continuum. In its weakest form, telepathy seemed to resemble an ordinary spoken conversation, allowing simply for the exchange of verbalized ideas. This information-exchange type of telepathy often enabled people to communicate in images as well as words, however. A more intense form of telepathy was sometimes referred to as telempathy, and reportedly allowed for the direct exchange of feeling-states. Such experiences were often described in spiritual terms. Finally, the most intense form for telepathy was a state of self-dissolution where one could not differentiate one's own thoughts and feelings from those of the friend or partner. These experiences were often regarded as very challenging. Several interviewees also reported feeling uncomfortable over the lack of privacy that characterized the telepathic state. For some, this lack of privacy was sufficient reason to not want to repeat the experience, but others eventually grew accustomed to it. A few reported a normalization of telepathy experiences, regarding them as simply one of many fascinating features of the deep psychedelic state.

Another noteworthy characteristic of the telepathy narratives in this study is that they were often colorful and remarkable experiences. This characteristic contrasts with the standardized ganzfeld experiments conducted in parapsychological research, where the receivers are reported to pick the correct visual target one out of three times, rather
than one out of four times as chance would predict. While this effect, at least according to some studies and meta-studies (Storm et al., 2010; Williams, 2011), may lie outside the boundaries of normal statistical deviation, a relatively minor discrepancy in probabilities is not the type of effect that captures one’s imagination. As the philosopher C. D. Broad emphasized back in 1949, spontaneous cases of psi are often much richer in content and more interesting psychologically than the results of experiment with cards or drawings. In comparison with the latter they are as thunderstorms to the mild electrical effects of rubbing a bit of sealing-wax with a silk handkerchief. (Broad, 1949, p. 297)

However, it should be noted that the present study is subject to a range of obvious limitations. The study is based on Internet-mediated conversations with psychedelics users who claimed to have had telepathic experiences, but it was not possible to independently verify these reports. While the author had no reason to doubt the sincerity and truthfulness of the interviewees, neither of these is assured in principle. Some readers might even find that the fact that respondents were in a state of psychedelic intoxication while allegedly experiencing telepathic contact is in itself good reason to doubt the veracity of their reports.

**Further Studies**

In conclusion, further studies of psychedelic telepathy are clearly warranted. Furthermore, seeing that the ganzfeld experimenters, even when they can point to what appears to be solid statistical results, seem to have largely failed to convince the academic mainstream about the reality of psi, it might be advisable for parapsychologists to diversify their approach. In the following, I will therefore outline a research strategy for a study aiming to bring psychedelic telepathy into the laboratory. The final goal of this proposed study is to demonstrate telepathic communication between two experienced subjects within a controlled space. This is not an easy study to conduct, however, and will require long-term commitment from researchers.

Before proceeding, we can examine some earlier advice for
parapsychological research with psychedelics. Such advice often centers on the importance of set and setting, or in other words on the psychological and physical contexts of psychedelics use. Luke's (2015) summary of factors to take into consideration included “the participants’ expectations, attitudes towards themselves, idiosyncratic perceptions, and emotional orientation to the experiment,” and he emphasized the need for researchers to be friendly and supportive and thereby engender trust and acceptance among the participants (p. 160). This seems like good advice, but I would like to point out that this set of advice was probably intended for researchers conducting experiments with telepathically (and perhaps psychedelically) naïve subjects. For the study I am proposing, I would instead recommend recruiting participants who have already experienced psychedelics-induced telepathy and, at least to some extent, have developed skills allowing them to recreate such experiences. If such participants can be found, it should be recognized that these participants, rather than the researchers, are the experts in determining which set and setting might facilitate a telepathic experience. In the early phase of the study, it seems advisable for the researchers to proceed more as anthropologists conducting a field study than as psychologists aiming for experimental control. Later on, if the field study phase indicates that the participants are capable of inducing telepathic states, the study could be moved into the researchers’ laboratory and be repeated under controlled conditions.

The critical task for this study is to recruit suitable participants. Recruiting inexperienced participants into the laboratory and administering large doses of psychedelic drugs is not advisable, as the likelihood of untoward events rises with dosage (Nour et al., 2016; Studerus et al., 2012). In addition, the induction of telepathic states does not seem to be a sufficiently common effect of psychedelics use that such a straightforward approach is likely to succeed. Most of the interviewees in the present study found that they could not recreate the telepathic experience at will, but some of them claimed to have developed an ability to at least recognize and seize opportunities for a telepathic connection. The success of the proposed study relies on the supposition that these individuals were truthful and not deluded, and that they exist in sufficient numbers that a parapsychological researcher
will be able to recruit at least a pair of them. Recruitment might take the form of publishing notices at a range of online psychedelic communities, although this may result in much attention from pranksters and people hoping for free drugs. More fruitfully, perhaps, a prospective researcher may start by inviting online communities to a survey of psychedelic telepathy experiences, and at the end of the survey invite participants to follow-up interviews. Candidates for the experimental study may then be identified based on the information obtained in interviews. As an alternative, researchers may take a ‘spear-fishing’ approach where they monitor various psychedelic community fora and search through their archives in order to identify suitable candidates for the study, and then approach them individually via private messaging.

Assuming suitable candidates can be obtained, the researchers will need to engage with a gradual process of inserting themselves into the psychedelic practices of their subjects. This may be a delicate endeavor, as many psychedelics users regard the intoxicated state as a highly sensitive one, and may be uncomfortable with having strangers present. Unless the subjects are extremely proficient at inducing the telepathic state, simply transplanting them from their usual tripping environment into the researchers’ lab and supplying them with psychedelic drugs is unlikely to work. Instead, the researchers must gradually earn the confidence of their subjects, starting out with a minimal presence at psychedelic sessions and slowly allowing the study participants to get used to their new environment. At some point, it may be possible to bring neutral observers and recording devices into the experiment. If telepathy is a real effect, such a study might be able to demonstrate it in a manner that does not rely on statistical probability, but rather on interactions with subjects undergoing real-time telepathic conversations.

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Psychedelic Telepathy: An Interview Study


Chapter 6 - Day trip to hell: A mixed methods study of psychedelic “bad trip” experiences
Day trip to hell: A mixed methods study of challenging psychedelic experiences

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ABSTRACT

Background and aims: This article presents a mixed methods study of challenging psychedelic experiences or “bad trips”, with the aim of exploring the nature and characteristics of such experiences. While challenging psychedelic experiences have been studied in previous research, the article posits that the focus of this research has been overly narrow in terms of the characteristics and etiology of these experiences, and that it would be helpful to broaden our understanding of what a challenging psychedelic trip might be and how it affects users. Methods: In the first study, respondents (N = 38) were recruited at various online fora for individual anonymous interviews via private messaging. The Cannabis and Psychedelics User Survey used for the second study was constructed on the basis of the knowledge obtained from interviews, and recruited 319 participants (median age 33; 81% male) from seven different online communities. Respondents were asked to characterize both a typical and their worst psychedelic experience, allowing for comparisons between the two and for regression analyses of associations between challenging experiences and other factors. Results: Both in interviews and in the survey, respondents reported a broader range of characteristics for challenging psychedelic experiences than what has previously been recognized in the research literature. Despite the often dramatic narratives, they were convinced that the experience had positive long-term consequences. Conclusions: The two studies found that challenging psychedelic experiences have a greater thematic range than what has previously been identified. Besides the near ubiquity of fear in these experiences, confusion was also identified as an important aspect. Meditation practice had paradoxical effects on challenging psychedelic experiences, appearing as a fruitful area for further research.

KEYWORDS

adverse effects, bad trip, interview, meditation, qualitative, psychedelic, survey

INTRODUCTION

Psychedelics are a group of psychoactive drugs with powerful effects on feelings, thought, and perception (Nichols, 2004, 2016). They include mescaline (the active constituent of the cactus peyote), psilocybin (the active constituent of “magic mushrooms”), lysergic acid diethylamide (LSD), and N,N-dimethyltryptamine (DMT), the four of which are sometimes referred to as the classical psychedelics, as well as a range of other substances (overviews of psychedelic phenethylamines and tryptamines are available in Shulgin & Shulgin, 1991, 1997). The classical psychedelics are known for their low toxicity and are not considered to be reinforcing substances (Nichols, 2004), but some newer phenethylamines have higher toxicity (Nichols, 2016). Research on the therapeutic effects of psychedelics goes back to the 1940s, but was curtailed in the 1970s when psychedelics were designated drugs of abuse with no accepted medical applications (Cohen, 1960; Johnstad, 2020b; Rucker, Iliff, & Nutt, 2018). After a long hiatus, this line of inquiry has been taken up again during the past decade, with preliminary results indicating therapeutic effect from psychedelics on conditions such as depression (Carhart-Harris et al., 2016, 2018; Griffiths et al., 2016; Ross et al., 2016), anxiety (Gasser et al., 2013; Griffiths et al., 2016; Grob et al., 2011; Ross et al., 2016), and substance

Psychedelics have a long history of use in religious contexts among indigenous peoples (Dobkin de Rios, 1990; Huilkrantz, 1997; Labate & Cavnar, 2014; Maroukis, 2012), and their use has been associated with spiritual and mystical experience among modern westerners (Carhart-Harris & Nutt, 2010; Griffiths, Richards, McCann, & Jesse, 2006; Johnstad, 2018; Lyvers & Meester, 2012; Pahnke, 1966). This association may in part be explained by the finding that psychedelics sometimes induce experiences of ego dissolution in which users feel a sense of union with other people and with the universe (Nour, Evans, Nutt, & Carhart-Harris, 2016). Furthermore, some researchers have argued that the therapeutic effects of psychedelics may, unlike most other therapeutic drugs, depend at least in part on their experiential effect, and especially on effects related to ego dissolution and a sense of connectedness (Carhart-Harris, Erritzoe, Hajien, Kaelen, & Watts, 2017; Majić, Schmidt, & Gallinat, 2015).

However, not all psychedelics users are comfortable with experiencing the dissolution of their ego or self, and this effect can therefore lead to intense fear as users feel they are losing their sanity or are about to die. Researchers have attempted to measure this effect using a rating scale known as the DED scale (Studerus, Gamma, Kometer, & Vollenweider, 2012). High scores on the DED scale may therefore be understood as an indication of an unpleasant psychedelic drug state, or in other words a “bad trip”. However, Barrett, Bradstreet, Leoutsakos, Johnson, and Griffiths (2016) criticized the DED scale for overlooking some categories of challenging experiences, and constructed a scale based on a questionnaire of psilocybin experiences with seven categories or factors: grief, fear, death, insanity, isolation, physical distress, and paranoia. Thus, while one type of challenging trip may result from fearful resistance to the psychedelic effect of ego dissolution, others may be quite different in terms both of their characteristics and their etiology.

While researchers have generally been able to identify predictors for adverse psychedelic experiences (Rubinow & Cancro, 1977; Ungerleider, Fisher, Fuller, & Caldwell, 1968), it has long been recognized that the effects of psychedelic drug use are highly dependent on the factors of “set and setting”, where “set” refers to the user’s personality, preparation, expectation, and intention at the time of drug administration and “setting” to the physical, social, and cultural environment (Hartogsohn, 2017). Lucas (2005) summed up four rules of common sense for psychedelic trips, finding that any of the following could lead to a bad trip: (1) taking psychedelics when you are troubled about something; (2) taking them in an environment with people you do not trust; (3) taking them in an over-stimulating environment like a public place; or (4) taking too much (Lucas, 2005, p. 26).

In the psilocybin study by Studerus et al. (2012), the predictors for DED were high drug dose, being placed in a positron emission tomography (PET) scanner, and an indicator called “emotional excitability” that assessed the mental state before drug administration. What tended to cause difficult experiences, in other words, were two variables for a specific set and setting added to the unsurprising fact that higher psychedelic doses were found to be more challenging. These three factors were also central to the findings of an online survey of 1993 individuals about their most difficult or challenging psilocybin experience (Carbonaro et al., 2016). In this survey, higher psilocybin dosage increased the difficulty of the challenging trip, as expected, but, somewhat surprisingly, the use of cannabis or other drugs before or during the session was found to decrease the difficulty. In fact, some users commented that they smoked cannabis to deal with their challenging trip, although others noted that cannabis exacerbated the difficult experience. Besides these matters of dosage and drug combinations, factors related to set and setting – the emotional state before ingestion, the physical comfort of the setting, and the availability of social support during the session – also had a significant impact on the difficulty of the experience. Furthermore, mature and experienced users were generally better able to deal with the experience. One smaller survey of extra-pharmacological factors in the etiology of “bad trips” found that recreational use, large outdoor spaces, and user inexperience were associated with challenging experiences (Ona, 2018).

It seems, therefore, that set and setting are important for the outcome of a psychedelic trip. Whether they are sufficient to avoid a bad trip is another matter. Both Rubinow and Cancro (1977) and Ungerleider et al. (1968) acknowledged the helpfulness of an appropriate set and setting, but they also warned that precautions in this regard do not guarantee against adverse reactions. Lucas (2005) noted that bad trips can happen even when you follow all the rules of common sense, and criticized what she called the “set-and-setting attitude” as playing into a Western fantasy of control: “if we just do everything right, we can prevent negative experiences” (p. 26). Instead, she understood psychedelic bad trips as a shamanic initiation experience involving the dismemberment of inauthentic parts of the self.

This perspective on challenging trips as valuable learning experiences has been shared by both researchers and members of the psychedelic community. A large majority (84%) of the respondents to Carbonaro et al.’s (2016) survey endorsed having benefitted from the challenging trip, even as they also often reported that it was one of the most difficult experiences of their lives. Majić et al. (2015) suggested that the benefits of adverse psychedelic experiences might include therapeutic effects, as painful psychodynamic reactions are often considered fruitful in a psychotherapeutic context. However, they also noted that difficult experiences involving psychotic reactions might have anti-therapeutic
consequences. Lucas (2005) suggested that psychedelic bad trips only have valuable developmental and therapeutic effects when the user is willing and able to integrate their hard lessons, which may require the presence of wise and trusted counsel.

To sum up the state of current knowledge, it seems fair to say that the characteristics, etiology, and consequences of psychedelic “bad trips” remain somewhat unclear. Fear of death or insanity accompanying states of ego dissolution seems to play a central role, but probably does not account for all difficult experiences. Indeed, if we start from the assumption that challenging psychedelic experiences may be as varied as other forms of challenging experiences, even the seven categories identified by Barrett et al. (2016) may be too limited. Set and setting are clearly important, but have perhaps been overemphasized. Consequences seem largely benign, but perhaps only when the challenging experience is worked with in fruitful ways. The purpose of the present study was to expand our understanding of the characteristics that challenging psychedelic experiences may be as varied as other forms of challenging experiences, even the seven categories identified by Barrett et al. (2016) may be too limited. Set and setting are clearly important, but have perhaps been overemphasized. Consequences seem largely benign, but perhaps only when the challenging experience is worked with in fruitful ways. The purpose of the present study was to expand our understanding of the characteristics of the challenging psychedelic experience, and to test previously established findings about their etiology and consequences. Its working hypotheses were that challenging psychedelic experiences have a greater thematic range than what has been established in previous research, that set and setting are important but not decisive, and that respondent-assessed consequences are generally positive.

**METHOD**

In the interview study, 38 current or past psychedelics users were interviewed about their experiences in two phases of study. In the first phase, 26 users of psychedelic drugs in spiritual contexts were interviewed either individually or in groups about a broad range of aspects relating to their psychedelics use. These interviews always touched upon the subject of challenging trips, although not all responses opened up for a deeper investigation of the subject. In order to gain more insight, a second phase of study recruited 12 users specifically on the basis of their reports of challenging psychedelic experiences posted on Internet discussion fora. These 38 participants gave their informed consent to be included in the study. In addition, the study was informed by a number of “bad trip” reports posted on discussion fora by users who were either currently unreachable or who did not reply to recruitment attempts. These reports were often of considerable value to the study, but in order to preserve the privacy of their authors, the reports have not been quoted from in the article. Interviewees in the study often resisted the notion of a “bad trip”, preferring instead to refer to this as challenging experiences, and this terminology is adhered to in the presentation.

Interviews were asynchronous and Internet-mediated, and participants were encouraged to interact with the interviewer via anonymized email or messaging that protected their identity from the researcher. The study was designed in conformity with Norwegian Social Science Data Services ethical guidelines. It emphasized the preservation of participant anonymity, and aimed to ensure that no participant would be identifiable either to the researcher or to readers of published material. A few quotations have been translated from Norwegian, and statements have been edited for brevity and relevance. Insignificant details have sometimes been altered to preserve anonymity, and participants were asked to read through and verify the use of their quotations in their final form. As interviews took the form of written communication, transcription was unnecessary. Data were analyzed using thematic analysis (Braun & Clarke, 2006) and Kvale and Brinkmann’s (2015) procedure for meaning condensation, and themes were constructed in an open-ended, exploratory, and data-driven comparative analysis of participant narratives. The interview process allowed for the resolution of ambiguities through follow-up questions.

The Cannabis and Psychedelics User Survey was constructed on the basis of the interview study, with questions and the range of possible survey responses being based on themes identified in the interview analysis. Before the survey was deployed, it went through a round of asynchronous testing on 18 volunteers recruited online, although this resulted only in minor revisions. The survey was made generally available online via SurveyXact from April to September 2019 for self-selected participation. It was fully anonymous and recorded no identifying participant information, including IP addresses. Several articles based on the Cannabis and Psychedelics User Survey have been published or submitted for publication (Johnstad, 2020c, 2021a-e), and the dataset and survey questionnaire are available for download via figshare (Johnstad, 2020b).

Participants for the survey were obtained from seven communities: www.shroomery.org, www.dmt-nexus.me, www.bluelight.org, the Facebook page for Portland Psychedelic Society, the Reddit group r/Psychedelics, the Norwegian Association for Safer Drug Policy, and an informal group of psychedelics users in Bergen, Norway. Participants were recruited either via invitation threads started at each forum or via a snowballing email invitation. Women were especially invited to participate in the survey. The only inclusion criteria were adulthood (18 years or older), the ability to understand English well, and experience with a commonly used psychedelic drug. Individuals who did not meet the inclusion criteria were linked to a shorter version of the survey, and their data were not used in the analyses. Respondents reported using between 10 and 30 minutes to complete the survey.

**Measures**

The Cannabis and Psychedelics User Survey included basic demographic questions relating to age, gender, education, work status, and relationship status. Gender was measured with three categories (female, male, and other), but when the gender variable was used as a control in statistical analyses, seven participants who indicated an “other” gender were excluded from the analysis. Education was quantified from 1
Psychedelics User Survey.

Measurement tools were modified for the Cannabis and psychedelic drugs of the 2C family (2C-B [2,5-dimethoxy-4-bromophenethylamine] etc.), 5-MeODMT (5-methoxy-N,N-dimethyltryptamine), Ayahuasca (or analogues), smoked DMT (N,N-Dimethyltryptamine), LSD (Lysergic acid diethylamide), MDMA (3,4-Methylenedioxymethamphetamine), Mescaline/Peyote, Psilocybin/Magic mushrooms, and Salvia divinorum. The survey asked participants to choose one psychedelic drug from this list that they had experience with, and they were queried about their motivations for the use of this drug and asked to characterize emotional, cognitive and relational aspects of their worst experience.

In order to measure the personality of the participants, the survey included a version of Gosling, Rentfrow, and Swann’s (2003) Ten-Item Personality Inventory (TIPI), measured on a five-level Likert scale from “disagree strongly” to “agree strongly”. The TIPI is a concise measurement tool with only two items for each Big Five trait, but has been shown to have adequate construct validity, test-retest reliability, and patterns of external correlates (Gosling et al., 2003). The survey also included a version of Nicholson, Soane, Fenton-O’Creevy, and Willman’s (2005) Risk Taking Index (RTI), measured on a five-level scale from “never” to “very often”. The original RTI contained an item for health risk that related to substance use, and to adapt the scale to a sample of cannabis and psychedelics users this item was removed. Thus, the modified RTI used for this survey included only five items: recreational risk, career risk, financial risk, safety risk, and social risk. See Johnstad (2021c) for a more detailed discussion of how personality measurement tools were modified for the Cannabis and Psychedelics User Survey.

Statistical analysis

To predict the difficulty of a challenging psychedelic experience, an ordinal regression analysis used survey respondents’ characterizations of their worst psychedelic experience as the dependent variable. The survey presented a list of 24 emotional, cognitive, and relational characteristics, each of which the respondent could endorse or not endorse on a dichotomous basis as applying to their worst experience with psychedelics. Eight of these were negative items – anger or hate, confusion, disgust, fear, feeling of isolation from other people, regrettable behavior towards others, sadness, and violent behavior – all of which received a higher level of endorsement for the respondents’ worst experience than for a typical psychedelic experience (Table 2). To construct a variable indicating the difficulty of a psychedelic experience, these eight negative items were added together (variable range 0–8). Ordinal regression was used to assess the impact of a range of predictor variables on this additive variable while controlling for commonly used demographic covariates (Hendricks et al. 2015; Nour, Evans, & Carhart-Harris, 2017) as well as the Big Five personality traits and the overall risk taking score (RTI). In this model, the independent variables were gender (coded as female = 0, male = 1), age, education, the six personality traits, three dichotomous variables for spiritual practices involving meditation, prayer, and energy work (having such practice = 1), years of cannabis experience (coded from 1 = “Less than a year” to 5 = “10+ years”), the lifetime number of use occasions with the psychedelic chosen for the survey (coded from 1 = “1” to 8 = “101+”), a five-level ordinal variable for the social environment in which respondents most commonly used their chosen psychedelic (coded from 1 = “Alone”, 2 = “With a single partner”, 3 = “With a small group of close friends”, 4 = “With a group of friends and acquaintances”, and 5 = “At a party, night club, concert, festival or other public event”), an ordinal variable for how long the psychedelic session was planned in advance (coded from 1 = “One day or less” to 5 = “A year”), and a dichotomous variable for whether or not the respondent endorsed having an escapist motivation for their psychedelics use (yes = 1). The same set of independent variables were used in an ordinal regression model that analyzed the relative difficulty of the respondents’ worst psychedelic experience as compared to other difficult life experiences (coded from 1 = “Most difficult experience of your life”, 2 = “Among the five most difficult experiences of your life”, 3 = “Among the ten most difficult experiences of your life”, 4 = “The most difficult experience of a year”, 5 = “The most difficult experience of a month”, and 6 = “An everyday experience/not difficult”). Finally, a linear regression model analyzed the impact of the same set of independent variables, plus the additive variable indicating the difficulty of the experience, on the respondent-assessed long-term consequences of the respondents’ worst psychedelic experience (coded as a five-level Likert variable from 1 = “Negative”, 2 = “Mostly negative”, 3 = “No impact or mixed”, 4 = “Mostly positive”, and 5 = “Positive”). In these analyses, ordinal variables were treated as continuous. Data was analyzed with IBM SPSS Statistics 25.

RESULTS – INTERVIEW STUDY

Participant characteristics

Because psychedelics use is generally illegal, not all respondents were willing to provide demographic information. In order to reduce participation stress, only a minimum of such information was requested. Of the 30 participants who provided their gender and age, 28 were male and two female. The median age was mid-30s, with a range from the early 20s to the late 50s. Six were married (three with children), seven were in stable relationships (one with children), nine were single, one divorced, and one in the middle of a breakup. Eighteen held steady jobs in retailing, education, music teaching, journalism, industrial services, IT consulting,
carpentry, investment client support, and as a hospital worker, one was a business owner, one was an artist, four were students, one was unemployed, and one was recently disabled because of an inherited condition.

Types of challenging psychedelic experiences

Respondents reported a broad range of challenging psychedelic experiences. In many reports, the etiology and theme of the experience were clearly connected, as in cases of unpleasant insight into current life issues. In other cases, there was no obvious explanation for the challenging experience, but a comparative analysis of different reports sometimes yielded commonalities that may serve as tentative explanations. Narratives presented in this section have been categorized into different types or themes, but it should be noted that challenging experiences were sometimes the product of several converging themes that may have served to reinforce each other.

Life issues. One common form of challenging experience involved unpleasant insights about one's life. While uncomfortable at the time, these insights sometimes led to important changes. One psychedelics user, for instance, described a “so-called bad trip” from 20 years ago that focused on his habit of amphetamine use, and which made him quit amphetamines from that day. However, some users also described apparent insights that were actually delusional, turning minor issues into huge problems. One respondent described how he was sometimes confronted with personal traumas when tripping, and emphasized the therapeutic potential of this confrontation:

Traumas can show up with no warning, especially when an episode triggers old memories. I like to call tripping a kind of cosmic dive – you never know what will be brought to the surface. But wow! talk about therapeutic potential. (ID20)

Social paranoia. Also commonly reported as an aspect of challenging experiences were thoughts that other people do not like, accept, or approve of the user. Such experiences usually occurred when respondents used psychedelics in an unfamiliar social environment. Paranoid ideation sometimes also involved the prospect of the police arriving to arrest the psychedelics user, and, more generally, that the physical world was hostile and malicious.

Troubling visions. Psychedelics often affect how users perceive their surroundings, and in challenging experiences, these distortions may take on a menacing quality. One person reported that stains on the walls would turn into moving insects and faces in pictures would display anger, while another looked out of a window and saw that the trees had eyes and were staring back at him. Some also reported threatening inner visions:

In my vision I am flying slowly and timelessly into a whirlpool that is made entirely of emaciated-looking bodies like you would see in a Nazi concentration camp, but with eyes open and staring. I am being sucked into this horror in a timeless way, and I totally freaked out. As I was going in, I was sensing cold flesh, and parts of my body were aching and I freaked out! I should also say that the period when this happened was terrible. My life was very fucked up and I was working this terrible job in a factory sweat shop. So I had a lot of sadness in me. I regretted for years not going with the vision into the whirlpool of death. The experience freaked me out so much that it kind of made me fear tripping with eyes shut, and I think I also put blocks up to inner visions. But I wrote about it for a dissertation in art school, and it really inspired me in lots of ways regarding what books I got, my ideas for art etc. I am now over that fear, but there must always be awe. Ecstasy is very alive, awesome, and wild, and cannot be tamed. (ID17)

We find in this narrative also an example of how participants in the study worked to integrate challenging experiences, and claimed to benefit from them in the long run. Other reports of troubling visions involved evil or malicious entities. DMT users in particular often reported finding themselves in an alien environment surrounded by entities that seemed to have hostile intentions:

I was shown a frightening entity and within its tentacles was my human self. Not only me but many others as well. It was unreal. It was as if it were feeding on our souls. I was enveloped within its tentacles as if it were absorbing me and the others in its grip. (ID15)

In this case, the respondent understood that the malicious entity represented his frustration, anxiety, and anger, and that he could free himself from the entity’s grip by releasing his anger, but others reported seeing entities they regarded as external to themselves. Furthermore, some reports involved alterations to other senses than vision. One individual described a nightmarish vision of rapists and angry dogs, and reported that he could feel the tactile sensation of the dogs’ teeth tearing his flesh and the rapists penetrating his anus.

Mental and sensory overload. Psychedelics may enhance or stimulate certain aspects of cognition and perception. This is often regarded as a desirable effect, but respondents sometimes reported that the enhancement effect was uncomfortably strong, leading to states of mental and sensory overload. One user reported that he found himself rethinking every single thought he ever had in his life at the same time, which overwhelmed him. Such overload experiences commonly resulted in confusion and an inability to think straight:

On my previous mushroom trip I got reckless. The company I worked for had just filed for bankruptcy, so my professional future was less than crystal clear. In addition I was tired and worn down after work, and the place wasn’t heated properly. At the point where the trip peaked, it felt more intense than ever – in a negative sense. It was like I had been poisoned. Everything was just an out-of-control carousel of confusing chaos, thoughts, and physical discomfort. (ID18)

This individual tried to calm down using meditation techniques, but did not succeed with this. In the end, he
managed to maneuver through the challenging trip by interacting with his friends and directing his focus away from inner experience. Another respondent described an intense experience of cognitive overload where he relived several years of his life after taking 4-HO-MiPT (4-Hydroxy-N-methyl-N-isopropyltryptamine): I lay down, close my eyes, and immediately get a rushing feeling, like I’m in some kind of cosmic wind, blowing me out of my body. In front of me is a rotating gothic chrysanthemeum. I’m only looking at this for what feels like a second or two, and then it rotates, crystalizes, and opens up, hurting me into absolute darkness. I see light in the distance, I rush toward it... then open my eyes, sitting in class on the first day of ninth grade. Time speeds up, and I’m in tenth grade, having a conversation with my friend. I’m still absolutely astonished, but I have some memory of laying down in bed, while tripping, before this happened. I try to open my eyes but... I can’t. Thankfully, I don’t freak out. I gather myself, realize this is some kind of effect of the drug, and that I should try to pay attention, and see what it has to offer. The headspace was more or less like watching a movie, I was just my present self watching my actions through highschool me eyes. I won’t go into details about what I saw, but suffice to say I relived all of high school. A few parts were at normal speed, some parts were at double speed, but most of it went by very quickly, at something like 4,000× speed. (ID04)

As he came out of this experience, he noticed that only 15 seconds had passed since he laid down, meaning that his visions covering several years had taken place in a period of seconds. He then started to worry that he was having a psychotic break, but managed to calm himself, and did not have any lasting complications from the experience.

**Ego death.** Psilocybinics are well known for their dissolution of the user’s sense of having a separate self or ego, and this effect was sometimes experienced as threatening and distressing. Respondents who experienced fear of ego death often resisted the process of dissolution as if their lives and sanity depended on it. The relationship between ego death experiences and fear was not straightforward, however. One respondent described the process of psychedelic-induced ego death like this:

I was “crushed” out of existence. At the beginning of the experience an amorphous gray “cloud” was slowly descending toward my reclining body, and I somehow knew that when it reached me, I would be crushed. Indeed I was. It was a strong ego death experience, but once the ego was gone, it was very ecstatic. In my experience, the process of ego loss can sometimes be difficult, but it seems it’s the ego that experiences fear, and once the ego is gone, there is no fear. (ID01)

Thus, it seems that while fear often accompanies the process of ego dissolution, the completion of the process dissolves not only the ego but also ego-based fear. As we will see below, the respondent quoted here also reported feeling protected by ego loss during other intense psychedelic experiences. Another user described a lasting ego dissolution effect after using cannabis, where he for several days understood his true identity as a kind of spiritual force that was only playing at being “himself”. He now found that he had to make a conscious effort to keep up this charade or game, and worried that if he did not manage to keep playing the game, he would disappoint his mother and father and perhaps be labeled a schizophrenic.

**Mental and physical damage.** Another common cause for consternation among psychedelics user was the apparent insight that the state they were in was somehow damaging to their mental or physical health. One user reported an experience where he tried to recall old memories, but as he remembered them it was as if they were deleted and he could not access them anymore; he feared those memories were lost forever. Another described an acute fear of brain damage:

On LSD I reached a state where I felt that I somehow had lost my capacity to feel and to love, and it occurred to me that this loss might be permanent – that I had somehow fried my brain. In retrospect, I see that this fear was probably caused by earlier exposure to anti-drug propaganda. I went deeply into a state of self-contempt and full panic, fearing I was going insane. I got through it, but it was horrible. (ID19)

Some psychedelic experiences were so intense that users feared they would never be able to go back to the person they were before the experience. The respondent quoted above as having his sense of self crushed also reported an experience of seeing too much, fearing that the knowledge he had gained access to was not compatible with a continued existence as a sane person:

I felt the presence of emotionless entities with a mechanical quality about them. They wanted to show me something. I’m still not sure what it was, but my interpretation was that they were trying to show me how our reality is “constructed”. There is another reality “behind” ours, and they began to show it to me by “deconstructing” my reality. What I saw shocked me. I was not prepared to see how things worked. My illusions about reality were shattered. And I was still fully “me”, so I didn’t have the security blanket that ego-loss often provides. As I was witnessing these things, I thought “Having seen what I’ve seen, there’s no way I’ll ever be able to return without going completely insane.” I was convinced that I had gone too far, and that I wouldn’t be going back. (ID01)

Upon returning to his usual state of consciousness, this respondent was relieved to discover that he had forgotten the details of his dangerous insight, and he was able to continue his life much as before. It is interesting to note that in his own view, one reason that the experience was so difficult was that he had not gone through a process of ego dissolution, and was therefore deprived of the security blanket that ego loss might have offered.

The fear of mental and physical damage often occurred along with distressing bodily sensations, and would sometimes lead to the belief that one was dying. This was especially common in cases of accidental or thoughtless
overdosing, often because of combining different psychedelic drugs. One respondent reported a difficult experience caused by a combination of synthetic mescaline hydrochloride and 4-AcO-DMT (O-Acetylsilocin):

My mental state became saturated with a very tangible feeling of darkness, impending doom, despair and hopelessness. I felt weak, and lying there felt like something between a decaying old corpse and an aborted human fetus. It really felt like I was poisoned, and in a great deal of danger. My blood pressure was very high, and I was getting painful twinges in my heart and some weird electric twinges in my brain. Heart attack or seizure really seemed imminent... it was like my system was being worked to the very point of collapse, and it felt like death could occur at any moment. (ID02)

It is impossible to say whether these experiences represented cases of actual bodily peril, or if they were panic attacks based on a form of paranoid ideation that interpreted unfamiliar mental or bodily sensations as signs of grave danger.

**Time distortions.** Time loops or mental loops are experiences of time going in a circle, where one feels stuck in the loop, going through the same experiences, thoughts, and emotions on repeat. One time loop experience involved an inability to form memories:

The trip was going ok but at one point I felt like I got in a loop where I could not form memories. I started worrying about memories not forming and realized I could not tell how long this has been going on. Had I been like this for months? Would it ever end? (ID02)

This experience was the result of an intentional combination of *Peganum harmala* and a large dose of psilocybin mushrooms. Another respondent accidentally combined LSD, cannabis, and a strong 200× extract of *S. divinorum*, and found himself trapped in a tiny period of time on endless repeat:

Mentally (and this is all, essentially, metaphor), my consciousness became a Planck time. For reference, that's 5.39×10⁻⁴⁴ s. I became a personified version of that. It felt like I was a grain of sand on the crest of a wave that was hitting a shore. Every time the wave hit the shore, it created the universe at that particular moment, and the wave hit the shore a near infinite amount of times until the random arrangement of sand/Planck time units was just right, and then it repeated the cycle over and over again. I became one of these grains, and it was horrifying. It was hell. Hitting the shore, over and over and over again, begging to be freed. I could tell that there were other things like me around me, but I couldn't perceive anything about them besides that they were trapped eternally the same way I was. (ID04)

Another respondent drank a self-made tea based on *Mimosa tenuiflora* and *P. harmala* and described entering a void where there was nothing except his self-consciousness. He found himself utterly alone in this void of uncaring eternity, spending years or decades in a state that he described as being permeated with fear and endless despair.

A third respondent smoked a medium dose of DMT on top of a large dose of psilocybin mushrooms, and felt himself alone in a void surrounded by a noise that sounded like a wolf howl. He understood this as the sound of his soul being torn apart, and he found himself trapped feeling only horror and hopelessness for what he described as an eternity. Trying to escape from the experience by opening his eyes, he discovered that his eyes were gone. Finally, after taking a large dose of *Psilocybe semilanceata* and sharing a cannabis joint with his friends, a fourth respondent experienced what he referred to as a psychotic episode that also involved a feeling of eternal damnation:

I walked out on the balcony to gaze at the sky. Star signs were forming before my eyes. I believed it was the end of the world, the great dimensional shift – judgment day was upon us and I would soon have to stand trial for my sins. For some reason I believed that my girlfriend was in the neighbors’ apartment and needed rescuing, so I climbed over to their balcony and started banging on the window. The neighbors were horrified. My friend tried to stop me, but it seemed to me that he was sent from the devil to stop me from fulfilling my sacred mission. So I punched him straight in the face. He fell down and there was blood everywhere. The next thing I remember is that I tried to break their window. If I could only rescue my girlfriend then both of us would be picked up by a UFO and we would be safe. The neighbors screamed as I used whatever I found to break into their home. Before I got anywhere, the apartment filled up with a flock of vampires, who descended upon me with cruel smiles and black eyes. If there is an emotion that kicks in when you give up life and accept eternal damnation, that is what I felt. The vampires put me in a UFO that flew through time and space at the speed of light, and a few hours later I woke up in the emergency ward. It was the low point of my life. The first six months after the incident I was seriously traumatized and basically a nervous wreck. (ID20)

Despite the significant legal and social repercussions resulting from this experience, the respondent felt that the episode helped him deal with his long-standing psychological problems, and he did not have any further psychotic episodes.

**Finding the way back**

As we have seen, challenging psychedelic experiences come in a wide variety, and suggestions for how to integrate such an experience naturally depend on its nature. One thing everyone in this study had in common, however, is that they shared the experience with their psychedelic peers on an online forum. For some, the act of writing a report of one’s difficult experience and getting feedback from people who may have been in a similar situation was an explicit step in the process of integration. Others emphasized the return to normal life as a way to integrate the challenging experience. When the challenging aspects of the trip related to various life issues, respondents often spent a long time feeling their way around these issues and trying to implement necessary changes. Several respondents emphasized that difficult psychedelic experiences can teach you a lot, and that the best
strategy for dealing with such experiences may be to accept them as they come.

I think returning to everyday life, doing ordinary things, spending time with friends and family, etc. all contribute to the integration process. (ID01)

Writing out the trip here at the forum immediately made me feel better. (ID03)

Whatever you get in the trip, just observe it and learn from it. Be grateful for every difficult and hard trip because they are the ones that teach you the most. Once you start doing this, it doesn't matter anymore whether the trip is a 'good' or a 'bad' one. It just is what it is. (ID22)

For respondents who underwent especially high-intensity experiences such as those involving the feeling of eternal damnation, the path back to normality often involved talking to a partner or family member who could reassure the user that everything would be fine and help them calm down. Some, however, lacked a trusted confidant for their psychedelic misadventures, and instead pleaded for help at online discussion fora. A number of respondents also emphasized the importance of spiritual practices such as breathing exercises and meditation in guiding a psychedelic trip out of negative territory:

I had an experience a couple of years ago where I was getting lost in the chaos of the experience and the chaos in my own mind. When I started to chant, the chaos disappeared and everything became more harmonious. Meditation can also be a way to center yourself and to find inner peace and calmness. (ID21)

When I get anxious or feel out of it in some way, either when tripping or sober, it helps to focus on the breath and try to calm it down. (ID23)

RESULTS – QUANTITATIVE SURVEY

Participant characteristics

A total of 527 forms were submitted, but 202 of these were empty or near-empty and were excluded from analysis. Six responses with substantial discrepancies on repeated drug use assessments were also excluded. Of the 319 included participants, 213 completed the full survey, while 106 opted out from parts of it. An overview of participant characteristics for the survey is provided in Table 1. The typical participant was a male aged 32 with some university education, unmarried and childless but with a partner, situated in North America and working a full time job.

The most commonly chosen psychedelic drug for the survey was psilocybin (49%), followed by LSD (22%) and DMT (12%). Participants reported a generally moderate usage pattern for their chosen psychedelic drug, with the median participant having had between 1 and 10 use occasions over the past 12 months. A minority of 7% reported 11–50 use occasions over the last 12 months, indicating a range of use from between once per month to about once per week, while two per cent of participants reported use up to twice per week or more.

Characteristics of challenging psychedelic experiences

Participants were asked to characterize emotional, cognitive and relational aspects of their worst and a typical experience with their chosen psychedelic drug. They reported significant differences between their worst experience and a typical experience on 23 of 24 characteristics, with the only exception being ego death or dissolution (Table 2). Eight of the 24 characteristics were negatively worded – anger or hate, confusion, disgust, fear, feeling of isolation from other people, regrettable behavior towards others, sadness, and violent behavior – and these were the only items endorsed at higher levels for the worst experience than for a typical experience.

To analyze the variation in challenging psychedelic experiences, an indicator of the difficulty of the psychedelic experience was obtained by summing together the eight negative characteristics (variable range 0–8). This indicator had a mean value = 2.7 (SD = 1.8), suggesting that the average worst experience was only moderately difficult. Some 14% of respondents endorsed none of the negative characteristics as applying to their worst psychedelic experience, which seems to imply that they have never had a

<table>
<thead>
<tr>
<th>Table 1. Survey participant characteristicsa</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Age in years</td>
</tr>
<tr>
<td>(Median = 32)</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Relationship status</td>
</tr>
<tr>
<td>Number of children</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Religious backgroundb</td>
</tr>
<tr>
<td>Religious affiliation at presentb</td>
</tr>
<tr>
<td>Occupationb</td>
</tr>
<tr>
<td>Geographical location at present</td>
</tr>
</tbody>
</table>

Note: N = 319.

aSums may differ from 100% because of rounding.
bSums to more than 100% because respondents could choose several alternatives.
Table 2. Comparisons of a typical and the worst psychedelics experience

<table>
<thead>
<tr>
<th></th>
<th>Typical psychedelic experience</th>
<th>Worst psychedelic experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anger or hate</td>
<td>2%</td>
<td>11%</td>
</tr>
<tr>
<td>Confusion</td>
<td>24%</td>
<td>62%</td>
</tr>
<tr>
<td>Contact with non-ordinary beings</td>
<td>25%</td>
<td>18%</td>
</tr>
<tr>
<td>Contact with transcendent forces</td>
<td>34%</td>
<td>20%</td>
</tr>
<tr>
<td>Disgust</td>
<td>5%</td>
<td>25%</td>
</tr>
<tr>
<td>Ego death or dissolution</td>
<td>34%</td>
<td>32%</td>
</tr>
<tr>
<td>Fear</td>
<td>24%</td>
<td>69%</td>
</tr>
<tr>
<td>Feeling of homecoming or return to your essence</td>
<td>61%</td>
<td>17%</td>
</tr>
<tr>
<td>Feeling of isolation from other people</td>
<td>13%</td>
<td>41%</td>
</tr>
<tr>
<td>Improved connection with nature</td>
<td>77%</td>
<td>18%</td>
</tr>
<tr>
<td>Improved connection with other people</td>
<td>69%</td>
<td>21%</td>
</tr>
<tr>
<td>Inner visions</td>
<td>58%</td>
<td>31%</td>
</tr>
<tr>
<td>Insight into the world</td>
<td>79%</td>
<td>30%</td>
</tr>
<tr>
<td>Insight into your relations</td>
<td>76%</td>
<td>33%</td>
</tr>
<tr>
<td>Insight into yourself</td>
<td>87%</td>
<td>39%</td>
</tr>
<tr>
<td>Joy</td>
<td>86%</td>
<td></td>
</tr>
<tr>
<td>Love</td>
<td>78%</td>
<td>18%</td>
</tr>
<tr>
<td>Peace</td>
<td>84%</td>
<td>20%</td>
</tr>
<tr>
<td>Regrettable behavior towards others</td>
<td>7%</td>
<td>17%</td>
</tr>
<tr>
<td>Sadness</td>
<td>19%</td>
<td>44%</td>
</tr>
<tr>
<td>Surprise</td>
<td>43%</td>
<td>29%</td>
</tr>
<tr>
<td>Unity with transcendent forces</td>
<td>42%</td>
<td>16%</td>
</tr>
<tr>
<td>Violent behavior</td>
<td>0%</td>
<td>4%</td>
</tr>
<tr>
<td>Words cannot describe the experience</td>
<td>50%</td>
<td>39%</td>
</tr>
</tbody>
</table>

Note: N = 214. Stars indicate significant difference on the paired t-test between characteristics endorsed by respondents for a typical and their worst psychedelic experience: * P ≤ 0.05, ** P ≤ 0.01, *** P ≤ 0.001. Rows in bold show characteristics endorsed at a higher percentage for respondents’ worst psychedelic experience.

challenging experience, while 17% reported five or more negative characteristics. Respondents were also asked to estimate the relative difficulty of their worst psychedelic experience as compared to other difficult life experiences, with 6% declaring it the most difficult experience of their life, and a further 17% judging it one of their five most difficult life experiences (Fig. 1). At the other end of the scale, 26% stated that their worst psychedelic experience compared to an everyday or not difficult experience. Note that with this variable for relative difficulty, higher scores indicate lower difficulty. The indicators for absolute and relative difficulty of the worst psychedelic experience correlated strongly (rho = −0.50, N = 214, P < 0.001), but the relative assessment obviously depended upon the extent of other difficult life experiences, which the survey did not attempt to assess.

Ordinal regression was used to assess the impact of a range of predictor variables on these two indicators of experiential difficulty. The first indicator is labeled ‘absolute difficulty’, as it provides a difficulty score that is independent of other factors, while the second indicator is labeled ‘relative difficulty’ since it ranks the difficulty of the worst psychedelic experience relative to other difficult life experiences. The regression model for absolute difficulty was the strongest, with a Nagelkerke R² of 0.34 (Table 3).

In this model, both age and education, as controlled for the other variables, negatively predicted a difficult psychedelic experience, indicating that maturity and education reduce the difficulty of a challenging psychedelic experience. Female gender and the personality trait Emotional stability similarly served to reduce the number of negative characteristics. Perhaps surprisingly, meditation practice increased the difficulty of the experience, while practice involving energy work marginally reduced difficulty. One possible explanation for the effect from meditation is that meditators may be more accustomed to maintaining awareness of and labeling thoughts and emotions that arise in the mind, while individuals with energy practices may be skilled in diffusing negative states. The number of lifetime use occasions of the chosen psychedelic drug increased the difficulty of the worst experience, which we should probably understand to mean that the longer one uses psychedelics, the more likely one is to have a full-blown challenging experience. Years of cannabis experience, however, contributed to decrease difficulty. Finally, having an escapist motivation for psychedelics use served to increase the number of difficult characteristics. The regression model for relative difficulty was somewhat weaker, with a Nagelkerke R² of 0.24 (see Table A1 in the online appendix). This model is congruent with the first model in that female gender, education and the personality trait Emotional stability reduced the difficulty of the experience, while the number of lifetime use occasions increased difficulty. The other significant variables from the first model did not reach the level of significance for this model, but it introduced the personality trait Openness as a predictor of more relatively difficult experiences. In neither of these models did the variables for social environment and the extent of planning for the psychedelic session affect the difficulty of the experience. It should be noted, however, that these variables represent the typical setting and planning for the respondent when using psychedelics rather than the setting and planning specifically for the difficult session.

Consequences of challenging psychedelic experiences

Respondents reported few negative long-term consequences of their worst psychedelic trip (Fig. 2). More than 67%
regarded the long-term consequences to be either positive or mostly positive, compared to less than 4% who regarded the consequences to be either negative or mostly negative. There was no significant correlation between the assessment of long-term consequences and either the relative (\( \rho = -0.11, N = 214, P = 0.10 \)) or the absolute (\( \rho = 0.01, N = 214, P = 0.92 \)) difficulty of the worst psychedelic experience. A multivariate linear regression model that used the same independent variables as the previous models plus the indicator for absolute difficulty achieved an adjusted \( R^2 \) of only 0.05 (see Table A2 in the online appendix). In this model, only the personality trait Openness and the indicator for an escapist motivation for psychedelics use reached the level of significance, with Openness predicting positive consequences and escapism predicting negative consequences.

**DISCUSSION**

The working hypotheses for this study were that challenging psychedelic experiences have a greater thematic range than what has been established in previous research, that set and setting are important but not decisive for the occurrence of challenging episodes, and that respondent-assessed consequences of these experiences are generally positive. With regards to thematic range, both the interview and survey data indicated that challenging psychedelic experiences
come in a wide variety of types. The fear of ego dissolution that previous research has often emphasized (e.g., Studerus et al., 2012) was certainly an important aspect of many challenging psychedelic experiences in this study, but it was by no means a defining characteristic. In the survey data, ego dissolution was the only characteristic whose occurrence did not differ significantly between a typical and the respondents’ worst psychedelic experience, and in the interviews, it was mentioned that ego dissolution could actually serve to protect the psychedelics user from other fear-inducing experiences. Furthermore, the types of challenging psychedelic experiences in this study seemed to have a greater range and variation than the seven categories of challenging experiences identified by Barrett et al. (2016). In the interview data, the theme identified as social paranoia overlapped with their category of paranoia, and their category of grief broadly overlaps with the theme identified as life issues, where the psychedelics user would have unpleasant insights into his or her life, usually accompanied by sadness, guilt, fear, and other unpleasant emotions. There is also an overlap between their categories of physical distress and death and the interview theme of physical damage, which sometimes led interviewees to believe that death was imminent. In Barrett et al.’s (2016) model, the category of isolation refers to loneliness and social isolation, which was not a major theme among the interviewees for the present study. Some, however, reported experiences of existential isolation where they felt eternally trapped in an inescapable void of nothingness. These experiences also relate to their category of insanity, which included the item “I was afraid that the state I was in would last forever” (Barrett et al., 2016, p. 22). This category seems somewhat underdefined, however, since it would also have to include experiences with dread of ego dissolution, where interviewees sometimes feared that they would lose their minds along with their egos, experiences with fear of having incurred lasting brain damage, and the one experience of an actual psychotic break. Furthermore, social paranoia, debilitating panic attacks, troubling visions or hallucinations, and delusions also relate to forms of insanity. The critique of under-definition is equally relevant for Barrett et al.’s (2016) category of fear, which was ubiquitous in these narratives, taking a range of forms that included fear of social rejection, existential fear, fear of insanity, fear of ego dissolution, fear of malicious entities, fear of death, and fear of eternal damnation. Thus, the interview data indicates that fear should probably be regarded more as a defining characteristic than a category of challenging psychedelic experiences: what makes the experience challenging is, above all, its ability to induce fear.

This emphasis on fear is supported by the survey data, where fear was the most endorsed characteristic for respondents’ worst psychedelic experience at 69%. If we factor in the 14% who endorsed none of the negative characteristics for their worst (or, in these cases, least good) experience, only 17% of the sample reported any negative characteristics without also reporting fear. Most of these experiences involved sadness (25 respondents), confusion (19 respondents), and isolation (12 respondents). Of course, a state of profound sadness could be regarded as a challenging experience in and of itself, and in principle, the same might be said even about an experience of overwhelming positive emotions. Therefore, it is not possible in principle to close off the set of challenging psychedelic experiences to any combination of defining characteristics, since there is no limit to what human beings might characterize as challenging. Nevertheless, fear seems to be so strongly interwoven with other characteristics of challenging psychedelic experiences that it could probably serve as an operationalized indicator of such experiences.

The survey data otherwise supports Barrett et al.’s (2016) categories of social isolation and grief as important aspects of challenging psychedelic experiences. Furthermore, about a third of the respondents indicated that their worst psychedelic experience involved insight into themselves or their relations, which is congruent with the theme of challenging life issues identified in interviews. The survey did not ask about physical distress, death, or insanity in a general sense, but 32% of respondents indicated that their worst experience included ego dissolution, which was significantly correlated with fear ($r = 0.315, N = 214, P < 0.001$). These were probably often experiences where respondents feared they would either lose their minds along with their egos (in other
words, go insane), or lose their bodies along with their egos (in other words, die).

Beyond Barrett et al.’s (2016) seven categories, the survey identified confusion as an important characteristic of respondents’ worst psychedelic trip, endorsed by 62%. This was the highest level of endorsement for any characteristic except fear, which seems to indicate that confusion is a central aspect of challenging experiences. The indicator for confusion was significantly correlated with the indicator for ego dissolution ($r = 0.297$, $N = 214$, $P < 0.001$), which reflects the structure of Studerus et al.’s (2012) DED scale that included experiences of cognitive impairment and loss of self-control. Furthermore, the three characteristics anger or hate, regrettable behavior towards others, and violent behavior, which were all significantly correlated, seem to represent an important, if not very common, aspect of challenging psychedelic trips that has not been recognized in previous studies. The only corresponding narrative in the interview data was from the respondent who experienced a psychotic episode and attacked his friend. Although such violent episodes appear to be rare, 17% of the survey sample endorsed having behaved regretfully towards others, and it seems important to note that challenging psychedelic experiences sometimes have a behavioral aspect.

In the interviews, the most common form of challenging psychedelic experiences involved hard insights into one’s life. The psychedelics user would be confronted with an aspect of their life that seemed dysfunctional, and although this confrontation was usually unpleasant at the time, it paved the way for important life changes. This dynamic may be relevant for the positive therapeutic effect from psychedelic experiences on issues of substance dependence (e.g., Bogenschutz et al., 2015; Johnson et al., 2014). However, some respondents also found themselves obsessing over minor life issues during psychedelic trips, in a manner that resembled paranoid delusion more than genuine insight. Newcomers to the psychedelic experience often found that the altered state allowed their minds to run wild with paranoid ideation, while more experienced users had usually learned to guide their minds in more fruitful directions, developing skills of focus and recollection that might be characterized as meditation skills.

The employment of meditation skills – although not necessarily recognized as such – in order to overcome challenging psychedelic experiences was quite widespread among interviewees. One example was the individual who recognized the powerful and malicious entity he encountered as a representation of his own anger, and was able to overcome his entrapment by this entity through a conscious release of this anger. Another participant found himself trapped in a reenactment of his high school years and was unable to open his eyes, yet managed to calm himself and to focus on what the experience had to offer, and others explicitly employed the skills obtained from their everyday meditation practice in order to overcome mental chaos and anxiety during psychedelic trips. It seems clear from these narratives that the process of learning how to navigate psychedelic trips involves the development of meditation-type skills, whether or not they are recognized as such. Nevertheless, it should be noted that the regression model for the absolute difficulty of a challenging psychedelic experience found that a meditation practice was actually associated with a more difficult experience when controlled for the other variables in the model. Possible explanations for this unexpected association may be that meditators are able to delve more deeply into the psychedelic experience, and are therefore confronted with more challenges, or perhaps that they are more mindful of their experiences and therefore able to identify a greater range of separate characteristics for them. This seems like a promising area for further research.

Factors relating to set and setting were not as important in these studies as we would perhaps expect. Set was the most salient of the two, and a number of interviewees pointed to negative aspects of their state of mind or emotions in order to explain the occurrence of their challenging trip. In most reports, however, there was no clear link between a negative mind-state before the psychedelic session and the emergence of challenging material during the session. Furthermore, interviewees rarely mentioned the setting of their psychedelics use as a factor that might explain their challenging experience. The survey did not attempt to assess participants’ state of mind prior to the psychedelic session, but the variable for one’s most common social environment during psychedelics use did not reach statistical significance in the regression model. It is possible, however, that the difficult experience they were asked to characterize took place in a very different social environment than the typical setting for their psychedelics use. This complicates the interpretation of the null finding for the impact from social environment in the regression analyses.

A majority of the participants in these studies found that their challenging experience resulted in positive long-term consequences, which agrees with previous research (Carbano et al., 2016). A small minority of 4% pointed to negative consequences, however, and 29% regarded the long-term impact as either irrelevant or mixed. This finding may be taken as support for Lucas’ (2005) point that challenging psychedelic experiences only have positive consequences when the user is able to work with and integrate their hard lessons.

The main limitations of this explorative study were that participants were recruited via online psychedelic communities, and had to self-select for participation. It has previously been found that participants recruited on the Internet have more education and higher incomes (Hamilton & Bowers, 2006), which might potentially bias findings. While the Internet is probably more accessible to those with lower education and income levels today than it was in 2006, the Internet recruitment in this study may have served to exclude some psychedelics users. More specifically, it is difficult to know to which extent this sample of psychedelics users represents the population of such users, about which we arguably know very little (Johnstad, 2021). Furthermore, the study recruited mainly among current psychedelics
users, who as a group are probably favorably inclined towards such drug use, and should therefore be considered biased towards positive results.

CONCLUSION

These explorative studies expanded the range of challenging psychedelic experiences beyond what has previously been described in academic literature, and identified paradoxical effects from meditation practices on the difficulty of such experiences. They identified fear as the most common aspect of challenging experiences, while also noting the importance of confusion and identifying a behavioral aspect that should not be ignored. Challenging psychedelic experiences were sometimes extremely difficult, but it should also be noted that a sizeable number of respondents had never faced a difficult experience at all. Fewer than 4% of respondents reported that the long-term consequences of the experience were negative.

SUPPLEMENTARY MATERIALS

Supplementary data to this article can be found online at https://doi.org/10.1556/2054.2021.00155.

REFERENCES


Chapter 7 - The psychedelic personality: Personality structure and associations in a sample of psychedelics users
This article has been removed from the thesis due to publisher restrictions. The published version is available at: https://doi.org/10.1080/02791072.2020.1842569
Appendix A: Residual plots for regression analyses
Figure A1: Logistic regression model for the experience of fear: Residual scatter plot

Figure A2: Logistic regression model for the experience of love: Residual scatter plot
Figure A3: Logistic regression model for the experience of peace: Residual scatter plot

Figure A4: Logistic regression model for the experience of improved connection to other people: Residual scatter plot
Figure A5: Logistic regression model for the experience of contact with non-ordinary beings: Residual scatter plot

Figure A6: Logistic regression model for the experience of contact with transcendent forces: Residual scatter plot
Figure A7: Logistic regression model for the experience of ego death: Residual scatter plot

Figure A8: Logistic regression model for the experience of inner visions: Residual scatter plot
Appendix B: Participation consent form
Request for participation in research project - *Entheogens in Spiritual Practice*

**Background and purpose**
The study examines the use of entheogens in spiritual contexts, with the purpose of discovering long-term implications for spirituality, health, and life through in-depth interviews.

This is a master project conducted by the Institute of Religious Studies at the University of Bergen. Respondents are recruited through web forums and other internet arenas, with the only criteria for selection being adulthood and a self-identified spiritual context for the use of entheogenic drugs.

**Consequences of participation**
Participants in the study are requested to engage in an email conversation or interview with the author stretching over several weeks. In order to preserve privacy, participants are encouraged to create an anonymized web email account for the purpose of communication with the author. In the interview you will be asked questions concerning your personal background and life circumstances, use and usage history of entheogenic drugs, psychological and psychiatric situation and history, and encounters with law enforcement agencies. Please respond in general terms that cannot be used to identify you as a specific individual.

What happens to the information you provide?
All personal information is treated confidentially. Only the author of the project and immediate collaborators will have access to the data, although anonymized selections will be included in research papers for publication. The author guarantees that no participant will be identifiable from any published material.

The project is scheduled for completion by summer 2016. Email correspondence will be preserved indefinitely in anonymized forms for research purposes.

**Voluntary participation**
Participation in the study is voluntary, and you can withdraw your participation at any point without offering any reason. If you withdraw from the project, all information from and about you will be deleted.

If you wish to participate in the study, please contact petter@entheogenstudy.org. The university board of research ethics (Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS) has approved the project.

**Participation agreement**
I have received information about the study, and am willing to participate

----------------------------------------------------------------------------------------------------------------
(Please sign with email address and date.)
Appendix C: Interview guide
This guide describes some common questions used to guide the interview. Note that this guide was used only as a starting point. The most important questions for an interview were often not the questions from this guide, but rather individualized follow-up questions to an earlier interviewee response.

1. **Background and life situation**

   1.1. Nationality, age, gender
      
      1.1.1 What is your nationality?
      1.1.2 What is your age?
      1.1.3 Which gender are you?

   1.2. Education, vocation, family
      
      1.2.1 What education do you have?
      1.2.2 In which field do you work?
      1.2.3 How is your home situation?
         
         Do you have a partner?
         Do you have any children?

   1.3. Psychiatric history
      
      1.3.1 Have you ever had psychological problems?
         
         Did you get professional help for these problems?
         Did you use any medication?
         How long did the problems persist?
      1.3.2 Is there a history of psychological problems in your family?

   1.4. Religious background
      
      1.4.1 What is your background in terms of religion and spirituality?
         
         Were your parents religious?
         Was religion a part of your upbringing?
      1.4.2 Did you ever convert into a new religion?

   1.5. Spiritual beliefs and practices
      
      1.5.1 Can you sum up a few main points about your worldview?
      1.5.2 Do you do any kind of spiritual practice?
      1.5.3 Do you take part in any organized religious activities?
      1.5.4 Do you recall any spiritual experiences from the time before you started using entheogens?
2. Entheogenic experience

2.1. Use of drugs

2.1.1 Why do you use entheogenic drugs?

What was it that first attracted you to entheogens?

2.1.2 What kinds of entheogens have you used?

For how long?
How often have you used them?
Do you still use these entheogens? How often?

2.1.3 Can you describe the social situation of your entheogen use?

With whom do you use these drugs?
Where does it take place?
On which days of the week? At what time of day?

2.1.4 How do you prepare your use of entheogens?

2.2. Descriptions of experiences

2.2.1 Can you describe some drug-induced experiences that were important to you?

Was this a typical or an exceptional experience?

What, if anything, was different with this drug session in comparison to others?

2.3. Consequences for life, health, spirituality

2.3.1. How do you feel your use of hallucinogens has influenced your life for better or worse?

Have you noticed any negative consequences?

2.3.2. How does your use of hallucinogens fit in with your daily life?

Are there any consequences for work or school?
Did your drug use ever lead to conflicts with your family?
Have you had any trouble with the police?

2.3.3. How has the use of hallucinogens affected your personality?

Are you aware of any psychological consequences?
Are you aware of what you would call spiritual consequences?
Have you started doing any spiritual practices as a result of using hallucinogens?

2.3.4. Is it possible to develop an addiction to (the positive effects of) these drugs?

How do you feel about the addictive capacity of the drugs you have been using?
What exactly is it about these drugs that makes or does not make them addictive?
Did you ever try to quit anything without succeeding?

2.3.5. Have you ever felt that you were overdoing or abusing drugs?
What are the consequences of such abuse?
   Could it lead to «bad trips»?
Some people report that frequent use has a negative effect on their energy level, ability to concentrate and focus, and short-term memory. Did you experience any such effects?

2.3.6. Have you ever had any bad trips?
   How did you recover?
   What exactly was the problem?
   How did you deal with the situation?
   Were there long term consequences?
   How do you prepare sessions to minimize the risk of bad trips?

2.3.7. Have you ever experienced healing of physical or psychological issues as a result of using hallucinogenic drugs?
   Is it possible to explain how this healing happened?
   Over what period of time did it happen?
   Do you feel that the healing is an ongoing process, or does it belong to the past?
   Have previous problems ever returned?
Appendix D: Survey questionnaire
Cannabis and Psychedelics User Survey

This survey is part of a project at the Institute of Sociology at the University of Bergen. To participate, you must be 18 years or older, have a good understanding of English, and have at least some experience with psychedelics. Participation is fully anonymous: neither your IP address nor other identifying data is recorded. Please only answer the survey once.

I am 18 years or older
- Yes
- No

I understand English well
- Yes
- No

Demographics

Age
- 18-19
- 20-29
- 30-39
- 40-49
- 50-59
- 60+

Gender
- Female
- Male
- Other

Education
- Have not completed high school
- High school
- Some university
- Bachelor's degree
- Master's degree
- PhD

Occupation. Check all that apply.
Full-time job
Student
Part-time job
Unemployed
Pensioner
Other

Relationship status

Single
Partner
Married
Widow/widower

Number of children

0
1
2
3+

Geographical location at the present time

Africa
America (North)
America (South)
Asia
Europe (East)
Europe (West)
Middle East
Oceania

Spiritual or religious background. Check all that apply.

Hindu
Christian
Jewish
Secular/Humanist
Muslim
Buddhist
New Age/Alternative
Other

Personality

I see myself as...
<table>
<thead>
<tr>
<th>Trait</th>
<th>Disagree strongly</th>
<th>Disagree moderately</th>
<th>Neither agree nor disagree</th>
<th>Agree moderately</th>
<th>Agree strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical, quarrelsome</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anxious, easily upset</td>
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<td></td>
<td></td>
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<tr>
<td>Extraverted, enthusiastic</td>
<td></td>
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<td></td>
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<tr>
<td>Reserved, quiet</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Disorganized, careless</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open to new experiences, complex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sympathetic, warm</td>
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<tr>
<td>Dependable, self-disciplined</td>
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<tr>
<td>Calm, emotionally stable</td>
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<tr>
<td>Conventional, uncreative</td>
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</tbody>
</table>

How often have you taken risks of the following kinds

- **Financial risks** (e.g. gambling, risky investments)
- **Social risks** (e.g. taking an unpopular stance on a controversial issue, publicly challenging a rule or decision)
- **Recreational risks** (e.g., rock-climbing, scuba diving)
- **Safety risks** (e.g. fast driving, cycling without a helmet)
- **Career risks** (e.g. quitting a job without another to go to)

**Spirituality and religion**

Which spiritual or religious traditions do you currently feel connected to? Check all that apply.

- Hinduism
- Buddhism
- Secular/Humanist
- New Age/Alternative
- Judaism
- Islam
- Christianity
- Other

Do you do any regular spiritual or self-developmental practice? Check all that apply.

- Chanting/Singing
- Dream work
- Energy work
- Hypnosis/Regression
- Mantra
- Meditation
- Prayer
- Reading spiritual or religious texts
Non-psychedelic drug use

Which of the following drugs do you currently use?

<table>
<thead>
<tr>
<th>Drug</th>
<th>Daily</th>
<th>A few times per week</th>
<th>A few times per month</th>
<th>A few times per year</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ketamine</td>
<td></td>
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<tr>
<td>Alcohol</td>
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<tr>
<td>Cocaine</td>
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<tr>
<td>Other plant-based relaxants or stimulants (Betel, Kava, Kratom etc.)</td>
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<tr>
<td>Nootropics</td>
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<tr>
<td>Amphetamines</td>
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<tr>
<td>Cigarettes or tobacco</td>
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<tr>
<td>Opiates and opiate-like products</td>
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<tr>
<td>GHB</td>
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<tr>
<td>Coffee or tea</td>
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</table>

Cannabis

Do you have experience with the use of cannabis?

- Yes
- No

Cannabis usage pattern

For how many years have you used (or did you use) cannabis?

- Less than a year
- 1-3 years
- 3-5 years
- 5-10 years
- More than 10 years

How many times have you used cannabis?

- Once
- 2-3 times
- 4-6 times
- 7-10 times
- 11-20 times
How often have you used cannabis over the last 12 months?

- Not at all
- Once
- 2-3 times
- 4-6 times
- 7-10 times
- 11-20 times
- 21-50 times
- 51-100 times
- 100+ times

What is (or was) your most common social environment for using cannabis?

- Alone
- With a single partner
- With a small group of close friends
- With a group of friends and acquaintances
- At a party, night club, concert, festival or other public event

How far in advance do (or did) you usually plan the use of cannabis? Choose nearest option.

- One day or less in advance
- A few days in advance
- A few weeks in advance
- A few months in advance
- A year in advance

Motivation for cannabis use

What were your original motivations for starting to use cannabis? Check all that apply.

- Adventure
- Ego death experience
- Curiosity
- Spiritual experience
- To forget or escape from personal problems
- Socializing
- Insight and understanding for personal growth
- Psychological self-exploration
- Fun/party/recreation
To cure or heal personal problems
To cure or heal medical conditions
Other

What were your motivations for continuing to use cannabis after the first period of experimentation? Check all that apply.
- Ego death experience
- To forget or escape from personal problems
- Psychological self-exploration
- Fun/party/recreation
- Curiosity
- Insight and understanding for personal growth
- Spiritual experience
- To cure or heal medical conditions
- Adventure
- Socializing
- To cure or heal personal problems
- Other

Cannabis: most meaningful experience

Consider your most meaningful cannabis experience. Which of the following emotional characteristics apply to this experience? Check all that apply.
- Peace
- Sadness
- Love
- Joy
- Disgust
- Fear
- Surprise
- Anger or hate
- Other

Consider your most meaningful cannabis experience. Which of the following cognitive characteristics apply to this experience? Check all that apply.
- Inner visions
- Insight into the world
- Words cannot describe the experience
- Insight into yourself
- Confusion
- Ego death or dissolution
- Insight into other people and your relations with them
Consider your most meaningful cannabis experience. Which of the following relational characteristics apply to this experience? Check all that apply.

- Contact with transcendent forces
- Violent behavior
- Unity with transcendent forces
- Feeling of homecoming or return to your true essence
- Improved connection with other people
- Contact with non-ordinary beings
- Regrettable behavior towards others
- Feeling of isolation from other people
- Improved connection with nature
- Other

Consider your most meaningful cannabis experience. How meaningful was this experience to you?

- Most meaningful experience of your life
- Among the five most meaningful experiences of your life
- Among the ten most meaningful experiences of your life
- The most meaningful experience of a year
- The most meaningful experience of a month
- An everyday experience

Cannabis: typical experience

Consider a typical cannabis experience. Which of the following emotional characteristics apply to this experience? Check all that apply.

- Disgust
- Fear
- Joy
- Sadness
- Anger or hate
- Peace
- Love
- Surprise
- Other

Consider a typical cannabis experience. Which of the following cognitive characteristics apply to this experience? Check all that apply.

- Inner visions
- Confusion
- Insight into other people and your relations with them
Words cannot describe the experience
☑ Insight into yourself
☑ Ego death or dissolution
☑ Insight into the world
☑ Other

Consider a typical cannabis experience. Which of the following relational characteristics apply to this experience? Check all that apply.

☑ Violent behavior
☑ Contact with non-ordinary beings
☑ Feeling of homecoming or return to your true essence
☑ Contact with transcendent forces
☑ Improved connection with other people
☑ Improved connection with nature
☑ Regrettable behavior towards others
☑ Feeling of isolation from other people
☑ Unity with transcendent forces
☑ Other

Cannabis: worst experience

If you only have good experiences with cannabis, then your worst experience is simply your least good experience. In other words, your worst experience is not necessarily a bad experience.

Consider your worst cannabis experience. Which of the following emotional characteristics apply to this experience? Check all that apply.

☑ Peace
☑ Disgust
☑ Anger or hate
☑ Fear
☑ Joy
☑ Love
☑ Surprise
☑ Sadness
☑ Other

Consider your worst cannabis experience. Which of the following cognitive characteristics apply to this experience? Check all that apply.

☑ Insight into yourself
☑ Insight into other people and your relations with them
☑ Inner visions
☑ Ego death or dissolution
☑ Insight into the world
☑ Confusion
Words cannot describe the experience

Other

Consider your worst cannabis experience. Which of the following relational characteristics apply to this experience? Check all that apply.

- Contact with transcendent forces
- Regrettable behavior towards others
- Contact with non-ordinary beings
- Feeling of isolation from other people
- Unity with transcendent forces
- Improved connection with other people
- Violent behavior
- Improved connection with nature
- Feeling of homecoming or return to your true essence
- Other

Consider your worst cannabis experience. How difficult was this experience to you?

- Most difficult experience of your life
- Among the five most difficult experiences of your life
- Among the ten most difficult experiences of your life
- The most difficult experience of a year
- The most difficult experience of a month
- An everyday experience / not difficult

Consider your worst cannabis experience. How would you judge the long-term consequences of this particular experience?

- Long-term negative impact on life and health
- Mostly negative long-term consequences for life and health
- No significant or mixed long-term consequences for life and health
- Mostly positive long-term consequences for life and health
- Long-term positive impact on life and health

Cannabis: consequences of use

What are the long-term consequences of using cannabis on your physical health?

- Serious worsening of overall health
- Moderate worsening of overall health
- No significant consequences for health
- Moderate improvement of overall health
- Serious improvement of overall health

What are the long-term consequences of using cannabis on your
psychological health?
☑ Serious worsening of overall health
☑ Moderate worsening of overall health
☑ No significant consequences for health
☑ Moderate improvement of overall health
☑ Serious improvement of overall health

What are the long-term consequences of using cannabis for your personal happiness?
☑ Much less happy
☑ Less happy
☑ Same as before
☑ More happy
☑ Much more happy

What are the long-term consequences of using cannabis for your ability to get along with other people?
☑ Much reduced relationship ability
☑ Reduced relationship ability
☑ Same as before
☑ Improved relationship ability
☑ Much improved relationship ability

What are the long-term consequences of using cannabis for your spiritual practice?
☑ Much reduced intensity of practice
☑ Reduced intensity of practice
☑ Same as before
☑ Improved intensity of practice
☑ Much improved intensity of practice

Have you had flashback experiences because of your cannabis use?
☑ No
☑ Yes, and they were mainly positive experiences
☑ Yes, and they were mainly negative experiences

Psychedelics survey

How many times have you used these psychedelics?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Once</th>
<th>2-3 times</th>
<th>4-6 times</th>
<th>7-10 times</th>
<th>11-20 times</th>
<th>21-50 times</th>
<th>51-100 times</th>
<th>100+ times</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSD</td>
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<tr>
<td>MDMA</td>
<td></td>
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</tbody>
</table>
You will now be asked about your experiences with psychedelics. Please choose one of the psychedelics from the list below. All the remaining questions in this survey will be about your experience with this one psychedelic.

Please choose one psychedelic that you have experience with and wish to speak about in this survey:

- Salvia divinorum
- Psilocybin/Magic mushrooms
- 5-MeO-DMT
- Ayahuasca (or analogues)
- Mescaline/Peyote
- Salvia divinorum
- 2C family (2C-B etc.)
- DMT (smoked)

Usage pattern

Note: all questions pertain to the psychedelic you chose previously.

For how many years have you used (or did you use) this psychedelic?
- Less than a year
- 1-3 years
- 3-5 years
- 5-10 years
- More than 10 years

How many times have you used this psychedelic?
- Once
- 2-3 times
- 4-6 times
- 7-10 times
- 11-20 times
- 21-50 times
How often have you used this psychedelic over the last 12 months?
- Not at all
- Once
- 2-3 times
- 4-6 times
- 7-10 times
- 11-20 times
- 21-50 times
- 51-100 times
- 100+ times

What is (or was) your most common social environment for using this psychedelic?
- Alone
- With a single partner
- With a small group of close friends
- With a group of friends and acquaintances
- At a party, night club, concert, festival or other public event

How far in advance do (or did) you usually plan the use of this psychedelic? Choose nearest option.
- One day or less in advance
- A few days in advance
- A few weeks in advance
- A few months in advance
- A year in advance

Motivation for psychedelic use

Note: all questions pertain to the psychedelic you chose previously.

What were your original motivations for starting to use this psychedelic? Check all that apply.
- To forget or escape from personal problems
- Insight and understanding for personal growth
- Psychological self-exploration
- Curiosity
- To cure or heal medical conditions
- Spiritual experience
- Socializing
- To cure or heal personal problems
What were your motivations for continuing to use this psychedelic after the first period of experimentation? Check all that apply.

- To cure or heal personal problems
- Socializing
- Insight and understanding for personal growth
- To cure or heal medical conditions
- Fun/party/recreation
- Spiritual experience
- Ego death experience
- Curiosity
- To forget or escape from personal problems
- Adventure
- Psychological self-exploration
- Other

**Most meaningful experience**

Note: all questions pertain to the psychedelic you chose previously.

Consider your most meaningful experience with this psychedelic. Which of the following emotional characteristics apply to this experience? Check all that apply.

- Sadness
- Surprise
- Fear
- Disgust
- Anger or hate
- Joy
- Peace
- Love
- Other

Consider your most meaningful experience with this psychedelic. Which of the following cognitive characteristics apply to this experience? Check all that apply.

- Insight into yourself
- Insight into the world
- Words cannot describe the experience
- Inner visions
- Confusion
Insight into other people and your relations with them
Ego death or dissolution
Other

Consider your most meaningful experience with this psychedelic. Which of the following relational characteristics apply to this experience? Check all that apply.
- Regrettable behavior towards others
- Contact with non-ordinary beings
- Violent behavior
- Improved connection with other people
- Improved connection with nature
- Unity with transcendent forces
- Feeling of homecoming or return to your true essence
- Contact with transcendent forces
- Feeling of isolation from other people
- Other

Consider your most meaningful experience with this psychedelic. How meaningful was this experience to you?
- Most meaningful experience of your life
- Among the five most meaningful experiences of your life
- Among the ten most meaningful experiences of your life
- The most meaningful experience of a year
- The most meaningful experience of a month
- An everyday experience

**Typical experience**

Note: all questions pertain to the psychedelic you chose previously.

Consider a typical experience with this psychedelic. Which of the following emotional characteristics apply to this experience? Check all that apply.
- Surprise
- Joy
- Anger or hate
- Fear
- Peace
- Sadness
- Love
- Disgust
- Other

Consider a typical experience with this psychedelic. Which of the following cognitive characteristics apply to this experience? Check all that apply.
Consider a typical experience with this psychedelic. Which of the following relational characteristics apply to this experience? Check all that apply.

- Feeling of homecoming or return to your true essence
- Regrettable behavior towards others
- Improved connection with nature
- Contact with non-ordinary beings
- Improved connection with other people
- Unity with transcendent forces
- Violent behavior
- Contact with transcendent forces
- Feeling of isolation from other people
- Other

Worst experience

Note: all questions pertain to the psychedelic you chose previously.

If you only have good experiences with this psychedelic, then your worst experience is simply your least good experience. In other words, your worst experience is not necessarily a bad experience.

Consider your worst experience with this psychedelic. Which of the following emotional characteristics apply to this experience? Check all that apply.

- Sadness
- Love
- Peace
- Fear
- Joy
- Anger or hate
- Surprise
- Disgust
- Other

Consider your worst experience with this psychedelic. Which of the following cognitive characteristics apply to this experience? Check all that
apply.
- Confusion
- Insight into yourself
- Insight into other people and your relations with them
- Words cannot describe the experience
- Ego death or dissolution
- Inner visions
- Insight into the world
- Other

Consider your worst experience with this psychedelic. Which of the following relational characteristics apply to this experience? Check all that apply.
- Improved connection with nature
- Feeling of isolation from other people
- Feeling of homecoming or return to your true essence
- Regrettable behavior towards others
- Contact with non-ordinary beings
- Unity with transcendent forces
- Violent behavior
- Improved connection with other people
- Contact with transcendent forces
- Other

Consider your worst experience with this psychedelic. How difficult was this experience to you?
- Most difficult experience of your life
- Among the five most difficult experiences of your life
- Among the ten most difficult experiences of your life
- The most difficult experience of a year
- The most difficult experience of a month
- An everyday experience / not difficult

Consider your worst experience with this psychedelic. How would you judge the long-term consequences of this particular experience?
- Long-term negative impact on life and health
- Mostly negative long-term consequences for life and health
- No significant or mixed long-term consequences for life and health
- Mostly positive long-term consequences for life and health
- Long-term positive impact on life and health

**Consequences of use**

Note: all questions pertain to the psychedelic you chose previously.
What are the long-term consequences of using this psychedelic on your physical health?

- Serious worsening of overall health
- Moderate worsening of overall health
- No significant consequences for health
- Moderate improvement of overall health
- Serious improvement of overall health

What are the long-term consequences of using this psychedelic on your psychological health?

- Serious worsening of overall health
- Moderate worsening of overall health
- No significant consequences for health
- Moderate improvement of overall health
- Serious improvement of overall health

What are the long-term consequences of using this psychedelic for your personal happiness?

- Much less happy
- Less happy
- Same as before
- More happy
- Much more happy

What are the long-term consequences of using this psychedelic for your ability to get along with other people?

- Much reduced relationship ability
- Reduced relationship ability
- Same as before
- Improved relationship ability
- Much improved relationship ability

What are the long-term consequences of using this psychedelic for your spiritual practice?

- Much reduced intensity of practice
- Reduced intensity of practice
- Same as before
- Improved intensity of practice
- Much improved intensity of practice

Have you had flashback experiences because of your use of this psychedelic?

- No
- Yes, and they were mainly positive experiences
- Yes, and they were mainly negative experiences
Thank you!

Your responses have been recorded anonymously, and will contribute to a deeper understanding of psychedelics use and its consequences.