Chapter 5:

Psychedelic Social Psychology

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Abstract

This chapter provides a comprehensive review of past and current research using classic psychedelics and MDMA, with a focus on psychological and well-being outcomes. Specifically, the acute effects and potential long-term impacts of these substances on affect, personality, self-insight, psychological flexibility, creativity, and social connection are explored. Studies assessing the mechanisms of action, the benefits, and the risks associated with psychedelics and MDMA are highlighted, as well as the significance of contextual factors, such as set and setting. The chapter concludes by identifying current research limitations and proposing future directions within the emerging field of psychedelic social psychology.

Keywords: MDMA, psychedelics, psylocibin, LSD, ayahuasca, well-being, social psychology

Introduction

Psychedelics have a rich history of ancient use for spiritual, ritual, and healing purposes (e.g., Guerra-Doce, 2015), and have been studied for their therapeutic potential starting in the 19th century. However, due to recreational use and counterculture associations, scientific research was halted between the 1960s and 1980s (Johnson et al., 2019). A renaissance in psychedelic science began in the 1990s, with a focus on clinical applications, leading to a resurgence of interest in the therapeutic potential of psychedelics. Recent studies have explored both short-term and long-term psychological effects of these substances and have documented enduring positive changes on psychological well-being and quality of life (e.g., Aday et al., 2020b). This chapter describes past and present research of the most widely studied psychedelics and highlights their effects, their mechanisms of action, their benefits and risks, and the importance of context, as well as research limitations and potential future directions.

What are Psychedelics?

Psychedelics (or hallucinogens) are psychoactive compounds that when consumed can lead to changes in affect, cognition, and perception (Johnson et al., 2019). Classic psychedelics (henceforth, psychedelics) include natural substances such as psilocybin (hallucinogenic mushrooms), mescaline (the main psychoactive ingredient in peyote), and N, N-dimethyltryptamine (DMT; a psychoactive compound present in the ceremonial beverage *ayahuasca*). Synthetic substances, such as lysergic acid diethylamide (LSD) and ketamine, are also considered psychedelics. MDMA, or 3,4-methylenedioxymethamphetamine (colloquially known as ecstasy or molly), is often categorized as a psychedelic. However, given that MDMA does not typically produce hallucinogenic effects, it is more accurately described as an *empathogen* (for its empathy-producing effects) or *entactogen*—a term derived from Latin and

Greek meaning “to produce touching within” (Pentney, 2001). Psilocybin, LSD, MDMA, and, to a lesser extent, DMT are the most widely studied in the context of well-being. Therefore, this chapter focuses on these substances. However, to help contextualize their research origins, we provide a brief history of the aforementioned psychedelics and MDMA in the next section.

History of Psychedelics and MDMA

A Brief History of Psychedelics

The use of peyote, psychedelic mushrooms, and plants containing DMT dates back millennia and is associated with sacramental healing ceremonies led by the First Peoples of the American continent (Johnson et al., 2019). Western discovery of these practices intrigued and inspired scientists to explore psychedelic substances, which led to the discovery of their chemical composition, and the assessment of their mechanisms, side effects, and potential therapeutic use starting in the late 1800s.

Mescaline, an alkaloid present in some types of cacti (e.g., the Andean San Pedro and the Mexican peyote), was the first psychoactive drug scientifically studied (Jay, 2019; Johnson et al., 2019). Pharmacologist Arthur Heffter isolated mescaline in 1896 and conducted self-experiments to assess its hallucinogenic effects (Gurschler, 2019). Mescaline was first synthesized in 1919 by the Australian chemist Ernst Spaeth. The first human studies sought to assess “thresholds between normal and pathological sense perception, the mechanisms of visual hallucination, and to induce ‘transitory psychosis’” (Gurschler, 2019). Clinical research continued into the 1950s with a focus on testing its potential to treat schizophrenia. However, research was largely abandoned in the 1960s in favor of LSD, which had similar effects, but was more potent (Jay, 2019).

DMT was first synthesized in 1931 by chemist Richard Manske. However, it was Stephen Szara, a Hungarian chemist and psychiatrist, who discovered DMT's hallucinogenic properties in 1956 (Barker, 2018). Research assessing the properties and effects of DMT is limited and typically uses *ayahuasca*, a botanical brew containing DMT as well as harmala alkaloids and harmaline, which are monoamine oxidase inhibitors (MAOIs) that allow the activation of DMT in the gut and liver (Hamill et al., 2019). Therefore, the remainder of this chapter will present research findings on ayahuasca in place of DMT.

Psilocybin is derived from a variety of mushroom species and was popularized in the U.S. in 1957 when *Life* magazine published a story from amateur mycologist R. Gordon Wasson, who visited the Sierra of southern Mexico and recorded the traditional use of this substance in a Mazatec ritual (Nichols, 2020). Mycologist Roger Heim, accompanied Wasson in a subsequent trip and collected specimens, which he then cultivated. Wasson then sent a sample to Albert Hofmann, a prominent scientist who discovered the psychedelic effects of LSD, to analyze the dried mushroom. This joint effort led to the successful synthesis of psilocybin in 1959 (Van Court et al., 2022).

Psilocybin is perhaps the most studied natural psychedelic in the context of therapeutic and clinical use given its long history, relatively low risk of side effects, and short duration of acute effects (Geyer, 2023). As of 2022, 60 clinical trials sponsored by the U.S. National Institute of Health had been launched to assess the long-term effects of this substance in the treatment of various mental health conditions. Preliminary findings indicate that psilocybin therapies may be effective against depression (e.g., Carhart-Harris et al., 2017b; Fang et al., 2024), obsessive-compulsive disorder (Andersen et al., 2022), nicotine dependence (Johnson et al., 2014; Johnson et al., 2017), and alcohol use disorder (Bogenschutz et al., 2015).

The history of synthetic psychedelics such as LSD and ketamine dates to the mid-1900s. *LSD* was first synthesized by chemist Albert Hofmann who discovered its psychoactive effects in 1943 (Johnson et al., 2019). Thereafter, LSD became the focus of extensive research, with over one thousand papers published between 1950 to 1970 reporting its ability to treat substance use disorder, depression, and end-of-life psychological distress (Bender & Hellerstein, 2022).

Ketamine was first synthesized in 1962 by chemist Calvin Stevens as an anesthetic, which continues to be its primary use to date. No other drug is known to simultaneously produce sleep, analgesic, and amnesic effects (Gao et al., 2016). Recent studies have highlighted the potential of ketamine to treat physical pain, depression, bipolar disorder, and suicidal behavior, as well as alcohol use disorder, heroin addiction, and end-of-life anxiety (Cavarra et al., 2022; Gao et al., 2016). For example, a study assessing the effects of this substance on suicidal ideation found a 69% decrease in suicidal thoughts (Phillips et al., 2020). Despite these prospects, however, some researchers have raised concerns about the effects of long-term use (Schatzberg, 2014). Given that ketamine's antidepressant effects last less than 1 week, its potential for addiction and the consequences of repeated dosing need to be better understood.

A Brief History of MDMA

A key figure in the history of MDMA is biochemist Alexander Shulgin, who is sometimes referred to as the "father" of Ecstasy (Benzenhöfer & Passie, 2010; Parrott, 2007). Shulgin is credited with synthesizing MDMA in 1965 and introducing it to psychotherapist Leo Zeff, who was ostensibly the first to use MDMA as a supplement to psychiatric treatment in 1976 (Parrott, 2007). The first comprehensive report of MDMA as a psychotherapeutic tool was published by psychotherapist George Greer in 1986. Twenty-nine participants, who provided informed consent and were screened for physical health, reported no serious side effects after consuming 75 to 150

mg of MDMA, followed by a smaller dose a few hours later to prolong the session. In addition to the therapy sessions, participants also completed follow-up questionnaires from 2 months to 2 years after the last session (M = 9 months). All participants reported feeling more positive, and all but one patient felt that their interpersonal communication had improved. Most patients also reported cognitive benefits (e.g., "expanded mental perspective, insight into personal patterns or problems, improved self-examination skills"; Greer & Tolbert, 1986, p. 320). Other smaller, uncontrolled studies were also conducted in the 1980s, mostly among clinicians who found that MDMA was an effective adjunct to psychotherapy, strengthening the therapeutic bond by promoting self-disclosure and enhancing feelings of trust (Grinspoon & Bakalar, 1986). Recent controlled experimental studies assessing social closeness have replicated these findings (for a meta-analysis, see Regan et al., 2021).

MDMA has also been extensively evaluated for the treatment of PTSD. Phase I trials began in 1994, with Phase II human trials in 2004, and Phase III in 2018. In Phase III, 90 patients clinically diagnosed with severe, chronic PTSD were randomized into placebo and test groups; 67% of patients in the MDMA group no longer met PTSD diagnosis criteria after the 18-week trial, compared to 32% of patients in the placebo group (Mitchell, et al., 2021). In a multi-site, double-blind confirmatory Phase III clinical trial to assess the effects of MDMA-assisted therapy to treat moderate to severe PTSD (N = 104; 27% Latinx and 34% non-White), 71% in the MDMA group no longer met PTSD diagnosis criteria after the 18-week trial (versus 48% in the placebo group), with 46% meeting remission criteria (versus 21% in the placebo group; Mitchell, et al., 2023).

The Ups and Downs of Psychedelic and MDMA Research

Researchers studying psychedelics and MDMA have experienced a winding road. Apart from ketamine, the U.S. Drug Enforcement Administration (DEA) has designated these substances under Schedule I. Ketamine has a Schedule III classification because it is approved as an anesthetic (Schatzberg, 2014). The proliferation of other psychedelics in the 1960s, as well as MDMA in the 1970s and 1980s, within nonclinical, social settings led to their Schedule I designation, thus making these substances illegal and limiting researchers' ability to continue studying their potential benefits and harms (e.g., Pentney, 2001). Similar classifications exist across the globe. Schedule I is reserved for drugs that serve no medical purpose and have a high potential for abuse (DEA, 2024). However, research has challenged this designation, given that multiple studies have shown that psychedelics and MDMA are significantly less harmful, addictive, and neurotoxic compared to other (legal) substances, such as alcohol and tobacco (e.g., Degenhardt et al., 2010; Moore et al., 2019; Nutt et al., 2010). Although these findings do not imply that psychedelics and MDMA are risk-free, they point to the importance of conducting further work to weigh their benefits and risks as is done with other pharmacological substances, including comparing them to current alternatives (Doblin et al., 2014; Nutt et al., 2013).

Organizations such as the Multidisciplinary Association of Psychedelic Studies (MAPS), the Beckley Foundation, and the Heffter Research Institute, which are mostly funded by philanthropic efforts, have been instrumental in the continued study of the effects of psychedelics and MDMA. Their efforts ignited a resurgence in research, starting in the mid-1990s. MAPS, for example, sponsored the aforementioned MDMA clinical trials for the treatment of PTSD (e.g., Mitchell et al., 2023) Results from these types of scientific studies have led the U.S. Food and Drug Administration to designate MDMA-assisted therapy for the treatment of PTSD and psilocybin-assisted therapy for treatment-resistant depression as Breakthrough Therapies (Doblin

et al., 2019; Geyer, 2023). Despite this progress, many gaps in scientific knowledge of psychedelics and MDMA remain. Therefore, the continued philanthropy of organizations and individuals, and increased support of government agencies (e.g., the FDA, NIH, NSF) beyond written endorsements (Aday et al., 2020a), through funding and the decriminalization of these substances for the purpose of scientific research (Nutt et al., 2013), are key to the sustained learning of their potential benefits, harms, and harm reduction strategies.

Psychedelics and MDMA: Mechanisms of Action and Side Effects

Psychedelic Mechanisms of Action

There are some similarities in the effects of different psychedelics, but there are also some key variations. A common feature of these substances is that they can lead to changes in visual perception (e.g., hallucinogenic effects). These effects seem to occur due to lowered alpha oscillations, which influence illusory perception, in the parieto-occipital brain areas (De Gregorio et al., 2021a). Psychedelics also exert their effects by interacting with the brain's serotonin system, which is involved in regulating mood, perception, and cognition. Changes in brain activity and communication between brain regions occur through the 5-HT_2a serotonin receptor (Bender & Hellerstein, 2022; van Elk & Yaden, 2022). This interaction is thought to cause a cascade of effects, including increased synaptic growth and complexity, changes in brain network connectivity, and alterations in brain function—all of which likely influence changes in affective states (e.g., feelings of awe, ego dissolution, enhanced emotions), cognition (e.g., mindfulness, creativity, psychological flexibility), beliefs (e.g., meaning, suggestibility, supernatural attributions), sociability (e.g., connectedness, empathy), and behavior (e.g., shifts in habits; van Elk & Yaden, 2022). Preliminary findings suggest that psychedelics increase glutamate, boost oxytocin, and have anti-inflammatory properties. These changes, combined

with serotonergic effects, contribute to the reported effectiveness of psychedelics to treat disorders such as depression and addiction.

While these substances share common hallucinogenic and serotonergic features, they have distinct effects due to differences in their pharmacological profiles. Each psychedelic has unique outcomes with regard to brain network function and neurotransmitter systems, contributing to differences in their subjective effects and potential therapeutic applications (Bender & Hellerstein, 2022; De Gregorio et al., 2021a). Further complicating the psychopharmacological assessment of the outcomes within and across psychedelics is that receptors can activate different biochemical signals leading to different experiences within and across individuals (Nichols, 2016).

Most research exploring psychedelics' mechanisms of action have focused on psilocybin and LSD, including their ability to strengthen the connection between the thalamus and certain cortical brain regions, a process that appears to reduce associative network functioning and increase the internal processing of sensory information (De Gregorio et al., 2021a). Altered sensory experience of the self and the environment may reduce ruminative thinking and provide relief to individuals suffering from depression and anxiety, in particular. Psilocybin research has also shown reduced amygdala reactivity in healthy participants (Barrett et al., 2020). These findings have important implications in therapeutic contexts, as they suggest that psilocybin may be effective in normalizing negative cognitive bias, thus facilitating emotional processing and subjective well-being (De Gregorio et al., 2021a).

Psychedelic Side Effects

The most common physiological side effects of psychedelics are mild and typically resolve within 24 hours. These side effects include nausea, vomiting (especially with ayahuasca),

fatigue, headache, anxiety, and hypertension (among older patients with underlying conditions; Bender & Hellerstein, 2022). The most common acute psychological effects of psychedelics include feelings of fear and panic (Griffiths et al., 2006; Griffiths et al., 2011). However, these effects seem to vary based on individual differences and context. For example, high trait openness is associated with positive psychedelic experiences, whereas apprehension or preoccupation prior to consumption is related to negative effects (Aday et al., 2021). Treatment setting, excitability, and age can also predict positive and negative reactions of psychedelic use (Studerus et al., 2012). The risk of sustained adverse effects, such as persistent psychotic disorders and psychological instability, is low, particularly in controlled settings where participants are screened for health conditions and are offered appropriate preparation, supervision, and follow up (Bender & Hellerstein, 2022).

A small proportion of psychedelic users report enduring negative side effects. In an online longitudinal study among psilocybin users, 11% of participants (N = 1,182) reported mood changes and depressive symptoms 2- to 4-weeks after psilocybin consumption, with 7% of participants in the same study (N = 657) reporting these outcomes 2 to 3 months later (Nayak et al., 2023). Although the risk of adverse side effects is low, it should not be minimized, and warrants further study, particularly given the history and political divisiveness of these substances (Bremler et al., 2023). There are significant opportunities to expand research in this area. Findings from meta-analyses and systematic reviews assessing the effects of psychedelics are mostly comprised of psilocybin studies given their predominance (e.g., Aday et al. 2020b; Andersen et al., 2020). Although psychedelics share similar neurophysiological mechanisms, they also have distinct features that may lead to discrete side effects. Furthermore, side effects are typically assessed in controlled clinical or laboratory settings that do not reflect the

experience of recreational users who may also be consuming other psychoactive substances that can interact with psychedelics, such as alcohol, prescription medication, or over-the-counter drugs. In particular, due to the presence of MAOIs ayahuasca can produce strong interactions with other substances, increasing the risk of severe drug effects (Malcolm & Thomas, 2021). Finally, individuals with underlying health issues (e.g., cardiovascular, neurologic, hepatic) are typically excluded from psychedelic research. Therefore, the side effects that might emerge among individuals with pre-existing health conditions are unclear (Bender & Hellerstein, 2022).

MDMA Mechanisms of Action and Side Effects

MDMA is a powerful central nervous system stimulant and metabolic stressor (Parrott, 2007) that increases serotonin, dopamine, and norepinephrine (Hasler et al., 2009). The activation of these neurotransmitters, as well as the release of oxytocin, vasopressin, and cortisol hormones, are thought to lead to MDMA's entactogenic and empathogenic properties, including positive self-awareness and self-understanding (Green et al., 2003; Greer & Tolbert, 1986; Jerome et al., 2020; Kamilar-Britt & Bedi, 2015; Nichols, 1986), as well as increased feelings of happiness, love, social connection, bonding, and trust (Doblin, 2002; Parrott, 2001, 2007). MDMA also decreases fear, anxiety, negativity, and defensiveness, making this substance particularly useful in building strong bonds with others (Lyubomirsky, 2022). Research suggests that positive emotions and feelings are sustained after the effects of MDMA wear off—in some cases up to a year later (Greer & Tolbert, 1986; Jerome et al., 2020).

Reported somatic side effects of MDMA include teeth grinding, jaw clenching, fatigue, dizziness, nausea and/or vomiting, headaches, body temperature changes, accelerated heartbeat, muscle aches or tightness, dry mouth and/or thirst, headache, and loss of appetite (Baylen & Rosenberg, 2006). These symptoms are typically mild to moderate and usually resolve without

intervention shortly after consumption (Mithoefer et al., 2011). Negative emotional effects include depression, anxiety or nervousness, fear, and paranoia. Other less commonly reported effects are confused thoughts, shifts in visual perception, and insomnia (Baylen & Rosenberg, 2006). There are also some reports of memory and cognitive deficits, as well as serotonergic neurotoxicity (de Win et al., 2008; Parrott, 2013). However, some of these findings have not been successfully replicated (see Doblin et al., 2014, for a response to Parrott, 2013). Outcomes are contextual and dependent on an individual's drug tolerance and past use, as well as medical and psychiatric pre-conditions (such as cardiovascular issues; Lyubomirsky, 2022). As with psychedelics, there is a need to further explore potential mechanisms that underlie the potential adverse side effects of using MDMA.

Well-Being Outcomes

The study of psychedelic social psychology is only beginning. Most research exploring the subjective well-being effects of these substances has been conducted in medical, clinical, neurophysiological/neuropsychological, epidemiological, and other psychological fields (e.g., Jungaberle et al., 2018). Given that subjective well-being has not typically been the primary focus of research, this section expands on the effects of psychedelics and MDMA on well-being-relevant constructs, including self-insight and psychological flexibility, creativity, social connection, and prosocial behavior (Forstmann et al., 2023; Johnson et al., 2019; Mason et al., 2019).

Changes in Affect and Personality

The acute positive effects of psychedelics and MDMA have been widely studied. LSD (e.g., Carhart-Harris et al., 2016; De Gregorio et al., 2021a; Schmid et al., 2015), psilocybin (Barrett et al., 2020; Mason et al., 2019; Nayak et al., 2023), and ayahuasca (Kuypers et al.,

2016; Sampedro et al., 2017) have been found to enhance subjective well-being, mood, openness, trust, optimism, empathy, and cognitive flexibility, and to diminish feelings of depression and anxiety. MDMA has similarly been shown to influence affect and personality; however, MDMA is unique in fostering feelings of social closeness and self-confidence while decreasing feelings of social anxiety (e.g., De Gregorio et al., 2021a; Jungaberle et al., 2018; Lyubomirsky, 2022). A critical review of 77 studies assessing the beneficial effects of psychedelics and MDMA found that psilocybin, LSD, and MDMA can reduce reactivity to negative stimuli (Jungaberle et al., 2018). Brain imaging assessing neural responses to social rejection indicate lower activation in brain regions that are associated with fear, anxiety, emotional distress, and social pain under the influence of psilocybin (Preller et al., 2016), with similar findings reported in MDMA studies (e.g., Bedi et al., 2009; Frye et al., 2014). MDMA, LSD, and psilocybin have also been found to impair the recognition of sad, fearful, and angry (for MDMA only) faces (Dolder et al., 2016; Hysek et al., 2014; Kometer et al., 2012), suggesting that these substances might be effective in removing "mental barriers" to work through past trauma.

Many individuals consider taking psychedelics and MDMA as one of the most profound experiences of their lives (e.g., Doblin et al., 2019; Griffiths et al., 2006; McDaniel, 2017), even months and years later (Aday et al., 2020b; Doblin, 1991). Although most reports are anecdotal, some quantitative evidence suggests that the effects of psychedelics and MDMA outlast their acute effects. In a double-blind controlled study, participants who took a high dose of psilocybin reported sustained improvements in attitudes and behaviors 2 months after the intervention, with friends and family also noticing these changes (Griffiths et al., 2006). Further, in a follow-up study 14 months after the initial intervention, 64% of the same participants reported

improvements in well-being or life satisfaction following treatment (Griffiths et al., 2008). Other longitudinal studies of the effects of psilocybin use have found reductions in feelings of anxiety, depression, and neuroticism, as well as increases in cognitive flexibility, emotion regulation, spiritual well-being, and extraversion for up to 3 months (Nayak et al., 2023), and openness for up to 1 year (MacLean et al., 2011). Similarly, reported long-term effects of LSD (Carhart-Harris et al., 2016; Pouyan et al., 2023; Schmid & Liechti, 2018) and MDMA (for a review, see Lyubomirsky, 2022) include improved mood, openness, and life satisfaction. MDMA studies also report increases in self-esteem and self-compassion. The particularly concrete, evocative, and memorable thoughts experienced under the acute influence of MDMA appear to influence these sustained changes in behavior (Pollan, 2018). Research exploring the long-term benefits of ayahuasca are limited and typically take place in ceremonial or ritual settings, which present potential confounds. However, these studies point to decreases in neuroticism for up to 3 months (Weiss et al., 2021a), sustained improvements in subjective well-being, confidence, optimism, and independence for up to 6 months (Barbosa et al., 2009), and higher levels of openness in long-term users when compared to a spiritual non-ayahuasca control group (Bouso et al., 2015).

However, although current research hints at some potential long-term benefits of using both psychedelics and MDMA, further research is needed to ascertain the longevity of these positive effects, the ideal dosage schedule for each substance, and the environment(s) that are most conducive to positive experiences.

Self-Insight and Psychological Flexibility

Psychedelics and MDMA appear to enhance self-insight and psychological flexibility in different ways. Whereas the hallucinogenic effects of psychedelics facilitate mystical experiences, ego dissolution, awe, mindfulness and spirituality (e.g., Forstmann et al., 2022;

Hendricks, 2018; Johnson et al., 2019; van Elk & Yaden, 2022), MDMA has been observed to produce self-insight after its acute effects have dissipated (e.g., Lyubomirsky, 2022). Despite these differences, both psychedelics and MDMA seem to promote well-being through self-discovery and self-acceptance. For example, a systematic review of LSD clinical studies found that changes in perceptions of the self and one's surroundings (i.e., psychological flexibility) enhanced positive valence systems (e.g., reward, happiness, affect, and mood; Pouyan et al., 2023). Similarly, a double-blind cross-over study using psylocibin and LSD found that mystical-type experiences increased perceptions of well-being and quality of life (e.g., Forstmann et al., 2022). A naturalistic study conducted in multi-day mass gatherings in the U.K. and the U.S., found that psychedelics, but not other substances (like cocaine or MDMA), were associated with transformative experiences which, in turn, were correlated to positive mood and feelings of connection with others (Forstmann et al., 2020). Furthermore, studies assessing the effects of ayahuasca have observed improvements in mindfulness (Soler et al., 2016) and changes in brain activity that correlate with increases in self-compassion and nonjudging behavior (Sampedro et al., 2017). The latter was sustained 2 months following ayahuasca consumption.

MDMA appears to induce self-insight through increased feelings of authenticity and self-compassion. For example, in a placebo control, double blind, within-subjects study, those in the MDMA group reported decreases in feelings of social anxiousness and increases in feelings of authenticity, as well as improved comfort describing emotional memories (Baggott et al., 2016). When individuals are prompted to act in ways that differ from their regular selves (e.g., more trusting, more open, more empathetic), those under the influence of MDMA report still feeling like themselves but see others as less threatening and judgmental (Doss et al., 2018; Frye et al., 2014). These effects are thought to aid emotional memory processing by allowing individuals to

access difficult feelings and experiences in unreactive ways. In turn, this self-disclosure helps individuals work through past traumas by reducing the perception of risk associated with speaking openly (Baggott et al., 2016).

Self-insight and psychological flexibility are thought to be inherent in the psychedelic and MDMA experience. However, questions remain about the underlying mechanisms preceding and following these effects (Forstmann et al., 2022). An integrative theory of causation, based on existing pharmacological, neurocognitive, and psychological models could help inform future studies aimed at addressing unanswered questions and replicating current findings utilizing more holistic approaches (for a review, see van Elk & Yaden, 2022).

Creativity

Accounts of how psychedelics and MDMA are linked with creativity are popular in mainstream media. Many artists and technology leaders have attributed use of these substances to their creativity (Baggott, 2015). The scientific evidence, however, is inconclusive. As mentioned previously, psychedelics and MDMA can produce novel thoughts and cognitive changes, but whether these effects lead to creative thinking seems to depend on how creativity is operationalized and assessed.

Some research suggests that the psychedelic effect of unconstrained thought facilitates changes in cognition (e.g., feelings of increased insight), affect, and meaning, which may enhance certain types of creative thinking (Girn et al., 2020). For example, increases in divergent thinking, which require low automatic and deliberate constraints that foster the generation of multiple and conflicting ideas, have been observed during the acute effects of ayahuasca (Kuypers et al., 2016) and LSD (Wießner et al., 2022). On the other hand, convergent thinking,

which requires speed, accuracy, and logic, seems to be attenuated following ayahuasca and LSD use.

Other studies propose that psychedelic states enhance subjective feelings of creativity rather than actual creativity. For example, studies comparing perceived creativity against external assessments of creativity have found that individuals under the influence of psilocybin and MDMA report increases in perceived performance of creative thinking tasks, even though actual performance is lower compared to baseline and controls (Jones et al., 2009; Mason et al., 2021).

Further research is needed to assess how psychedelics and MDMA may enhance or deter different kinds of creative thinking, both in the short- and long-term. Baggott (2015) suggests careful consideration of creative tasks used in experimental research given that psychedelics and MDMA may tap into some creativity domains, but not others. Further, there is likely variability in the psychedelic experience, as well as in participant engagement, based on interest and prior knowledge. Indeed, the relationship between creativity and psychedelics and MDMA may be bidirectional (e.g., Baas et al., 2008; Tan et al., 2021).

Social Connection

Broadly, preliminary research suggests that psychedelics and MDMA can foster social connectedness by strengthening relationships with close others, decreasing feelings of loneliness, supporting the therapeutic alliance, and helping individuals overcome social deficits (e.g., Jungaberle et al., 2018; Lyubomirsky, 2022; Weiss et al., 2021b). A meta-analysis by Regan and her colleagues (2021) aggregated sociability-related outcomes from 27 randomized placebo-controlled MDMA experiments and noted a moderate to large effect size of MDMA consumption (relative to control/placebo) on subjective feelings of social connection, including feeling friendly, sociable, and talkative. Similarly, in a large online longitudinal study, feelings of

subjective well-being and social connectedness increased significantly 2 weeks after psychedelic use, compared to 1 week prior (Carhart-Harris et al., 2017a). Another online longitudinal study assessing social functioning and connectedness among psychedelic users 1 week before, 1 day before, a few days after, 2 weeks after, and 4 weeks after consumption found increases in perceived social connectedness and decreases in quarrelsome behavior (Weiss et al., 2021b). Interestingly, feelings of relatedness increased 2 weeks post psychedelic consumption, but were not sustained 4 weeks later.

Some studies have shown prosocial and social effects in ceremonial or ritual settings (e.g., Watts et al., 2017). For example, in a double-blind experiment during two spiritual practice sessions, participants who consumed 20 and 30 mg of psilocybin during each session, respectively, reported greater positive social effects (altruism), compared to participants in the low dose psilocybin group (1 mg) 6 months after the last session (Griffiths et al., 2018). In a similar experiment at a 5-day mindfulness retreat among experienced meditators, fMRIs before and after a psilocybin experience found increases in brain regions associated with ego dissolution, which in turn predicted improvements in social behavior 4 months post-intervention (Smigielski et al., 2019). In another study comparing ritualistic ayahuasca users to a control group (i.e., community members actively participating in non-ayahuasca religions) found that individuals in the ayahuasca group showed stronger feelings of psychosocial bonds 1 year after baseline assessment (Bouso et al., 2012).

As mentioned previously, a key limitation of studies conducted in ceremonial or ritualistic settings is that they may confound the effects of psychedelics with other features of the setting and the types of individuals who self-select to consume psychedelics, as these settings are designed to enhance social cohesion (Kettner et al., 2021; van Elk & Yaden, 2022). Across

multiple study designs, MDMA, LSD, and psilocybin have been shown to produce acute subjective effects conducive to prosocial feelings, such as trust, empathy, closeness, openness, forgiveness, and acceptance (e.g., Griffiths et al., 2018; Kamilar-Britt & Bedi, 2015). These unique features seem to facilitate an individual's ability to work through past trauma and negative feelings without fear of judgment, thus fortifying the therapeutic alliance (Andersen et al., 2020; Dolder et al., 2016; Lyubomirsky, 2022). Furthermore, this change in emotion processing also strengthens social bonds. For example, in a recent double-blind, within-subjects study, participants under the influence of MDMA (100 mg), compared to placebo, felt a strong sense of connection while having a semi-structured conversation with a confederate (Molla et al., 2023). Indeed, early clinical work in the 1970s and 1980s, combined with current knowledge about the biopsychosocial effects and outcomes of MDMA, suggests that this substance could be an effective treatment in couples therapy (Wagner, 2021). However, building and maintaining a strong social connection can be maladaptive if that connection is not conducive to an individual's well-being (e.g., an abusive partner or friend, unrequited love), or if the individual regrets over-sharing or self-disclosing to inappropriate others or at inappropriate times (Lyubomirsky, 2022). Therefore, careful consideration should be given to the potential benefits and consequences of sharing and over-sharing, and with whom, under the influence of psychedelics and MDMA.

Most studies examining the acute effects of psychedelics on social connection have focused on MDMA (e.g., Hysek et al., 2012; Molla et al., 2023; Wardle & de Wit, 2014) and to a lesser extent on LSD (e.g., Dolder et al., 2016; Schmid & Liechti, 2018). As previously mentioned, these substances impair the recognition of negative faces and emotions (Dolder et al., 2016; Hysek et al., 2014), but not the recognition of positive faces and emotions (Bershad et al.). These effects help reduce perceptions of social rejection (Frye et al., 2014). Research on

psilocybin is limited in this space, with the exception of one published study showing parallel findings (Kometer et al., 2012). Although these face recognition effects can enhance social closeness, some caution is warranted. For example, in some circumstances, it is adaptive to recognize others' negative feelings, emotions, and actions (e.g., bullying, discrimination, or abuse) so that one may react appropriately and manage the situation (Lyubomirsky, 2022). Hence, future researchers need to be sensitive to the environment in which psychedelics and MDMA, particularly in naturalistic settings.

Relative to other psychoactive substances, MDMA may be uniquely suited to help individuals build and sustain strong bonds. A review of various laboratory studies found that MDMA has distinctive qualities that enhance social processing and social behavior (Bershad et al., 2016). Neuropharmacological studies have found that MDMA, but not psychedelics, increases plasma levels of oxytocin (e.g., Dumont et al., 2009; Holze et al., 2020; Kamilar-Britt & Betti, 2015), which are thought to facilitate feelings of trust, generosity, and empathy. A double-blind, placebo controlled, within-subjects study assessing the distinct acute effects of MDMA and LSD found that both substances produced similar positive acute effects (e.g., openness), but that LSD produced more untoward acute effects (e.g., anxiety; Holze et al., 2020). In the context of building social connections, a "blissful state" (versus an altered state of consciousness) may make the experience feel relatively more real. However, given that research on social connection with psychedelics and MDMA is limited to retrospective studies or clinical and lab studies with small sample sizes, additional work is needed to replicate and expand current knowledge, including longitudinal, non-retrospective, and naturalistic studies that compare the biopsychosocial effects of psychedelics and MDMA to one another.

Set and Setting

Set and setting are integral to the effects of psychedelics and MDMA (e.g., Carhart-Harris et al., 2018; Elmer et al., 2024; McElrath & McEvoy, 2002; Sessa, 2008; Shewan et al., 2000). *Set* comprises an individual's intention, preparation, expectation, mood, and personality, while *setting* includes the physical, social, and cultural environment in which an individual consumes psychedelics or MDMA. Because set and setting can positively or negatively influence an individual's experiences, it is essential to consider these constructs in any social psychological research involving psychedelics and MDMA. A systematic review conducted by Aday and his colleagues (2021) found that feelings of openness, acceptance, and positivity about the psychedelic experience were positively correlated with favorable outcomes, while feelings of apprehension, confusion, and distress were negatively related to positive outcomes. Similarly, an online study found that MDMA users whose intentions for using the substance were either focused on self-insight or were mixed (i.e., aiming for self-insight and euphoria and energy) reported greater long-term socio-emotional benefits compared to individuals with intentions to experience euphoria and energy only (Elmer et al., 2024). In a qualitative study, the most commonly cited reasons for having a bad experience with psychedelics included an unsafe environment, negative expectations, relationship tensions or lack of social support during the trip, and past personal or family history of a psychiatric or mental disorder (Bremler et al., 2023). Large online quantitative studies have replicated these findings (Haijen et al., 2018; Russ et al., 2019). For example, Haijen and her colleagues (2018) interviewed participants 7 days prior, 1 day prior, 1 day after, 14 days after, and 28 days after taking psychedelics, and found that feeling at ease in one's setting, including having other people around, and having a spiritual or therapeutic intention predicted higher well-being post-psychedelic consumption. As previously mentioned, psychedelics consumed in ritualistic or ceremonial settings designed to enhance

social integration and cohesion (i.e., *communitas*) may incrementally benefit outcomes (e.g., Kettner et al., 2021; van Elk & Yaden, 2022).

The concepts of set and setting are prominently featured in sociological and anthropological studies but have been largely omitted in therapeutic and clinical research given the latter's focus on understanding the neurobiological mechanisms of psychedelics and MDMA in controlled substance-placebo settings (Hartogsohn, 2017). However, as the study of these substances enter new fields, including social psychology, it is critical to consider the role of set and setting in both lab and naturalistic work.

Future social psychological studies must assess the short- and long-term effects of psychedelics and MDMA, as well as consider the influence of set and setting in order to mitigate drug harms and help inform safe drug consumption policies (Hartogsohn, 2017). Furthermore, given that most studies in this space are retrospective, correlational, or qualitative, huge opportunities exist to test the set and setting hypothesis using alternative naturalistic and experimental designs. For example, what predicts positive outcomes may not be intention but user type (e.g., takes safety seriously), or perhaps a bidirectional relationship exists between the two. Testing these constructs in experimental designs may elucidate how set and setting, as well as their correlates (e.g., individual differences in set and setting preferences), play a role in the effects of psychedelics and MDMA.

Limitations

Although psychedelic and MDMA research presents many promising avenues for social psychologists, it is important to consider some limitations when interpreting current findings. First, most evidence comes from outside of social psychology and has not primarily focused on social psychological constructs and theories. Existing studies are, of course, an important first

step in allowing social psychologists to weigh safety concerns, and to understand biopsychosocial effects, mechanisms of action, and potential long-term outcomes to inform future work.

Second, experimental studies are mostly conducted in highly controlled laboratory settings, which work well to isolate and unpack the psychological and biological effects of psychedelics and MDMA but may not be representative of the effects of these substances in naturalistic contexts. For example, these substances may exert different effects depending on set (e.g., consumption with the aim of self-discovery versus distraction from worries) and setting (e.g., consumption at a big party versus with a partner at home). These substances may also show different effects when consumed on their own versus mixed with other psychoactive substances (e.g., alcohol, over-the-counter medication). In addition, the longevity of outcomes after the acute effects have dissipated, as well as the optimal dosage schedule to maintain positive outcomes, are not yet well understood.

Third, given the difficulty in carrying out this type of research, sample sizes in clinical and lab studies are generally small, with large sample sizes typically characterizing online retrospective studies. Further, research is mostly conducted in Western, educated, industrialized, rich, and democratic regions, among individuals with a generally positive disposition towards psychedelics and MDMA, which may lead to selection bias and underrepresentation of the larger population.

Finally, for safety reasons, most of these studies are conducted with healthy individuals, which also limits generalizability. Future research examining individual characteristics is needed to provide a more nuanced understanding of who might benefit most and least from psychedelic and MDMA interventions—e.g., testing moderators like age, gender, race, ethnicity, personality,

health pre-conditions, and current substance use. Addressing these limitations will be important to help inform social psychological work, as well as drug policy and harm reduction strategies.

Conclusions and Future Directions

Psychedelic social psychology is an exciting new frontier. Research on psychedelics and MDMA has been going on, with fits and starts, for over a century, and their positive effects on subjective well-being are hard to ignore. However, caution to not repeat mistakes is warranted. Given the political divisiveness of these substances (Bremler et al., 2023), additional care and consideration should be given to any social psychological research involving the use of psychedelics and MDMA. At the same time, it is important to advocate for expanding research in this field. Like other psychopharmacological substances, psychedelics and MDMA deserve proper cost-benefit and comparative analyses against current alternatives (Doblin et al., 2014). Ultimately, no psychological intervention is 100% risk-free. For example, nonpharmaceutical interventions to promote well-being, such as practicing gratitude and kindness, mostly lead to positive outcomes but can also produce backfiring effects (Fritz & Lyubomirsky, 2018).

Increased collaboration between scientists, nonprofits, and the government (Aday et al., 2020a) to lower the barriers of research, including in the field of social psychology and well-being science, is of utmost importance. This cooperative effort could lead to the development of scientific programs that are inclusive and aimed at targeting populations that are most in need. In addition, this emerging field could provide an opportunity to (a) expand knowledge on how psychedelics and MDMA might enable or inhibit social psychological processes (e.g., connectedness, creativity, stress, anxiety); and (b) design responsible biointerventions to elucidate self-discovery and psychological flexibility with the aim of improving people's lives

(e.g., increasing self-acceptance, alleviating loneliness; Lyubomirsky, 2022). Thus, the time is ripe to harness the social connectedness and psychological well-being potential of psychedelics and MDMA and to accept psychedelic science into mainstream psychological science.

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