DIGITAL ACCESS TO SCHOLARSHIP AT HARVARD
DASH.HARVARD.EDU

HARVARD LIBRARY

# Travel Far Enough, Meet Yourself: Subjective Interoception, Emotion Regulation, and the Psychedelic Experience—Implications for Crisis Management in Middle Adulthood

## Citation

Pollonais, JoAnna. 2022. Travel Far Enough, Meet Yourself: Subjective Interoception, Emotion Regulation, and the Psychedelic Experience—Implications for Crisis Management in Middle Adulthood. Master's thesis, Harvard University Division of Continuing Education.

## Link

https://nrs.harvard.edu/URN-3:HUL.INSTREPOS:37374026

## Terms of use

This article was downloaded from Harvard University's DASH repository, and is made available under the terms and conditions applicable to Other Posted Material (LAA), as set forth at

https://harvardwiki.atlassian.net/wiki/external/NGY5NDE4ZjgzNTc5NDQzMGIzZWZhMGFlOWI2M2EwYTg

## Accessibility

https://accessibility.huit.harvard.edu/digital-accessibility-policy

## Share Your Story

The Harvard community has made this article openly available.
Please share how this access benefits you. Submit a story

# Travel Far Enough, Meet Yourself: Subjective Interoception, Emotion Regulation, and the Psychedelic Experience—Implications for Crisis Management in Middle Adulthood

JoAnna Pollonais

A Thesis in the Field of Psychology

for the Degree of Master of Liberal Arts in Extension Studies

Harvard University

March 2023

Copyright 2022 JoAnna Pollonais

## Abstract

This study investigated the prevalence of crisis episodes in middle adulthood (ages 35 to 60) and possible relationships between crisis/stress, interoception, emotion regulation, resilience, and psychedelic experiences. A wide-ranging methodological approach was implemented to fill gaps in knowledge regarding etiology and management of crisis/stress in middle adulthood, inclusive of multi-dimensional measures to investigate causes and outcomes of chronic stress states and 1) whether a higher prevalence of maladaptive traits is associated with an increase in crisis episodes in middle adulthood, 2) if the presence of crisis states in midlife is associated with negative traits down-regulating subjective interoception, emotion regulation, and resilience, and 3) if positively perceived psychedelic experience(s) in midlife are associated with a decrease in incidence and/or intensity of crisis states and upregulating subjective interoception, emotion regulation, and resilience outcomes.

The data analysis was largely insignificant except almost all respondents stating they were currently in crisis or had experienced one, with most crisis episodes taking place between the ages of 41 to 50 ($N$=42). The common age of onset was between 35-40 and 41-50 years of age and most cited causes of crisis were professional dissatisfaction, changes to central relationships, the onset of illness or disease, and existential despair.

Along with higher alcohol and tobacco intake/frequency in the 41 to 50 age group, particularly amongst those who reported experiencing a crisis state, many participants in crisis experienced changes in their interoceptive and emotive capacities

with significant numbers ignoring physical tension or distracting themselves to avoid unpleasant interoceptive sensations and emotions, which impeded their resilience and ability to cope with stress. People in crisis generally felt more upset, hostile, nervous, and afraid, as well as less alert, attentive, and active. Negative emotionality trends emerged between crisis and non-crisis groups with the former undergoing frequent mood swings, not "being relaxed most of the time," getting upset easily, and feeling blue. Generally, survey respondents who were/had been in crisis had significant and near-significant difficulties in exercising resilience in the face of longstanding episodes of stress/crisis.

There were no significant associations between a positively perceived psychedelic experience and upregulation of interoception, emotion regulation, and resilience, 26 participants had sought a psychedelic experience at some point in their lives and cited doing so for curiosity, fun, and personal growth. Psilocybin, MDMA, and LSD were the most used substances and only one respondent took psychedelics in a clinical setting for therapeutic purposes—they perceived it to be an unsuccessful treatment. Although the role of the psychedelic experience in augmenting interoceptive and emotive tone for resilience and stress/crisis recovery was largely insignificant, this could largely be attributed to the sample size in question as no respondents reported seeking a psychedelic experience to expressly deal with a current crisis episode.

Table of Contents

List of Tables ..... vii

List of Figures ..... viii

Chapter I. Introduction ..... 1

Characterizing Crisis States in Middle Adulthood ..... 3

Psychedelic Experiences and Psychophysiology ..... 4

Crisis, Subjective Interoception, Emotion Regulation, and the Psychedelic Experience ..... 6

Hypotheses ..... 19

Study Significance ..... 21

Chapter II. Methods ..... 24

Materials and Measures ..... 25

Study Protocol and Procedure ..... 28

Data Analysis ..... 29

Chapter III. Results ..... 32

Aim 1/Hypothesis 1: Crisis states and contributing factors in middle adulthood ..... 32

Aim 2/Hypothesis 2: Relationship between up/down-regulating factors that influence the prevalence or intensity of crisis/stress in midlife ..... 34

Aim 3/Hypothesis 3: Relationship between psychedelic experiences, subjective interoception, emotion regulation, and resilience ..... 40

Chapter IV. Discussion ..... 42
Limitations ..... 45
Appendices ..... 48
Appendix 1. Developmental Crisis Questionnaire (DCQ-12) ..... 48
Appendix 2. International Positive and Negative Affect Schedule—Short Form (I-PANAS-SF) ..... 50
Appendix 3. Mini-International Personality Item Pool (Mini-IPIP) ..... 51
Appendix 4. PTSD Checklist for DSM-5 (PCL-5) ..... 52
Appendix 5. Pittsburgh Sleep Quality Index (PSQI) ..... 53
Appendix 6. Psychedelic Experience Questionnaire (PEQ) ..... 54
Appendix 7. Multidimensional Assessment of Interoceptive Awareness (MAIA-2) Scale ..... 58
Appendix 8. Emotional Breakthrough Inventory (EBI) ..... 60
Appendix 9. Connor-Davidson Resilience Scale 10 (CD-RISC 10) ..... 61
Appendix 10. Survey Introduction/Summary and Consent form ..... 62
Appendix 11. Screening Questions ..... 67
Appendix 12. Demographic Questions and Closing Statement ..... 69
Appendix 13. Research Study Recruitment Poster ..... 73
References ..... 74

List of Tables

Table 1. DCQ-12 Values and Crisis Episodes ..... 34

Table 2. DCQ-12 and Perceived Health ..... 36

Table 3. DCQ-12 and Diet ..... 37

Table 4. Analysis of Interoception (MAIA-2) and Age Group ..... 39

Table 5. Analysis of Resilience (CD-RISC 10) and Presence of Crisis Episode* ..... 39

List of Figures

Figure 1. Tobacco Smoking and Crisis Episodes ..... 33

Figure 2. Alcohol Consumption and Age ..... 34

Figure 3. DCQ-12 Values and Crisis States ..... 35

Figure 4. DCQ-12 and Perceived Health ..... 36

Figure 5. Comparative DCQ-12 and Diet Values ..... 37

Figure 6. Percentage of Respondents Who Ever had a Psychedelic Experience ..... 41

# Chapter I.

## Introduction

Crisis states in middle adulthood and management interventions have not been extensively covered in psychophysiological or neuroscience literature. Most studies focus on singular, narrow, or specific diseases and illnesses (depression, Alzheimer's, cancer), biological milestones (menopause), destabilizing events (death of a loved one) or changes (job loss, interpersonal relationships), and there is neither a comprehensive psychosocial characterization of midlife, nor an extensive catalogue of the psychological and neurophysiological changes unique to this "fluid" period (Blanchflower, 2020; Freund & Ritter, 2009; Hedgeman et al., 2018; Moen & Wethington, 1999). Moreover, the rise in maladaptive psychosocial and physical health outcomes linked to chronic stressors—suicidality and "deaths of despair" (George et al., 2021), depression, addiction, anxiety, obesity, lack of connection, and isolation (Kiesow et al., 2021; Wickrama et al., 2021; Zanello et al., 2017)—add pressure to already taxed socioeconomic and healthcare systems. Data collected during the COVID-19 pandemic show over one billion people around the world suffer from a full-blown mental disorder with millions more burdened by inconvenient and debilitating symptoms that do not present as DSM-5 clinical conditions but have been exacerbated (i.e., high-risk drinking) by lockdowns and restrictive pandemic measures (Daly & Robinson, 2021; World Health Organization, 2020). For now, it is unknown whether the virus will add to rising negative mental health outcomes given the atrophy and brain tissue damage seen in people who contracted SARS-CoV2 (Gollub, 2022), as well as instances of neuroimmune dysregulation (e.g.,

"brain fog") and brain inflammation in healthy individuals who did not contract the virus (Brusaferri et al., 2022). It is a confluence of circumstances that have experts forecasting increasingly severe negative consequences as early 2045, if not sooner, in high-income countries (Blanchflower, 2020; Patel et al., 2018).

Insight into the role of interoception[1]—awareness of internal body sensations — emotion regulation, and resilience in mental health has grown in recent years with Murphy et al. (2017) arguing that interoception plays an important role in higher-order brain signaling with knock-on effects. A protective cognitive function, interoception guides and moderates stress physiology responses in cortical areas affiliated with emotion regulation and perception, and aids in memory and decision making (Ganzel et al., 2010; Garland et al., 2015; Kiesow et al., 2021; Murphy et al., 2017). It also bolsters dynamic coping skills such as resilience and managing social expectations (Infurna et al., 2020), willingness to seek social support, or taking action to reduce stress and shift perception to make positive emotional adjustments (Schuette et al., 2021). When interospective processes are blunted, they affect emotive output and ability to adequately respond to stress. If/when stress becomes chronic, it induces a range of symptoms that characterize crisis episodes: Somatic illness, changes in mood, dissatisfaction, depression, burnout, unhappiness, increased anxiety (Arnett, 2018; Blanchflower, 2020; Ganzel et al., 2010; Lachman et al., 2015; Ong et al., 2009), and crippling feelings of existential indifference and dread (Moreton et al., 2020).

Successful crisis management and recovery involves recognizing threats and down-regulating or mediating physiological and emotional responses when no longer

[1] Interoceoption' was first used by neurophysiologist Sir Charles Scott Sherrington in 1907 alongside 'exteroception' and 'proprioception'.

required or useful (Ganzel et al., 2010; Kavan et al., 2006). Overlapping factors in midlife seem to affect one's ability to assess and apply relevant/reliable protocols that improve subjective sensory and emotion-driven processes that have been weakened or arrested (Aldwin, 2021). This lack of preparedness ingrains maladaptive patterns, blunts coping mechanisms, dampens cognitive flexibility (Blanchflower, 2020; Strenger, 2009), causes hyper/hypo arousal (Price & Hooven, 2018), and dulls emotive ability to handle stress (Eldesouky & English, 2018)—precursors to negative "long-term physiological and health-related" outcomes (Diehl & Hay, 2010).

## Characterizing Crisis States in Middle Adulthood

Few have attempted to link psychophysiological and socio-contextual components in midlife to understand why some seem to transition effortlessly through their late 30s, 40s, and 50s while others struggle to cope and experience dips in mental health and well-being. Those who have, applied specific lenses: psychosocial (Freund & Ritter, 2009; Lachman et al., 2015; Moen & Wethington, 1999), cognition and neuroanatomy (Kiesow et al., 2021), interpersonal relationships (Keenan et al., 2017; Kwon, 2021; Wickrama et al., 2021), or identifying singular variables correlated with mental health and well-being in midlife such as biological transitions (Hedgeman et al., 2018), decrease in happiness (Blanchflower, 2020), increase in maladaptive affect or traits (Noel et al., 2021; Petrov et al., 2021), and the presence of high-risk behaviors, like substance use disorder and suicidal ideation (Berkovitch et al., 2021; Daly & Robinson, 2021; Gaydosh et al., 2019; Hu et al., 2008). Collectively, findings appear to suggest challenges in navigating this pivotal period are multi-dimensional and further compounded by competing large-scale demands (external) and built-in desires (internal) (Moen & Wethington, 1999); financial

vulnerability or hardship (Hedgeman et al., 2018); stagnating perspectives on time, meaning, purpose, growth (Petrov et al., 2021); isolation; changes to central social networks and relationships, and/or the inability to sustain connections that bridge generations (Infurna et al., 2020; Kiesow et al., 2021; Lachman et al., 2015; Perrig-Chiello, 2005). So much goes on that the "U-turn" of middle adulthood seems host to more intense and enduring incidences of stress than young or late adulthood—with experiences that are, in turn, perceived negatively and lead to maladaptive behavior or outcomes (Blanchflower, 2020; Petrov et al., 2021), negatively exacerbate preexisting conditions and general mental health, and increase allostatic load (Moustafa et al., 2020).

## Psychedelic Experiences and Psychophysiology

The renaissance of interventions involving psychedelic experiences (PEs) are rapidly changing medical and therapeutic protocols in Western, Educated, Industrialized, Rich and Democratic (WEIRD) countries. Common psychoactive substances like psilocybin (a 5-hydroxytryptamine [5-HT] receptor antagonist), lysergic acid diethylamide (LSD), N,N-Dimethyltryptamine (DMT), 3,4-Methylenedioxymethamphetamine (MDMA, a 5-HT releasing substance), ayahuasca (DMT dominant), and 3,4,5-trimethoxyphenethylamine (mescaline) that act on multiple serotonergic receptors have been shown to successfully treat mood disorders (Schmid et al., 2021), lower rates of substance use disorder (SUD) and death by suicide in American adults (Hendricks et al., 2015), have anti-depressive and anxiolytic effects, decrease the incidence of intimate partner violence (Thiessen et al., 2018), increase emotional processing capabilities, and help doctors and therapists make breakthroughs on tough-to-

treat mental disorders and addictions (Berkovitch et al., 2021; Dos Santos et al., 2016; Roseman et al., 2019).

The "plastic" effects of the psychedelic experience (PE) on neural networks promote lasting downstream changes in subjective interoception, emotion regulation, mood, affect, and behavior (Carhart-Harris et al., 2014; Moreton et al., 2020). Brouwer and Carhart-Harris (2021) believe substances acting on 5-HT2A receptors during periods of subjective psychological crisis have therapeutic qualities that can spark lasting psychological change. Likewise, others see them as novel solutions for overcoming or managing periods of stress and crisis (Blanchflower, 2020). If empirical evidence continues to support the potential of psychedelic experiences in promoting cognitive and neuroplastic changes in those with post-traumatic stress disorder (PTSD) and major depression (Schmid et al., 2021), terminal illnesses, hard-to-treat mental disorders, plus healthy individuals, applicability may exist for those in midlife who struggle to manage high allostatic loads and are in need of alternative approaches for addressing mood and emotive dysregulation, improving resilience, and accessing 'growth-enhancing' states (Carhart-Harris & Goodwin, 2017; Zsoldos, 2016). I hypothesized maladaptive psychophysiological factors (i.e., trait/state, presence of PTSD, poor sleep quality, and demographic attributes) would be associated with an increase in the incidence and intensity of crisis states/episodes in middle adulthood according to factors that are, in part, responsible for down-regulating stress-related effects on subjective interoception, emotion regulation, and resilience. Moreover, I posited that positively perceived psychedelic experience(s) in midlife are associated with an upregulation of these three factors that can lead to a decrease in the incidence and intensity of crisis episodes/states.

## Crisis, Subjective Interoception, Emotion Regulation, and the Psychedelic Experience

Studies on the relationship between crisis management, interoceptive awareness, emotion regulation and resilience across the life cycle narrowly focus on neurological disorders/illnesses and related therapies (cognitive behavioral therapy [CBT]), specific emotive outcomes (e.g., life satisfaction), groups of people believed to be more prone to trauma (e.g., veterans or emergency responders), or developmental conditions in late (> 65 yrs) and young adulthood (<25 yrs). Stephan (2009) and (Blanchflower, 2020), for example, found happiness and life satisfaction rise considerably in late adulthood, after the age of 65, with older respondents viewing this time with more positive regard than anticipated. Martins et al. (2018), meanwhile, investigated emotion regulation in *N*=80 men (50% aged 17 to 23 and 50% between 57 and 86) and found participants 57 years of age and older, when faced with undesirable stimuli or adverse emotions, decreased their exposure to negative stimulus using dissociation and distraction. Older men in the Martins et al. study (2018) tended to engage more with positive stimuli than younger participants and had an easier time improving emotive affect than those aged 17 to 23 years.

In line with aspects of socioemotional selectivity theory (Carstensen et al., 1999), findings like these indicate motivational shifts in cognition take place according to chronological age with people exchanging expansive cognitive processes for emotive ones as they get older (Aldwin, 2021). But because comparative analyses have been limited in scope, life course analysts are moving beyond young and late categories to collate data on people in midlife through longitudinal efforts like the Midlife in the

United States Study (MIDUS), which investigates cognitive, neurological, health, physiological, and psychosocial features of middle adulthood (Infurna et al., 2020).

However, despite the general consensus amongst psychologists that emotional upheaval or eroded self-awareness can take place at any time in the life course, crisis states have been yoked to middle adulthood in ways that have been problematic since its inception (Blanchflower, 2020; Schmidt, 2020; Wethington, 2000). The term midlife crisis—first used by Canadian psychoanalyst, Elliott Jaques, to describe "abrupt changes in lifestyle and productivity in his midlife clients as well as their coming face-to-face with their own limitations and ever-increasing salience of mortality" (Infurna et al., 2020)—has saturated the sociocultural fabric of high-income countries, replacing complex lived experiences with normative and clichéd stereotypes. This may be due in part to cultural ideations and implicit/explicit psychosocial biases that frame middle adulthood as a time when one is confident, optimistic, goal-oriented, assertive, and emotionally balanced because they ought to be "in control" and in their professional, financial, social, and interpersonal prime (Arnett, 2018; Moustafa et al., 2020). Such conceptualizations are buoyed by data that shows midlife adults score higher on emotional intelligence and regulation or reappraisal tasks, using "secondary controls" more effectively than younger adults when regulating mood, augmenting optimism, and shifting perspective (Blomstrom, 2020; Chapman & Hayslip, 2006; Lachman et al., 2015). The data has been used to reject the concept of midlife crisis states or make claims that studies like Blanchflower's unhappiness 'U' curve have a contracted focus on indicators (e.g., happiness) that fail to capture the multitude of factors that raise/lower one's risk of entering into crisis in middle adulthood (Galambos et al., 2020).

Notwithstanding the inconsistencies, a growing body of evidence suggests negative stress and crisis episodes in middle adulthood are real, multidimensional, and come with high stakes. In a study on risk and resilience in *N*=239 adults aged 18 to 89, Diehl and Hay (2010) found age neither reduced negative emotions across groups nor moderated effects of daily stress on negative affect, which implies daily stress has adverse effects regardless of age. Likewise, in the Blanchflower (2020) meta-analysis on happiness, responses from 14 million people in 168 countries indicated a decline in life satisfaction in participants 35 to 55 years of age, with a negative "U-bend" emerging as early as 30 before peaking at 49. The "U-turn" study connected poor cognitive appraisal and high stress in midlife to diagnoses of depression in 9.8% of those aged 40 to 59 compared to 5.4% of adults older than 60 years and 7.4% of participants aged 18 to 39 (Blanchflower, 2020). Moreover, Blanchflower and Graham (2022), in their meta-analysis of 409 earlier studies, found similar 'U' distributions in instances where other researchers claimed there were none and instead doubled down on assertions like the "effects of the mid-life dip are comparable to major life events like losing a spouse or a job" (p. 31).

What takes place during midlife therefore goes beyond biological changes involving chronological age—such as diminishment of grey matter volume in the mPFC and parietal lobes that cause shortfalls in handling challenging events and/or social experiences for example (Hedgeman et al., 2018; Kiesow et al., 2021)—or environmental factors that threaten one's health, wellness, relationships, identity, and socioeconomic position (Blomstrom, 2020; Kwon, 2021; Wethington, 2000). Middle adulthood is full of complex, overlapping, and compounded chronic and/or concurrent stressors that decrease

interoceptive tone (Infurna et al., 2020), dampen cognitive coping mechanisms like mindful awareness and resilience (Kabat-Zinn, 2013; Lutz et al., 2016), and increase negative emotional affect such that maladaptive thoughts and behaviors increase (Aldwin, 2021; Daly & Robinson, 2021; George et al., 2021; Ong et al., 2009; Wickrama et al., 2021). In studies examining physiological determinants or relationships, participants between 35 and 65 years of age reported greater dependence on alcohol, difficulties concentrating and sleeping, and higher frequency of severe headaches than older or younger individuals (Hendricks et al., 2015; Hu et al., 2008; Krebs & Johansen, 2013). These increases in negative trends—be it death by suicide amongst White, middle-aged men in the United States (Hu et al., 2008; Infurna et al., 2020), 'diseases of despair' like drug and alcohol addiction (Berkovitch et al., 2021; George et al., 2021), depression, anxiety, or chronic liver disease in high-income countries (Berkovitch et al., 2021; Blanchflower, 2020; Hendricks et al., 2015; Moreton et al., 2020)—challenge conventional ideas that well-being is at its apex in middle adulthood (Arnett, 2018; Galambos et al., 2020).

In terms of demographic differences, women appear slightly more vulnerable to the psychosocial and physical highs and lows of midlife with 36.1% (vs. 34% of men) reporting they experienced a crisis (Wethington, 2000). In a 2013 retrospective-autobiographical study of $N$=1,023 adults in the United Kingdom by Robinson and Wright, the numbers rose to 59% of women and 46% of men—and held steady in a 2015 review by Lachman et al. (percentages for American adults were 10% for women and 20% for men). Interestingly, in studies where authors parsed demographic data, negative psychophysiological health trends skewed higher for people who belong to groups where

disparities are historically entrenched: Racialized and marginalized individuals, as well as those with less education and higher financial stress (Hedgeman et al., 2018; Hendricks et al., 2015; Infurna et al., 2020; Moustafa et al., 2020).

Although triggers vary, negative trends across demographic categories suggest a concoction of contextual and environmental factors play a bigger role in stress and crisis-related mental health outcomes than previously thought (Blanchflower & Graham, 2022; Hedgeman et al., 2018). Across contexts, crisis episodes appear to be more common in midlife because of broad, unexpected changes in employment or careers (Moen & Wethington, 1999), socioeconomic standing, relationship status, identities, beliefs and worldviews (Kiesow et al., 2021; Kwon, 2021; Wickrama et al., 2021). Furthermore, there is also an inability to create purpose or meaning, stalled personal growth, onset of chronic illness (Chapman & Hayslip, 2006; Robinson & Wright, 2013; Wethington, 2000), and existential anxiety in grappling with the reality of being "no longer young and yet not quite old" (Freund & Ritter, 2009). A midlife dip in mental health and psychophysiological wellness has serious implications for individual and well-being and interpersonal relationships (Blanchflower, 2020; Kiesow et al., 2021). Even if happiness is only one part of the emotive spectrum, Blanchflower's data, in particular, offers a powerful, partial explanation for the number of people suffering from mental health issues—with depression and anxiety at the forefront (Moustafa et al., 2020; World Health Organization, 2020). These emerging global mental health crises, exacerbated by psychophysiological changes brought on by existential concerns like climate change or COVID-19 pandemic stressors (Brusaferri et al., 2022), already costs governments and

healthcare systems upwards of $210 billion US dollars each year (Big Idea Series, 2019). This number is projected to grow to $16 trillion US dollars by 2030 (Patel et al., 2018).

The ways in which sensory stimuli are processed have a direct impact on cognitive performance, memory, behavior, and decision making (Murphy et al., 2017; Schuette et al., 2021). As a cognitive function, subjective interoception drives activity in cortical areas affiliated with emotion reappraisal and autonomic nervous system responses to stress (Ganzel et al., 2010; Garland et al., 2015), influences the expression of individual attributes (mood and self-regulation), affects empathy levels (Robinson & Wright, 2013), and informs actions that strengthen external support networks and close relationships (Ong et al., 2009; Price & Hooven, 2018; Stephan, 2009). Improved interoceptive capacities can help individuals regulate emotions, boost self-esteem, and amplify adaptive faculties—raising resilience such that it lowers or prevents onset of mental and physical disorders (Bonaz et al., 2021; Gross & John, 2003; Price & Hooven, 2018; Sullivan et al., 2018). Findings from a study of 100 students by Zamariola et al. (2019) showed those with low interoception had more trouble with emotion regulation and adaptive recovery than their peers and were unable to tap into positive thoughts/actions nor handle negative experiences. This obstacle appears to increase with age and frequency of negatively perceived experiences, which helps explain why adults in midlife are more likely to abandon primary, problem-focused strategies in favor of secondary, emotion-dominant protocols. Only when one realizes it is impossible to control the circumstances or environment related to a situation will they default to exerting control over their internal responses (Aldwin, 2021).

Emotion regulation and subjective interoception, therefore, act as bridges for positive cognitive appraisal and dynamic coping (Schuette et al., 2021). Self-directed methods to improve these processes have reduced conflict and disruptive relationship outcomes in organizational settings (Jiang et al., 2013), and increased stress resistance in women with drug addictions to foster improvements in "interoception capacity, emotion regulation, and substance use" (Grabbe et al., 2021, p. 11). Traditional interventions for those in crisis, irrespective of age, center on external-turned-internally-soothing approaches that promote greater psychophysiological awareness, adaptation, and increase the quality of life: Nutrition, physical activity, 'mind-body' practices like breathwork, massage, meditation, and social engagement (Gross & John, 2003; Infurna et al., 2020; Sullivan et al., 2018), as well as medical care and psychotherapy (Blanchflower, 2020; Kavan et al., 2006). These approaches "act as a stimulus for change" (Robinson & Wright, 2013) by opening the door to self-reflection, empathy, and "post-crisis" growth (Aldwin, 2004; Mehling et al., 2018; Murphy et al., 2017). Also mainstream, albeit for more severe or protracted cases, are pharmacological treatments that come with variable results. The prolonged use (+6 months) of selective serotonin reuptake inhibitors (SSRIs) is common but not always an effective solution for patients, sometimes resulting in withdrawal, discontinued treatment, or relapse (Moreton et al., 2020). In a literature review by Berkovitch et al. (2021) on the efficacy of psychedelic use in psychiatry, 60% of patients diagnosed with depression remained symptomatic after a single course of antidepressants while 33% were symptomatic after four rounds of treatment.

Clinical studies on the application of psychedelic substances in medical and therapeutic settings, by contrast, have demonstrated they are generally well-tolerated,

safe, and potentially viable methods of treating SUD (Andersen et al., 2021), anxiety, PTSD, suicidality, obsessive compulsive disorder (OCD), and depression in high-risk populations (Berkovitch et al., 2021)—likewise provoking medium- to long-term changes in affect, mood, and behavior (Bender & Hellerstein, 2022; Roseman et al., 2019). Even if popular interventions like CBT, psychotherapy, or administration of SSRIs alleviate symptoms and improve mental health indicators in the short run, success is not contiguous, dangerous side effects arise, and access to quality care is neither equal nor feasible (Dos Santos et al., 2016). Breakthroughs or transformations by way of psychiatry and psychotherapy can take months, if not years, of dedicated, active work to achieve. Income inequality combined with partial, substandard, and discriminatory systems or communities of practice reinforce barriers to entry in WEIRD countries (George et al., 2021). Not everyone has (equal) access to quality care, nor the time, social support, emotional bandwidth, or money for such investments (Kwon, 2021; Wickrama et al., 2021).

In clinical settings, traditional psychoactive substances like LSD, psilocybin, MDMA, DMT, ayahuasca, mescaline, and ketamine have been seen to alleviate depression and anxiety (Berkovitch et al., 2021), moderate emotion processing responses in men and decrease intimate partner violence (Thiessen et al., 2018), mute phobias and panic attacks, lower rates of addiction and death by suicide in American adults (Hendricks et al., 2015), and enable clinical researchers and "underground" therapists to make breakthroughs on tough-to-treat disorders (Dos Santos et al., 2016). Positive outcomes are the result of interactions between psychedelics and neural networks where emergent altered states of consciousness, neuroplastic feedback involving 5-HT2A

receptors, and downregulation of activity in the prefrontal cortex and CNS take place (Carhart-Harris et al., 2014; Cavanna et al., 2018). Neuroplasticity is, in part, needed for enhancing subjective interoception and improving emotive affect and mood, such that direct effects on mental health, physical well-being, and interpersonal relationships are seen (Carhart-Harris et al., 2014; Hendricks et al., 2015; Kiesow et al., 2021; Roseman et al., 2019), and changes in emotion appraisal, regulation, and adaptive behavior take place (Carhart-Harris et al., 2014; Moreton et al., 2020; Thiessen et al., 2018). At present, the most striking clinical potential of psychedelics involve LSD, psilocybin, DMT, and MDMA, all of which prompt positive improvements in physiological and cognitive well-being by acting as antagonists on 5-HT2A serotonin receptors to reduce activity in the default mode network (DMN) and amygdala, stimulate transient hypofrontality, override executive function through the downregulation of receptors in the prefrontal cortex, reduce CNS inflammation, yield analgesic effects (Ramaekers et al., 2021), and promote neuroplastic adaptation in the hippocampus (Carhart-Harris et al., 2014; Hendricks et al., 2015).

In multiple studies on mental illness and patients with terminal cancer, a single dose of psilocybin produced rapid anxiolytic and anti-depressant effects, outperforming and outlasting traditional drug therapies involving antidepressants and mood stabilizers (Big Idea Series, 2019; Carhart-Harris & Goodwin, 2017). In a double-blind, placebo-controlled study on LSD-assisted psychotherapy in 12 terminally ill participants struggling with anxiety those in the LSD group experienced a significant reduction in anxiety with no adverse psychophysiological effects (Blomstrom, 2020). Meanwhile, researchers focusing on depression and suicide found any past use of psychedelics was

associated with a significant reduction in the probability of psychological distress in the preceding month or suicidal plans/attempts in the last year—this is in stark contrast to studies where depression and suicide increased in long-term users of other drugs across demographic categories (George et al., 2021; Hendricks et al., 2015). Regarding anxiety, a literature review by Berkovitch et al. (2021) featured studies that showed an "efficacy of psychedelics on anxiety symptoms with a greater reduction in anxiety scores in the psychedelic group after 4–5 weeks and 7–8 weeks than in the control group" (p. 378). Overwhelmingly, the salutatory anxiolytic and antidepressant effects of psychedelic substances like psilocybin and LSD persisted in patients at six and 12-months (De Gregorio et al., 2022; Gasser et al., 2014; Griffiths et al., 2016). A recent NYU School of Medicine study on the administration of psilocybin (coupled with psychotherapy) to treat psychological distress in people diagnosed with cancer resulted in 71% of participants experiencing improvements in their quality of life and mental health, along with decreases in existential anxiety six months after treatment (Agin-Liebes et al., 2020). Of note is that results from this study were sustained during a secondary follow-up at the 4.5-year mark where 60% to 80% of participants still met "criteria for clinically significant antidepressant or anxiolytic responses" (Agin-Liebes et al., 2020, p. 156).

Although relationships between psychedelics and neurotransmitter or chemical cascades are still under investigation, evidence suggests outcomes may be linked to how certain psychedelics impede normal 5-HT2 and 5-HT2A receptor function (Schmid et al., 2021), affect dopamine and alpha-2 adrenergic receptors and elevate glutamatergic transmission in the mPFC (Więckiewicz et al., 2021), and augment 5-HT1A sensitivity which cause neurites and synaptic connections to form that prevent anxiety or distress

from escalating under stressful conditions, as seen in a study on chronic restraint stress in mice (De Gregorio et al., 2022). Not only did the administration of low to moderate doses of LSD increase spine density and 5-HT activity in the stressed mice, but "electrophysiological and morphological changes were observable also in the non-stress conditions" (De Gregorio et al., 2022, p. 8). Similarly, in a human study where low doses of LSD were administered, researchers found short-lived increases of brain-derived neurotrophic factor (BDNF) in healthy, recreational users of psychedelics (Hutten et al., 2021). Insights into BDNF are acutely relevant because of associations between BDNF expression in limbic system structures that moderate sensory perception, emotive responses, mood, memory, and pain/pleasure—and increases in CNS neurotrophic and/or chemical profiles are seen following a single dose of LSD, ketamine, or DMT (Hutten et al., 2021; Ramaekers et al., 2021).

Regarding resilience, 379 participants who reported a PE in a study by Roseman et al. (2019) experienced changes to their resilience thresholds—a finding that helped validate the Emotional Breakthrough Scale. Authors of the study found the emotional breakthrough to be a distinct constituent of psychedelic phenomenology that positively enhanced emotion regulation and adaptive processes, assisting participants in finding "internal balance," process insights, raise resilience, and support personal growth (Roseman et al., 2019). Although similar outcomes have resulted from mindfulness and body-oriented therapies that focus on the reappraisal of mental states and internal/external expectations (Garland et al., 2015; Moen & Wethington, 1999), redirect conscious attention to alter the processing of perceptual experiences (Brown et al., 2007), reduce emotional reactivity potentially linked to heightened activation of the visual

cortex (Lutz et al., 2016), or call on internal equilibrium to "override and rescript maladaptive stress responses and automatic patterns" (Price & Hooven, 2018)—the degree to which changes take place and sustainability of success remain unclear. And while dysphoric reactions involving psychedelics have occurred, they tend to happen according to "traits of the individual treated and the social context of drug administration" (Bender & Hellerstein, 2022, p. 13). By and large, psychedelic use in controlled settings, and when accompanied by secondary or tertiary approaches, has a positive net effect in effectively treating major depressive disorder and decreasing substance use disorders involving alcohol and tobacco (Andersen et al., 2021; Carhart-Harris et al., 2014; Hendricks et al., 2015)—all of which have become health crises in WEIRD countries in the last decade.

Furthermore, public perceptions about psychedelic experiences and net benefits are changing in many countries, even in the face of illegality and criminalization. This is reflected by an increase in informal psychedelic use with people turning to underground therapists and guides or administering them as self-prescribed treatments. In 2010, 32 million people in the United States reported taking a psychedelic at least once in their lifetime with a mean of 30- to 34-year-olds, followed by those in the 26 to 29 and 35 to 49 age categories (Krebs & Johansen, 2013). This significant because since Krebs & Johansen published their results, recreational and/or informal use of the "big five"—psilocybin, LSD, MDMA, mescaline, ketamine[2]—steadily increased over a decade across all age categories in the United States, mainland Europe, United Kingdom, and Canada as

[2] Although ketamine is an NMDA receptor antagonist that does not bind to 5-HT2A or 5-HT receptors in the same way as other psychedelics—provoking different serotonergic and dopaminergic cascades in the brain—it is one of the more commonly used psychotropic substances in clinical and recreational settings.

exemplified by 6% of participants in a global study on LSD and psilocybin who reported taking one or both for self-treatment, as well as the 223% increase in LSD use in adults 35 to 49 in the United States (Butler, 2021; Nuwer, 2020). Primary reasons cited for informal administration include curiosity, escape, mind expansion, alleviating chronic stress, improving mental health and well-being, and addressing self-diagnosed depression, anxiety, PTSD, drug and alcohol abuse, emotion imbalance, or grief (Butler, 2021; Krebs & Johansen, 2013; Nuwer, 2020).

Until recently, sociocultural trends have outpaced those in the sciences and health care fields, which may explain the rush to empirically validate the effectiveness of substances used for thousands of years in indigenous communities (Schultes et al., 2001) to determine why, how, and in what ways they outperform modern, synthetic drugs to improve interoceptive tone (Thiessen et al., 2018), feelings of hope and connectedness, increase motivation, and help people create meaning with "salutary effects that persist long after the user has stopped taking the drug" (Moreton et al., 2020, p. 22). Ideas proposed in a theoretical article on pivotal mental states by Brouwer and Carhart-Harris (2021) highlight the potential therapeutic benefits of substances acting on 5-HT2A receptors when used during intense or chronic episodes of stress to prompt lasting, improved psychological changes that enhance subjective well-being and augment adaptive recovery (Bonaz et al., 2021). If experiences with psychedelics like psilocybin, MDMA, or LSD promote cognitive and neuroplastic and physiological changes that address previously unmet neuropsychological needs (Carhart-Harris & Goodwin, 2017)—aiding veterans with post-traumatic stress disorder (PTSD), increasing rates of radical acceptance in the terminally ill, promoting adaptive recovery or alleviating

anxiety (Berkovitch et al., 2021; Moreton et al., 2020)—there may be applicability for crisis management in those who inhabit the middle ground of adulthood when allostatic load is high, stressors are in multiples, and perceptive, interoceptive, and emotive faculties are blunted or overworked (Zsoldos, 2016). Improving existing approaches to help adults transition through mild-to-moderate crisis episodes is supported by mapping the unique characteristics of crisis in midlife to better inform the design of integrated interventions that bolster interoceptive and emotive reappraisal capabilities, and tap into resilient "post-crisis" growth factors some claim are central for managing crisis (Mehling, 2016; Murphy et al., 2017). In addition, broadening the existing roster of potential psychedelic therapies can aid practitioners in determining actual rates of crisis in their communities and identify validated and reliable countermeasures to prevent the onset of severe mental or physical illness in individuals with no formal diagnosis, low access to quality care, or who present with too few symptoms that meet DSM-5 (or related) criteria (Dos Santos et al., 2016; Roseman et al., 2019).

## Hypotheses

This study took an empirical approach to further characterize crisis episodes in middle adulthood and investigate the role of the PE in amplifying subjective sensory awareness, "upregulating" emotion appraisal, and raising resilience. The analysis demonstrated if connections exist between psychedelic experiences and crisis management outcomes by characterizing and quantifying, 1) crisis states in middle adulthood and contributing factors, 2) the direction and degree of contributing factors that influence the prevalence or intensity of crisis/stress in midlife, and 3) relationships between the psychedelic experience, subjective interoception, emotion regulation, and

resilience in catalyzing positive outcomes for individuals "in crisis" by prompting psychophysiological changes that improve stress/crisis coping capabilities, and overall mental health. Based on existing evidence, I expected a positive relationship to emerge between subjective interoception, emotion regulation, and resilience outcomes in those who have a PE in middle adulthood and use the experience as a tool for growth and management—whether the experience took place in a clinical setting or without clinical intervention. Relying on established and nascent scales, I investigated if psychedelic experiences in midlife have the capacity, through positive cognitive and behavioral changes, to improve one's general mental health and well-being. I hypothesized:

- H1) Higher prevalence of maladaptive traits like negative emotionality, negative mood qualities that affect subjective wellbeing, and presence of clinical or sub-clinical PTSD, poor sleep quality, and specific demographic features will be associated with increased incidence and intensity of crisis episodes in middle adulthood.
- H2) Increased incidence and/or intensity of crisis states in middle adulthood will be associated with H1 traits [presence of PTSD, poor sleep, negative affect items, and negative emotionality, emotion regulation factors and outcomes, and resilience capabilities].
- H3) Positively perceived psychedelic experience(s) in midlife will be associated with a decrease in incidence and/or intensity of crisis states in middle adulthood, and further correlated with the upregulation of subjective interoception and emotion regulation factors and outcomes, an emotional breakthrough, and resilience capabilities.

What also emerged in study findings was a determination of traits and factors that could serve as loci to consider when formulating crisis management interventions or strategies for those in middle adulthood. Participants aged 35 to 60 were asked to complete a survey comprised of closed/open-ended questions on PEs, standard instruments on physiological determinants to further characterize traits of crises in middle adulthood, as well as CD-RISC 10, MAIA-2, and Mini-IPIP psychometric inventories to investigate the role of subjective interoception, emotion regulation, and resilience in augmenting crisis management capabilities.

## Study Significance

It is hoped this study will add to the discourse on characteristics of crisis in middle adulthood and the potential of psychedelic experiences to generate positive cognitive and behavioral outcomes that have psychological and sociocultural implications. In studying connections between PEs and crisis-mediating factors (subjective interoception, emotion regulation, and resilience) I hoped to contribute statistically significant data on the psychophysiological characteristics of crisis in midlife. This comprised whether psychedelic experiences can mitigate mild-to-moderate crisis states—potentially acting as a countermeasure for enhancing mental health and wellness or preventing the onset of chronic illness and intractable disorders. Findings have scientific, political, justice/legal, and social implications given that mental and physical health indicators in middle adulthood have stagnated or are trending in negative directions globally (Blanchflower, 2020; Patel et al., 2018). Although governments in many middle- and high-income Western, Educated, Industrialized, Rich and Democratic (WEIRD) countries like Canada, Europe, United States, Australia, Japan, and New

Zealand attempt to boost economies and usher in a return to "normal life"—now that COVID-19 is viewed as a virus to live with instead of defeat—health experts and practitioners struggle to manage rising caseloads of people with mental health disorders that may have been aggravated by the (World Health Organization, 2020). Psychophysiological grievances include cognitive dysfunction like neuroinflammation, negative mood, and physical and mental fatigue in those who contracted SARS-CoV2, as well as healthy individuals (Brusaferri et al., 2022).

If rates of depression, anxiety, suicide, and substance abuse continue to grow, new approaches must be considered that can be modified for, and accessed by, everyone: From the historically disenfranchised to individuals with no formal diagnosis for hard-to-treat disorders, many of whom struggle to manage their psychophysiological health and well-being. Public policy ramifications hinge on the imminent legalization and decriminalization of psychedelic substances that already have investors jockeying for position and future profits, and affect social/legal codes, which research is financed, plus therapeutic design, and broader inclusivity and accessibility in the process (Bender & Hellerstein, 2022). Scientists, experts, advisors, gatekeepers, and providers are responsible for bridging gaps between pharmacology, biology, psychophysiology, and phenomenology—demystifying the psychedelic experience and helping shape what is taking place at the crossroads of multiple disciplines.

Advancing practitioner and public understanding on connections between mental health, crisis recovery, psychedelic experiences, and cognitive functions like subjective interoceptive tone, emotion regulation, and resilience is unifying, multi-dimensional work that helps to: 1) better characterize psychophysiological factors driving stress/crisis in

midlife, 2)  identify subjective interoception, emotive tone, and resilience links with stress/crisis management, 3) assess the degree to which psychedelic-based experiences produce (or not) subjectively felt, economically viable results for the average person in middle adulthood with the fewest risks or side effects, and 4) address issues of equity, inclusion and access in the process.

# Chapter II.

## Methods

Research commenced upon approval by the Harvard Committee on the Use of Human Subjects. Qualitative data from *N*=124 adult participants was collected through a single survey comprised of nine instruments/inventories administered via Qualtrics (Qualtrics, Provo, UT) and *n*=75 participants completed the entire study. Before commencing the study, a priori power analyses were performed for all three hypotheses, which yielded the target sample size of *N*=210 for the study. For H1 (incidence and intensity of crisis episode) and H2 (incidence/intensity of crisis episode downregulates mediating factors) MANCOVA/ANCOVA fixed effects *F*-test was used to calculate effect sizes (ES) for eight groups where $f = 0.25$, $\alpha$ value = 0.05, and desired statistical power $(1-\beta) = 0.80$. In H3 (positively perceived psychedelic experiences upregulate mediating factors and decrease crisis episodes) Cohen's d for an independent t-test was calculated for the independent variable where effect size (ES) $d = 0.25$, $\alpha$ value = 0.05, and desired statistical power $(1-\beta) = 0.80$.

The collected sample size was determined by a limited available data collection time of approximately 2.5 months. As such, study hypotheses were powered as follows: (H1) $f = 0.31$, $\alpha$ value = 0.05, and actual statistical power $(1-\beta) = 0.67$, (H2) where $f = 0.34$, $\alpha$ value = 0.05, and actual statistical power $(1-\beta) = 0.77$, and (H3) where $f = 0.32$, $\alpha$ value = 0.05, and actual statistical power $(1-\beta) = 0.71$.

Inclusion criteria for participants was between 35 and 60 years of age, ability to read/write English, and who have access to Internet and the survey platform, and residents of high-income countries. Respondents under 35 or over 60 were excluded, along with those currently incarcerated, or who have been diagnosed and/or living with, a psychiatric condition or terminal illness. Data collection was anonymous, and information stored on an encrypted drive to protect respondent identities. No personal information or pseudonyms was requested, and demographic variables (age, sex, gender, ethnicity, income, relationship status, nationality, and education) were broken down according to category. All participants were deidentified with numerical ID numbers assigned to each profile to track results.

## Materials and Measures

To capture relevant data for analysis, I used the below instruments and/or scales.

### *Developmental Crisis Questionnaire (DCQ-12)*

The novel three-factor DCQ-12 measures the incidence of adult developmental crisis according to the categories of 'disconnection and distress', 'lack of clarity/control', and 'transition and turning point' (Petrov et al., 2021; Appendix 1). In a benchmark study by DCQ-12 developers, the instrument showed predictive validity with test-retest reliability of 0.78 to 0.89 (subscales) at four weeks. Responses were rated using a 5-point Likert scale from 'strongly disagree' to 'agree'. DCQ-12 was complimented by three questions (yes/no and open-text) that will be scored independently.

### *International Positive and Negative Affect Schedule—Short Form (I-PANAS-SF)*

Modified from the 20-item Positive and Negative Affect Schedule (Watson et al., 1988), the I-PANAS-SF (Thompson, 2007) is an internationally used 10-item

questionnaire scored according to a 5-point Likert scale. I-PANAS-SF offers psychometric validity and reliability, as well as less room for misinterpretation or error, when measuring positive and negative affect in individuals in cross-cultural research settings (Appendix 2).

*Mini-International Personality Item Pool (Mini-IPIP)*

A complement to I-PANAS-SF is the 20-item Mini-IPIP (Appendix 3), revised by Donnellan et al. (2006). The scale showed consistent convergent validity and internal consistencies in five studies, including test-retest correlations, and was conferred as a valid psychometrically shortened practical measure of the Big Five factors of personality.

*PTSD Checklist for DSM-5 (PCL-5)*

A 20-item self-report measure, the PCL-5 (Appendix 4) was used to screen and diagnose individuals for PTSD and monitor symptoms as per the DSM-5 (Weathers, Litz, et al., 2013). Responses are scored using a 5-point Likert scale according to item values from 0-4. Calculations resulted in a 'severity score' between 0 and 80 with a cut-off of 31-33—scores above this range suggest the respondent meets sub-threshold criteria or no PTSD symptoms while scores >33 indicate the presence of moderate to high severity of PTSD (Weathers, Litz, et al., 2013). PCL-5 was administered without Criterion A, abbreviated Criterion A assessment, or the Life Events Checklist for DSM-5 (LEC-5) (Weathers, Blake, et al., 2013).

*Pittsburgh Sleep Quality Index (PSQI)*

Developed by Buysse et al. (1989), the self-rating PSQI was validated for measuring sleep quality and patterns in seven categories: subjective sleep quality, latency, and duration, habitual sleep efficiency, sleep disturbances, use of sleep

medication, and daytime dysfunction. Answers were scored on a 4-point Likert scale to capture sleep-related complaints, as well as duration and frequency of symptom criteria (Appendix 5). The PSQI shows high reliability and internal consistency in multiple studies (Cronbach's $\alpha = 0.83$).

*Psychedelic Experience Questionnaire (PEQ)*

This section of the survey included five closed-ended, one short answer, and three open-text questions on the PE, with the former covering type of substance(s) used, # of experiences, time since last experience, recall and evaluation of experience, and reason for use (Appendix 6). Qualitative questions were measured on a 5-point Likert scale. Three open-text questions asked respondents, if they so choose, to elaborate on their psychedelic experience (e.g., set and setting, accompanying interventions like psychotherapy or antidepressants) and perceptions on their well-being, ability to regulate emotions and handle crisis post-experience. Scales on psychedelic experiences are nascent and emerging and, therefore, vary in scope. However, questions for this study were curated and modified based on current trends in the fields of psychology, counselling, physiology, and neuroscience in the absence of measures that confirm validity and reliability.

*Multidimensional Assessment of Interoceptive Awareness, v.2 (MAIA-2)*

The eight-factor item MAIA-2 state-trait scale by Mehling et al. (2018) was applied (Appendix 7) to measure past and present subjective interoceptive capacities in study respondents. MAIA-2 has improved reliability compared to the original MAIA, particularly in cross-cultural contexts ($\omega = .70$ across eight dimensions) (Eggart et al., 2021). Thirty-seven questions were scored using a 6-point Likert scale with responses

from ‘never’ (0) to ‘always’ (5) and higher scores suggesting higher levels of interoceptive awareness and emotional regulation.

*Emotional Breakthrough Inventory (EBI)*

Newer studies on psychedelic substances tend to incorporate an emotion appraisal, regulation, or breakthrough questionnaire. To complement MAIA-2, three questions from the eight-item EBI (Appendix 8)—developed by Roseman et al. (2019) for a trial on treatment-resistant depression involving psilocybin—were rolled into the study. Neither of the two ‘negative’ reverse scored questions, were used and ‘yes/no’ responses were requested instead of a normal rating according to a sliding visual analogue scale (Kuc et al., 2021).

*Connor-Davidson Resilience Scale 10 (CD-RISC 10)*

The abridged CD-RISC 10 (Campbell-Sills & Stein, 2007; Appendix 9) was used to measure respondent ability to tolerate challenging situations and changes in adaptive recovery through factor items such as personal confidence, ability to regulate emotions like anger and fear, respond to success and failure, goal achievement, and adaptability to change. Modified from the original CD-RISC 25 (Connor & Davidson, 2003), the 10-item CD-RISC 10 has shown high internal consistency (Cronbach’s $\alpha = 0.88$) and supports high test-retest reliability and internal consistency across contexts (Scali et al., 2012).

## Study Protocol and Procedure

Posing no greater than minimal risk to subjects, the study was comprised of inventories that characterize crisis states in midlife and three that measure the relationship between the PE and psychophysiological changes that bolster the ability to cope and

manage crisis/stress states. The first part of the study featured a brief introduction, summary, and consent form (Appendix 10). This was followed by a set of pre-study questions to screen participants who do not meet inclusion criteria or provide informed consent for data collection (Appendix 11), triggering the study to stop and these records to be expunged from the final sample.

Subsequent survey tests/scales were used to establish intensity of (and maladaptive traits correlated with) crisis states in middle adulthood and whether these may down-regulate stress-related effects on subjective interoception, emotive regulation, and resilience. Instruments also tested if positively perceived psychedelic experience(s) in midlife are associated with the upregulation of subjective interoception, emotion regulation, and resilience (including emotional breakthroughs), and lead to improved crisis management or a decreased incidence in crisis episodes. A description of, and link to, the anonymous survey was advertised (Appendix 13) and advertised on the following platforms and/or digital channels: Qualtrics, Survey Circle, social media platforms (Reddit, LinkedIn, Twitter, Facebook, and Instagram), and via the digital boards, newsletters, and websites of selected therapeutic and research networks. Snowball methodology advertising to offline/off-platform individuals has been integrated. The survey took an average of 30 minutes to complete and was accessible online for three months. Quality checks were routinely carried out throughout data collection in the database for testing and outcome assessments.

## Data Analysis

Parametric scores for incidence of crisis episodes (DCQ-12), PTSD (PCL-5), maladaptive mood (I-PANAS-SF) and trait states (Mini-IPIP), interoceptive awareness

and emotion regulation (MAIA-2), emotional breakthrough (EBI), resilience capabilities (CD-RISC10), occurrence and quality of psychedelic experience (PEQ), and non-parametric data (demographic categories and Part B of the PEQ) were collected to test study hypotheses. Data was analyzed using exploratory and descriptive statistical methods that included testing for normality of distribution and checked by the Thesis Director. Relationships between dependent and independent variables for each hypothesis were calculated using descriptive and inferential statistics of one-way ANOVA, factor analyses, and post hoc tests, with additional analyses performed based on the outcomes of these tests.

The dependent variable in H1 was incidence/intensity of crisis episode in middle adulthood and independent variables were maladaptive affect/trait factors, sleep quality, and PTSD. The independent variables in H2 were downregulated mediating effects of subjective interoception, emotion regulation, and resilience (scored, totaled, and standardized using MAIA-2 and CD-RISC 10) and the dependent variable was incidence/intensity of crisis episode. For H3, the presence/absence of a positively perceived psychedelic experience (PEQ) and decrease in incidence/intensity of crisis episodes in midlife (DCQ-12) were dependent variables, while the dependent variables were upregulated mediating effects of subjective interoception, emotion regulation, and resilience (MAIA-2, PEQ, CD-RISC 10).

Based on results of exploratory statistical tests the comparative analysis was done using Bonferonni and multivariate statistical methods to determine relationships between the presence and intensity of crisis states in the sample population, degree to which crisis/stress episodes downregulate mediating factors like subjective interoception,

emotion regulation and resilience, and whether PEs upregulate these mediating factors and decrease the presence and/or intensity of crisis episodes. The analysis was complimented by pairwise comparisons for all outcome measures. Differences involving non-parametric covariates—demographic characteristics of age category, sex, gender, ethnicity, annual income, relationship status, and level of education (see Appendix 12) were controlled for in the analysis through logistic regression and *t*-tests.

# Chapter III.

## Results

All measures were scored and weighted using SPSS statistical software (IBM, Released 2019). Data was suitable for an exploratory factor analysis based on Bonferonni's α. A total of 124 respondents accessed the survey, 86 consented to take part and passed the screening questions, and 75 completed the questionnaire with a gender breakdown of men (22; 29%), women (37; 49%), and gender queer (1; 1%), and 15 who did not respond (DNR). Participants were primarily from the United States and Canada (*n*=36) and Europe (n=18), with *n*=7 respondents from the United Kingdom, and one (*n*=1) each from the Middle East, Australia, and Africa. Eleven respondents did not provide information on their country of residence. Fifteen (*n*=15) countries were represented, and the ethnic breakdown of respondents was White (*n*=47), Middle Eastern or North African (*n*=3), Hispanic, Latino, or Spanish origin (*n*=6), Asian (*n*=4), Multi-ethnic (*n*=2), prefer not to answer (*n*= 2), another ethnic origin (*n*=1), and Black (*n*=1) and 15 respondents did not respond to the question. Age distribution of respondents was evenly spread across all groups: 30.7% in the 35-40 range, 45.3% aged 41-50, and 24% aged 51-60.

### Aim 1/Hypothesis 1: Crisis states and contributing factors in middle adulthood

Findings for H1 were largely non-significant except for dietary and lifestyle indicators of alcohol and tobacco intake/use in people in middle adulthood who report

experiencing a crisis state ($F4,30 = 3.15$, $p < .028$). Alcohol intake and frequency were both higher in respondents aged 40 to 50 than 39 to 40 or 51 to 60. While not significant, the 18% diagnosed with a psychiatric condition ($n$=14) were predominantly between 41 to 50 years of age. Of participants who responded in the affirmative to currently experiencing a crisis/stress episode ($N$=42) there was no significant difference across age categories. There was significance in the number of 51- to 60-year-olds who reported they were not currently experiencing a crisis, but had in the past, and cited it began between the ages of 35 to 40 ($F2,35 = 13.3$, $p < .000$) or 41 to 50 ($F2,35 = 13.3$, $p < .012$) years of age.

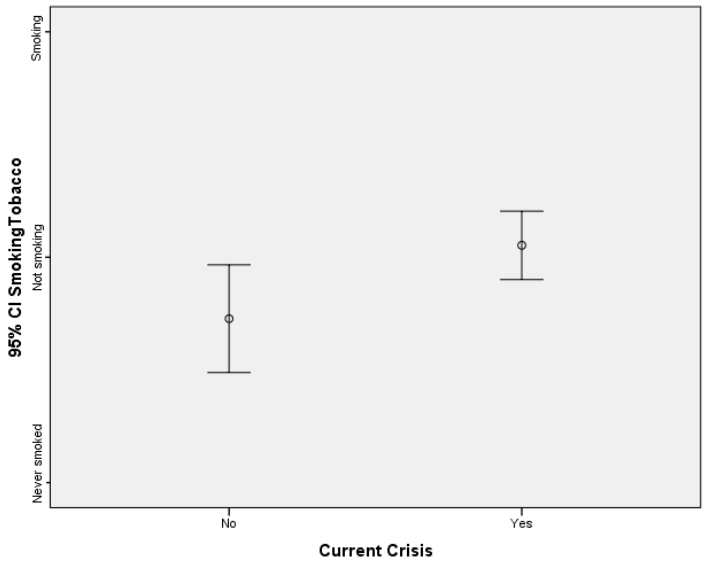



Figure 1. Tobacco Smoking and Crisis Episodes

*Lower incidence of historic/active tobacco smoking in individuals not currently in crisis ($p<0.019$).*

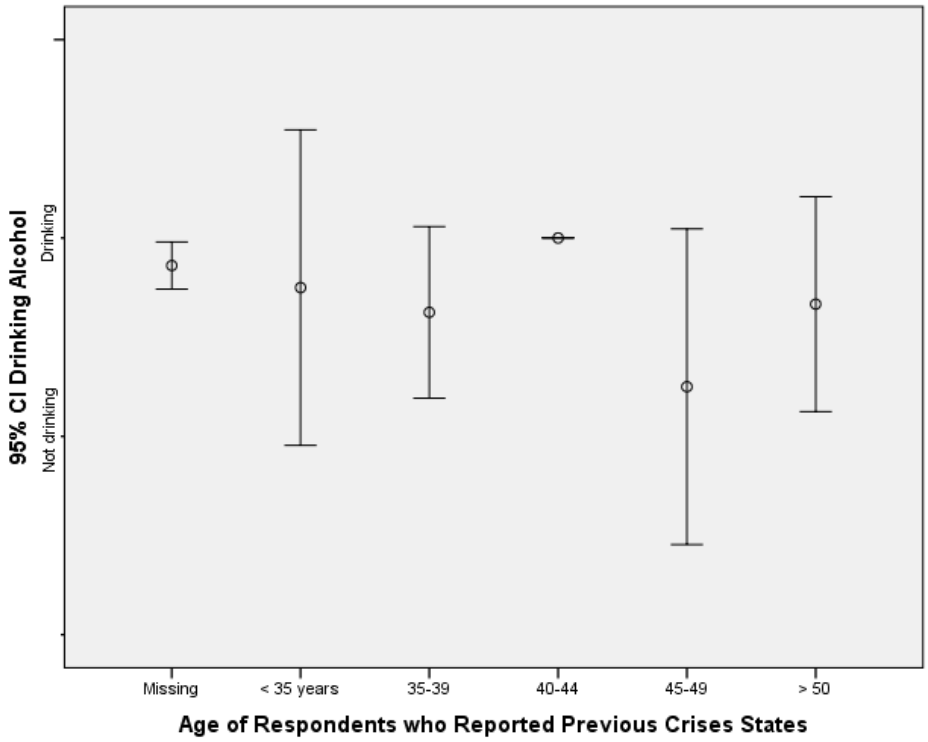



Figure 2. Alcohol Consumption and Age

*Highest incidence of alcohol consumption during crisis is in 40 to 44 age sub-group.*

Aim 2/Hypothesis 2: Relationship between up/down-regulating factors that influence the prevalence or intensity of crisis/stress in midlife

For H2, two-way factor comparisons and post-hoc tests involving the DCQ-12 scale showed significance in nearly all dimensions in adults aged 35 to 60 who reported experiencing a crisis episode (Table 1, Figure 3).

Table 1. DCQ-12 Values and Crisis Episodes

*Please indicate whether the following statements describe your life **over the past six months or so**. When appraising if you have been experiencing something more than 'normal', make a judgement of the past six months relative to your adult life generally.*

| | *F* | *df* | *p* |
|---|---|---|---|

| | | | |
|---|---|---|---|
| *Questioning life more than usual* | 33.6 | 1, 74 | < .0001 |
| *Life has lost direction* | 10.1 | 1, 74 | .002 |
| *Stronger negative emotions than normal* | 38.9 | 1, 74 | < .0001 |
| *Life is meaningless* | 4.8 | 1, 74 | .031 |
| *Feeling in control of one's life* | 10.1 | 1, 74 | .002 |
| *Life feels stable and predictable* | 24.9 | 1, 74 | < .0001 |
| *Having available resources for life's challenges* | 4.5 | 1, 74 | .038 |
| *Passing through major turning point in life* | 12.7 | 1, 74 | .001 |
| *Leaving "old self" behind, building "new"* | 6.5 | 1, 74 | .013 |
| *Thoughts of life have changed* | 13.7 | 1, 74 | < .0001 |

*DCQ-12 variables significantly associated with currently experiencing a crisis. Significance level set to α = .05.*

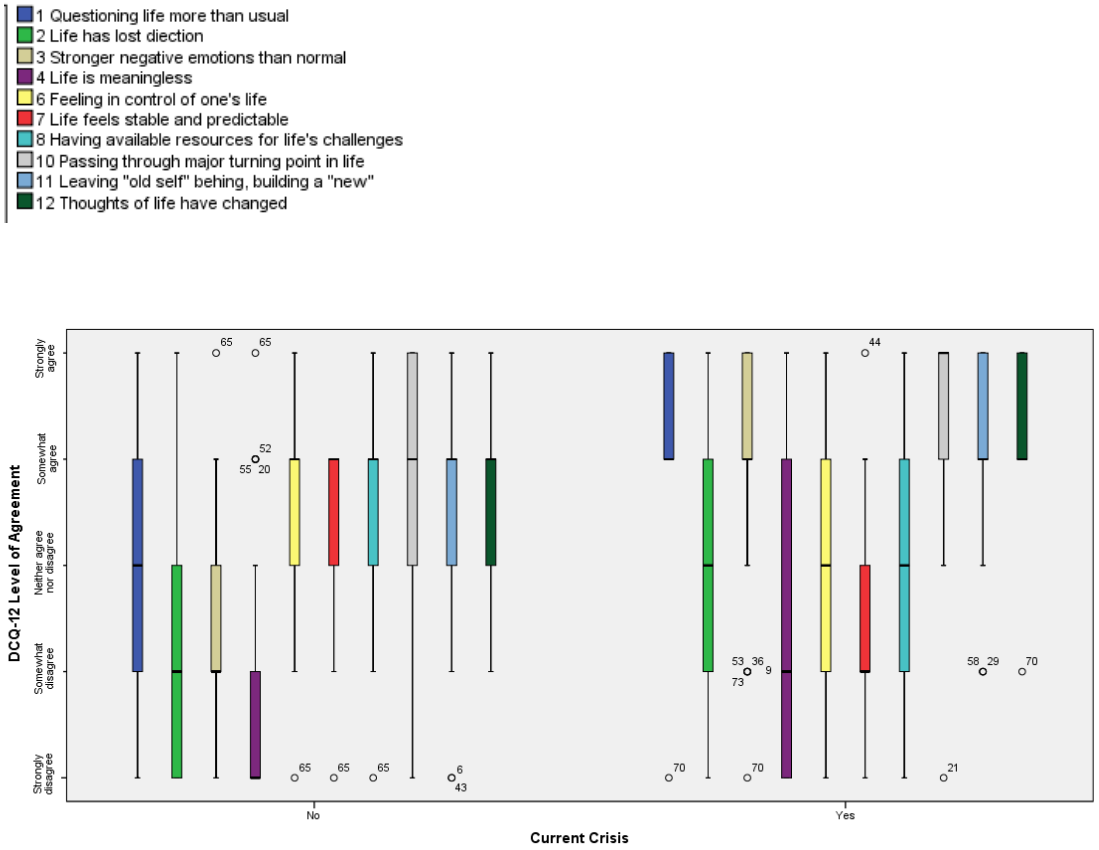



Figure 3. DCQ-12 Values and Crisis States

*Comparative DSQ-12 variables associated with currently experiencing a crisis. Error bars represent 95% confidence intervals.*

Analyses on DCQ-12 dimensions against other diet/lifestyle and demographic factors turned up significant findings with perceived health. Perceived meaninglessness was associated with poorer assessment of health status, while experiences of transition and major turning points in life were associated with perceived high levels of health (Table 2, Figure 4).

Table 2. DCQ-12 and Perceived Health

| | *F* | *df* | *p* |
|---|---|---|---|
| *4 Life is meaningless* | 4.3 | 1, 56 | .004 |
| *9 Experiencing a time of transition in life* | 2.6 | 1, 56 | .046 |
| *10 Passing through major turning point in life* | 2.8 | 1, 56 | .037 |

*DCQ-12 variables associated with perceived health status. Significance level set to α = .05.*

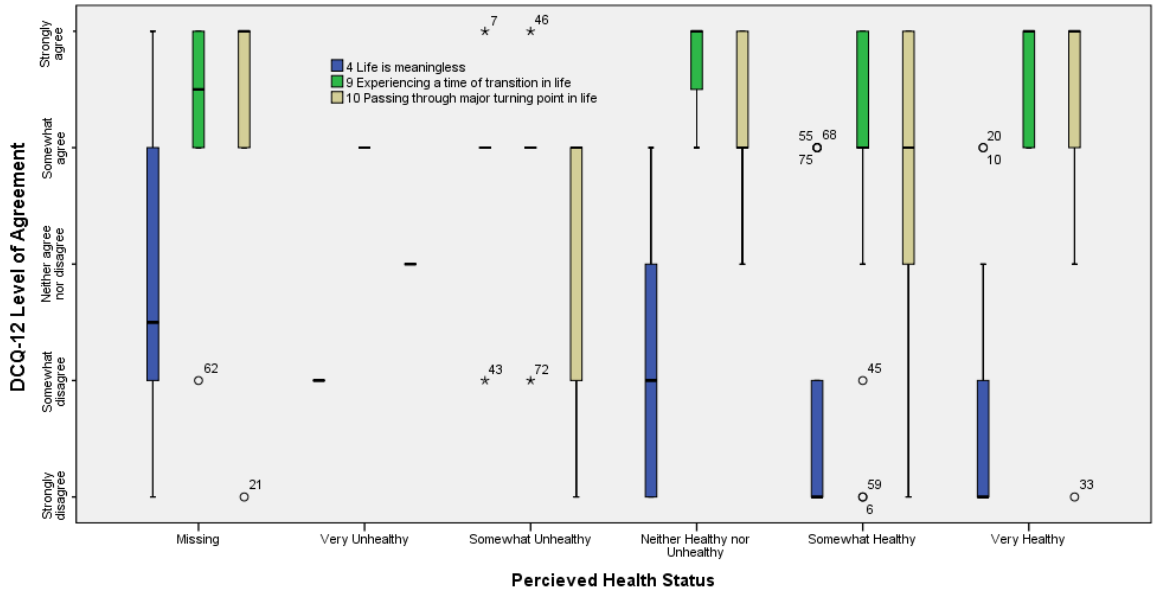



Figure 4. DCQ-12 and Perceived Health

*Comparative DCQ-12 variables associated with perceived health status. Error bars represent 95% confidence intervals.*

Perceived loss in direction of life, and its meaninglessness were associated with poorer assessment of diet, while experiencing major turning points in life was associated with perceived higher quality dietary status (Table 3, Figure 5).

Table 3. DCQ-12 and Diet

| | *F* | *df* | *p* |
|---|---|---|---|
| *2 Life has lost direction* | 3.3 | 1, 55 | .043 |
| *4 Life is meaningless* | 3.9 | 1, 55 | .025 |
| *10 Passing through major turning point in life* | 3.0 | 1, 55 | .057* |

*DCQ-12 variables associated with diet. Significance level set to α = .05; * approaching significance.*

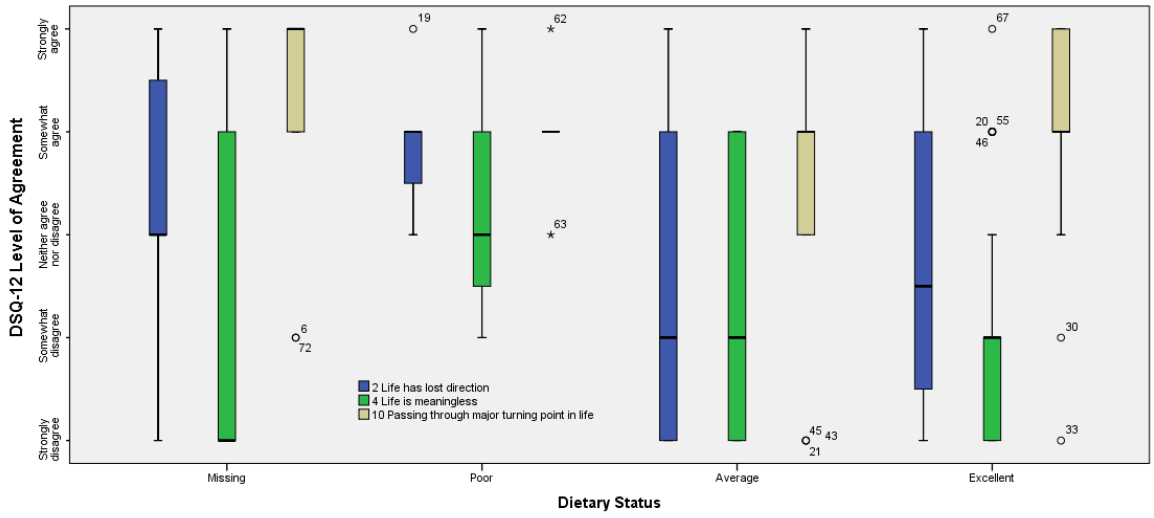



Figure 5. Comparative DCQ-12 and Diet Values

*Comparative DSQ-12 variables associated with perceived dietary status. Error bars represent 95% confidence intervals.*

In addition, individuals with higher attained educational status trended toward defining themselves as being in transition in life more than individuals with lower attained educational status ($F1,57 = 2.7$, $p = .51$). Individuals identifying as gender queer reported a markedly lower perceived control of their life ($F1,58 = 3.9$, $p = .26$) and marginally higher perceived personal transformation from an "old" into a "new" self ($F1,58 = 2.9$, $p = .61$). Respondents who identified as female, reported having changed thoughts about life more than male respondents ($F1,58 = 3.2$, $p = .49$).

Although no significant correlations emerged between age categories and prevalence of crisis with reference to PTSD-traits of the PCL-5 or resilience capabilities (CD-RISC 10), significant relationships were seen when comparisons were run between several demographic categories and psychometric inventories between age groups and reports of being in crisis. Two-way ANOVA factor analysis of mood/affect between groups with I-PANAS-SF showed a higher significance of people in crisis experienced generally felt more upset ($F1,65 = 12.2$, $p < .001$), hostile ($F1,65 = 3.97$, $p < .05$), nervous ($F1,65 = 3.72$, $p < .058$), and afraid ($F1,65 = 5.36$, $p < .024$), as well as less alert ($F1,64 = 5.16$, $p < .026$), attentive ($F1,65 = 4.15$, $p < .046$), and active ($F1,65 = 4.75$, $p < .033$). The "having problems maintaining enthusiasm to get things done" dimension of the PSQI sleep scale showed a significant difference between 'yes' and 'no' crisis groups ($F1,60 = 20.95$, $p < .000$), while responses trended towards significance under the domains of having trouble sleeping because of an inability to breathe properly ($F1,60 = 3.50$, $p < .066$), having bad dreams ($F1,60 = 3.78$, $p < .057$), and needing to take medicine to aid with sleep ($F1,60 = 3.43$, $p < .069$). These scores may correlate with those seen in the two-way analysis of interoceptive capacities (MAIA-2) where there

were significant binary divisions in age (35- to 50-year-olds vs. those aged 51 to 60) in two categories and nearing significance in one other.

Table 4. Analysis of Interoception (MAIA-2) and Age Group

| | |
|---|---|
| 2 I notice when I am uncomfortable in my body | $F_{1,57} = 4.34$, $p < .042$ |
| 4 I notice changes in my breathing, such as whether it slows down or speeds up | $F_{1,57} = 4.18$, $p < .045$ |
| 25 I notice that my body feels different after a peaceful experience | $F_{1,57} = 3.01$, $p < .088$ |

Further relationships according to interoception scores from MAIA-2 were seen in terms of ignoring physical tension or discomfort until they become more severe (#5) ($F1,57 = 4.56$, $p < .037$), occupying oneself with something else to avoid feeling unpleasant body sensations, (#10) ($F1,57 = 5.29$, $p < .025$), as well as trending significance in terms of respondents distracting oneself from sensations of discomfort (#6) ($F1,57 = 3.30$, $p < .074$) and being unable to return awareness to the body when distracted (#19) ($F1,57 = 3.22$, $p < .078$).

To investigate whether prevalence of crisis down- or up-regulated resilience capacities, a factor analysis was run on CD-RISC 10 and negative trends were seen in multiple dimensions with survey respondents experiencing a crisis episode reporting significant and near-significant difficulties in exercising resilience in the face of longstanding stress/crisis states

Table 5. Analysis of Resilience (CD-RISC 10) and Presence of Crisis Episode*

| | |
|---|---|
| 1 I am able to adapt when changes occur | $F_{1,57} = 3.39$, $p < .071$ |
| 4 Coping with stress can make me stronger | $F_{1,57} = 6.49$, $p < .014$ |

| | |
|---|---|
| 6 I believe I can achieve my goals, even if there are obstacles | $F_{1,57} = 3.49$, $p < .067$ |
| 7 Under pressure I stay focused and think clearly | $F_{1,57} = 4.12$, $p < .047$ |
| 8 I am not easily discouraged by failure | $F_{1,57} = 4.37$, $p < .041$ |
| 10 I am able to handle unpleasant or painful feelings like sadness, fear, and anger | $F_{1,57} = 3.84$, $p < .055$ |

**Negative trends in CD-RISC 10 dimensions based on affirmative responses to crisis episode in midlife.*

Negative emotionality analyses of the Mini-IPIP showed significance between groups crisis and non-crisis groups on experiencing frequent mood swings ($F1,59 = 6.75$, $p < .012$), "being relaxed most of the time" ($F1,59 = 19.52$, $p < .000$), getting upset easily ($F1,59 = 4.12$, $p < .047$), and feeling blue ($F1,59 = 11.25$, $p < .001$). Trends towards significance were observed under the dimensions of perceiving to make a mess of things ($p < .070$) and an inability to get chores done immediately ($p < .074$).

Aim 3/Hypothesis 3: Relationship between psychedelic experiences, subjective interoception, emotion regulation, and resilience

H3 associations between positively perceived psychedelic experiences, upregulation of interoception (MAIA-2) and resilience (CD-RISC 10) or decreases in crisis episodes (DCQ-12) was not supported by the data. Of the 62 respondents who answered the question about ever having had a PE, 26 replied 'yes', 36 answered 'no', and 24 DNR.

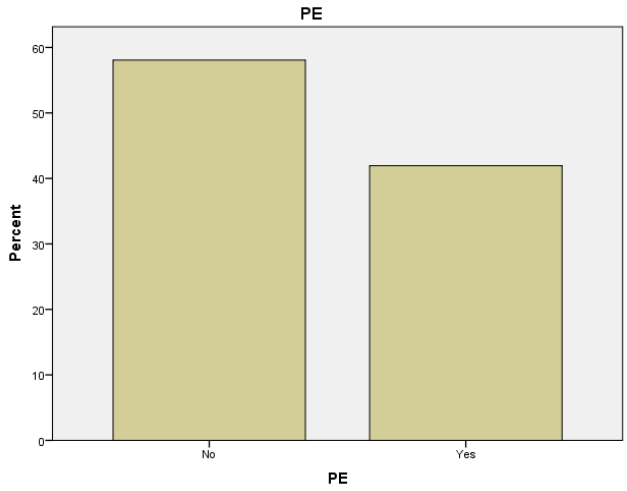



Figure 6. Percentage of Respondents Who Ever had a Psychedelic Experience

Of the 26 participants who replied ‘yes’ to having PE, 11 had a least one in the last three years (with the most recent being in the last month) and the remaining 15 reported having one more than six years ago (with the oldest being 42 years ago). The most frequently used substance was psilocybin (*n*=22), followed by MDMA (*n*=11) and LSD (*n*=10). Predominant qualitative reasons cited for having a PE varied, but the primary three were curiosity, fun (both *n*=9), and for personal growth or therapeutic reasons (*n*=7). All PEs took place in informal settings save for one, which occurred as part of a formal, clinical protocol. Of the 65 survey participants who responded to the question about whether they have or would consider having psychedelic experience now or in the future for stress/crisis management 38% answered ‘yes’, 28% ‘no’, and 26% responded ‘maybe/not sure’.

# Chapter IV.

# Discussion

Although studies on crisis in the life course have been carried out, only a small number have exclusively investigated these states in middle adulthood (people aged ~35 to 60/65) and fewer still have examined the potential drivers or factors behind crisis episodes, relationships to interoception and emotion regulation, and/or effects and outcomes of psychedelic experiences, especially in healthy populations. The present study is one of the first to take a multi-factor approach. Although data did not support H1 in that there was no significant correlation between a higher prevalence of maladaptive traits, negative mood qualities, and specific demographics and greater incidence of crisis in midlife, significant trends and relationships were seen in the incidence of crisis/stress episodes in middle adulthood and several H2 (increased incidence of crisis states is associated with down-regulated subjective interoception, emotion regulation, and resilience outcomes) and H3 dimensions (positively perceived psychedelic experiences decrease crisis states and are correlated with the upregulation of subjective interoception and emotion factors and outcomes).

The population sample of respondents was largely comprised of people who identify as White (71%, DNR=15), women (63%), residents of the United States and Canada (85%), well educated (86% of those who responded to the question on education hold a Bachelor, Masters, Doctoral, or Post-doc degree), married or living common-law (71%), and earning over $100,000 US dollars a year in annual household income (48%).

Only three out of 75 participants responded they had never experienced a crisis episode in middle adulthood with 56% reporting being currently in crisis and 43.6% having experienced one at some point in their past. Across all categories crisis/stress episodes appears to be highest for those ages 41 to 50, followed by 35- to 40-year-olds. There were no significant relationships between a reported crisis episode and demographic categorizations or causes related to the psychometric measures of PTSD and poor sleep.

Findings suggest crisis episodes may be more universal than previously thought and are more related to causal, contextual factors and less to demographic features (e.g., ethnicity, education, income, etc.) or maladaptive traits and diagnoses like PTSD. Of the qualitative responses received on details of most recent crisis episodes, oft cited reasons were: Professional stresses, burnout, and related financial concerns; changes to central relationships (divorce, children leaving home, death of loved one, caring for aging parents, etc.); existential despair and search for meaning; longstanding and unresolved forms of abuse; personal health concerns that involved chronic pain or onset of disease and/or a serious illness, and feelings of loneliness and isolation with 10 respondents linking these feelings to recent COVID-19 lockdown measures. Moreover, both alcohol intake and frequency were higher in respondents who experienced a crisis state, which tracks with findings in the literature where alcohol and drugs are employed as coping strategies, as well as the age when crisis episodes appear to peak with more 41 to 50-year-olds frequently imbibing than those in the 39 to 40 or 51 to 60 age cohorts.

The analysis of relationships between interoceptive and emotive capacities and crisis showed an existence of negative mood/affect differences between respondents currently in crisis and those who reported feeling more afraid, nervous, upset, hostile, and

less alert than those who were not. Significant trends suggest differences may be related to negative physiological outcomes that include sleep problems caused by a higher-than-normal frequency of bad dreams, inability to breathe at night, needing to take medication to sleep, and being unable to keep up levels of enthusiasm for "getting things done." PSQI and I-PANAS-SF scores, along with taking medication for a diagnosed mental illness, and using alcohol and tobacco to cope are also connected with the downregulation of certain interoceptive, emotive, and resilience abilities in those aged 35 to 50 vs. 51- to 60-year-olds who may no longer be acutely stressed or "in crisis." Findings suggest participants experiencing a crisis episode tend to avoid or distract themselves from feeling and/or adequately processing unpleasant interoceptive sensations and emotions, ignoring physical tension until it becomes severe, being discouraged by failure, or ineffectively handling painful or unpleasant emotions, all of which render it challenging to exercise or raise resilience when managing stress.

Although survey data did not support the third hypothesis—strong relationships between positively perceived psychedelic experiences, potential upregulation of interoception and emotion regulation, and decreases in the prevalence or intensity of crisis episodes—interesting findings emerged on the prevalence of psychedelic use and experiences, most used substances (psilocybin, MDMA, and LSD), reasons for taking psychedelics, and retroactive thoughts about a PE. Of the 26 participants who responded 'yes' to having had a psychedelic experience, reasons for doing were aligned with what has been found in other studies with equal numbers ($n$=9) doing so for both curiosity and fun, seven for personal growth/therapeutic, two to try and solve a physical issue. Half of those who had a PE felt it helped them improve aspects of their emotional well-being,

mental health, and ability to adapt and/or overcome crisis while the other half did not—something that may be correlated the 19 respondents who rated their PE to be 'very positive' or 'positive' vs. the four who had a 'very negative' or 'negative' experience. There were a wide range of responses regarding types of interventions and/or actions to manage stress or crisis episodes in midlife with references to exercise/physical activity, psychotherapy, drinking (alcohol) and smoking, developing/nurturing close connections ("talking to friends/family" or "venting"), meditation, taking medication for diagnosed mental disorders, travel, and prayer.

Reported results were based on a sample collected over the course of 64 days and the cut-off time for inclusion was determined by the administrative deadline for thesis submission. The survey, however, remains open online for new respondents. An additional 66 participants completed the survey by the time the thesis was submitted and, as such, I plan to re-analyze the data according to the full sample size following manuscript preparation as I anticipate some of the trends seen in the data will reach the threshold of statistical significance.

## Limitations

Most studies involving psychedelic substances take place in laboratory or clinical settings where observational and/or neuroimaging and psychophysiological monitoring methodologies give researchers a real-time, "inside" look into the central and peripheral nervous systems while one is under the influence of a psychoactive substance. This study, by contrast, relied on retrospective and/or subjective feedback and, as such, was limited by the absence of objective measures and controls. No psychedelic substances were administered, participants were not observed while under the influence of a substance,

and no imaging or psychophysiological methods were used. Additional constraints include small study size, temporal issues (i.e., no follow-up surveys or interviews), a small and un-diverse sample size (predominant of respondents identified as White) and recall validity with respect to inaccuracies in memory or 'misrememberings'. Moreover, the subject matter and self-report nature of measures use opened the study to self-selection, biased or obfuscated responses, as well as internal pressure for participants to submit socially acceptable or "politically correct" feedback. The 60% attrition rate (only 75 out of 124 completed the survey until the end) and patchy responses to parts of the survey, suggest timing, questionnaire size, and the number of psychometric inventories used may have been restrictive factors for some respondents. It could also explain the lack of diversity in respondents and imbalanced distribution across demographic categories (e.g., socioeconomic, geographic, ethnic, age, gender, etc.) with the length, time needed to complete the survey, and no offer of compensation possibly deterring potential participants from taking part in, or completing, the questionnaire. All limitations mean results should be interpreted with caution.

Fundamentally, this was a modest, first attempt at connecting the distinct and under-researched concepts of the contributing factors that characterize crisis episodes in middle adulthood, relationships between crisis traits and subjective interoception, emotion regulation, and resilience for managing these states of crisis, and the role of the psychedelic experience in augmenting interoceptive and emotive tone for improved resilience and stress/crisis recovery. Statistically significant outcomes that emerged—and those that trended towards significance—should be retested by others in the future

through studies that examine the nuances, complexities, and interconnectedness of these variables, albeit with greater precision.

# Appendices

## Appendix 1.

## Developmental Crisis Questionnaire (DCQ-12)

The 12-item DCQ-12 by Petrov, Robinson, & Arnett (2021) measures the incidence of adult developmental crisis according to three dimensions. It was complimented by four open- and closed-text questions that were scored independently.

Please indicate whether the following statements describe your life in general over the past six months or so. In relation to appraising whether you have been experiencing something more than 'normal', make a judgement of the past six months relative to your adult life generally.

| | **Items** |
|---|---|
| 1. | I have been questioning myself and my life more than I normally do. |
| 2. | I feel like my life has lost direction. |
| 3. | I have been experiencing stronger negative emotions than normal. |
| 4. | I have been thinking that life is meaningless. |
| 5. | I have been confident about what I need to do to make it in life. (R) |
| 6. | I have been feeling in control of my life. (R) |
| 7. | My life feels stable and predictable. (R) |
| 8. | I have felt that I have had the resources to deal with any challenges that life throws at me. (R) |
| 9. | I am experiencing a time of transition in my life. |
| 10. | I am passing through a major turning point in my life. |
| 11. | I feel like I may be in the process of leaving the 'old me' behind and am developing a 'new me'. |
| 12. | I have noticed that the way I have thought about my life has changed. |

Would you say you are currently experiencing a crisis or stress state/episode?

| Yes | No |
|---|---|
| ○ | ○ |

You answered ‘no’, have you experienced a crisis or stress state/episode in the past?

| Yes | No |
|---|---|
| ○ | ○ |

You responded ‘yes’ to the previous question, please select the age (chronological) when the crisis/stress episode began using the drop-down menu.

If you would like, please provide details about your most recent episode of crisis/stress, including age of onset, duration, perceptions, and feelings during this period.

Appendix 2.

International Positive and Negative Affect Schedule—Short Form (I-PANAS-SF)

The 10-item I-PANAS-SF E. R. Thompson (2007) is a psychometrically valid inventory for measuring positive and negative affect in cross-cultural research settings.

Instructions to respondents:

Thinking about yourself and how you normally feel, to what extent do you generally feel:

Items:

Items in administered order:

Upset

Hostile

Alert

Ashamed

Inspired

Nervous

Determined

Attentive

Afraid

Active

Interval measure:

*Never* 1 2 3 4 5 *Always*

Positive affect items:

Alert, Inspired, Determined, Attentive, Active

Negative affect items:

Upset, Hostile, Ashamed, Nervous, Afraid

Appendix 3.

Mini-International Personality Item Pool (Mini-IPIP)

The 20-item Mini-IPIP was adapted in 2006 by Donnellan et al. (2006) from the 50-item International Personality Item Pool-Five-Factor Model measure by Goldberg (1999). The scale was used in this study to compliment I-PANAS and measure personality factors given the validity and consistencies, and its shorter length than other Big Five Trait scales.

**Mini-International Personality Item Pool**
**IPIP**

Items

| Item | Factor | Text | Original Item Number |
|---|---|---|---|
| 1 | E | Am the life of the party. | 1 |
| 2 | A | Sympathize with others' feelings | 17 |
| 3 | C | Get chores done right away. | 23 |
| 4 | N | Have frequent mood swings. | 39 |
| 5 | I | Have a vivid imagination. | 15 |
| 6 | E | Don't talk a lot. (R) | 6 |
| 7 | A | Am not interested in other people's problems. (R) | 22 |
| 8 | C | Often forget to put things back in their proper place. (R) | 28 |
| 9 | N | Am relaxed most of the time. (R) | 9 |
| 10 | I | Am not interested in abstract ideas. (R) | 20 |
| 11 | E | Talk to a lot of different people at parties. | 31 |
| 12 | A | Feel others' emotions. | 42 |
| 13 | C | Like order. | 33 |
| 14 | N | Get upset easily. | 29 |
| 15 | I | Have difficulty understanding abstract ideas. (R) | 10 |
| 16 | E | Keep in the background. (R) | 16 |
| 17 | A | Am not really interested in others. (R) | 32 |
| 18 | C | Make a mess of things. (R) | 18 |
| 19 | N | Seldom feel blue. (R) | 19 |
| 20 | I | Do not have a good imagination. (R) | 30 |

*Note.* E = Extraversion; A = Agreeableness; C = Conscientiousness; N = Neuroticism; I = Intellect/Imagination; (R) = Reverse Scored Item. Original 50-item IPIP-FFM available at http://ipip.ori.org/newQform50b5.htm.

Appendix 4.

PTSD Checklist for DSM-5 (PCL-5)

A 20-item self-report measure comprised of three criterion, the PCL-5 checklist designed by Weathers, Litz, et al. (2013) was used to screen and diagnose individuals for PTSD, as well as monitor symptoms.

**PCL-5 with LEC-5 and Criterion A**

**Part 1**

**Instructions:** Listed below are a number of difficult or stressful things that sometimes happen to people. For each event check one or more of the boxes to the right to indicate that: (a) it happened to you personally; (b) you witnessed it happen to someone else; (c) you learned about it happening to a close family member or close friend; (d) you were exposed to it as part of your job (for example, paramedic, police, military, or other first responder); (e) you're not sure if it fits; or (f) it doesn't apply to you.

Be sure to consider your entire life (growing up as well as adulthood) as you go through the list of events.

| Event | Happened to me | Witnessed it | Learned about it | Part of my job | Not sure | Doesn't apply |
|---|---|---|---|---|---|---|
| 1. Natural disaster (for example, flood, hurricane, tornado, earthquake) | | | | | | |
| 2. Fire or explosion | | | | | | |
| 3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash) | | | | | | |
| 4. Serious accident at work, home, or during recreational activity | | | | | | |
| 5. Exposure to toxic substance (for example, dangerous chemicals, radiation) | | | | | | |
| 6. Physical assault (for example, being attacked, hit, slapped, kicked, beaten up) | | | | | | |
| 7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb) | | | | | | |
| 8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm) | | | | | | |
| 9. Other unwanted or uncomfortable sexual experience | | | | | | |
| 10. Combat or exposure to a war-zone (in the military or as a civilian) | | | | | | |
| 11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war) | | | | | | |
| 12. Life-threatening illness or injury | | | | | | |
| 13. Severe human suffering | | | | | | |
| 14. Sudden violent death (for example, homicide, suicide) | | | | | | |
| 15. Sudden accidental death | | | | | | |
| 16. Serious injury, harm, or death you caused to someone else | | | | | | |
| 17. Any other very stressful event or experience | | | | | | |

Appendix 5.

Pittsburgh Sleep Quality Index (PSQI)

The PSQI is comprised of nine self-rated questions for assessing daytime, sleep-related complaints, as well as the presence, frequency and duration of sleep symptom criteria (Buysse et al., 1989).

**Pittsburgh Sleep Quality Index (PSQI)**

**Instructions:** ***The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.***

**During the past month,**

1. When have you usually gone to bed? _____
2. How long (in minutes) has it taken you to fall asleep each night? _____
3. When have you usually gotten up in the morning? _____
4. How many hours of actual sleep did you get that night? (This may be different than the number of hours you spend in bed) _____

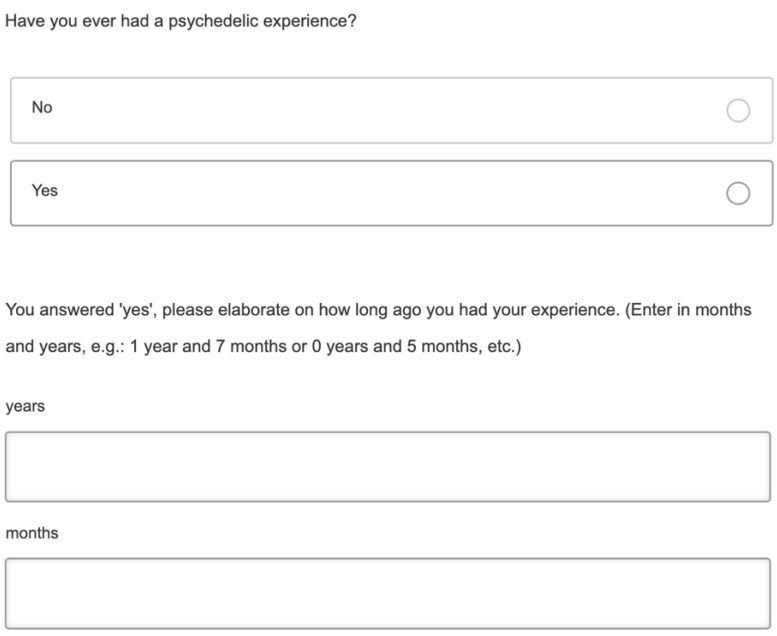
| 5. During the past month, how often have you had trouble sleeping because you… | Not during the past month (0) | Less than once a week (1) | Once or twice a week (2) | Three or more times a week (3) |
|---|---|---|---|---|
| a. Cannot get to sleep within 30 minutes | | | | |
| b. Wake up in the middle of the night or early morning | | | | |
| c. Have to get up to use the bathroom | | | | |
| d. Cannot breathe comfortably | | | | |
| e. Cough or snore loudly | | | | |
| f. Feel too cold | | | | |
| g. Feel too hot | | | | |
| h. Have bad dreams | | | | |
| i. Have pain | | | | |
| j. Other reason(s), please describe, including how often you have had trouble sleeping because of this reason(s): | | | | |
| 6. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep? | | | | |
| 7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity? | | | | |
| 8. During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done? | | | | |
| | Very good (0) | Fairly good (1) | Fairly bad (2) | Very bad (3) |
| 9. During the past month, how would you rate your sleep quality overall? | | | | |

Appendix 6.

Psychedelic Experience Questionnaire (PEQ)

Sample questions were curated and modified based on those used in two research studies: one on psychedelic experiences and stressful life events overseen by Dr. Max Wolff, faculty member at the Departments of Psychology and Psychiatry and Psychotherapy at Technische Universität Dresden, and a team of researchers from the university and the MIND Foundation, and the other investigating the impact of the COVID-19 pandemic on psychedelic experiences by Dr. Lisa Luan at the Imperial College of London and MAPS.

*Closed-ended questions*



How clearly do you recall your psychedelic experience?

Not at all | Somewhat | Clearly | Very clearly | Crystal clear



If yes, please indicate which substances you had a psychedelic experience with. (Please include experiences with microdosing.)

- [ ] Psilocybin or psilocybin-containing mushrooms/fungi (e.g., "magic mushrooms")
- [ ] Ayahuasca or similar DMT-containing plants
- [ ] Mescaline or mescaline-containing plants (e.g., peyote)
- [ ] LSD or related substances (e.g., ALD-52, 1P-LSD)
- [ ] MDMA (e.g., ecstacy, Molly, etc.)
- [ ] Ibogaine
- [ ] 5-MeO-DMT
- [ ] Ketamine
- [ ] Other(s) (enter in box below)

Do you think your psychedelic experience helped you improve your emotional well-being, mental health, and ability to adapt and/or overcome crisis?

| Yes | No |
|---|---|
| ○ | ○ |

How would you evaluate your experience from your perspective **today**?

Very negative | Negative | Neutral | Positive | Very positive



Were you able to explore challenging emotions and/or memories during your psychedelic experience?

| Yes | Maybe/notsure | No |
|---|---|---|

Do you feel the experience facilitated an emotional release or "breakthrough," or improved your ability to find closure on an emotional problem?

| Yes | Maybe/notsure | No |
|---|---|---|

Have you, or would you consider, having a psychedelic experience **now or in the future** for stress/crisis management?

| Yes | Maybe/not sure | No |
|---|---|---|

*Open-text questions on the psychedelic experience*

Think back to your most recent psychedelic experience and use the box below to enter your reason(s) for seeking or engaging in an experience.

(E.g., curiosity, fun, to deal with a physical problem, to improve my mental health, for escape, to increase performance, personal growth, etc.)

Was your experience in a clinical setting or accompanied by another “formal” therapeutic intervention (e.g., psychotherapy, clinical trial, pharmacological intervention, etc.)?

Appendix 7.

Multidimensional Assessment of Interoceptive Awareness (MAIA-2) Scale

This state-trait scale designed by Mehling et al. (2018) measures subjective interoceptive awareness and was used in accordance with existing permissions. In this study, MAIA-2 followed the section on psychedelic experiences.

**Below you will find a list of statements. Please indicate how often each statement applies to you generally in daily life.**

| . | Circle one number on each line | | | | | |
|---|---|---|---|---|---|---|
| | Never | | | | | Always |
| 1. When I am tense I notice where the tension is located in my body. | 0 | 1 | 2 | 3 | 4 | 5 |
| 2. I notice when I am uncomfortable in my body. | 0 | 1 | 2 | 3 | 4 | 5 |
| 3. I notice where in my body I am comfortable. | 0 | 1 | 2 | 3 | 4 | 5 |
| 4. I notice changes in my breathing, such as whether it slows down or speeds up. | 0 | 1 | 2 | 3 | 4 | 5 |
| 5. I ignore physical tension or discomfort until they become more severe. | 0 | 1 | 2 | 3 | 4 | 5 |
| 6. I distract myself from sensations of discomfort. | 0 | 1 | 2 | 3 | 4 | 5 |
| 7. When I feel pain or discomfort, I try to power through it. | 0 | 1 | 2 | 3 | 4 | 5 |
| 8. I try to ignore pain | 0 | 1 | 2 | 3 | 4 | 5 |
| 9. I push feelings of discomfort away by focusing on something | 0 | 1 | 2 | 3 | 4 | 5 |
| 10. When I feel unpleasant body sensations, I occupy myself with something else so I don't have to feel them. | 0 | 1 | 2 | 3 | 4 | 5 |
| 11. When I feel physical pain, I become upset. | 0 | 1 | 2 | 3 | 4 | 5 |
| 12. I start to worry that something is wrong if I feel any discomfort. | 0 | 1 | 2 | 3 | 4 | 5 |
| 13. I can notice an unpleasant body sensation without worrying about it. | 0 | 1 | 2 | 3 | 4 | 5 |
| 14. I can stay calm and not worry when I have feelings of discomfort or pain. | 0 | 1 | 2 | 3 | 4 | 5 |
| 15. When I am in discomfort or pain I can't get it out of my mind | 0 | 1 | 2 | 3 | 4 | 5 |
| 16. I can pay attention to my breath without being distracted by things happening around me. | 0 | 1 | 2 | 3 | 4 | 5 |
| 17. I can maintain awareness of my inner bodily sensations even when there is a lot going on around me. | 0 | 1 | 2 | 3 | 4 | 5 |
| 18. When I am in conversation with someone, I can pay attention to my posture. | 0 | 1 | 2 | 3 | 4 | 5 |

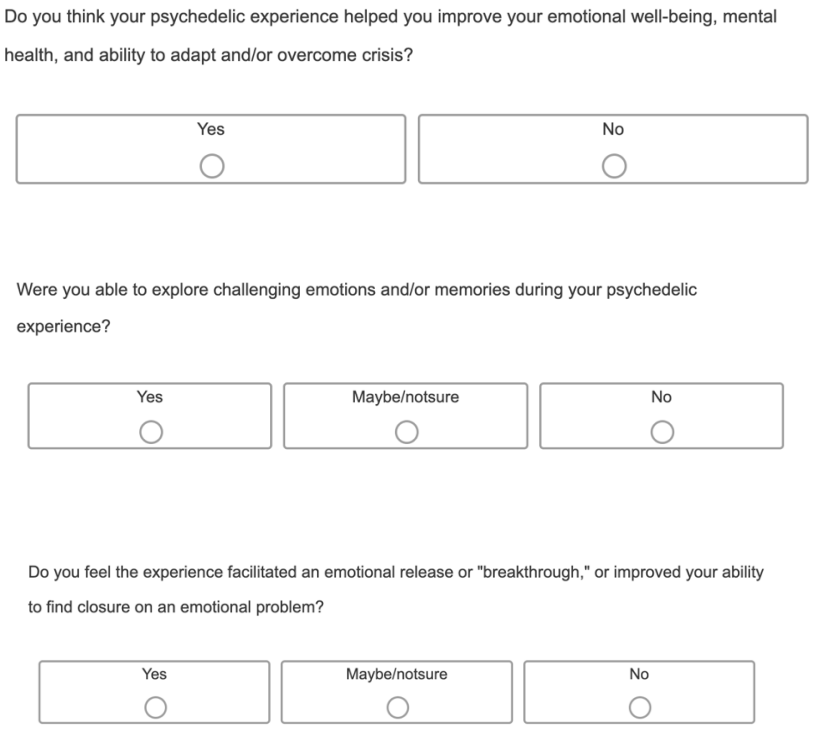
**How often does each statement apply to you generally in daily life? Circle one number on each line**

| | Never | | | | | Always |
|---|---|---|---|---|---|---|
| 19. I can return awareness to my body if I am distracted. | 0 | 1 | 2 | 3 | 4 | 5 |
| 20. I can refocus my attention from thinking to sensing my body. | 0 | 1 | 2 | 3 | 4 | 5 |
| 21. I can maintain awareness of my whole body even when a part of me is in pain or discomfort. | 0 | 1 | 2 | 3 | 4 | 5 |
| 22. I am able to consciously focus on my body as a whole. | 0 | 1 | 2 | 3 | 4 | 5 |
| 23. I notice how my body changes when I am angry. | 0 | 1 | 2 | 3 | 4 | 5 |
| 24. When something is wrong in my life I can feel it in my body. | 0 | 1 | 2 | 3 | 4 | 5 |
| 25. I notice that my body feels different after a peaceful experience. | 0 | 1 | 2 | 3 | 4 | 5 |
| 26. I notice that my breathing becomes free and easy when I feel comfortable. | 0 | 1 | 2 | 3 | 4 | 5 |
| 27. I notice how my body changes when I feel happy / joyful. | 0 | 1 | 2 | 3 | 4 | 5 |
| 28. When I feel overwhelmed I can find a calm place inside. | 0 | 1 | 2 | 3 | 4 | 5 |
| 29. When I bring awareness to my body I feel a sense of calm. | 0 | 1 | 2 | 3 | 4 | 5 |
| 30. I can use my breath to reduce tension. | 0 | 1 | 2 | 3 | 4 | 5 |
| 31. When I am caught up in thoughts, I can calm my mind by focusing on my body/breathing. | 0 | 1 | 2 | 3 | 4 | 5 |
| 32. I listen for information from my body about my emotional state. | 0 | 1 | 2 | 3 | 4 | 5 |
| 33. When I am upset, I take time to explore how my body feels. | 0 | 1 | 2 | 3 | 4 | 5 |
| 34. I listen to my body to inform me about what to do. | 0 | 1 | 2 | 3 | 4 | 5 |
| 35. I am at home in my body. | 0 | 1 | 2 | 3 | 4 | 5 |
| 36. I feel my body is a safe place. | 0 | 1 | 2 | 3 | 4 | 5 |
| 37. I trust my body sensations. | 0 | 1 | 2 | 3 | 4 | 5 |

Appendix 8.

Emotional Breakthrough Inventory (EBI)

Modified versions of the EBI, first developed by Roseman et al. (2019) are used to determine the level and scope of emotional changes that take place following a psychedelic experience in the absence of measures that confirm validity and reliability. In this study, the EBI was modified like in the study by Dr. Max Wolff and team of researchers from Technische Universität Dresden and the MIND Foundation, and three EBI items were rated using 'yes', 'no', and 'maybe/not sure' responses. They were integrated with questions on the psychedelic experience and scored as part of the PEQ.



Appendix 9.

Connor-Davidson Resilience Scale 10 (CD-RISC 10)

The 10-item version of the CD-RISC (Campbell-Sills & Stein, 2007) measures subjective psychological coping and resilience with items using a 5-point, self-rating Likert scale from ‘not true’ (0) to ‘true nearly all the time’ (4). Internally consistent and reliable, it factors measure personal confidence, ability to regulate emotions like anger and fear, perception/response to success and failure, goal achievement, and adaptability to change in respondents.

Please indicate how much you agree with the following statements as they apply to you over the last month. If a particular situation has not occurred recently, answer according to how you think you would have felt.

| **Items** |
| --- |
| 13. I am able to adapt when changes occur. |
| 14. I can deal with whatever comes my way. |
| 15. I try to see the humorous side of things when I am faced with problems. |
| 16. Having to cope with stress can make me stronger. |
| 17. I tend to bounce back after illness, injury, or other hardships. |
| 18. I believe I can achieve my goals, even if there are obstacles. |
| 19. Under pressure, I stay focused and think clearly. |
| 20. I am not easily discouraged by failure. |
| 21. I think of myself as a strong person when dealing with life’s challenges and difficulties. |
| 22. I am able to handle unpleasant or painful feelings like sadness, fear, and anger. |

Appendix 10.

Survey Introduction/Summary and Consent form

Summary and consent content were adapted from multiple sources, including Harvard University protocols and content on psychedelic experiences inspired by research projects carried out by Dr. Lisa Luan at the Imperial College of London and Dr. Max Wolff at Technische Universität Dresden.



Crisis Episodes, Stress, Recovery, Psychedelic Experiences, and Midlife

**Crisis Episodes and Stress in Midlife, and the Therapeutic Potential of Psychedelic Experiences**



**CONSENT FORM**

**Thank you for your interest in participating!**

The following is a summary, including a consent protocol, to help you decide whether to take part in this study.

**Why am I being invited to take part in this research study?**

Because you are 35 to 60 years of age and:

- May have had “midlife” crisis or episode of crisis/stress.
- May have had a psychedelic experience (formal/informal/recreational) in the last three (3) years to try and improve your mental health and well-being.

**What should I know about the research study?**

- Whether or not you take part is up to you.
- Your participation is completely voluntary.
- You can agree to participate and later change your mind.
- You can decide to withdraw at any time without consequence.

**Why is this study being done?**

As of April 2022, close to *one billion people around the world* suffer from a full-blown, clinical condition while tens of millions more may have not been diagnosed with a condition, burdened by inconvenient and debilitating symptoms that have gotten worse (i.e., high-risk drinking or anxiety) linked to lockdowns and restrictive pandemic measures. Overlapping factors in midlife (~35 to 60) may affect our ability to apply approaches that improve the way we feel and process emotions and "bounce back" in the face of constant stress or episodes of crisis. When someone is unable to manage symptoms that include changes to mood, behavior, ability to regulate feelings and emotion, and perceptions, *and* stressors last for more than six months, it can blunt our ability to cope or affect our mental and physical health.

Chronic stress is thought to be behind the current rise in death suicidality, depression, addiction, anxiety, obesity, lack of connection, and isolation. In North America and Europe—these negative outcomes add pressure to already exhausted socioeconomic and healthcare systems. But evidence from research into psychedelic substances (e.g., psilocybin, MDMA, ketamine, LSD, ayahuasca, etc.) suggest psychedelic experiences (PE) can cause chemical and biological changes in the brain that offer relief from depression, post-traumatic stress disorder (PTSD), anxiety, change how we perceive the things that happen to us, and positively impact our emotions, moods, and behaviors. In many cases, one experience has positive knock-on effects for 6-12 months or longer.

If research findings continue to support the potential of psychedelic experiences in promoting psychological and neurological changes in those with PTSD, major depression, terminal illnesses, and hard-to-treat mental disorders there *may be* applicability for these substances to help people in midlife who struggle to manage high levels of stress for prolonged periods. Especially individuals from marginalized groups and people who lack access to quality care.

**What is the purpose of this research?**

To map the causes of crisis episodes in middle adulthood and investigate the role of the psychedelic experience in improving subjective sensory awareness, "upregulating" emotions, and increasing resilience. Specifics look at:

- Crisis states in middle adulthood and contributing factors.
- Factors that influence the existence or intensity of crisis/stress in midlife.
- Relationships between the psychedelic experience, subjective feelings (interoception), emotions, and resilience.

**How long will the research last and what do I need to do?**

We expect the questionnaire will take less than 30 minutes to complete. You will be asked to fill out questions on your:

- Sleep habits.
- Personality characteristics.
- Current emotional, mood, and feeling (interoceptive) states.
- Difficult, stressful, or traumatic events.
- How you feel about your life in general.
- Your ability to “bounce back” or be resilient.
- Psychedelic experience(s) (if applicable).

**Is there any way being in this study could be bad for me?**

We believe the risks of participating in this study are minimal. Most questions are ‘yes/no’ or based on a rating scale, with some optional open-ended questions you can answer in your own words. It is possible some questions may cause you to feel psychological or physical discomfort. Examples include:

- I feel like my life has lost direction.
- I have been thinking that life is meaningless.
- When I am in discomfort or pain I can’t get it out of my mind.
- In the past, physical assault (e.g., being attacked, hit, slapped, kicked, beaten up) happened to (choose one): me, I witnessed it, learned about it, is part of my job, not sure, doesn’t apply.
- Life-threatening illness or injury happened to (choose one): me, I saw it, learned about it, is part of my job, not sure, doesn’t apply.

If you feel distress or need support while completing the questionnaire you can stop without consequence and/or contact the helpline/crisis centers numbers provided below. These will be available throughout the study.

**Will being in this study help me in any way?**

There are no direct benefits from you taking part in this research and we cannot promise benefits to others from your taking part in this research. Indirect benefits include your anonymous contribution of data on crisis episodes/stress in middle adulthood that may inform future study design and health/public policies.

**What happens if I agree to participate, but I change my mind later?**

You can leave the study at any time without consequence.

**If I take part in this research, how will my privacy be protected? And what happens to the information you collect?**

Conventional types of personal information (name, address, government-issued ID numbers, etc.) will not be collected. All efforts have been made to limit the use and disclosure of information and reduce data breaches, reputational risk, or undue psychological distress by:

- Clearly outlining the purpose of the study and use of data.
- Data collection is anonymous and no personal information is requested. Participants will be deidentified with numerical IDs to track results.

Information collected for this study will be kept on an encrypted drive and not distributed to others for future research studies.

**Who can I talk to?**

If you have questions, concerns, or complaints, or think the research has hurt you, you can contact the research team by email. This research has been reviewed and approved by the Harvard University Area Institutional Review Board ("IRB"). You may talk to them at +1 (617) 496-2847 or cuhs@harvard.edu if:

- Your questions, concerns, or complaints are not being answered by the research team or you cannot reach the research team.
- You want to talk to someone besides the research team.
- You have questions about your rights as a research subject.
- You want to get information or provide inputs about this research.

**Resources**

Although the chance is small, some questions in this survey may cause distress. If you find this is the case you can reach out to any of the following:

| | |
|---|---|
| **United States and Canada** | For potentially life-threatening situations, dial 911 (24/7) for immediate assistance. U.S. National Suicide Prevention Lifeline: 24/7, 7 days a week, dial 988 (as of July 16, 2022), 1-800-273-TALK (8255), or TTY: 1-800-799-4889. Crisis Services Canada: toll free (24/7) dial 1 (833) 456-4566 or text support (4pm-12am ET daily): 45645 Canadian Crisis Hotline: dial 1 (888) 353-2273. |
| **United Kingdom** | Samaritans: 24/7, tel: 116 123 (free from any phone). SANEline: tel 0300 304 7000 (4.30pm–10.30pm every day). |
| **Mainland Europe** | For potentially life-threatening situations, dial 112 (24/7) for immediate assistance. |
| **France** | S.O.S. Amitié: 24/7, tel: 09 72 39 40 50 or Suicide écoute: tel: 01 45 39 40 00. |
| **Switzerland** | Samaritans/Helping Hand: call 143 to speak to someone anonymously or visit the 143 website. |
| **Netherlands** | Suicide prevention on 0800 – 0113 or Samaritans on 116 – 123. |
| **Germany** | Telefonseelsorge Deutschland National Hotline: 0800 1110 111 or 0800 1110 222, and website: telefonseelsorge.org. |
| **Spain** | El Teléfono de la Esperanza hotline 902 500 002 or visit the website. |
| **Belgium** | Tele Onthaal (24/7) for Dutch speakers, call 106 or Télé-Accueil Bruxelles (24/7) for French speakers, call 107. |
| **Portugal** | SOS Voz Amiga: call 0800 202 669. |
| **Scandinavia** | Livslinien (Denmark) tel: 70 201 201, SOSphone (Sweden) tel: 031-800 650, Kirken SoS (Norway) tel: 0047 22 40 00 40 or Mental Helse tel: 116 123. |

Next

* It is unlikely, but some questions may cause distress while answering them. If you want to stop you can leave the survey without consequence. You can also reach out to any of the crisis/help resources listed at end of the survey. For immediate assistance dial 988 (North America), 116 123 (UK), and 112 (mainland Europe).



Crisis Episodes, Stress, Recovery, Psychedelic Experiences, and Midlife

The survey will take approximately 30 minutes to complete. Your participation is voluntary and anonymous. It will not be possible to identify you by your responses. If you click the button you agree that:

• You are between 35 and 60 years of age;

• The purpose of the study has been explained to you;

• The potential risks (psychological or discomfort) have been explained to you;

• You agree to participate in the survey.

I agree, take me to the survey. ◯

I do not agree. ◯

Back Next

* It is unlikely, but some questions may cause distress while answering them. If you want to stop you can leave the survey without consequence. You can also reach out to any of the crisis/help resources listed at end of the survey. For immediate assistance dial 988 (North America), 116 123 (UK), and 112 (mainland Europe).

Appendix 11.

Screening Questions

Questions were modified from surveys on psychedelics by the CPA, one on psychedelic experience and stressful life events overseen by researchers at the Technische Universität Dresden and MIND Foundation, and a study on the impact of the COVID-19 pandemic on psychedelic experiences by researchers at the Imperial College of London and MAPS.

SQ1

Have you completed this survey before?
(This survey has been online since July 2022 and you should not participate more than once.)

- ○ Yes
- ○ No

SQ2

How old are you?
(To participate in this study you must be between 35 and 60 years of age.)

- ○ Under 34 or 61 years old and over
- ○ 35 - 40
- ○ 41 - 50
- ○ 51 - 60

SQ3

Do you read, write, and speak English fluently?

- ○ Yes
- ○ No

SQ4

Are you currently incarcerated?

- ○ Yes
- ○ No

SQ5

Are you living with or recently been (in the last year) diagnosed with a psychiatric condition or terminal illness?

- ○ No
- ○ Yes

# Appendix 12.

## Demographic Questions and Closing Statement

What is your country of residence?

What is the highest level of school you completed or highest degree you have received?

- Less than high school degree
- High school graduate (high school diploma or equivalent including GED)
- Some college but no degree
- Associate degree in college (2-year)
- Bachelor's degree in college (4-year)
- Master's degree
- Doctoral degree
- Professional degree (JD, MD)

How many adults (older than 18) reside in your household? Choose from the dropdown list.

How many children/young people (under 18) live in your household? Choose from the dropdown list.

Which ethnic category best describes you?

- Hispanic, Latino or Spanish origin (e.g.: Mexican or Mexican American, Puerto Rican, Cuban, Salvadoran, Dominican, Colombian, etc.)
- Black (e.g.: African American, Jamaican, Haitian, Nigerian, Ethiopian, Somalian, etc.)
- Asian (e.g.: Chinese, Filipino, Asian Indian, Vietnamese, Korean, Japanese, etc.)
- Indigenous or First Nations (e.g.: Navajo nation, Blackfeet tribe, Mayan, Aboriginal, Aztec, etc.).
- Middle Eastern or North African (e.g.: Lebanese, Iranian, Egyptian, Syrian, Moroccan, Algerian, etc.)
- White (e.g.: British, Canadian, American, Australian, European, etc.)
- Native Hawaiian or Pacific Islander (e.g.: Samoan, Chamorro, Tongan, Fijian, etc.)
- Multi-ethnic (two or more of any listed category)
- Another ethnicity, race, or origin
- Prefer not to answer

What gender (if any) do you identify with?

- Male
- Female
- Non-binary or third gender
- Two-spirit
- Transgender
- Gender queer
- Prefer not to say

What is your relationship status? Select a response from the dropdown list.

What is your approximate yearly **household income after taxes**?

(Values are in US dollars. As of July 15, 2022, $1 US dollar = $1.30 CAD, €0.99 EUR, £0.84 GBP, 127.9 JPY, $1.47 AUD, and 7.85 HKD.)

| Under $25,000 | $25,000 to $49,999 | $50,000 to $74,999 | $75,000 to $99,999 | $100,000 to $125,999 | $125,000 to $149,999 | C $15 |
|---|---|---|---|---|---|---|

*Closing statement*

**Thank you for completing this survey!**

The research team would like to hear from other people in midlife, like you, who may have had similar experiences. If you know someone who might be interested in taking this survey because of a stress/crisis episode or psychedelic experience please share the anonymous link to this study or direct them to the MindMap website.



If you or someone you know is in crisis and needs help please contact one of the below resources and ask for assistance.

Appendix 13.

Research Study Recruitment Poster

**Stress is a common feature in midlife.**

Multiple factors (e.g., financial hardship, job loss, health, existential issues, changes to central relationships, etc.) affect one's ability to effectively manage episodes of "**crisis**" that result.



**You qualify to participate if you are:**

- Between the ages of 35 and 60.
- Speak/read/write English.
- Have a stable Internet connection to access the survey.

**Participation involves**:

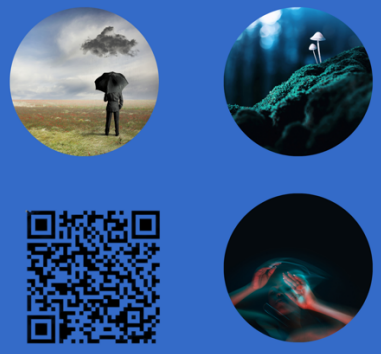
- Filling out a questionnaire that takes ~20-25 minutes to complete.

**FOR MORE INFORMATION OR TO START THE SURVEY**

Scan the QR code, visit mindmapresearch.org, or email lead researcher (JoAnna) at contactmindmapresearch[at]gmail[dot]com.

This study has been approved by the Institutional Review Board at Harvard Extension School, Department of Continuing Education.

**Volunteers needed for survey on stress in midlife, crisis episodes, and/or psychedelic experiences.**



References


Agin-Liebes, G. I., Malone, T., Yalch, M. M., Mennenga, S. E., Ponte, K. L., Guss, J., Bossis, A. P., Grigsby, J., Fischer, S., & Ross, S. (2020). Long-term follow-up of psilocybin-assisted psychotherapy for psychiatric and existential distress in patients with life-threatening cancer. *Journal of Psychopharmacology (Oxford), 34*(2), 155-166. https://doi.org/10.1177/0269881119897615

Aldwin, C. M., & Levenson, M. R. (2004). Posttraumatic growth: A developmental perspective. *Psychological Inquiry, 15*(1), 19-22.

Aldwin, C. M., Yancura, L., & Lee, H. (2021). Stress, coping, and aging. In *Handbook of the Psychology of Aging* (Ninth Edition, 275–286). Elsevier Inc. https://doi.org/https://doi.org/10.1016/B978-0-12-816094-7.00016-7

Andersen, K. A. A., Carhart-Harris, R., Nutt, D. J., & Erritzoe, D. (2021). Therapeutic effects of classic serotonergic psychedelics: A systematic review of modern-era clinical studies. *Acta Psychiatrica Scandinavica, 143*(2), 101-118. https://doi.org/10.1111/acps.13249

Arnett, J. J. (2018). Happily stressed: The complexity of well-being in midlife. *Journal of Adult Development, 25*(4), 270-278. https://doi.org/https://doi.org/10.1007/s10804-018-9291-3

Bender, D., & Hellerstein, D. J. (2022). Assessing the risk-benefit profile of classical psychedelics: a clinical review of second-wave psychedelic research. *Psychopharmacology (Berlin)*. https://doi.org/10.1007/s00213-021-06049-6

Berkovitch, L., Romeo, B., Karila, L., Gaillard, R., & Benyamina, A. (2021). Efficacy of psychedelics in psychiatry, a systematic review of the literature. *Encephale, 47*(4), 376-387. https://doi.org/10.1016/j.encep.2020.12.002 (Efficacité des psychédéliques en psychiatrie, une revue systématique.)

Big Idea Series. (2019). Revealing the mind: The promise of psychedelics. [Video file]. John Templeton Foundation, World Science Festival. https://www.youtube.com/watch?v=Fi66wFfOC-4&feature=youtu.be

Blanchflower, D. G. (2020). Unhappiness and age. *Journal of Economic Behavior & Organization, 176*, 461-488. https://doi.org/10.1016/j.jebo.2020.04.022

Blanchflower, D. G., & Graham, C. L. (2022). The mid-life dip in well-being: A critique. *Social Indicators Research, 161*(1), 287-344. https://doi.org/10.1007/s11205-021-02773-w

Blomstrom, M., Burns, A., Larriviere, D., & Penberthy, J.K. (2020). Addressing fear of death and dying: Traditional and innovative interventions. *Mortality (Abingdon, England), 27*(1), 18-37. https://doi.org/https://doi.org/10.1080/13576275.2020.1810649

Bonaz, B., Lane, R. D., Oshinsky, M. L., Kenny, P. J., Sinha, R., Mayer, E. A., & Critchley, H. D. (2021). Diseases, disorders, and comorbidities of interoception. *Trends in Neurosciences, 44*(1), 39-51. https://doi.org/10.1016/j.tins.2020.09.009

Brouwer, A., & Carhart-Harris, R. L. (2021). Pivotal mental states. *Journal of Psychopharmacology, 35*(4), 319-352. https://doi.org/10.1177/0269881120959637

Brown, K. W., Ryan, R. M., & Creswell, J. D. (2007). Mindfulness: Theoretical foundations and evidence for its salutary effects. *Psychological Inquiry, 18*(4), 211-237. https://doi.org/10.1080/10478400701598298

Brusaferri, L., Alshelh, Z., Martins, D., Kim, M., Weerasekera, A., Housman, H., Morrissey, E. J., Knight, P. C., Castro-Blanco, K. A., Albrecht, D. S., Tseng, C. E., Zurcher, N. R., Ratai, E. M., Akeju, O., Makary, M. M., Catana, C., Mercaldo, N. D., Hadjikhani, N., Veronese, M., . . . Loggia, M. L. (2022). The pandemic brain: Neuroinflammation in non-infected individuals during the COVID-19 pandemic. *Brain, Behaviour, and Immunity, 102*, 89-97. https://doi.org/10.1016/j.bbi.2022.02.018

Butler, G. (2021, April 4). Study Reveals More People are Using Psychedelics to Self-Treat Mental Health. VICE World News. https://www.vice.com/en/article/g5b7x9/study-reveals-more-people-are-using-psychedelics-to-self-treat-mental-health?fbclid=IwAR3ZnmRveh5TtIsC0FtHtM0mA2wiECCaOXf0XHCGPzyCKs5FeZZoYtf6axY

Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Research, 28*(2), 193-213. https://doi.org/10.1016/0165-1781(89)90047-4

Campbell-Sills, L., & Stein, M. B. (2007). Psychometric analysis and refinement of the connor-davidson resilience scale (CD-RISC): Validation of a 10-item measure of resilience. *Journal of Traumatic Stress, 20*(6), 1019-1028. https://doi.org/10.1002/jts.20271

Carhart-Harris, R. L., & Goodwin, G. M. (2017). The therapeutic potential of psychedelic drugs: Past, present, and future. *Neuropsychopharmacology, 42*(11), 2105-2113. https://doi.org/10.1038/npp.2017.84

Carhart-Harris, R. L., Leech, R., Hellyer, P. J., Shanahan, M., Feilding, A., Tagliazucchi, E., Chialvo, D. R., & Nutt, D. (2014). The entropic brain: a theory of conscious

states informed by neuroimaging research with psychedelic drugs. *Frontiers in Human Neuroscience, 8,* 20. https://doi.org/10.3389/fnhum.2014.00020

Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously. A theory of socioemotional selectivity. *American Psychologist, 54*(3), 165-181. https://doi.org/10.1037//0003-066x.54.3.165

Cavanna, F., Vilas, M. G., Palmucci, M., & Tagliazucchi, E. (2018). Dynamic functional connectivity and brain metastability during altered states of consciousness. *Neuroimage, 180*(Part B), 383-395. https://doi.org/10.1016/j.neuroimage.2017.09.065

Chapman, B. P., & Hayslip, B., Jr. (2006). Emotional intelligence in young and middle adulthood: cross-sectional analysis of latent structure and means. *Psychology and Aging, 21*(2), 411-418. https://doi.org/10.1037/0882-7974.21.2.411

Connor, K. M., & Davidson, J. R. T. (2003). Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). *Depression and Anxiety, 4*(2), 76-82. https://doi.org/10.1002/da.10113

Daly, M., & Robinson, E. (2021). High-risk drinking in midlife before versus during the COVID-19 crisis: Longitudinal evidence from the United Kingdom. *American Journal of Preventative Medicine, 60*(2), 294-297. https://doi.org/10.1016/j.amepre.2020.09.004

De Gregorio, D., Inserra, A., Enns, J. P., Markopoulos, A., Pileggi, M., El Rahimy, Y., Lopez-Canul, M., Comai, S., & Gobbi, G. (2022). Repeated lysergic acid diethylamide (LSD) reverses stress-induced anxiety-like behavior, cortical synaptogenesis deficits and serotonergic neurotransmission decline. *Neuropsychopharmacology, 47*(6), 1188-1198. https://doi.org/10.1038/s41386-022-01301-9

Diehl, M., & Hay, E. L. (2010). Risk and resilience factors in coping with daily stress in adulthood: the role of age, self-concept incoherence, and personal control. *Developmental Psychology, 46*(5), 1132-1146. https://doi.org/10.1037/a0019937

Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). Mini-International Personality Item Pool (Mini-IPIP). [Database record]. https://doi.org/10.1037/t30359-000

Dos Santos, R. G., Osorio, F. L., Crippa, J. A., Riba, J., Zuardi, A. W., & Hallak, J. E. (2016). Antidepressive, anxiolytic, and antiaddictive effects of ayahuasca, psilocybin and lysergic acid diethylamide (LSD): a systematic review of clinical trials published in the last 25 years. *Therapeutic Advances in Psychopharmacology, 6*(3), 193-213. https://doi.org/10.1177/2045125316638008

Eggart, M., Todd, J., & Valdés-Stauber, J. (2021). Validation of the Multidimensional Assessment of Interoceptive Awareness (MAIA-2) questionnaire in hospitalized

patients with major depressive disorder. *PLoS One, 16*(6), e0253913-e0253913. https://doi.org/10.1371/journal.pone.0253913

Eldesouky, L., & English, T. (2018). Another year older, another year wiser? Emotion regulation strategy selection and flexibility across adulthood. *Psychology and Aging, 33*(4), 572-585. https://doi.org/10.1037/pag0000251

Freund, A. M., & Ritter, J. O. (2009). Midlife crisis: a debate. *Gerontology (Basel), 55*(5), 582-591. https://doi.org/10.1159/000227322

Galambos, N. L., Krahn, H. J., Johnson, M. D., & Lachman, M. E. (2020). The U-shape of happiness across the life course: Expanding the discussion. *Perspectives on Psychological Science, 15*(4), 898-912. https://doi.org/10.1177/1745691620902428

Ganzel, B. L., Morris, P. A., & Wethington, E. (2010). Allostasis and the human brain: Integrating models of stress from the social and life sciences. *Psychological Review, 117*(1), 134-174. https://doi.org/10.1037/a0017773

Garland, E. L., Farb, N. A., Goldin, P. R., & Fredrickson, B. L. (2015). Mindfulness broadens awareness and builds eudaimonic meaning: A process model of mindful positive emotion regulation. *Psychological Inquiry, 26*(4), 293-314. https://doi.org/https://doi.org/10.1080/1047840X.2015.1064294

Gasser, P., Holstein, D., Michel, Y., Doblin, R., Yazar-Klosinski, B., Passie, T., & Brenneisen, R. (2014). Safety and efficacy of lysergic acid diethylamide-assisted psychotherapy for anxiety associated with life-threatening diseases. *Journal of Nervous and Mental Disease, 202*(7), 513-520. https://doi.org/10.1097/NMD.0000000000000113

Gaydosh, L., Hummer, R. A., Hargrove, T. W., Halpern, C. T., Hussey, J. M., Whitsel, E. A., Dole, N., & Harris, K. M. (2019). The depths of despair among US adults entering midlife. *American Journal of Public Health, 109*(5), 774-780. https://doi.org/10.2105/AJPH.2019.305002

George, D. R., Snyder, B., Van Scoy, L. J., Brignone, E., Sinoway, L., Sauder, C., Murray, A., Gladden, R., Ramedani, S., Ernharth, A., Gupta, N., Saran, S., & Kraschnewski, J. (2021). Perceptions of diseases of despair by members of rural and urban high-prevalence communities: A qualitative study. *JAMA Network Open, 4*(7), e2118134. https://doi.org/10.1001/jamanetworkopen.2021.18134

Gollub, R. L. (2022). Brain changes after COVID revealed by imaging. *Nature (London), 604*(7907), 633. https://doi.org/10.1038/d41586-022-00503-x

Grabbe, L., Higgins, M., Jordan, D., Noxsel, L., Gibson, B., & Murphy, J. (2021). The Community Resiliency Model®: A pilot of an interoception intervention to increase the emotional self-regulation of women in addiction treatment.

*International Journal of Mental Health and Addiction, 13*(3), 793-808. https://doi.org/https://doi.org/10.1007/s11469-019-00189-9

Griffiths, R. R., Johnson, M. W., Carducci, M. A., Umbricht, A., Richards, W. A., Richards, B. D., Cosimano, M. P., & Klinedinst, M. A. (2016). Psilocybin produces substantial and sustained decreases in depression and anxiety in patients with life-threatening cancer: A randomized double-blind trial. *Journal of Psychopharmacology, 30*(12), 1181-1197. https://doi.org/10.1177/0269881116675513

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85*(2), 348-362. https://doi.org/10.1037/0022-3514.85.2.348

Hedgeman, E., Hasson, R. E., Karvonen-Gutierrez, C. A., Herman, W. H., & Harlow, S. D. (2018). Perceived stress across the midlife: longitudinal changes among a diverse sample of women, the Study of Women's health Across the Nation (SWAN). *Women's Midlife Health, 4*(1). https://doi.org/10.1186/s40695-018-0032-3

Hendricks, P. S., Thorne, C. B., Clark, C. B., Coombs, D. W., & Johnson, M. W. (2015). Classic psychedelic use is associated with reduced psychological distress and suicidality in the United States adult population. *Journal of Psychopharmacology, 29*(3), 280-288. https://doi.org/10.1177/0269881114565653

Hu, G., Wilcox, H. C., Wissow, L., & Baker, S. P. (2008). Mid-life suicide: an increasing problem in U.S. whites, 1999-2005. *American Journal of Preventative Medicine, 35*(6), 589-593. https://doi.org/10.1016/j.amepre.2008.07.005

Hutten, N., Mason, N. L., Dolder, P. C., Theunissen, E. L., Holze, F., Liechti, M. E., Varghese, N., Eckert, A., Feilding, A., Ramaekers, J. G., & Kuypers, K. P. C. (2021). Low doses of LSD acutely increase BDNF blood plasma levels in healthy volunteers. *ACS Pharmacology & Translational Science, 4*(2), 461-466. https://doi.org/10.1021/acsptsci.0c00099

Infurna, F. J., Gerstorf, D., & Lachman, M. E. (2020). Midlife in the 2020s: Opportunities and challenges. *American Psychologist, 75*(4), 470-485. https://doi.org/10.1037/amp0000591

Jiang, J. Y., Zhang, X., & Tjosvold, D. (2013). Emotion regulation as a boundary condition of the relationship between team conflict and performance: A multi-level examination. *Journal of Organizational Behavior, 34*(5), 714-734. https://doi.org/https://doi.org/10.1002/job.1834

Kabat-Zinn, J. (2013). Full catastrophe living. (Revised Edition). Ye Ren/Tsai Fong Books.

Kavan, M. G., Guck, T. P., & Barone, E. J. (2006). A practical guide to crisis management. *American Family Physician, 74*(7), 1159-1164. https://www.ncbi.nlm.nih.gov/pubmed/17039753

Keenan, K., Ploubidis, G. B., Silverwood, R. J., & Grundy, E. (2017). Life-course partnership history and midlife health behaviours in a population-based birth cohort. *Journal of Epidemiology and Community Health, 71*(3), 232-238. https://doi.org/10.1136/jech-2015-207051

Kiesow, H., Uddin, L. Q., Bernhardt, B. C., Kable, J., & Bzdok, D. (2021). Dissecting the midlife crisis: Disentangling social, personality and demographic determinants in social brain anatomy. *Communications Biology, 4*(1), 728. https://doi.org/10.1038/s42003-021-02206-x

Krebs, T. S., & Johansen, P. O. (2013). Over 30 million psychedelic users in the United States. *F1000 Research, 2*, 98. https://doi.org/10.12688/f1000research.2-98.v1

Kuc, J., Kettner, H., Rosas, F., Erritzoe, D., Haijen, E., Kaelen, M., Nutt, D., & Carhart-Harris, R. L. (2021). Psychedelic experience dose-dependently modulated by cannabis: results of a prospective online survey. *Psychopharmacology, 239*(5), 1425-1440. https://doi.org/10.1007/s00213-021-05999-1

Kwon, M., & Oh, J. (2021). Mediating effects of family stress on the relationship between self-efficacy and midlife crisis in middle-aged men. *Sustainability, (Basel, Switzerland), 13*(7), 3761. https://doi.org/https://doi.org/10.3390/su13073761

Lachman, M. E., Teshale, S., & Agrigoroaei, S. (2015). Midlife as a pivotal period in the life course: Balancing growth and decline at the crossroads of youth and old age. *International Journal of Behavioral Development, 39*(1), 20-31. https://doi.org/10.1177/0165025414533223

Lutz, J., Bruhl, A. B., Doerig, N., Scheerer, H., Achermann, R., Weibel, A., Jancke, L., & Herwig, U. (2016). Altered processing of self-related emotional stimuli in mindfulness meditators. *Neuroimage, 124*(Part A), 958-967. https://doi.org/10.1016/j.neuroimage.2015.09.057

Martins, B., Sheppes, G., Gross, J. J., & Mather, M. (2018). Age differences in emotion regulation choice: Older adults use distraction less than younger adults in high-intensity positive contexts. *Journals of Gerontology. Series B, Psychological Sciences and Social Sciences, 73*(4), 603-611. https://doi.org/10.1093/geronb/gbw028

Mehling, W. (2016). Differentiating attention styles and regulatory aspects of self-reported interoceptive sensibility. *Philosophical Transactions of the Royal Society B: Biological Sciences, 371*(1708). https://doi.org/10.1098/rstb.2016.0013

Mehling, W. E., Acree, M., Stewart, A., Silas, J., & Jones, A. (2018). The Multidimensional Assessment of Interoceptive Awareness, Version 2 (MAIA-2). *PLoS One, 13*(12), e0208034. https://doi.org/10.1371/journal.pone.0208034

Moen, P., & Wethington, E. (1999). Chapter 1: Midlife development in a life course context, in Life in the Middle (pp. 3-23). Academic Press.

Moreton, S. G., Szalla, L., Menzies, R. E., & Arena, A. F. (2020). Embedding existential psychology within psychedelic science: reduced death anxiety as a mediator of the therapeutic effects of psychedelics. *Psychopharmacology (Berlin), 237*(1), 21-32. https://doi.org/10.1007/s00213-019-05391-0

Moustafa, A. A., Miezah, D., Crouse, J. J., Tindle, R., Richard, Y., & & Mattock, K. (2020). Chapter 12: A review on depression following major life transitions. In A. A. Moustafa (Ed.), The nature of depression: An updated review (pp. 195-220). Elsevier Science & Technology.

Murphy, J., Brewer, R., Catmur, C., & Bird, G. (2017). Interoception and psychopathology: A developmental neuroscience perspective. *Developmental Cognitive Neuroscience, 23*, 45-56. https://doi.org/10.1016/j.dcn.2016.12.006

Noel, O. R., Segal, D. L., & Granier, K. L. (2021). Personality, interpersonal problems, and anxiety among older adults. *Psychological Reports*, 332941211061697. https://doi.org/10.1177/00332941211061697

Nuwer, R. (2020, July 10). Americans Increase LSD Use—and a Bleak Outlook for the World May Be to Blame. Scientific American. https://www.scientificamerican.com/article/americans-increase-lsd-use-and-a-bleak-outlook-for-the-world-may-be-to-blame1/

Ong, A. D., Bergeman, C. S., & Boker, S. M. (2009). Resilience comes of age: defining features in later adulthood. *Journal of Personality, 77*(6), 1777-1804. https://doi.org/10.1111/j.1467-6494.2009.00600.x

Patel, V., Saxena, S., Lund, C., Thornicroft, G., Baingana, F., Bolton, P., Chisholm, D., Collins, P. Y., Cooper, J. L., Eaton, J., Herrman, H., Herzallah, M. M., Huang, Y., Jordans, M. J. D., Kleinman, A., Medina-Mora, M. E., Morgan, E., Niaz, U., Omigbodun, O., . . . UnUtzer, J. (2018). The Lancet Commission on global mental health and sustainable development. *Lancet, 392*(10157), 1553-1598. https://doi.org/10.1016/S0140-6736(18)31612-X

Perrig-Chiello, P., & Perren, S. (2005). Biographical transitions from a midlife perspective. *Journal of Adult Development, 12*(4), 169-181. https://doi.org/https://doi.org/10.1007/s10804-005-7085-x

Petrov, N., Robinson, O., & Arnett, J. J. (2021). The Developmental Crisis Questionnaire (DCQ-12): Psychometric Development and Validation. [Measurement

instrument]. Available at SSRN Electronic Journal: https://doi.org/10.2139/ssrn.3886295 or http://dx.doi.org/10.2139/ssrn.3886295

Price, C. J., & Hooven, C. (2018). Interoceptive awareness skills for emotion regulation: Theory and approach of Mindful Awareness in Body-Oriented Therapy (MABT). *Frontiers in Psychology, 9*, 798. https://doi.org/10.3389/fpsyg.2018.00798

Ramaekers, J. G., Hutten, N., Mason, N. L., Dolder, P., Theunissen, E. L., Holze, F., Liechti, M. E., Feilding, A., & Kuypers, K. P. (2021). A low dose of lysergic acid diethylamide decreases pain perception in healthy volunteers. *Journal of Psychopharmacology, 35*(4), 398-405. https://doi.org/10.1177/0269881120940937

Robinson, O. C., & Wright, G. R. T. (2013). The prevalence, types and perceived outcomes of crisis episodes in early adulthood and midlife. *International Journal of Behavioral Development, 37*(5), [Measurement instrument], 407-416. https://doi.org/https://doi.org/10.1177/0165025413492464

Roseman, L., Haijen, E., Idialu-Ikato, K., Kaelen, M., Watts, R., & Carhart-Harris, R. (2019). Emotional breakthrough and psychedelics: Validation of the Emotional Breakthrough Inventory. *Journal of Psychopharmacology, 33*(9), 1076-1087. https://doi.org/10.1177/0269881119855974

Scali, J., Gandubert, C., Ritchie, K., Soulier, M., Ancelin, M.-L., & Chaudieu, I. (2012). Measuring resilience in adult women using the 10-items Connor-Davidson Resilience Scale (CD-RISC). Role of Trauma Exposure and Anxiety Disorders. *PLoS One, 7*(6), e39879. https://doi.org/10.1371/journal.pone.0039879

Schmid, Y., Gasser, P., Oehen, P., & Liechti, M. E. (2021). Acute subjective effects in LSD- and MDMA-assisted psychotherapy. *Journal of Psychopharmacology, 35*(4), 362-374. https://doi.org/10.1177/0269881120959604

Schmidt, S. (2020). Midlife crisis: The feminist origins of a chauvinist cliché. UPSO eCollections, University of Chicago Press.

Schuette, S. A., Zucker, N. L., & Smoski, M. J. (2021). Do interoceptive accuracy and interoceptive sensibility predict emotion regulation? *Psychological Research, 85*(5), 1894-1908. https://doi.org/10.1007/s00426-020-01369-2

Schultes, R. E., Hoffman, A., & Rätsch, C. (2001). Plants of the gods: Their sacred, healing, and hallucinogenic powers. (Revised and expanded edition). Healing Arts Press.

Stephan, Y. (2009). Openness to experience and active older adults' life satisfaction: A trait and facet-level analysis. *Personality and Individual Differences, 47*(6), 637-641. https://doi.org/https://doi.org/10.1016/j.paid.2009.05.025

Strenger, C. (2009). Sosein: Active self-acceptance in midlife. *The Journal of Humanistic Psychology, 49*(1), 46-65. https://doi.org/https://doi.org/10.1177/0022167808319725

Sullivan, M. B., Erb, M., Schmalzl, L., Moonaz, S., Noggle Taylor, J., & Porges, S. W. (2018). Yoga therapy and polyvagal theory: The convergence of traditional wisdom and contemporary neuroscience for self-regulation and resilience. *Frontiers in Human Neuroscience, 12*, 67. https://doi.org/10.3389/fnhum.2018.00067

Thiessen, M. S., Walsh, Z., Bird, B. M., & Lafrance, A. (2018). Psychedelic use and intimate partner violence: The role of emotion regulation. *Journal of Psychopharmacology, 32*(7), 749-755. https://doi.org/10.1177/0269881118771782

Thompson, E. R. (2007). Development and validation of an internationally reliable short-form of the Positive and Negative Affect Schedule (PANAS). *Journal of Cross-Cultural Psychology, 38*(2), 227-242. https://doi.org/10.1177/0022022106297301

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070. https://doi.org/10.1037//0022-3514.54.6.1063

Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., & Keane, T. M. (2013). The Life Events Checklist for DSM-5 (LEC-5) – Standard [Measurement instrument]. Available from https://www.ptsd.va.gov /

Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., & Schnurr, P. P. (2013). The PTSD Checklist for DSM-5 (PCL-5) [Measurement instrument]. Scale available from the National Center for PTSD at www.ptsd.va.gov

Wethington, E. (2000). Expecting stress: Americans and the "midlife crisis." *Motivation and Emotion, 24*(2), 85-103. https://doi.org/https://doi.org/10.1023/A:1005611230993

Wickrama, K. A. S., Klopack, E. T., & O'Neal, C. W. (2021). How midlife chronic stress combines with stressful life events to influence later life mental and physical health for husbands and wives in enduring marriages. *Journal of Aging Health, 33*(1-2), 14-26. https://doi.org/10.1177/0898264320952905

Więckiewicz, G., Stokłosa, I., Piegza, M., Gorczyca, P., & Pudlo, R. (2021). Lysergic acid diethylamide, psilocybin and dimethyltryptamine in depression treatment: A systematic review. *Pharmaceuticals (Basel, Switzerland), 14*(8), 793. https://doi.org/10.3390/ph14080793

World Health Organization. (2020, August 27). World Mental Health Day: An opportunity to kick-start a massive scale-up in investment in mental health [Press

release]. https://www.who.int/news/item/27-08-2020-world-mental-health-day-an-opportunity-to-kick-start-a-massive-scale-up-in-investment-in-mental-health#:~:text=Mental%20health%20is%20one%20of,every%2040%20seconds%20by%20suicide

Zamariola, G., Frost, N., Van Oost, A., Corneille, O., & Luminet, O. (2019). Relationship between interoception and emotion regulation: New evidence from mixed methods. *Journal of Affective Disorders, 246*, 480-485. https://doi.org/10.1016/j.jad.2018.12.101

Zanello, A., Berthoud, L., & Bacchetta, J. P. (2017). Emotional crisis in a naturalistic context: characterizing outpatient profiles and treatment effectiveness. *BMC Psychiatry, 17*(1), 130. https://doi.org/10.1186/s12888-017-1293-3

Zsoldos, E., & Ebmeier, K. (2016). Chapter 38: Aging and psychological stress. In G. Fink (Ed.), Stress: Concepts, cognition, emotion, and behavior (pp. 311-323). Elsevier Inc. https://doi.org/https://doi.org/10.1016/B978-0-12-800951-2.00039-X