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Tripping over Trauma: A proposal of psilocybin-assisted therapy for comorbid post-traumatic stress disorder and depression

Liam Paul Gomez

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by

Liam Gomez

Annandale-on-Hudson, New York

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Dedicated to my gallbladder and the bile it never ejected; may it burn in hell.

Also, to me - now gallbladder-less and graduated.

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Thank you to my parents for being curious about my passions.

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Abstract

Post-traumatic Stress Disorder (PTSD) is a widespread, often debilitating affliction that is only partially attenuated by current first-line treatment despite its heightened prominence in the sociopolitical arena. Since individuals with PTSD also experience high rates of depression comorbidity and resultant suicidality, it is essential that treatment is more holistically effective. A possible novel intervention, psilocybin-assisted therapy, has shown promising results for the improvement of depression, addiction, and other disorders; prospectively, when administered with non-directive therapy, it could prove to be an efficacious intervention for PTSD with comorbid depression. In the proposed study, there will be two participant groupings: the control group - low-dose psilocybin - and the treatment group - high-dose psilocybin. Over the span of about two months with an additional six-month follow-up, participants will undergo two increasingly scaled dosing sessions in low or high dosage groups and, throughout, will be measured for PTSD and depression symptom severity. Participants will be measured using the Clinician Administered PTSD Scale for the DSM-5 (CAPS-5) and Beck-Depression Inventory II (BDI-II) as primary measures for PTSD and depression. Outcome measures will be taken at baseline, before and after both dosing sessions, at the end of the two-month study period, and at six-month follow-up. A *t*-test will be conducted to measure any significant differences in symptom scores between the two participant groupings.

*"**Just as when we come into the world, when we die we are afraid of the unknown. But the fear is something from within us that has nothing to do with reality. Dying is like being born: just a change.**"*
- Isabel Allende, The House of the Spirits

*"**To savor what is at this very moment, without trying to change it or even describe it.**"*
- Michael Pollan, How to Change Your Mind

Author's Statement

Our present day does not defy the cycles of history; although we may refer to contemporary strife as unprecedented, we repeat the same mistakes and withstand the same heartsickening consequences that many people already have lifetimes before. We study history to avoid this repetition, yet still the COVID-19 pandemic mimics the Spanish flu a century ago and the Russian invasion of Ukraine can be so easily likened to the aggression that precipitated our two world wars. Despite all of my history education and the lessons I have internalized on how best to avoid the mistakes of my predecessors, I feel as if it has only just rendered me a more observant bystander to our collective failure. Powers too large and too integrated sway the tides of suffering and success for the masses; for the general population, staying afloat is the most typical agency we get to enact.

For those others who have practiced their agency on behalf of the masses - politicians, world leaders, the grossly rich - they have acted regardless of all else, all others; selfishness is the prevailing wind in this maelstrom. Self-interest is a primary motivator for most people - in itself, it is intrinsic and necessary - but when those with power lean on it steadfastly and become increasingly more detached from the consequences of their actions, apathy is the result. 'Care' has been mechanically extracted from our lives, as we were all siphoned down a disassembly line [insert *snaps* here]. I see it as my goal to drum up empathy from within myself and eventually from others; to compensate for the lack of trickle down, I want to push a tide from the bottom-up. When caught in a whirlpool, you should remain calm, wait for the right moment to escape the current, and use what you can to stay afloat. We must withstand the current that pushes against us with calm, care, and poise, push with overwhelming strength but measured

intent when an opportunity arises to push through the tide, and pray that the force is enough to shift the current and prevent a drenched demise. Then, hopefully, everyone can be provided a life jacket when they need it most.

That's where this research comes in. Many have already been deeply scarred by life's relentless deluge. An imbalance between the supply and demand of care has left many individuals to struggle on their own. People with post-traumatic stress disorder (PTSD) - veterans, sexual assault victims, refugees, parents, brothers, sisters, children - are in dire need of empathy and a system that will catch their fall after the system pushed them in the first place. *Leading with love* sounds cheesy and is precisely what one would expect out of a paper on psychedelics, but its potency still abides. This paper explores the grounded methods by which such a laconic sentiment can become pragmatic and structured, but that does not negate the sentimentality of its roots and the emotionally meaningful impacts it can have; we could all do with a little more sentimentality these days. Ultimately, psilocybin could be one of the many wrenches necessary to, not only halt apathetic works, but build a system grounded in the natural, the spiritual, and the charitable.

Introduction

Overview of Research Purpose

Post-traumatic Stress Disorder (PTSD) is both a lived atrocity and a constant nuisance, it is an assault on one's calm, it is a despot of the mind and body, and it is ruinous to normal functioning. The United States Department of Veterans Affairs (USVA) reports a prevalence of PTSD in about 7% of Americans (Friedman, 2019). In most people, the disorder presents following exposure or proximal exposure to a trauma in an instance or a series. The symptoms themselves vary from recurrence of distressful memories to constant hypervigilance; from distorted memory about the trauma to dissociation (American Psychiatric Association, 2013). The symptomatology of PTSD is complex and dynamic, but one consistency throughout time and across definitions is the suffering it brings. Suicidality plagues the PTSD population: suicide attempts are 5.3 times likelier to occur in individuals with PTSD when compared with a normal population and controlled for depression and demographic (Gradus, 2018). Even for those who do not reach the diagnosis for PTSD - subthreshold individuals - the number of PTSD symptoms is positively associated with rate of suicidal ideation (Marshall et al., 2001).

Research suggests that many of the connections of an average adult human's 86 billion neurons can be disrupted by traumatic stress (Abdallah et al., 2017). PTSD is implicated in the loss of both synaptic connectivity and plasticity, meaning the brain is left in a dysfunctional stupor. Add in specifically hindered subcortical brain regions, and extreme emotional dysregulation and constant hypervigilance is the result (Friedman et al., 2021); everything can suddenly start feeling like a threat. Needless to say, PTSD can cause major damage to one's normal brain functioning.

This disorder is beyond a cause for concern; it is a plague: one widespread through pain but obfuscated by politics and cultural mores. There are limited pharmaceutical applications for PTSD; chiefly Selective Serotonin-Reuptake Inhibitors are used, and they tepidly address the range of symptomatology (Cipriani et al., 2018). Psychotherapy has relatively positive impacts on symptoms initially, but poorly addresses comorbidity, and individuals who experience the whole gamut of PTSD symptoms rarely experience broad symptom reduction (Bradley et al., 2005); many patients who undergo some form of PTSD-focused psychotherapy still experience lingering disturbances and dysfunction (Bryant et al., 2016).

Although, to date, there are no randomized controlled trials (RCTs) testing psilocybin-assisted therapy for PTSD, there is still some evidence to support its potential efficacy as an alternative treatment. The administration of psilocybin has shown rapid and sustained antidepressant effects for treatment-resistant depression and unipolar major depressive disorder (see Figure 1; Carhart-Harris et al., 2016, 2017, 2018; Davis et al., 2021; Griffiths et al., 2006; Gukasyan et al., 2022). Additionally, psilocybin has been efficacious at reducing the depression and anxiety around death among terminally-ill patients and has shown potential for addiction cessation in tobacco- and alcohol-dependent individuals (Bogenschutz et al., 2015; Daniel & Haberman, 2017; Griffiths et al., 2016; Johnson et al., 2014; Ross et al., 2016). Reductions in core obsessive-compulsive disorder (OCD) symptoms were also associated with

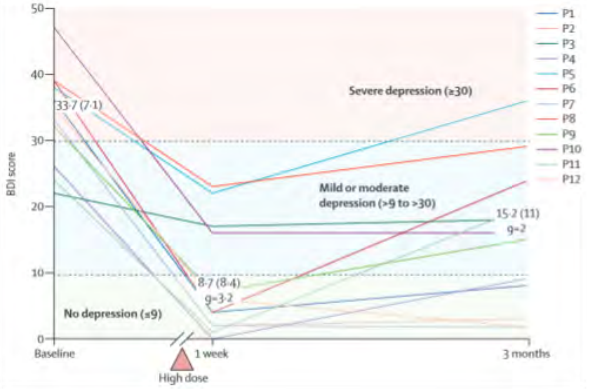

Figure 1. Depression severity (BDI) over time plotted for each of the 12 patients. Mean values (SD) are shown as well as the relevant effect sizes (Hedges' g) versus baseline. BDI=Beck Depression Inventory. (Carhart-Harris et al., 2016)

psilocybin administration in a small-scale study (Moreno et al., 2006). In total, the research on psilocybin-assisted therapy is incredibly promising for treating a wide-range of the disordered experience, but, moreover, psilocybin administration - provided proper screening and attention paid to set and setting - is safe and feasible for both disordered and healthy individuals (Carhart-Harris & Goodwin, 2017; Johnson et al., 2018; Lowe et al., 2021; Rucker et al., 2022). Considerable precautions need to be taken with a vulnerable and distressed population such as those afflicted with PTSD, yet the care taken by authors of the aforementioned psilocybin research provides a strong foundation upon which difficult research can be conducted. Psilocybin is showing a capacity to help a great many people, and it could be a beneficial tool for those with PTSD who have, for the most part, been thus failed by their treatment.

From Hysterics to Trauma to Treatment: A History of Post-Traumatic Stress Disorder in the United States

In the field of Psychology, Post-Traumatic Stress Disorder (PTSD) is a relatively young diagnosis. Only in 1980, with the release of the Third Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; APA), was PTSD substantiated in a Psychological framing. This unique diagnosis signaled the capacity for trauma to cause disorder; with the knowledge that external forces had more of a factor to play in the realm of pathology, the constituents of Psychology sprung into action, initiating new research about trauma and the role individual differences play in assessing and internalizing it. An important dichotomy established in the DSM-III between traumatic stressors and normal stressors is hinged on the concept that certain stressors are too overwhelming for one's normal faculties of coping to handle. This

follows the dose-response model of PTSD wherein the greater the stress is in extremity and/or duration, the more severe the symptoms of PTSD will manifest (McNally, 2003).

With the DSM-III-Revised (1987) and the DSM-IV (1994), PTSD started incorporating a broader range of symptomatology, although still precedent on a history of trauma. The diagnostic criteria of the DSM-IV introduced three symptom clusters: intrusive recollections, avoidant/numbing symptoms, and hyper-arousal symptoms. As well, this version curated the duration of the disorder and asserted that significant distress or functional impairment must occur in the diagnosis. Research following this fourth version began to shift the lens away from the objective aspects of the trauma and towards the subjective factors that influence how one experiences it. The dose-response model of PTSD struggled to accommodate this new research. The subjective interpretation and reinterpretation of a trauma figured significantly in symptom presentation initially and upon recollection; how severe a traumatic memory is remembered was found to be more heavily dependent on an individual's present clinical state rather than the trauma itself (McNally, 2003). Other research began asserting that people are differentially more predisposed to experiencing an event as traumatic or developing the full-fledged PTSD disorder based upon different neurobiological, cultural, and cognitive characteristics (Friedman, 2019). Although these subjective facets are incredibly important to better understanding the roots of PTSD, they tie in more with the prevention side of PTSD rather than the treatment side, and therefore present less in the diagnostic criteria of the DSM series.

The DSM-5 (2013) further expanded on the potential symptom presentation, shifting away from an exclusively fear-based anxiety disorder and recategorizing it into a new bracket: trauma- or stressor-related disorder. In that, negative cognition and mood as well as disruptive

behavior became valid presentations of PTSD. The traumatic event no longer had to be directly experienced by the individual, but could be more vicariously experienced. Recollection of the traumatic event must be persistently distressing, agoraphobic-like avoidance can crop up, and hyperarousal, nearing on paranoia, is typically present as well. The DSM-5 is still the current standard for diagnosis of PTSD, yet the Psychology community is still finding new hairs to split from their PTSD problem child. Antecedent to the 11th revision of the World Health Organization's (WHO) International Classification of Diseases (ICD-11), a newer conceptual dichotomy has arisen in the trauma- and stressor-related diagnostics. The authors seek to separate the more elaborate symptom presentation that was recognized in the DSM-5 from PTSD alone. By establishing a distinct disorder - Complex PTSD (CPTSD) - that would include the primary aspects of PTSD (reexperiencing, avoidance, and sense of threat) but also supplement the newly assimilated symptoms (affect dysregulation, negative self-concept, and difficulties in relationships), the obtuseness of the PTSD diagnosis might be curtailed and the individuals who are either overlooked by or fit poorly within the current diagnosis might be better treated (Brewin et al., 2017). This proposal contradicts the DSM-5 but also creates a more acute concept within trauma- and stressor-related disorders. Clearly, PTSD is still being honed. It has a ways to go, but the present debate is not unfounded. It is just indicative of PTSD’s long and complicated history; one that has habitually incapacitated and revived the construct to the point that its routine existence is, fittingly, somewhere between life and death.

Undoubtedly, the Psychology community has done extensive, meticulous work to understand trauma-based disorders and how they fluctuate across individuals and communities. For decades, good researchers and therapists have dedicated themselves to remedying the

debilitation that is PTSD. However, that work could not be done in a vacuum; society and culture have always had some role to play in the theater of trauma. Following A Short History of PTSD by Allan V. Horwitz (2018) - a sociologist with a particularly polemic take on Psychology's handling of PTSD - the history of Post-Traumatic Stress Disorder (PTSD) can be seen in its dynamism through a pair of sociopolitical and scientific eyes, as it oscillates between falsehood and righteousness, internal and external, predisposition and environment. Horwitz provides a skeptical view of the PTSD diagnostic and recounts a social history in the United States to substantiate his objections to the present definition of the disorder. This recounting provides a rather limiting view of treatment and diagnosis for PTSD, but it is valuable in its comprehensive representation of the history and in providing a realistic view of how complicated PTSD can be in diagnosis and treatment; if novel treatment is to be developed for a disorder, it should meet that disorder where it stands currently, not where it should stand.

The chronicling of this history begins in the 19th century, a time in the U.S. when the wounds of soldiers in the American Civil War and catastrophes of railroad workers were important steps for social, political, and economic progress. More than 600,000 fatalities were recorded in the whole of the civil war - a massive loss when taking into account population inflation. To boot, inexperienced soldiers made up a majority of the Union and Confederate ranks and therefore were the perpetrators of any brutality between North and South; lost limbs - amputated or mauled - deadly infection, and hand-to-hand combat all made for a pretty good pool of traumatic experiences for the given veteran to draw from later on in life. However neither PTSD nor trauma were conceptualized or treated as they are now. Nicknames of the time, such as "combat fatigue," loosely suggested the presence of some psychiatric concern, but generally

claims of non-physical impairment were met with skepticism or charged with malingering. In the case of railroad workers, train traffic became common, and the resultant wrecks did as well. Many workers found themselves caught in a careening piece of steaming, prototyped metal: the epitome of uncontrol in the face of imminent death. Following a crash, left with understandably unhealthy mental states or persistent emotional erraticism, the workers were effectively alone in a fight with their minds.

The contemporaneous attempts at understanding these 'new', stressor-related traumas were empathetic in intent, flawed in conception, but moderately helpful in outcome. It became commonplace to misattribute any leftover psychic misnomers rather to the body than the mind. Civil war veterans began to fall under a diagnosis of "irritable heart," indicated by some of the hypervigilant and emotional reactive symptoms that we now associate with PTSD. As for railroad workers, the misattribution was more dorsal; "railroad spine" became the leading diagnosis for latent psychic trauma following a train-related accident. This physical ailment - separate from hysteria, which carried similar manifestations but was connoted with greater femininity - was defined as a spinal compression that subsequently dysregulated the usual and expected emotional stolidity of man; gender proves to be a complicating factor throughout the history of wartime trauma in that mental trauma is only culturally allotted to the effeminate.

These speculative diagnoses physicalized an apparently more mental disruption, but nonetheless the product was relatively positive for the disrupted. Prior to a physical diagnosis, these struggles were ones to be had quietly, insularly, and with the help of alcohol or opiates. These struggles became liable to the environment rather than the individual and his poor continence. In turn, they became liable to the powers that precipitated the individual's exposure

to that environment. For the soldiers, this was the U.S. government, mandated to repay in the form of a pension. For the workers, this was the railway corporations, mandated to repay in the form of liability compensation.

This is where the history becomes rather financial in nature; the conversation around mental trauma as a result of life-threatening circumstances shifts in a monetary direction. Not only is the narrative of malingering perpetuated by a new financial incentive, but the only solution devised for harmed individuals in the warring countries, as a result of the countries warring, was a financial one. This then created a paradigm for trauma-denial based around compensation rather than the previous implication of laziness or cowardice. The 'traumatic malingerer' is a caricature that will appear time and time again in this history, rationalized rather acrobatically at times. As expected, the persistent, transgressive habits that arose out of soldiers in the American Civil War also began arising in those of World War I; present in soldiers both acutely and chronically, a variety of symptoms - some intersecting with PTSD, some not - were attributed to another body-based ailment called "shell shock". In this, the physical impact of artillery shelling resulted in psychosomatic symptoms; over time, this definition bore its latent trauma, hinging more on the emotional repercussions of the war than the ill-fitting physical paradigm. Even once the effects of war were generally recognized in the public and clinical eyes, there was still debate to be had over their causes. If problems these soldiers experienced could be understood psychogenically - in that, soldiers with predisposed vulnerabilities or weaker machismos were the only sufferers of mental hangovers - rather than extragenically - in that, any soldier could suffer mental hangovers of war given the right, or extremely wrong, circumstances - then the blame could still be deftly placed on the victim.

The stress of war yet again begot monetary recompense; however, this time pensions strained a world that was already withstanding the waves of a Great Depression. Alongside the money came a shadow of moral judgment that began, once again, associating veterans with laziness and dishonesty. Veteran advocacy groups had managed to elicit federal intervention on behalf of the psychically harmed, yet this stoked the cultural flame of stigma and created the possibility of unhealthy monetary dependence for the affected. Just in time, World War II ushered in a clinical assertion of inevitable psychic neuroses given enough wartime exposure. The official US report, *Combat Exhaustion*, following the Second World War laid out clearly that war had the capacity to take its toll on nearly everyone, with the exceptions being psychopathic outliers (Bartemeier et al., 1946). Military psychiatrists had been proliferated throughout the frontlines, charged with providing immediate psychiatric support to the psychically wounded so they could promptly return to the fighting. Veteran advocacy groups managed to win support broader than pure pension provisions and, in the US and most of the Western world, the general population was thriving as a benefit of winning the war. Less attention was paid to war-based neuroses when there was funding available for veteran programs and the war had been a financial and moral victory.

The next, and arguably most pivotal, stage in the history of PTSD is its diagnosis; how the disorder is structured today is informed by its first official recognition in the Third Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III). In this section of the history, a more diverse perspective is warranted provided the polemic perspective Horwitz takes on diagnosis itself. With that, Richard J. McNally's (2003) recounting of the Vietnam War and the consequent formalization of PTSD into the DSM-III, in his systematic review Progress and

Controversy in the Study of Posttraumatic Stress Disorder, will supplement, and occasionally contradict, Horwitz's history. Both authors seem to agree on the note that the Vietnam War precipitated a cultural fervor behind veterans that mismatched to the lived experience of those veterans. The archetype of the disenfranchised, maltreated Vietnam vet strayed from reality, with media attempting to illustrate the senselessness of the war through a fictional, pitiful character; the rate of mental breakdown was far lower in Vietnam fighters than in both Korea and WWII and there was no evidence of broad mistreatment or felt disdain upon the soldiers' return home (Dean, 1997). Regardless, there was a strong push for the standardization of trauma as a result of the immoral war, and the authors of the DSM-III were forced to contend with the societal affront. Given that the DSM-III was intended to include only a-causal disorders, ones that were separate from identity and individual traits, the outcry for trauma-resultant disorder was rather problematic. Moreover, the DSM authors, somewhat ignorantly, were wary to include disorder that appeared to be linked with a single historical event (i.e. Vietnam War) rather than something generalized (McNally, 2003).

Despite these stated goals and apprehensions, in 1980 the authors decided to implement PTSD into the psychologist's diagnostic deck of cards. This diagnosis included four main aspects: the presence of a remarkable stressor from present or past, recurrence of trauma, general numbing, and experiencing two out of a slew of intractable symptoms indicating overhanging manifestations of trauma; in addition, a distinction was drawn between acute PTSD and chronic/delayed PTSD based upon the time before symptoms occur and persist following the initial trauma (APA, 1980). For better or for worse, the diagnosis was validated and bestowed to those who could meet the official criteria; the DSM-III sparked a wealth of research into trauma

as a psychological phenomenon (McNally, 2003). From this initial formalization of trauma-based disorder, beginning a slow opening of psychological purview over trauma. The DSM-IV pivotally instituted a more distant standard for trauma. The confrontation with a trauma could warrant a PTSD diagnosis under the DSM-IV, rather than a direct encounter with anything life-threatening or awful (APA, 1994; McNally, 2003). The psychological community began seeing a wider range of trauma victims; whether this change was a removal of blinders or a decline of prescription is still up for debate. The PTSD diagnosis began to incorporate the experiences of the general population more and more; Horwitz and McNally both note that the line between normative distress and disordered distress became blurred (Horwitz, 2018; McNally, 2003).

At this time, an important signifier of cultural and clinical complication began to spread. McNally and Horwitz both touch on the Recovered Memory Movement and the capacity it had to enrapture patient and practitioner alike. This movement was hinged on the concept that traumatic memories could be repressed to the point that only therapeutic intervention could resurface the trauma; this theory became particularly attendant to childhood sexual abuse. Horwitz implants a disproportionately large portion of writing to this topic - an entire chapter - given its somewhat meager timeline in relation to other events discussed, seemingly since it coalesces with his overarching argument that culture has had too meaningful an impact on the clinical understanding of PTSD. Nonetheless, McNally still points out the importance of addressing the public misconstrual of clear research. With the help of some researchers, namely those who misinterpreted clear findings - such as claiming that children who were struck by lightning had no recollection of the event due psychogenic amnesia and repression rather than

organic amnesia from a lightning bolt - traumatic memories became ripe for implantation and proliferation without the need for an initial trauma (McNally, 2003). In practice, talk of satanic cults and mass childhood sexual abuse became commonplace, yet more often than not, the talk could not be substantiated by empirical evidence or verified by other sources; regardless of whether there was validity in the claims, the poor foundation of the movement undercut any true offense within it. Yet, with events like that still present in the cultural understanding of PTSD, the diagnosis struggles to find solid ground in the public eye.

As the diagnosis exists now in the DSM-5, PTSD is still ever-changing. The differential experience and presentation of PTSD puzzles much of the psychological community still. What seems ultimately necessary for both McNally and Horwitz is the separation of science and politics (Horwitz, 2018; McNally, 2003). An important caveat, not presented by those two authors but rather the author of this paper, is necessary for this plea to exist outside of just written ideology. Science will always and should always be political to some degree; if there is no information being drawn from the political, research in psychology can rarely be explanatory, but instead only exploratory. The plight of McNally and Horwitz derides politics and how it touches science: either directly - through policy - or indirectly - through public opinion. Ensuring that science exists in a semi-permeable membrane floating in a pool of politics is the most grounded and attainable goal. Scientists, particularly psychologists, should have an interest in doing science for people, in line with their concerns and curiosities. Yet above all else, out of the same fears that McNally and Horwitz expressed, scientists must prevent politics from violating empiricism; without the scientific method, science is no different from politics and the synthetic posturing that comes with them. Misrepresentation of science must be condemned and bad

science must be appropriately labeled. One might be tempted to remove the human background from the study of trauma and its effects on people, but we must be able to rely on empiricism within political rhetoric and social morays. Otherwise, empiricism itself is flawed. The work of scientists cannot and will not exist in a vacuum.

The Terms and Conditions of Post-Traumatic Stress Disorder

Despite the contentious history over the PTSD diagnosis, there is a strong foundation of science that has corroborated its existence since the 1980s. Although there is still a lot more to learn about the disorder, there is much that has been uncovered already. The work that is being done today is structured on decades of rigorous, peer-reviewed research: research that has attempted, and widely succeeded, at parsing through some of the complex intricacies of PTSD.

Psychological Models

To better understand PTSD in its great complexity, it must be viewed from a variety of differing perspectives. Those perspectives manifest, with varying degrees of coalescence, in different models of the disorder. These models not only help to describe PTSD as a neurological or psychosomatic phenomenon, but they also inform treatment interventions. PTSD, represented under several different models, is delineated by Matthew J. Friedman (2021) in the Third Edition of the Handbook of PTSD: Science and Practice. All models are founded on certain pre-existing psychological theories, which are, in this circumstance, then used to infer the root of disorder. Two foundational concepts to some of the PTSD models, and many psychological models generally, are classical and operant conditioning. The former, Pavlov's brain-child is best shown with a bell, a dog, and some meat: a bell rung alone elicits no response in the dog. The meat alone triggers the dog's salivation. When the bell is rung when meat is presented to the dog, the

dog associates the bell's ring with the meat, and the dog will eventually salivate with just the ringing of the bell. The latter, operant conditioning, is an interaction between behavior and environment, environment and behavior. In simplest terms, if a certain behavior results in a reward, that behavior increases, whereas the opposite is true for behavior that begets a punishment; the rewards and punishments can oscillate between positive - where something is added, like a cookie or a shock - and negative - where something is removed, like burdensome weight or a delightful shiny thing (Akpan, 2020).

These two concepts are the twin girders of the PTSD behavioral model. Mowrer (1960) developed a two-factor theory, fusing both modes of conditioning, stating that the avoidance of a fear stimulus is reinforced when that avoidance reduces anxiety experienced from the stimulus; this attempted to explain the general trend of avoidance following a fear-inducing experience. Although this model is imperfect, in that reduced fear does not necessarily predict reduced avoidance, it does underwrite much of the therapeutic interventions we presently employ for PTSD treatment. The fear-conditioning model follows a similar logic, but more directly applies conditioning to the reexperiencing-trauma and fear-response dynamic: when an individual is exposed to a trauma - the unconditioned stimulus - it elicits an unconditioned fear response; subsequent reminders of the trauma - the conditioned stimuli - then trigger the conditioned fear response, even if those stimuli are benign in nature, such as a popping balloon reminding an individual of a gunshot (Friedman et al., 2021). This model does well to explain the hormonal aspect of PTSD, in which hormones associated with fear response (epinephrine, norepinephrine, and cortisol) are at abnormal levels (heightened epinephrine and norepinephrine levels; lowered cortisol levels) in individuals with PTSD for a prolonged period following a trauma, suggesting

that the fear response is incessantly retriggered by conditioned stimuli (Kosten et al., 1987). The fear-conditioning model, similar to the behavioral model, illustrates well the nagging impacts a trauma can have well after the incidence of the trauma. Additionally, both models have provided the foundation for current treatment interventions like exposure therapy or Cognitive-Behavioral Therapy with a Trauma Focus (CBT-TF).

Other models of PTSD rely less heavily on conditioning in their explanations. The information-processing model, rather than focusing on the associations connected with a traumatic event, touches on the mental processes, like memory and attention, that could be implicated in the event's initial interpretation and an individual's resultant response. It is suggested that traumatic experiences - those that overwhelm one's preconceived notions of stress and fear - are encoded into memory alongside information about what is or could be a future source of trauma and the responses that should be triggered in preparation for that (Foa et al., 1989). As a result, individuals develop a fear structure wherein threatening stimuli are more readily expected and an attentional bias towards threat is formed. In a color-naming, threat-related Stroop task, participants were presented with either threat-associated words (i.e. "mutilated") or neutral words (i.e. "cherry"), and were told to respond as quickly as possible, ignoring the content of the word, and only stating the color of the word; slower responses to threat-associated words among the PTSD group were suggested to be indicative of greater threat interference at a preattentive stage (Harvey et al., 1996; McNally et al., 1990). The treatment in the information-processing model does not diverge far from those which grew out of conditioning-based models; it supports the use of progressive exposure and re-rationalization of

the traumatic event to reintegrate it into normal memory and thereby reduce hypersensitivity to threat (Friedman et al., 2021).

The dissociative, cognitive, and social models are distinct in a very illustrative way. The dissociative model hinges on the experience during trauma: whether dissociation occurred, and how that could inform if or how PTSD manifested. The cognitive model leaps over the trauma itself and focuses more on the individual's internal, adaptive tendencies following trauma and how self-referential cognition could predict PTSD symptoms. The social model looks beyond the trauma and, uniquely, even the epistemic; instead, it highlights how the external environment following a threat of trauma could dictate the development of PTSD (Friedman et al., 2021).

The dissociative model puts forth that dissociation during a trauma predicts the development of PTSD, as supported by evidence that indicates a direct relationship between peritraumatic dissociation and PTSD, or an indirect relationship through an unknown third variable as supported by a study that measured the degree of peritraumatic dissociation soon following a massive explosion in the Netherlands with a high number of casualties; affected individuals were measured for PTSD severity, intrusions, and avoidance reactions. The study found significant positive associations at 18 months after the disaster between peritraumatic dissociation and intrusions as well as avoidance reactions. This suggests a capacity for dissociation during a trauma to dictate, either directly or indirectly through a mediator, the manner and timeline of PTSD (Velden et al., 2006). In contrast, other research critiques that peritraumatic dissociation data and any conclusions drawn from them are based on retrospective reports, which can be highly unreliable since it is difficult to recall past emotional states; therefore, it is possible that the association between peritraumatic dissociation and PTSD is

better attributable to the measures used than a causal relationship (Candel & Merckelbach, 2004; Marshall & Schell, 2002).

The second model - cognitive - homes in on an important and often understated aspect of PTSD: an unhealthy initial appraisal of the trauma and the negative reassessments of the incident that recur upon memory retrieval or trauma retrigger. The cognitive model understands PTSD in a very present sense. The continuous damage of negative self-appraisal and unstoppable intrusive memories is the problem of PTSD, not necessarily of the trauma. Ehlers and Clark (2000) postulate a cognitive model of PTSD persistence in which, not only the constant negative appraisal of the trauma perpetuates PTSD symptoms, but a memory of the traumatic event being miscategorized and poorly integrated into autobiographical memory - without a sense of context or information surrounding the event results in intrusive memories and subsequent hyperarousal and hypervigilance. These specific symptoms of PTSD likely manifest due to the fact that traumatic memories that are poorly integrated and elaborated in autobiographical memory are much more often retrieved through automatic processes (i.e. response to a triggering stimulus) rather than controlled processes (i.e. intent to recollect a memory). The cognitive model, as described above, leads directly into particular forms of treatment, such as Cognitive Processing Therapy (CPT), in which individuals reassess traumatic memories and work through unhealthy cognitions and behaviors - also referred to as ‘stuck points’ - around them; with the goal in mind of integrating and elaborating traumatic memories in autobiographical memory, unhealthy memory retrieval patterns in PTSD might be curbed (Watkins et al., 2018).

The third in this grouping and final in this whole series of psychological models is the social: less widely used than the others but no less important. When an individual must bargain

with a traumatic experience, the social model posits that attachment theory - the concept that people's willingness to emotionally connect with another person varies between individuals - centers itself in that exchange. In that, the capacity for one to deal with a trauma is strongly influenced by one's attachment security and the access to, or amenability to access, social support. This is best substantiated by a meta-analysis that shows seeking attachment or social support following a trauma can improve PTSD outcomes, and the lack of social support is one of the strongest risk factors for PTSD following a trauma (Brewin et al., 2000). As well, it was found that just pondering a figure of attachment (i.e. "Mom") helped to regulate levels of hormones implicated in negative trauma-based alterations after participants were subjected to physiological arousal (Bryant & Chan, 2015). The broad and valuable takeaway from this model is that attachment styles could inform the development of PTSD and robust social support should always be the standard for non-directive, or even non-clinical, treatment.

An important note that Friedman et al. (2021) make about these models, which this paper endorses as well, is that they each exist independent of one another, but function best when viewed as part of a whole. Stress-related hormones, such as the norepinephrine and glucocorticoid systems, manage the mind and body's most immediate response to a stressor. The potential dysregulation of those hormones can result in chronic stress or hypervigilance. Hormone activation simultaneously creates an association between fear and stress-related stimuli which can be subsequently activated well after the trauma has occurred. All information and memories surrounding the event are prejudicially encoded, resulting in an attentional bias geared towards threat, fracturing the event into sensory-based stimuli. Fragmentation of the memory places it outside of the autobiographical memory system, preventing it from being appropriately

reprocessed and overcome. Appraisal processes influence how the intrusive memories of a traumatic event are reconceptualized, for better or for worse, and, tangentially, social interaction guides the acceptance of a trauma and the track of PTSD symptoms, for better or for worse.

These individual factors - aspects of different models - interact more extensively than their individual definitions suggest, but the generality of this explanation illustrates how PTSD can best be viewed from an array of perspectives at once. PTSD is multifold; it might appear to be complicated by an intertwining of different explanatory models, yet a broad view of the disorder is still necessary until research has grasped its full span and specificity. Since the current treatment out in the clinical world has been shaped by these models, the models themselves can provide an insight on how to generate novel treatment that works off of the successes and failures of the current standard. The different ways in which PTSD is conceptualized provide a mapping of potential treatment avenues; it seems as if constructing PTSD from a variety of perspectives is the most accurate and appropriate approach, so treatment might function similarly. A treatment that holistically addresses PTSD's varied symptoms could be the most accurate and appropriate approach; to that point, psilocybin-assisted therapy shows holistic potential.

Serotonin in PTSD

Moving from the general to the specific, from models to minds, neurology takes over. To start a deep dive into functional neurology, a good starting place is with the key components to brain communication: neurotransmitters. They are messengers and messages of the brain, and they play a part in both normal and abnormal functioning. Of course, this implies that certain neurotransmitters have their own piece of the culpability pie in PTSD. The brain shocked by a traumatic experience undergoes extraordinary anxiety and stress. This demands extra resources

from certain neurotransmitters. This is particularly vital when considering the neurotransmitter, serotonin, since one of its primary roles is as intermediary for behavioral inhibition. Having an active serotonin system, particularly in the 5-HT section, can result in stress resilience and prevention of trauma recurrence (Connor & Davidson, 1998; Frazer & Hensler, 1999). By the same logic, a hindered serotonin system is a risk factor for the development and persistence of PTSD. This warrants the use of selective serotonin reuptake inhibitors (SSRIs) for PTSD, which specifically target the 5-HT system to enhance resilience to stressful stimuli and recurrent traumatic memories (Corchs et al., 2009). For the sake of both prevention and treatment, serotonin is an incredibly important factor.

Neuroplasticity

Just as with its capacity to communicate, the brain's capacity to change should not be undervalued. The human ability to adapt to new environments, challenges, and, notably, stressors is what has propelled us into our own realm outside of the natural world. In contemporary society, one's capacity, not necessarily to change one's mind, but for one's mind to change, distinguishes adaptive from maladaptive behavior. This trend carries over to environments of stress and trauma; if the brain is able to accommodate outlying experiences into proportionate behavioral responses, it is to the benefit of the individual. And yet, if that response persists after the stressful or traumatic stimulus has already gone - the brain molds its form around chronic stress - it can be particularly harmful to the individual, as seen in PTSD.

The phenomenon responsible for this adaptability that human brains share is something called synaptic plasticity or neuroplasticity. These terms refer to the brain's faculty to form new connections between neurons or alter existing ones by forming new or removing old synapses -

the liminal space between neurons through which neurotransmitters are passed (Abdallah et al., 2017). Taking this into the context of PTSD, trauma is a particularly trying test of synaptic plasticity. The ability to integrate a stressful experience into existing memory and self-referential cognitive mechanisms can help to ward off PTSD, but it might necessitate a capacity for adaptation (Foa et al., 1989).

As already referenced in the information-processing and cognitive models, individuals with PTSD experience a failure in fear processing and memory consolidation. Vital to understanding PTSD in relation to synaptic plasticity, PTSD could be explainable by an impairment to synaptic plasticity that inhibits an updating of those processes essential for negotiating trauma, like fear extinction (see Figure 2, Mahan & Ressler, 2012). That impairment shows itself in vital brain regions like the hippocampus, amygdala, and prefrontal cortex, which are most significantly implicated in memory processing, emotional processing, and emotional regulation. Failures in something like fear extinction might be partly explained by a gene mutation. In a study of 72 participants, half with a specific gene mutation (Val66Met) in the brain-derived neurotrophic factor (BDNF), which is thought to be the main propulsion for brain cell growth and function, participants were presented with an aversive stimulus that was paired with a neutral cue. After pairing, the then-conditioned cue was presented without the aversive stimulus. Participants with the gene mutation were slower to lose the conditioned fear response, indicated by skin conductance, than the

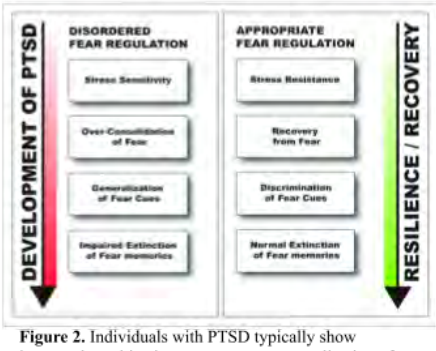

Figure 2. Individuals with PTSD typically show increased sensitization to stress, overgeneralization of fear to irrelevant stimuli, and impaired extinction of fear memories. Individuals who demonstrate resilience to PTSD, and/or who recover from traumatic/stressful experiences, are able to discriminate between fearful and non-fearful stimuli, as well as displaying normal extinction of fear memories. (Mahan & Ressler, 2012)

non-gene mutation participants, suggesting impaired extinction in the gene mutation group (Soliman et al., 2010). The presence of this individual genetic difference is correlated with altered activation in the hippocampus, amygdala, and prefrontal cortex, hinting at a meaningful relationship between the brain-derived neurotrophic factor gene and synaptic plasticity in these regions (Mahan & Ressler, 2012).

Another possible root of failed synaptic plasticity is chronic stress' effect on long-term potentiation (LTP) in the hippocampus. Long-term potentiation is the mechanism, theorized to be behind learning and memory, which involves the strengthening of neural connections after repeated use. In a study conducted on 27 rats, half were restrained and tail-shocked 30 times over the span of 30 minutes while the other half were unrestrained and not shocked for 30 minutes. Evaluating a specific layer of the rodent hippocampus, long-term potentiation was significantly impaired in the shock group when compared with the non-shock group (Foy et al., 1987). This suggests that the stress, and helplessness to remediate that stress, inhibited synaptic plasticity in the hippocampus (Kim et al., 2015). These are just two potential explanations for failures in synaptic plasticity that might precede PTSD, but there are many more possibilities. Despite any uncertainty in its causes, it is known that failures in synaptic plasticity are problematic for the mind and the body; without the capability to alter modes of cognition, trauma sticks in the memory, radicalizes the emotions, and forces mental stagnancy.

Triple-Network Dysregulation

Select brain regions have differential relationships with different disorders. Alterations in certain regions are pivotal for the present conceptualization of how disorder manifests. With PTSD specifically, a large network of brain regions is appearing more and more vital to the

disorder and its treatment. Due to recent advances in neuroimaging, it is possible to evaluate brain region connectivity more holistically, parsing through noise better, targeting analysis with greater spatial specificity, and, importantly, detecting resting state data - data gleaned from functional magnetic resonance imaging (fMRI) when an individual was not performing a task (Goulden et al., 2014). These new capabilities ushered in data on three relevant networks that compose a greater network among themselves. This triple-network is made up of the Central Executive Network (CEN), the Default Mode Network (DMN), and the Salience Network (SN). The most broad relationship that has been ascertained about this network and its constituent components is that the Central Executive Network is involved in cognitively demanding tasks while the Default Mode Network is activated most in a resting cognitive state - in ponderance - and the two take part in a zero sum game of cognitive resources. Since the two are activated with mutually exclusive processes, activation tends to be nearly completely distributed to either one network or the other (Sridharan et al., 2008). To date, it's postulated that the Central Executive Network is comprised of dorsolateral prefrontal cortex (dlPFC) and posterior parietal cortex and the Default Mode Network is made up of posterior cingulate cortex (PCC), posterior parietal cortex (PPC) and the ventromedial prefrontal cortex (vmPFC). The Salience Network primarily serves the purpose of responding to stimulus or sensation that appears important; in the triple-network, it is responsible for modulating the commutative relationship between the Central Executive Network and the Default Mode Network. The Salience Network is made up of ventrolateral prefrontal cortex (vlPFC), anterior insula, and the anterior cingulate cortex (ACC)

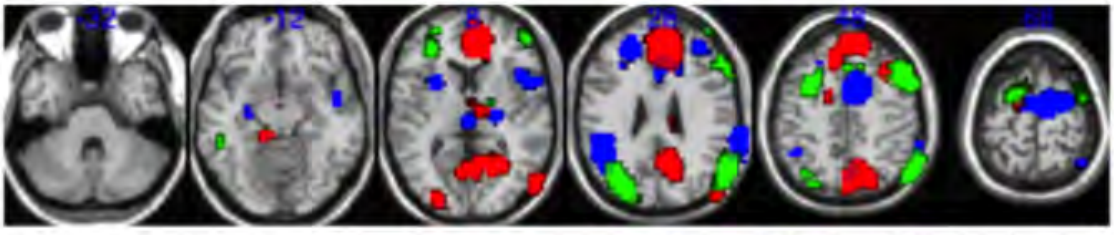

Figure 3. The templates used to define the resting state networks in this analysis are displayed as such: The default mode network (DMN) is shown in red, the salience network (SN) in blue and the central executive network (CEN) in green. We display slices at z = −22, −12, 8, 28, 48 and 68. (Goulden et al., 2014)

(Goulden et al., 2014; Porto et al., 2018; Wang et al., 2019). With this rag-tag trio forming a chaperoned push and pull, the question arises: can the group fall out of balance? Also, what happens if they do?

Well, looking at this through a lens of trauma, imbalance of the triple-network is not only possible, but very likely. With imbalance comes serious implications for cognitive and behavioral functioning in the form of PTSD symptomatology. There is a wealth of information regarding PTSD that can be drawn from this broad network, yet only some of the most pertinent to symptom manifestation is presented here. In a sample of 20 survivors of a coal mining flood disaster, divided by PTSD diagnosis, connectivity within different regions of the three respective networks were all significantly decreased in the PTSD group when compared with the healthy group (Liu et al., 2017). In the Central Executive Network, the significantly decreased connectivity was chiefly in the left middle frontal gyrus. This is noteworthy given a study on participants with sexual assault trauma exposure, half with PTSD and half without. In that study, it was found that connectivity in the left middle frontal gyrus on fMRI was significantly decreased in the PTSD group when presented with negative affective pictures compared to the non-PTSD group (New et al., 2009). This suggests that within-network disconnectivity in the Central Executive Network - a hub of higher-level processing and top-down control - may be responsible for emotional dysregulation in PTSD. Additionally, it was found that this disconnectivity in the Central Executive Network was significantly correlated with greater PTSD symptom severity, reinforcing the argument that this network is related to emotional failures specific to PTSD (Liu et al., 2017).

Given the Default Mode Network's role in self-concept, the greater within-network disconnectivity under PTSD could be influential on the sense of self. Two pivotal components to the network, the medial prefrontal cortex (mPFC) and lateral orbitofrontal cortex (lOFC), showed decreased between-region connectivity significantly correlated with greater PTSD symptom severity (Akiki et al., 2018). Along with that, the medial prefrontal cortex was found to be particularly important for self-referential processing in a study with 30 healthy participants; the grouping of participants who were asked to recall self-referential descriptor words displayed better recall and higher activation of the medial prefrontal cortex on fMRI when compared to the grouping who were asked to recall descriptor words about an intimate other (Heatherton et al., 2006). Thus, the medial prefrontal cortex both plays a necessary role in self-concept and shows greater disconnectivity with PTSD. It wouldn't be inconceivable that these two factors result in PTSD's negative alterations in self-concept like depersonalization and dissociation from self.

Aligning with the function of the Salience Network, to detect salient phenomena, the dysfunction of the network under PTSD appears to alter that necessary and constant process. In 45 participants, split by PTSD participants, combat-exposed healthy participants, and non-combat-exposed healthy participants, greater connectivity was found within the Salience Network, particularly the insula, on resting-state fMRI in the PTSD group when compared with controls. In that same study, higher connectivity with the right anterior insula was correlated with higher PTSD severity scores, particularly hyperarousal symptoms (Sripada et al., 2012). Given the role that the insula, and Salience Network generally, plays in the assessment of stimuli, heightened activation could speak to a lower threshold in recognizing salience, or alternatively described as hypervigilance (Friedman et al., 2021). The Salience Network plays a fundamental

role in the regulation of the two other networks; therefore any dysregulation in one likely speaks to a dysregulation in the other two (Friedman et al., 2021; Liu et al., 2017).

The whole span of intricate network changes under PTSD cannot be delineated here, but, in total, it appears that the dysfunction of these three networks and their pivotal, ingredient regions, whether through increased or decreased connectivity between different components, is tied in with PTSD's manifestation and how different aspects of symptomatology present. Although it appears ever-more likely that this large network is responsible for much of PTSD's symptomatology, Liu et al. (2017) make the weighty point that the different presentations of the disorder - slight alterations in symptoms possibly due to different trauma types or genetic factors - may eventually be mapped onto different activation patterns in this network. The triple-network plays a role in memory, emotion, perception, and nearly every aspect of cognition, so it is not unrealistic to attribute much of PTSD as it is currently understood to traumatic changes in this complex network.

Network Segregation and Integration

The brain is unremittingly taking in an influx of information, sensed from a near-infinite source of stimuli. Such a vast intake requires an organization into which the information is filtered and manipulated. This compartmentalization is a natural, necessary process for the functioning of the human organism. The dynamics of connection and separation form the topography of the brain and inform the relationships throughout it. Integration is the yardstick for measuring how well a brain region receives different information and processes it within a network. Segregation is understood as a complementary function to integration in which information is designated to only individual regions within a network in order to efficiently

organize and process different information (Lord et al., 2017); segregation can be alternatively understood as a metric for the localization of brain function to a given network.

A good example of these processes is a study of 35 young and healthy participants. They were presented with two separate tasks - one, a simple, motor skill task, and the other, a cognitively-demanding memory task - and were evaluated with global-brain fMRI. In the simple task, participants showed significantly higher segregation, with more within-network activation. Conversely, the participants in the demanding task showed higher integration, with more global, between-network activation. Since the simple task required only specific activation of motor-skill related regions, greater segregation was efficient. Since the demanding task required a variety of different brain regions, greater integration was adaptive. In healthy individuals, integration and segregation develop a harmonious balance based upon cognitive demand (Cohen & D'Esposito, 2016). Naturally, the network changes elicited by integration and segregation are intrinsically linked with synaptic plasticity. Although the integration and segregation are mostly focused on large-scale network change, that reconfiguration is also happening on a small-scale at the synaptic level (Cohen & D'Esposito, 2016; Lord et al., 2017). Yet, in the context of disorder, the conversation around dysregulated integration and segregation focuses more on how the brain has changed rather than whether it still has the capacity to do so.

In different neuropsychiatric disorders, integration and segregation present differently. In individuals with Major Depressive Disorder (MDD) and Bipolar Disorder (BD), fMRI has found reduced segregation and integration in specific portions of the Default Mode Network. This suggests a failure of localized function and variable information intake during emotional processing and self-referential processing. Also, in individuals with Major Depressive Disorder

there was greater dynamic segregation in the putamen - a brain region, not part of the Default Mode Network, but still important for its role in mood and motivation - which could inform the impenetrable negative cognitions of the depressive disorder (Luo et al., 2021). Looking over to individuals with schizophrenia, lower segregation has been observed in the primary sensory and motor cortices as well as the thalamus when compared to individuals of high-risk to schizophrenia but without the diagnosis. The decrease of short-range connections within these regions necessary for sensory intake and top-down function, could explain schizophrenic symptoms like paranoia and hallucination. As well, individuals with schizophrenia also displayed higher functional integration in the prefrontal cortex; over-integration in a region already so important for coalescing varied sensory input could result in abnormal or muddled output (Duan et al., 2019).

Integration and segregation have also shown to present uniquely in PTSD. Segregation has shown to be hindered particularly in the prefrontal cortex. This suggests that the prefrontal cortex is limited in performing its specialized functions, one of which is exerting top-down regulation on other brain regions. This specific hindrance is important because it has more general implications beyond one cortex; if the prefrontal cortex is showing lowered segregation, it could mean a variety of brain regions, like the amygdala and hippocampus, are poorly optimized for their specific functions. The capacity to ward off unconscious intrusion is a function that would be thereby hindered (Spielberg et al., 2015). Adding to the dysregulation, it's been observed that the segregation in the occipital and subcortical networks increase; this increase provides the other half of the story, in which, without the top-down prefrontal control, regions important for emotion, memory, and attention become highly internally active

(Rangaprakash et al., 2019). As for integration, the impact is rather similar in these regions. Subcortical-, parietal-, and occipital-associated nodes (outside of the prefrontal region) all showed higher integration in PTSD than control, hinting at a generally overactive or inflated regions of the brain without the necessary control functions. However, in total, on a global brain scale, integration and segregation was lower in PTSD than control. This seems to mean that specialized processing fails and effective communication is limited under disorder (Rangaprakash et al., 2019). This neurological profile suggests that PTSD creates a disorderly, inefficient brain.

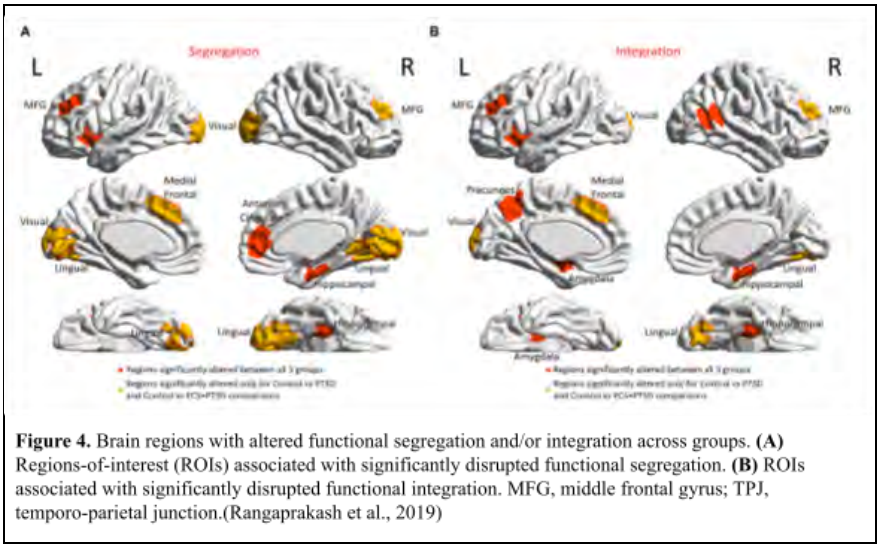

Figure 4. Brain regions with altered functional segregation and/or integration across groups. **(A)** Regions-of-interest (ROIs) associated with significantly disrupted functional segregation. **(B)** ROIs associated with significantly disrupted functional integration. MFG, middle frontal gyrus; TPJ, temporo-parietal junction.(Rangaprakash et al., 2019)

Depression Comorbidity

Discouragingly, comorbidity is a rule rather than an exception in PTSD. To overlook it in concept or treatment is to ignore most of the disorder and to ignore many of those afflicted. With 30-50% of individuals with PTSD also meeting criteria for a depression diagnosis, or Major Depressive Disorder (MDD), considering depression symptoms alongside those of PTSD should be a standard (Angelakis & Nixon, 2015). Such a high rate of coincidence truly muddles the view of PTSD as independent. In conceptualizing PTSD, one must be able to separate the distinct neuro-cognitive phenomena and resultant symptomatology of PTSD and depression. In

remedying the disorder, one must create a standard of treatment, but that could be by addressing PTSD alone or establishing comorbid-specific interventions. The question stands tall in the psychological community: how can we understand PTSD and depression together, and moreover how can we treat it?

The roots between the two disorders are so deeply intermeshed that the diagnosis of comorbid depression and PTSD is not entirely distinct from PTSD alone. In fact, it is even suggested that, following a trauma, co-occurring depression and PTSD should not be viewed as separate constructs but a singular traumatic reaction (O'Donnell et al., 2004; Post et al., 2011). The implications that this carries for the diagnosis of psychological disorder is significant. If the only unique aspect of diagnostic criteria is the initial cause (i.e. a traumatic event), the diagnosis has the capacity to do more harm than good by drawing arbitrary distinctions where, meaningfully, there are none. However, the most optimal approach, in the present understanding, is to conceptualize PTSD and its comorbidities as distinct diagnoses that have overlapping presentations (Barbano et al., 2019; Post et al., 2011).

The two disorders, even when considered distinct, destructively work in tandem. Depression heightens the risk of developing PTSD and PTSD is also a risk factor for depression onset following a trauma (Angelakis & Nixon, 2015). PTSD alone poses high risks for suicidality, but even higher in individuals with comorbid depression (Nichter et al., 2019; Panagioti et al., 2012). To boot, quality of life, emotional well-being, and broadscale mental health are at their worst between PTSD and depression than at either of the poles (Nichter et al., 2019). They simultaneously manifest at such a high rate and pose such severe detriments in their overlap that an overwhelmingly distressing situation is created for anyone caught in the middle.

Therefore, treatment is of extremely high import. Yet still, treatment too is complicated by comorbidity; depression has the potential to diminish treatment outcomes for interventions specifically targeting PTSD (Angelakis & Nixon, 2015). With that, it is necessary for treatment to consider the overlap. Even if PTSD and depression are truly distinct, the imbrication between the two co-occurring disorders is vast enough that comorbid-specific treatment should not just be an exception. Novel treatment interventions are being actively employed to address PTSD and MDD's comorbidity. One of these is Behavioral Activation Therapy (BA), which has shown success in addressing the dual complexity, improving participant quality of life and depression alongside the reduction in PTSD symptoms (Jakupcak et al., 2010; Mulick & Naugle, 2004). Following this guideline of more comprehensive intervention, treatment outcomes will hopefully improve for a broader population. Treatment for PTSD unfortunately cannot be limited to the diagnostic criteria of just PTSD; the complexity of this far-reaching disorder must beget a clinical response of proportional holism.

First-line Treatment

In crafting the appropriate clinical response to a disorder, understanding the models of the disorder and its neurological idiosyncrasies may help guide part of the way, but exploring the active treatment methods can help with the rest. In the present day, the primary interventions for PTSD are psychotherapy. Cognitive Behavioral Therapy with a Trauma Focus (CBT-TF), Prolonged Exposure (PE) therapy, and Cognitive Processing Therapy (CPT). As the name would suggest, Cognitive Behavioral Therapy, usually around 10 sessions, incorporates both cognitive and behavioral techniques, such as cognitive restructuring and exposure respectively. In the traumatic context, the former focuses on replacing unhealthy beliefs or thoughts about the trauma

and self with rational thought. The latter focuses on imaginal exposure to the trauma and employing different techniques of recollection (Watkins et al., 2018). These individual components contribute to a moderately successful treatment with relatively low chance for relapse (Bryant et al., 2008). Prolonged Exposure therapy, which usually spans about 12 sessions, is rather self-explanatory as well; the goal is to repeatedly expose patients to their trauma over and between the session periods in order to better integrate the experience into existing emotional and rational thinking; this approach, with adaptable methods, appears to be effective for a wide variety of patients (Rauch et al., 2012). Lastly, Cognitive Processing Therapy targets illogical thinking that can contribute to negative self-value and hypervigilance. A large part of this process is the addressing of "stuck points": a patient's persistent and problematic misconceptions regarding the traumatic event. When not properly addressed, these "stuck points" can result in self-loathing and self-blaming, worsening the impact of PTSD and preventing new, ameliorative thoughts on the incident (Resick et al., 2016). Cognitive Processing Therapy has been successfully implemented into treatment for a wide variety of trauma types (Watkins et al., 2018).

And yet, despite the success that these different interventions have had, there is an overwhelming downside to them, a common thread: the exposure basis. Whether it's imaginal, written, or vocalized, reexposure to trauma can be incredibly difficult for even the toughest patient. This arduous aspect of PTSD therapy results in a large minority dropout rate (Hembree et al., 2003). It also means that certain high-risk populations (i.e. high suicidal ideation rate) are often not provided with these first-line treatments. Given a high attrition rate, one might look beyond psychotherapy. Yet, pharmacological intervention does not provide much of an

alternative or supplement to therapy; the selective serotonin-reuptake inhibitors (SSRI) approved for PTSD are not broadly applicable to disorder treatment (DePierro et al., 2019). More work is needed to apply treatment effectively to more people within the PTSD complex. More specifically, given that exposure therapy, when it is withstood, seems to effectively address PTSD, treatment to supplement that therapy and render it more palatable could be the appropriate next step.

Combat Trauma

When considering novel treatment for PTSD, there are a slew of factors that cannot be overlooked. The mechanisms mentioned above illustrate some of the underlying factors that both explain and complicate the current modes of treatment intervention. There are numerous pieces to the treatment puzzle and some are not exclusively reserved to the brain. Taking a step away from the neural domain allows a broader view of PTSD in its different shapes and colors. Outside of the brain and the individual exists a pivotal origin: the trauma. The specifics of the event that precipitated the disorder manifesting are incredibly important for understanding the specifics of the disorder. This paper, for several reasons, is concerned with a specific type of trauma: combat exposure. For starters, combat-related trauma, on average, shows the highest symptom severity out of all trauma types, significantly greater than all but sexual trauma (Guina et al., 2018). In the realm of treatment, military populations with PTSD show worse outcomes than civilian populations (Straud et al., 2019). So, part of the rationale for focusing on combat-related trauma is necessity; in this study it might be possible to determine whether the proposed novel treatment is effective with even the most treatment-resistant population.

The other side to this rationale is rather political in nature. Veterans are a unique population in the American sociopolitical sphere; they garner bipartisan support in a way that most disenfranchised populations do not. Adjacent to their political position, is the large roadblock to the political progress of psychedelics: leftover, right-wing stigma from the psychedelic movement in the 1960s (to be expanded upon in the next section) and Reagan's War on Drugs in the 1980s is still endorsed by many, veterans included. Yet some veterans have managed to see past it, often out of a necessity for treatment. If psychedelic treatment continues on its successful course, it is likely that the treatment will eventually become accessible to more people, including veterans. The narrative of psychedelics can be significantly shaped by the veteran population, for or against it; practically, veterans are a necessary ally in the political fight for psychedelic acceptance. Ensuring that the treatment works effectively and safely with veterans both follows good research practice and sociopolitical practice. Above all else, even without their function as a political tool, this treatment is owed to the veterans. Out of the other PTSD populations, veterans with combat-related trauma are a group that the government is most directly responsible for helping. By waging wars and offering a flawed healthcare system to its soldiers upon their return, the government has tacitly failed one of its most 'treasured' populations. Now the government, with scientific substantiation, has the capacity to help those who have suffered its transgressions by rescheduling pro-therapeutic psychedelics. Withholding that federal action would be perpetuating further harm. If the government truly cares for its veterans and the suffering they've endured, it will follow the science and support this research however possible. This study, therefore, wishes to reinforce that call for long-owed treatment to a population of great concern.

Shrooms, Tycoons, and the Boons of Their Research: A History of Psilocybin Mushrooms in the United States

Fungi persists. It has existed since before human animals, has been the life and death of a myriad Earth's evolving creatures, and has abided apocalypse, unwavering (Schwartzberg, 2019). Dating back to prehistoric times, psychoactive off-shoots of fungi were present and consumed by humans. From then, indigenous groups, most notably the Mayan and Aztec cultures, revered mushrooms and assimilated the psychoactive kinds into religious and medicinal practice (Winings, 2021). Psychedelics cannot and should not be integrated into Western standards of clinical practice without first recognizing its roots in indigenous tradition with and reverence for the mushroom; a culturally-informed approach to psychedelic treatment is the only approach that respects its own foundations and forebearers.

This paper is focused on the most current Western practices of psychedelic treatment, therefore the history of psilocybin that is rendered in this paper is focused on the psychedelic tumult in the United States and how that led to the research practices of today. This history is heavily influenced by the work of Michael Pollan (2018), specifically his book How to Change Your Mind, in which he speaks on his own uncovering of the rich world of psychedelics and the research he did with some of the largest proponents of these eclectic substances. Although Pollan himself is no expert on psychedelics, he constructs his work from experts of different backgrounds with different opinions; Pollan does a good job to nuance his perspective as an outsider and, to the reader's benefit, incorporate conflicting viewpoints. There is no perfect history of psychedelics in the U.S., but Pollan does well to recount it from an honest standpoint.

In the early-to-mid Twentieth Century, the Western world was coming to terms with the trauma of rampant war and discrimination; a group of molecules were working their way over the borders, bound for popular disruption. In the United States, psychedelics were thrust into the zeitgeist by researchers sure only of their uniqueness, but relatively ignorant of their ability to affect unprecedented change on both a personal and cultural level. The term “psychedelic” - what was once a completely alien collection of syllables - became a colloquialism on par with “radical” or “cool” for some, and for others, a signifier of anti-patriotism from a misguided youth. One of the primary vectors for this psychedelic polarization was the banker, anthropologist, and amateur mycologist R. Gordon Wasson after he recalled his psilocybin (4-phosphoryloxy-N,N-dimethyltryptamine) experience in Life magazine. In the June of 1955, Wasson’s trip in Huautla de Jiménez, Oaxaca with the guide, or curandera, María Sabina elicited a frenzy of interest in the rousing substance - a frenzy which would dictate the newest dichotomy in American politics for the coming decades and one which would tarnish the small town of Huautla and fill a once-welcoming María Sabina with regret.

Yet, a very similar molecule managed a more covert introduction into the western world as, about a decade prior in 1943, Albert Hofmann accidentally synthesized Lysergic Acid Diethylamide (LSD) when attempting to develop a pharmaceutical for improved circulation; his first time testing the substance, which happened to be on himself, resulted in a life-changing surprise as he was sent on a trip well beyond the circulatory system. By 1950, after Hoffman produced the twenty-fifth molecule in the series, or LSD-25, and word of his personal experience transcended his Swiss lab, the molecule was being thoroughly examined and tested. For some time, LSD was believed to induce a form of madness. It was therefore tested for the insight it

could provide into schizophrenics and psychotically-disordered individuals (this type of pharmaceutical can also be referred to as a psychomimetic). A concept now commonplace in the professional and recreational realms of psychedelics is the importance of set and setting pre- and peri-trip. That is, it is vital to pay particularly close attention to one's state of mind and all aspects of the venue in which the trip will take place when planning a trip, as these two variables can entirely shift a psychedelic experience for better or for worse.Working off of that, given how impactful a tripper's hopes and expectations can be on the psychedelic trip, when participants anticipated madness when taking 'psychomimetic' LSD, that is precisely what they experienced; subjects witnessed horrifying images and underwent a duress so great that it began to resemble the disordered experience they initially anticipated. Despite the horrors that arose from this psychotomimetic model, patients treated with LSD surprisingly still found remission from their habits (Mangini, 1998). As the world of psychology started a slow move away from purely behaviorist methods of analysis, wherein a subject's opinion and felt experience was not of scientific value, the testimony and perception of LSD participants started to hold more weight; the transcendent and ecstatic aspects of psychedelic trips appeared to be at odds with psychomimetic conceptualization of psychedelics.

What arose from this conflict were two new models: psycholytic and psychedelic. The former believed existing psychodynamic processes were just heightened under these substances while the latter postulated that the experience was an entirely separate form of mysticism or emergent functioning (Di Leo, 1981). Research under these models moved psychedelics into a more mainstream treatment structure, addressing addiction, depression, anxiety, and other disorders (Chi & Gold, 2020). By the start of the 1960s, psilocybin and LSD were both being

utilized in a great breadth of research. Their results were promising, particularly to those conducting the research. However, at the end of the decade, psychedelics had not yet 'escaped the lab.' There was a storm of controversy yet to touch ground, but with the help, and more importantly distribution, of figures like Timothy Leary - Harvard's champion of psilocybin and salaciousness - and Al Hubbard - "The Johnny Appleseed of LSD" - psychedelics would bound from research to recreation. Although lesser-known good research would continue being conducted throughout the 1960s, the popular narrative around psychedelics would stop reflecting that (Butler et al., 2020).

Celebrities were swept into the surge in psychedelic fervor, bringing their experiences under altered states of consciousness into the spotlight, advertising existential relief to the masses. Al Hubbard, an anomalous man with inexplicable federal and monetary connections, dedicated himself to 'liberating' great swaths of noteworthy figures in the 1950s and 60s with the help of an inordinate amount of LSD. As 1960 dawned upon the United States, the lugubrious Harvard professor, Timothy Leary, dedicated himself to a similar path as Hubbard but rather with psilocybin in hand and a research foundation beneath him. However, unlike Leary, Hubbard's personal credentials in research were entirely fraudulent: he toted a false PhD. Despite Hubbard's more bizarre beginnings and discordant placement within the world of psychedelics, Leary is most often labeled as responsible for triggering an enraged opposition to these new substances by placing himself, his fiery rhetoric, and shoddy research at the heart of psychedelics. Although his work started more conservative in the early 1960s with a tenuous respect for controls and blinding, yet none for subject population, Leary's later work in the Harvard Psilocybin Project lost any semblance of good experimental practice, bucked for an over-intellectualized cult. As

Leary, within a greater counterculture, pushed back against the war effort and federal regulation of any kind, President Nixon denounced Leary and psychedelic-use; most onlookers were forced to take a side, not only on the average bipartisan politics, but psychedelics as a whole. There was a certain inevitability for such potent and enrapturing substances to be seized and suppressed after 'escaping the laboratory,' so the blame cannot be left entirely at Leary's feet, but he certainly did his part to stoke the flame and endanger the research.

Anti-psychedelic propaganda spread across the nation as fast as the term "psychedelic" had about a decade before. Some of the indoctrinating rhetoric was founded in reality, like the role LSD played in the Manson Murders and numerous testimonies of psychosis. Yet most were unfounded, like, for example, the belief that one's chromosomes could be disrupted with psychedelic use. Once Leary was on the lam for marijuana charges in the latter half of the 1960s, the U.S. government started cracking down on all involvement with psychedelics. As LSD and psilocybin were labeled illegal substances, nearly all structures for research and recreation were flattened. At the turn of the decade, these drugs were named Schedule I substances under the Controlled Substances Act and no psychedelics were being legally studied in the United States (except for the Maryland Psychiatric Research Center, which ended its research in 1976). The field of research on psychedelics would be dormant for decades.

Despite the lack of overt work being done with psychedelics towards the end of the 20th Century, many, if not all, of the researchers from the psychedelic heyday still faithfully supported the therapeutic potential of these molecules regardless of their recreational potency and the public framing that entrapped them. With a 2006 study conducted by Roland G. Griffiths at John Hopkins University, the first rumblings of the eruption that was to be the psychedelic renaissance

began. This study, the first to receive U.S. Food and Drug Administration (FDA) approval for psilocybin since the Controlled Substances Act took place, focused on the mystical aspect of psychedelics and the subjective importance of the altered-state experience (Griffiths et al., 2006). As this study navigated a thorough evaluation of the research practices and a brief media frenzy that harkened back to the fervent 1960s, the research field kept moving forward, one measured step at a time. LSD, psilocybin, ketamine, 3,4-methylenedioxymethamphetamine (MDMA) have all been tested in randomized controlled trials (RCT) since that Griffiths study. Moreover, esketamine (a patented off-shoot of ketamine) has been approved for clinical use for depression, now listed as a schedule III drug. MDMA and psilocybin have been designated by the FDA under breakthrough therapy statuses for PTSD and depression respectively; they are on the track for rescheduling. With researchers like Michael Mithoefer and Jennifer Mitchell, like Robin Carhart-Harris and Roland Griffiths, this psychedelic renaissance is being carried on experienced, passionate, and dedicated shoulders. As long as the current psychedelic proponents can manage to eschew the mistakes of the past, the American people may be able to experience more than just a blinding glimpse of psychedelics.

Shrooman Behavior: The Commerce Between Mycology and Psychology

One starts to wonder, with the fanaticism and demur around psilocybin throughout its fitful but albeit brief history in the U.S., does it work? How does it work if it really does? Also, what does it mean for psilocybin to work? All of these questions have now been asked for decades by layperson and researcher alike, yet the answers are a puzzle yet to be fully solved. Nonetheless, the knowledge gleaned of psilocybin thus far is promising and awe-inspiring. So,

please, welcome this psilocybin trip with open arms and an open mind; fear can be a wonderful thing to lose.

Magic Mushrooms and Their Molecular Mechanisms

Psilocybin ([3-(2-dimethylaminoethyl)-1H-indol-4-yl] dihydrogen phosphate), alongside dimethyltryptamine (DMT), is a member of the tryptamine group of classical psychedelics; LSD and mescaline, other members under the classical psychedelics umbrella, belong to the lysergamides and the phenethylamines respectively. The distinctions here are just based upon chemical structure differences between the substances. Psilocybin is also the psychedelic ingredient in the naturally occurring *psilocybe* genus of mushroom. However, psilocybin's effects alone are not immediately psychotropic: the active ingredient *psilocin* is the psychoactive product of psilocybin metabolism; the removal of a phosphate group from psilocybin results in the formation of psilocin, which readily occurs in the acidic, human stomach . Following that digestion and prodrug conversion, psilocin enters the intestines and, due to the lipid solubility of psilocin, it is absorbed and distributed through the bloodstream. Psilocin can then elicit its psychotropic effects since lipid soluble substances have the capacity to cross the brain barrier (Bauer, 2019).

It's worth noting that the process described above is most directly applicable to the consumption of the mushroom form, but generally in the clinical setting, this is not the preferred method due to the acrid taste and the meager psilocybin content of a dry mushroom (~5mg of psilocybin for every 1g of mushroom) (Winings, 2021). Rather, it is more often administered with a gelatin capsule after development in a lab. The digestion of both psilocybin forms follow a similar track regardless of their natural or artificial syntheses. However, the artificial synthesis

methods of psilocybin are still in their fledgling stages: their yields are not of ideal potency and are still rather expensive; there is more work being done to find the proper foundations for mass replication (Lowe et al., 2021). Yet anyhow one chooses to consume the mushroom, its trademark psychedelic effects occur when it crosses the brain barrier.

So what is a 'trip' neurologically? Well the journey starts at the serotonin receptors. These receptors, previously discussed in relation to PTSD, are protein-based receivers of chemical messengers, such as the neurotransmitter serotonin; these receptors are implicated in a slew of neurocognitive processes, like mood, memory, and learning. The majority of serotonin receptors are found in the digestive tract, but those found in the brain are most relevant to psilocybin's psychological effects. Specifically, psilocybin has a high affinity for the 5-HT2A (5-hydroxytryptamine) receptors, which are largely present in cortical areas like the frontal cortex (Frazer & Hensler, 1999). This specific subtype of serotonin receptors is a mediator in the relationship between psilocybin and the rest of the brain. This just means that, if the 5-HT2A were removed or knocked out, psilocybin would not inspire psychedelic effects in the greater brain (López-Giménez & González-Maeso, 2017). This relationship coalesces with the main function of the serotonin neurotransmitter which is to relay messages all across the brain (Bouchez, 2011). With greater activation of these 5-HT serotonin receptors under psilocybin versus normal, there is already a greater resiliency to PTSD recurrence, as mentioned earlier (Corchs et al., 2009). The potency of the psilocybin-affected 5-HT2ARs spans beyond just serotonin, but it must start there.

Once the digested psilocin binds to the 5-HT2A receptor pathway, it acts as an agonist. An agonist is a drug that binds to the receptor and causes it to activate, which is opposite to an

antagonist that inhibits the receptor; drugs that agonistically pair with serotonin, like psilocybin and other classical psychedelics, are referred to as serotonergics. Psilocin is a particularly potent serotonergic at the 5-HT2A site, with lower affinities for other serotonin subtypes as well. As psilocybin is continuously converted to psilocin in the body, the hallucinogenic effects begin and persist through that pivotal binding site (Bauer, 2019). That agonism appears to precipitate a wide range of activation and inhibition. In the prefrontal cortex, glutamate, the most prolific neurotransmitter in the brain, is released after psilocin binding, potentially resulting in the anxiolytic and antidepressant effects often experienced on magic mushrooms (see Figure 5: Ling et al., 2022). Most generally, what results following the activation of the 5-HT2A receptor is broad and varied: a state of consciousness on psychedelics that is referred to as the entropic brain, highlighting the disorder and irregularity across a wide range of brain regions. Brain regions undergoing a jolt of fungi suddenly interact differently and more globally (Carhart-Harris et al., 2014). This model of consciousness provides a foundation for implementing psilocybin as a remediation to PTSD neural dysfunction.

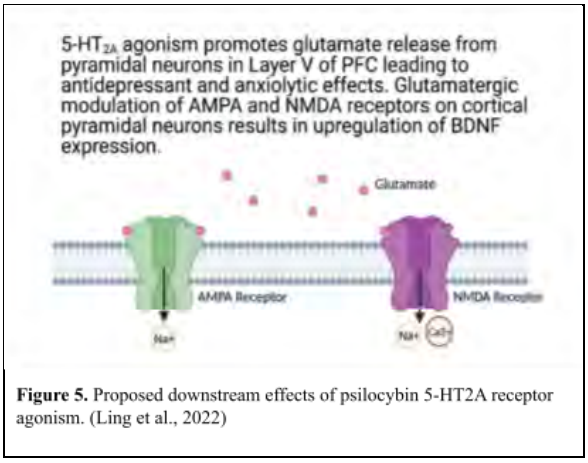

Figure 5. Proposed downstream effects of psilocybin 5-HT2A receptor agonism. (Ling et al., 2022)

Psilocybin and PTSD

Harkening back to the topography of trauma and how it maps onto a brain affected by PTSD, we can begin to contextualize psilocybin as treatment. In order to cradle a neurocognitive exploration of psilocybin, the same structure previously used to outline PTSD will be replicated

anew. Neuroplasticity, the triple-network, and segregation and integration take center stage once more, hand-in-hand, to expound upon the entropic brain and how chaos might be therapeutic.

An incredibly important aspect to psilocybin, and psychedelics generally, is their psychoplastogenic capacity, or the ability to induce synaptic plasticity. This, as mentioned earlier, just means the brain's capacity to develop new connections and therefore alter existing modes of cognition. Psilocybin is often touted for its ability to 'change your mind,' to render the well-worn neural pathways temporarily disrupted and redirected. In vitro analysis of serotonergic psychedelics administration on cortical neurons - implicated in the dysfunction of anxiety disorders - has shown increased dendritic arbor complexity, which just speaks to the aptitude a neuron has to develop new diverse connections with other neurons (see Figure 6). In vivo administration of psilocybin has also shown in rats that dendritic spine length increases in the prefrontal cortex, pointing towards greater synaptic change (Shao et al., 2021). Both structural and functional plasticity can persist well after the acute effects of classical psychedelics have diminished (Ly et al., 2018). Looking beneath the cortical structures of the brain, we can look to the constituent regions of the limbic system. Two of that system's regions, the hippocampus and the amygdala, undergo change with psilocybin. Neurogenesis increased for both regions. At low doses of psilocybin, cued-fear conditioning extinguished faster than control in mice alongside the alterations in neural connections between, within, and around the hippocampus and amygdala

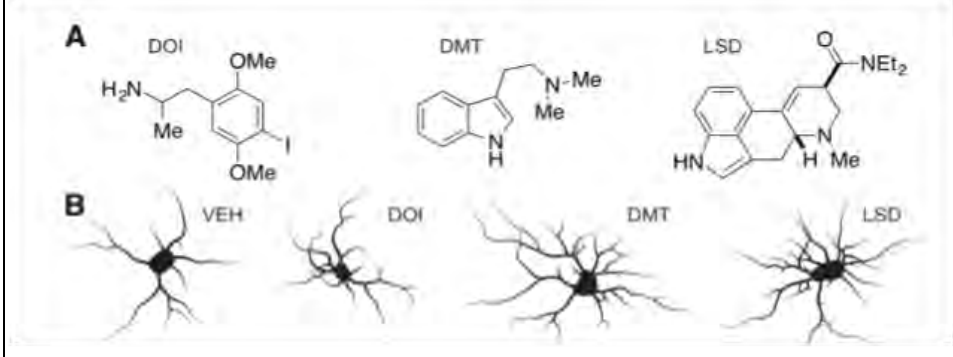

Figure 6. A) Chemical structures of psychedelics. B) Representative tracings of cortical neurons (DIV6) treated with compounds. (Ly et al., 2018)

(Catlow et al., 2013; Mertens et al., 2020). However it is possible that these brain changes are not just a result of the drug's neural mechanisms, but in fact the experience of the drug and its integration into psychotherapeutic practices cultivates neuroplasticity (Vollenweider & Kometer, 2010).

Therapeutic intervention alongside psychedelics is incredibly important but not extensively researched; the type and span of therapy has not been drastically varied in the trials thus far, mainly relying on non-directive approaches. As well, there is still the question of whether psychedelics should exist in their unfiltered form like magic mushrooms or whether they should be reduced to a pure ligand to better control the experience and administration of them (Lowe et al., 2021). However, since the root of this psychedelic-induced neuroplasticity hasn't been pinned down, there is no asserting whether the removal of the uncontrolled experience that is a 'trip' would benefit or hinder the therapeutic advantages of the psychedelic. Regardless of how the neuroplasticity is manifested, there is a link between psychedelics and a rather global creation of new connections and new neurons, but importantly in areas that are marred by PTSD. In the world of treatment, getting past the mental stasis that PTSD impels is incredibly valuable, so psychedelic-assisted therapy might provide a good starting point for that process.

Another way of looking into the psilocybin trip is through the triple-network: the Central Executive, Default Mode, and Salience Networks. Each of these vital networks go through a journey of their own once the psilocin molecule reaches that 5-HT2A receptor. Network alterations as a result of psilocybin are commonly described as changes in circuitry; the crests and troughs of functional connectivity explain the relationship among the triple-network on psilocybin. Since much of the research conducted on therapeutic psilocybin administration has

been directed toward depression, there is a disproportion of writing on the default mode network above the other two (Ling et al., 2022). Yet, such research is not irrelevant for two reasons; depression is a large factor in PTSD and if psilocybin alteration of the default mode network reduced depression symptoms then it could have a similar impact on PTSD symptoms (Krediet et al., 2020). Deactivation occurs between the posterior cingulate cortex and the medial prefrontal cortex in the course of psilocybin (see Figure 7). These two regions are large constituents of the default mode network and are rather important in self-referential cognition and appear to be the foundation of the stable concept of self; it's been suggested that this reduction of functional connectivity on psilocybin can be linked with the egoless experience often recalled. The deactivation of these pivotal regions correlates directly with the subjective effects of the substance (Carhart-Harris et al., 2012). The default mode network plays an important part in major depressive disorder, particularly around self-conceptualization. To have reduced activity in this network could limit the negative cognitions directed inwards that perpetuate depressive cycles, and could even be productive at curbing unhealthy thought patterns of PTSD, in line with cognitive models of PTSD and the associated treatment methods (i.e. Cognitive Processing Therapy).

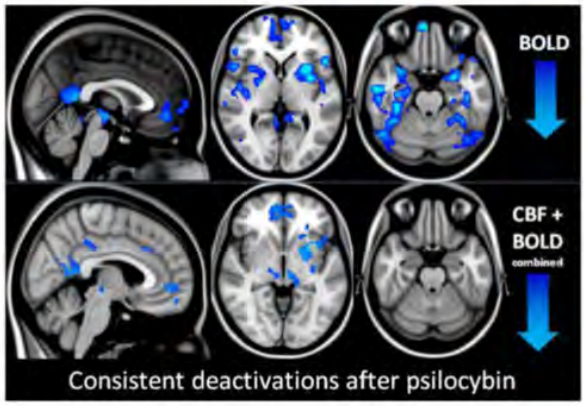

Figure 7. Brain deactivations after psilocybin. (Upper) Regions where there was a significant decrease in the BOLD signal after psilocybin versus after placebo (z:1.8–3). Mixed-effects analysis, $z > 1.8$, $P < 0.05$ whole brain cluster corrected, $n = 15$. (Lower) Regions where there was a consistent decrease in CBF and BOLD after psilocybin. For display purposes, significant BOLD decreases were calculated within a mask based on the ASL result (Fig. 2) at an uncorrected voxel level threshold of $P = 0.05$. Note, we observed no increases in CBF or BOLD signal in any region. (Carhart-Harris et al., 2012)

Vital to the neurological course of psilocybin are the extensions of the default mode network; the impacts they have on those brain regions outside of the triple-network also plays a role in psychedelic remediation. Some regions of the limbic system have a unique relationship with the default mode network. Under normal functioning the emotion and memory hubs of the brain - the amygdala and hippocampus - are strongly coupled with the network. On one end, stronger connection between these regions, under the umbrella of the medial temporal lobe, and the default mode network has been positively correlated with greater depressive rumination (Berman et al., 2011). On the other end, psilocybin administration precedes a decoupling of that functional connectivity, meaningfully separating the default mode network - the self-referential headquarters - from the amygdala and hippocampus hubs; the stable sense of self starts to draw away from emotional processing and memory recall. This separation is pivotal for the rationale of psilocybin-assisted therapy directed toward PTSD; in essence, by removing the ego from traumatic memories and reducing emotional reactivity, it becomes much easier to come to terms with those memories and integrate them into normal thinking (Carhart-Harris et al., 2014; Pollan, 2018). The default mode network is so interconnected with the regions involved in disorder, that sometimes its functioning can perpetuate symptoms. By disturbing the norm of the default mode network, psychiatric disorder might become less engrained in thought and behavior and therefore easier to fend off.

To conclude the neural region of this section, the harbingers of neural connection - integration and segregation - offer a general explanation for connectivity under the influence of psilocybin. Using resting-state functional connectivity (RSFC) blood oxygen level dependent (BOLD) as an indirect indicator of activity shared between regions, it is possible to evaluate how

regions maintain segregation and integration in a psychedelic state. Evaluating a globally-representative sample of resting state brain networks on LSD, it was found that, in general, these networks displayed less connectivity within their networks and greater connectivity between networks (Carhart-Harris et al., 2016). This evidence underwrites the concept of the entropic brain; the reduced internal connectivity speaks to disintegration of brain networks and the reduced inter-network connectivity speaks to desegregation of brain regions (Carhart-Harris et al., 2014). This same trend of brain network disintegration and desegregation carries over to psilocybin as well (eg. Carhart-Harris, 2019; Carhart-Harris et al., 2012; Preller et al., 2020). Daws et al. (2022) most recently found that global integration increases under psilocybin, as indicated by fMRI detecting general lowered brain network modularity, or the measure of within-network connection density. Those brain networks activated through 5-HT receptors were, by and large, more flexible in connecting outside of their networks. Not only does the entropic brain seem to explain the experiential facet of psychedelics, but it also could prove to be a valued remediation to the problematic integration and segregation of PTSD (Madsen et al., 2021). Interestingly, in PTSD brain measures, those same measures were reduced. However, it seems as if the chaos of psilocybin is, very importantly, easier directed and molded than that of PTSD, once again highlighting the importance of structured therapeutic supplement in and around the acute window of psychedelic effects.

PTSD, when viewed from different angles of disorder, shows a diversity of interconnected regions dysregulated on local network levels and global connectivity levels. Funnily enough, psilocybin has a very similar effect, but acutely. The disruption elicited under psychedelic conditions has the potential to unstick those unhealthy cognitions that have become normalized

under PTSD and other disorders. An important aspect to the remediation potential is how that acute experience is shaped by intent and structure; in the clinical setting, that aspect is represented as therapeutic intervention. The next section will elaborate on the practices of psilocybin-assisted therapy and the research that has preceded the methods put forth by this paper. In that, the pre-existing trial-based research, although not directed at PTSD, cushions a PTSD-directed intervention by bearing the safety and efficacy of psilocybin-assisted therapy when directed at other disorder; moreover, when that other disorder is chiefly depression, such research is incredibly valuable for conceptualizing novel PTSD treatment.

Psilocybin-Assisted Therapy

Without randomized controlled trials on the topic, any human trials of psilocybin and PTSD are somewhat uncharted territory. However, that process of testing needs to start somewhere, and given the promising work that already exists for psilocybin, it seems appropriate to start considering what psilocybin-assisted therapy for PTSD would look like. Outside of the neurological, there is yet still treatment-specific research that guides its appearance.

In fear conditioning trials with mice, low doses of psilocybin were associated with accelerated fear extinction after mice had been conditioned to expect a shock 30 seconds after a tone; this conditioned state took the form of immobility for the 30 seconds after the tone, whereas the unconditioned, or fear-extinguished, state took the form of wandering about the cage after the tone. When compared with control and high-dose groups, the low-dose showed quicker recovery of the unconditioned state (Catlow et al., 2013). As well, general trait changes could be handy in the battle against PTSD. In a 6-month follow up with 19 participants treated for treatment resistant depression with psilocybin-assisted therapy, analyses were conducted

evaluating the presence of some experiential themes such as connectedness - meaning the connection one has with senses, self, others, world, and/or spiritual principle - and acceptance - meaning the foregoing of avoidance when faced with emotionally challenging thoughts or experiences - based upon self-report. In that, participants reported significantly higher levels of connectedness and acceptance when compared to participants' previous experience in treatment (i.e. SSRIs or talk therapy) (Watts et al., 2017). Historically, trauma-based disorder has shown a theme of disconnection and avoidance, so improvements along those metrics might be productive for both depression and PTSD.

Emotional dysregulation is another constant intrusion PTSD can have on daily life. Three studies, described below, show how psilocybin can start to curb that negative emotional output. After psilocybin administration on 25 healthy volunteers with no previous history of hallucinogen use, it was found that, when presented with negative and neutral stimuli of emotional imagery, amygdala reactivity was lowered on fMRI readings when compared to control (Kraehenmann et al., 2015). In the acute phase of psilocybin effects, 33 participants were evaluated for empathy capacity in hypothetical scenarios, in implicit computer-assisted measures, and in self-report. Participants in the psilocybin condition showed significantly higher levels of explicit and implicit empathy when compared to the placebo condition, regardless of the valence of the stimuli (Pokorny et al., 2017). 379 participants in an online survey, conducted before and after planned psilocybin administration, were presented with the Emotional Breakthrough Inventory (EBI), which evaluates the capacity of participants to endeavor upon new emotional thoughts, explorations, or struggles after psilocybin. Higher scores on the inventory were dose-dependent and also associated with a therapeutic supplement (Roseman et al., 2019). This is

all to say that psilocybin administration shows a positive relationship with stronger feelings of empathy and with more comfortable emotional expression and sensation.

Clearly, there is a very real possibility that psilocybin can diminish the behavioral cruxes of PTSD, but are these individual pieces of a treatment puzzle enough to take on the whole disorder? Looking to some noteworthy architects of psilocybin-assisted therapy - Robin Carhart-Harris and Roland Griffiths - there might be an answer. Carhart-Harris has crafted the conceptual heart of psilocybin in its mechanisms during the therapeutic process; through neurocognitive models, he has worked to render the classical psychedelic experience into its vital components. Bounding off of his own conceptualization, he has pushed forward the treatment approaches directing psilocybin toward depression; in focusing on set and setting, with blindfold and music during administration and more hands-on integrative therapy after administration, Carhart-Harris has established a standard for psilocybin treatment that has been carried forward by other researchers (e.g. R. Carhart-Harris et al., 2021; R. Carhart-Harris et al., 2018; Gukasyan et al., 2022; Yu et al., 2022). With a set standard that has shown some success in treating depression, the barrier of orienting psilocybin towards other disorders is less disconcerting.

Similarly, the research of Roland Griffiths has helped to drive psilocybin to the point of an adaptable therapy. Not only has he made contributions to the standards of psilocybin-assisted therapy practice, using similar methods to Carhart-Harris but adapted for terminally-ill patients, but he has also identified and curated an important therapeutic feature of psilocybin action: the mystical-type experience (Griffiths et al., 2006, 2016). This psilocybin occasioned experience is best described in the format of the Mystical Experience Questionnaire (MEQ) developed by Griffiths et al. (2006); the mystical experience is marked by (1) inner unity - the integrity of the

ego, (2) external unity - sense of connection or oneness with one's environment, (3) transcendence of time and space - loss of foundations for temporal and spatial grounding, (4) ineffability and paradoxicality - the experience being indescribable and illogical, (5) sense of sacredness - one's amazement and spiritual quality being heightened, (6) noetic quality - the experience being insightful and more meaningful than normal conscious living, (7) deeply-felt positive mood - intense joy to the point of ecstasy.

These baffling experiences are often what participants struggle to describe after a trip, but they have implications beyond pure research intrigue; higher scores on the mystical experience questionnaire have been related to better treatment outcomes for anxiety, depression, and addiction (Barrett & Griffiths, 2017). Therefore there is a real potency to the experiential and indescribable. This anomaly in therapeutic processes speaks to the anomalous nature of psilocybin as a treatment option; even if it does not directly target any individual disorder through specific neural processes, it could provide such a profound experience to then empower individuals to defy the patterns of disorder amid and following an entropic brain.

Introduction Insights

At this point socially, politically, and scientifically along the intersecting roads of psilocybin and disorder, there is a rich opportunity to drive further. However, the roads are still rife with obstacles and demand a cautious but driven approach. In the histories of psilocybin and PTSD, the sociopolitical sphere overtook the narrative and direction of research. Psilocybin was sidelined for decades, likely to the detriment of disordered and healthy individuals alike. PTSD is still caught in the throes of debate, rendering it difficult to treat without a specific definition or explanation for the disorder. One can only hope that history serves as a lesson learned for those

involved in present research, but a new generation is upcoming and whole-heartedly joining the effort. In light of that, the psychedelic movement must incorporate social conversation into the fuel of its drive. Getting ahead of rumors (or mushrumors) and leading with research when possible is the clearest path to proliferating psychedelic-assisted therapy; at no point should the popular narrative accelerate past evidence to ground it. Although easier said than done, the psychedelic community must practice control over its constituent members when possible to limit any far-reaching, alienating speech. One must always be cognizant of the fact that all speech and expression is political, and therefore all speech and expression in line with psychedelics should be careful to avoid the poles of opinion and politics. Treatment should be apolitical and accessible to all who need it; in the meantime, while federal regulation still restricts psychedelics, the message of psychedelics should be a call for treatment and little more until these substances are more palatable to the Western tongue.

Without available research from randomized controlled trials directing psilocybin at PTSD, uncertainty in methodology and results is inevitable. But uncertainty does not preclude strong evidence backing the safety of psilocybin as treatment, particularly when placed in the proper clinical setting. The mechanisms of psychedelics are almost incomparable to other treatment methods - even pharmaceutical ones. They redefine psychological treatment and possibly the psychological concept of disorder. Treatment rarely lends patients such meaningful experiences so consistently, in a way that psychedelics almost appear to circumvent the normal expectations of pharmacotherapy; conventionally, the drug's chemistry solely informs the treatment outcome whereas with psychedelics, there is more stress placed on the experience of

the drug and how that is integrated into normal living rather than just the interaction between molecule and receptor.

The research ahead is purely a proposal. In no way were these methods conducted; in no way was new data gathered to inform the results. It only serves to support the use of psilocybin in a therapeutic context for a disorder as stubborn as PTSD. Additionally, it may provide a template for possible future research, conducted by the proper, non-undergraduate researchers. Most of all, it serves to inform those who are interested or ill-acquainted with the subject. Magic mushrooms have far more capacity to help than to hurt; not only is that a personal opinion, but the scientific method has verified and is constantly reverifying that claim. Skepticism is appropriate and productive for all new things, and this paper does not assert that psilocybin will be a cure-all for PTSD or otherwise, but one must avoid fear under the guise of skepticism. The scientific method is reliable and inherently skeptical, so finding the line between errant claims and scientific assertions is the necessary charge for every truly skeptical consumer. This paper offers a strong foundation in good, peer-reviewed science and follows the pattern of psychological research that is currently being conducted with psychedelics. That being said, it is being offered by an author who is both an undergraduate and one rather passionate about that research. Take everything with a grain of salt, but, very likely, this substance is not poisonous.

Methods

Participants and Team Members

Anticipating a medium to large effect size, the desired sample size will be at least 110 participants for comparing two arms of treatment along PTSD and depression symptom severity. In taking a culturally-informed approach to psychedelic-assisted therapy, recruitment of the

study's participant pool and treatment team are two of the most important steps. Participants will be recruited focusing on veterans coming off of service in Afghanistan in order to limit variation in trauma type. Both participants and clinicians should be diverse in gender, race, sexual orientation, and religious belief. For participants, the minimum diversity should reflect that of the U.S. service members at large (~ 60% White, 15% Black, 15% Hispanic, 5% Asian, and 5% Other; ~ 18% Women; Barroso, 2019). Additionally the treatment team should be diverse enough so that every participant can be matched for race and gender by at least one monitor in the treatment stage; ideally, monitors should come from different levels of clinical training and from different backgrounds in therapeutic orientation as well. Before interacting with participants, all team members (both therapy team and independent evaluators) will undergo diversity training within the structure of Functional Analytic Psychotherapy (FAP), specifically directed at curbing microaggressions and personal biases; this training provides a space to empathetically respond to bias-based transgressions and turn them into learning opportunities (Tsai et al., 2009).

Clinicians actively seeing patients who served, as part of Operation Enduring Freedom (OEF), within two years of the American evacuation from Afghanistan and have an index trauma that is combat-related will be the focus in outreach; those clinicians will be identified through USVA health care and contacted via email. They will then serve as the primary liaison for recruitment. If both clinician and patient agree in favor of participation, the personal clinician will then make an assessment of comorbid PTSD and Unipolar Major Depression diagnoses and associated symptom severities. If the participant is included in the study, they will be asked to taper off of selective serotonin reuptake inhibitors (SSRI) for at least five half-lives prior to psilocybin administration for the sake of internal validity. Other contraindicated medications,

such as antipsychotic medication, will be tapered as well. This decision is left up to the discretion of the participant and the participant's clinician; this study is concerned with experimental validity, so common aspects of everyday treatment, like drug-drug interaction, will ideally be controlled for in this trial. With the oversight of the personal clinicians, patients will be referred to this study and, by preference, be contacted through email, paper mail, or text.

Following referral, participants will undergo screenings for mental and physical health. An important aspect of the screening process is taking the time needed for participants to feel heard and understand the steps of screening; this involves defining jargon terms and, sometimes, using entirely different terminology to avoid alienating minority populations (Williams et al., 2019). The former, mental health screening, will, by preference, be conducted over the phone or video call by a team of eight independent mental health practitioners: they will exclude individuals who have immediate family or personal history of psychosis or psychotic disorders, history of serious suicide attempts, traumatic brain injury, bipolar disorder, eating disorder with active purging, or any current substance-use disorder. These criteria have been delineated based upon safety precautions specific to psilocybin's neural mechanisms and generally controlling for complications in treatment process (i.e. interactions between psilocybin and other substances, having to fast pre-treatment or ingest psilocybin peri-treatment) .As well, participants are expected to have a moderate degree of competency with the English Language. The mental health practitioners will also conduct an assessment of PTSD and Unipolar Major Depression measures to ensure consistency, greater reliability of measure, and establish a participant baseline.

The latter, physical health screening, will be conducted in-person by a team of eight independent general practitioners, focusing on cardiovascular health (i.e. electrocardiogram for heart rate, sphygmomanometer for blood pressure) and any glaring health issues that would take up participant cognition during the trial; additionally, any MRI contraindications (i.e. metallic implants) or positive pregnancy will result in exclusion. Baseline cardiovascular measures will be taken at this stage. Following physical and mental health assessments, another exclusion criterium will be previous habitual use of psychedelics (ten times or more) in an effort to control for expectancy effects - the impacts that researcher's behavior or participant's preconceived notions of the treatment can have on the treatment outcome. As the final part of screening, participant demographic variables will be recorded through online surveys on Qualtrics.

Randomization

Speaking more to expectancy effects and participant priming, much attention will be focused on blinding and removing bias. Blinding is a major issue in psychedelic research, as the psychotropic effects of psychedelics can be distinguished from placebo rather easily by most people; blinding of a participant falls apart when the participant can confidently guess that they have received the treatment rather than placebo before procedural unblinding. This is even true when an active placebo - a non-treatment drug that induces psychosomatic effects with little to no therapeutic potential - is used for comparison. A drug like niacin has previously been used as an active placebo in psilocybin trials as it gives the consumer a warm tingling sensation, but masking still is not maintained due to the lack of hallucinogenic effects (Doblin, 1991).

Given that, the most optimal choice of treatment-placebo structure in the present study is using a low dose of psilocybin as an active placebo; a low dose constitutes enough to begin the

psychosomatic sensations of a psilocybin trip without inducing fully hallucinogenic effects. The caveat is that this type of active placebo is predicated on the concept that its low dosage is not enough to elicit therapeutic outcomes beyond those of inactive placebo. However, that has not always shown to be true in research that has used low-dose psilocybin (10mg) as an active placebo (e.g. Gasser et al., 2014). That is why this study will attempt a novel approach: withholding from participants the number of dose levels in the trial in hopes that they will not anticipate a placebo. The major roadblock to this approach is ethical in nature; it's uncertain whether this procedure violates informed consent, yet it might be necessary for proper blinding (Muthukumaraswamy et al., 2021). In other words, this might just take some convincing of the Institutional Review Board (IRB), but it is likely worth it.

After screening, participants are randomized into one of two treatment groups using the demographic survey from Qualtrics. The control group, or low-dose group, receives two low dose active placebos of psilocybin, with the lowest dose in the first session (3mg psilocybin/70kg body weight) and a slightly higher dose in the second session (7mg/70kg). The treatment group, or high-dose group, receives two therapeutic doses of psilocybin, lower in the first (22mg/70kg) and higher in the second (27mg/70kg). Participants will be blind to condition as they are unaware that there is more than one arm of the study.

Measures

Outcome Measures

Both diagnoses of Post-Traumatic Stress Disorder and Major Depressive Disorder will be based on the Structured Clinical Interview for DSM-5 (SCID-5; First et al., 2016). Symptom severity for the two will be based on the Clinician-Administered PTSD Scale for the DSM-5

(CAPS-5; Weathers et al., 2018) and Beck-Depression Inventory - II (BDI-II; Beck et al., 1996) respectively. These last two scales will be used as the study's primary outcome measures for evaluating psilocybin's efficacy at addressing PTSD and MDD comorbidity. Given that they are the primary outcome measures, they will be taken at baseline, before experimental sessions, after experimental sessions, and at long-term follow-up.

The secondary outcome measures will focus on different aspects of the PTSD-depression comorbidity. General quality of life will be assessed using the Quality of Life Inventory (QOLI; Frisch et al., 1992). Mood will be measured using the Brunel Mood Scale (BRUMS; Terry et al., 2003). Trait anxiety, or stable attention to negative emotions, will be measured using the Spielberger's Trait Anxiety Inventory (STAI; Spielberger, 1983). Avoidance will be measured using the Brief Experiential Avoidance Questionnaire (BEAQ; Chawla & Ostafin, 2007; Gámez et al., 2014). Suicidal ideation will be measured using the Suicidal Ideation Attributes Scale (SIDAS; van Spijker et al., 2014). The measures above will also be taken at baseline, before and after experimental sessions, and at long term follow-up. The Work and Social Adjustment Scale (WSAS; Mundt et al., 2002) and Emotional Breakthrough Inventory (EBI; Roseman et al., 2019) will only be taken at baseline and in follow-up.

Mystical experiences will be measured using the 43-item Mystical Experience Questionnaire (MEQ43; Maclean et al., 2012). This self-report scale will be taken exclusively after experimental sessions. This scale is being considered closely with the primary outcome measures since mystical-type experiences have been implicated in therapeutic outcome previously (Griffiths et al., 2006).

Reliability Measures

In order to assess blinding integrity, a questionnaire will be conducted post-treatment before and after debrief. The questions before debrief will evaluate whether participants would recommend the treatment and whether the experience was what they expected it to be. After debrief, the questions will evaluate whether they believed there was only one condition until debrief, or whether, effectively, the deception was successful. Expectancy effects will be measured through the Stanford Expectations of Treatment Scale (SETS; Younger et al., 2012), this will be taken at baseline, the fourth preparatory session, and the fourth integration session. Also, records will be kept of the 'study culture' and reported in debrief; how the study team and participants interact is incredibly important for understanding contextual effects on treatment. Generally, the culture should be framed by patience, clarity (when possible), care, and professionalism. This will be recorded through a questionnaire at debrief for both study team and participants.

Also measures will be taken to evaluate the subjective drug experience, somewhat like a manipulation check. The two measures, taken after both experimental sessions, will be the Hallucinogen Rating Scale (HRS; Strassman & Qualls, 1994) and the 5-Dimension Altered States of Consciousness (5D-ASC; Dittrich, 1998). These will illuminate whether subjective effects of the drug relate to therapeutic outcome and will evaluate the distinction in subjective experience between control and treatment groups.

Safety Measures

Throughout the trial, adverse events of special interest (AESIs) will be monitored by different members of the study team. The two main columns of these potential events are

cardiovascular complications and suicidality. Diastolic and systolic blood pressure and heart rate will be taken 10 minutes before and 30, 60, 90, 120, 180, 240, 300, and 360 minutes after psilocybin administration in line with Griffiths et al. (2006) safety procedure; this will be conducted by the general practitioners who also conducted screenings. Suicidal ideation will be monitored through questioning, either by independent rater, monitor, or therapist, during screening, preparatory sessions, experimental sessions, integration sessions, and follow-up. All participants will be provided with a 24/7 phone number to call in case of serious suicidal ideation or other mental health-related crisis, upon which a rotating member from the study facility will be on-call and respond.

Procedure

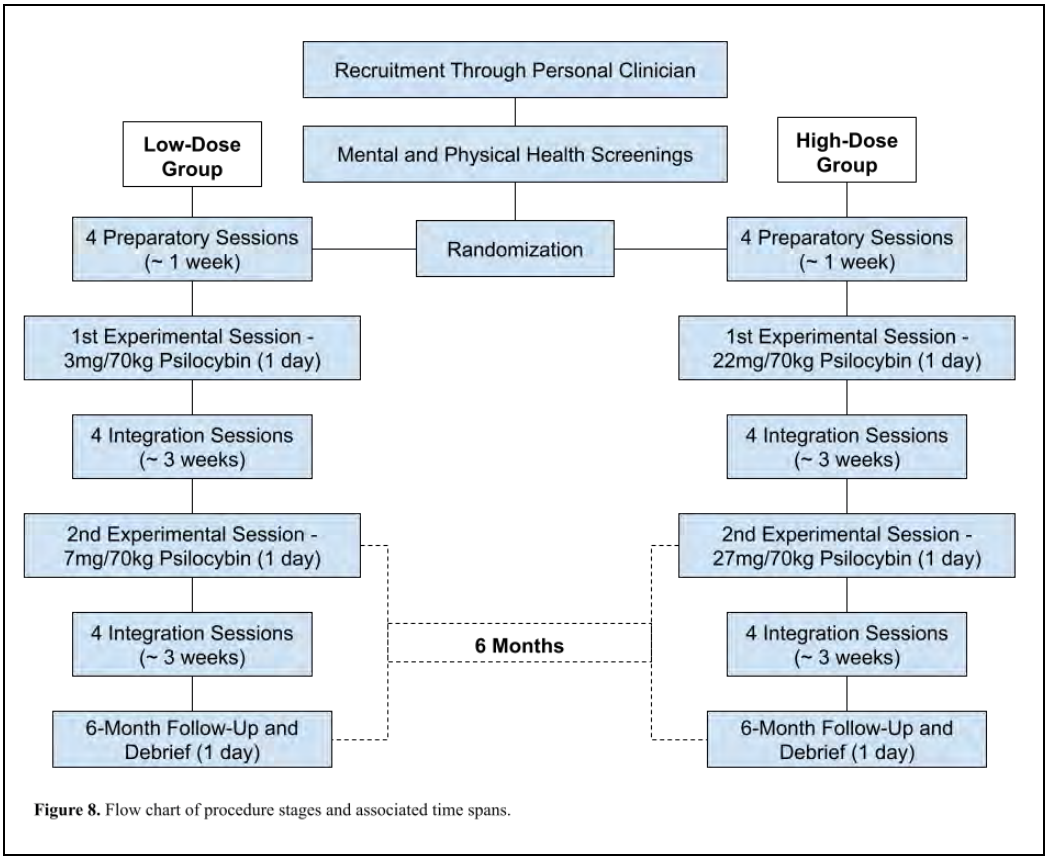

Figure 8. Flow chart of procedure stages and associated time spans.

Recruitment

Clinicians all across the United States who accept USVA health care will be contacted directly by phone. If the clinician shows interest in the study treatment, an email will be sent providing more specifics about the study; if the clinician habitually sees viable candidates - Afghanistan veterans with PTSD and depression - that clinician will reach out by email with a patient recommendation. The recommended patient will then reach out by email to the study team expressing interest which will initiate the screening process. After a correspondence has been made from both patient and clinician, the clinician will be expected to fax over the results from the SCID-5, CAPS-5, and BDI-II. For participants that have a combat-related trauma and meet the criteria for comorbid PTSD and depression, the study's mental and physical health screenings will be cleared. Yet prior to screenings, participants will be provided with informed consent in which the deception - there only being one arm of the study - will be elicited. Participants' baselines will be established for primary and secondary outcome measures, as well as safety measures from the mental and physical health screenings. Whether the mental health screening is over phone or video call is up to the participant, but that decision will be recorded for covariation in outcome measures. In total, the mental health screening will be composed of a description of the study - in line with the information provided with informed consent - and then the SCID-5, CAPS-5, BDI-II, Quality Of Life Inventory, Brunel Mood Scale, Spielberger's Trait Anxiety Inventory, Brief Experiential Avoidance Questionnaire, and Suicidal Ideation Attributes Scale. The physical health screening will be a general physical, asking and checking for any outstanding injuries or trauma that could inhibit therapeutic outcomes, in addition to baseline

blood pressure and heart rate measures with sphygmomanometer and electrocardiogram respectively. After the screenings, participants - blind to groupings - will be randomized into one of the two separate arms.

Set and Setting

The two separate groups will undergo identical procedures excluding dosing differences amid experimental sessions. The next step in the procedure is developing the therapeutic alliance and a comfortable study setting for participants throughout preparatory sessions. Each participant's sessions with the therapy team will take place in the same room throughout the study. Rooms should be adapted to look homey with landscape paintings, warm lighting, vegetation, and comfortable furniture. Only absolutely necessary medical equipment should be present, otherwise the space should be devoid of clinical paraphernalia besides the clinicians themselves. All sessions' audio will be recorded to retroactively detect any thematic differences between participant sessions and how that could relate to therapeutic outcomes; these recordings are matched with an ID number designated from Qualtrics in the demographic survey for participant de-identification.

The therapy teams are present in preparatory, experimental, integration, and follow-up sessions. Each team is composed of two individuals: clinical and experiential monitor. The former is a clinical psychologist, practiced with therapy for PTSD and depression, and the latter is a monitor more experienced with altered states of consciousness, particularly psychedelics, and dedicated to developing rapport with the participant. Expectations for the clinical monitor are to maintain some structure of talk therapy in all sessions outside of the experimental; most interaction will be between the participant and clinical monitor in preparatory and integration

sessions. Also, the clinical monitor will conduct all peri-session measures except the Mystical Experience Questionnaire, Hallucinogen Rating Scale, and the 5-Dimension Altered States of Consciousness. The experiential monitor will be responsible for education and understanding about the psychedelic experience; they will also attempt to provide reassurance throughout the study. This monitor is more important for creating a comfortable space; one in which the participant can feel free to ask any questions and express any concerns. In the experimental session amid psychotropic effects, they will be the primary touchpoints back to reality.

Preparatory Sessions

There will be four preparatory sessions for every participant in the span of a week. The first of those sessions will involve general introductions, discussion of previous therapy experience, and education about psychedelic-use in therapeutic settings. This will involve a description of what to expect in a psilocybin trip and how best to address the challenging experiences that may come with it; generally, the message is to submit oneself to the experience. Procedures of reassurance will be established (i.e. hand-holding and/or comforting words) as well. The second of these sessions will focus on the experience of a participant's comorbid disorder in everyday life: what aspects of the quotidian are most hampered by disorder and what does the participant most want to improve during the intervention. These goals can be small or large, specific or general; the point is to direct the experimental sessions towards certain cognition or behavior that is distressing. The third session is something of a quasi-experimental session. By using holotropic breathwork for about 60 minutes, or the taking of deep, fast breaths through the mouth, a state of altered consciousness can be induced. With the help of the experiential monitor, this strenuous, but meditative breathing exercise will yield participants

minor familiarity with the vulnerable state of a psychedelic trip. This session is also intended to reinforce the therapeutic alliance precedent to the experimental sessions. Before the breathwork session, the clinical monitor will conduct safety measures for suicidal ideation. Immediately after, cardiovascular measures will be taken for safety and the 5-Dimension Altered States of Consciousness will be taken for reliability. Participants will stay overnight at the study facility and the next morning, there will be a quasi-integration session where the participant is asked about the experience from the day before and whether any new insights have been gained from it regarding disorder or everyday life; in this session, primary and secondary outcome measures will be taken.

Experimental Sessions

One week following the fourth preparatory session, the first experimental session will take place for both conditions. Participants will be asked to fast for about 10 hours prior to psilocybin administration which is planned to start at 9AM. Before administration, safety measures will be taken; cardiovascular measures will be taken at the aforementioned time intervals throughout as well. Psilocybin will be administered in the form of a gelatin capsule with a dose of 3mg/70kg for the control group and 22mg/70kg for the treatment group. Both participants and monitors are blind to condition. During the 6-8 hours of psychoactive effects, the experiential monitor must be acutely aware of any psychological distress that would warrant reassurance or more rigorous intervention. Without any distress events during the session, the experiential monitor will still be responsible for check-ins about every hour, asking broad, subjective questions (i.e. “where do you find yourself now?”). Participants will be under blindfold, listening to a select playlist of music,and lying on a couch. If the participant needs

anything, such as the bathroom, the experiential monitor will be responsible for assisting. Generally, the session will be non-directive until the 8-hour mark, upon which the Mystical Experience Questionnaire, Hallucinogen Rating Scale, and the 5-Dimension Altered States of Consciousness will be conducted by the experiential monitor. Participants will be asked a few general questions about the experience to ground them and will then be provided with food and drink. Participants will stay overnight and undergo an integration session the following day. Three weeks after the first experimental session, the second experimental session will occur following the same procedure, but with 7mg/70kg and 27mg/70kg for the control and treatment groups respectively.

Integration Sessions and Follow-up

The first integration session will take place in the morning after the first experimental session. Both monitors will still be present, contributing equal parts to the integrative experience. The experiential monitor will help the participant put the experience into words and develop a logic around it. As well, the experiential monitor will draw attention to any specific thoughts or insights mentioned by the participant amid the experimental session. The clinical monitor will focus on any perceptual and/or symptom changes. Then, this monitor will try to orient the experience towards everyday life, how it could apply to the improvements the participant initially sought in treatment. Additionally, any new psilocybin-induced insights regarding the traumatic experience(s) will be an important topic to touch on. The integration sessions will also be important for identifying grounded behavioral changes to carry on after the trip; although psilocybin might provide an acute window for cognitive and behavioral change, that can only be carried forward with intention. The integration sessions are rather circumstantial, but can vary

from turning challenging experiences during the trips into insights or even breakthroughs to just visualizing the experiences through drawing or talking in order to evoke and recognize the emotions felt during the trip. Regardless of these general guidelines, it will be up to the participant to decide with whom to discuss the psilocybin experience out of the two; it can be either or both, but the choice will be the participant's. Three more integration sessions will take place over the span of three weeks, from the first experimental session until the second. Four integration sessions, using the above format, will also follow the second experimental session for a total of eight. Primary and secondary outcome measures will be taken at the first, fourth, fifth, and eighth integration sessions.

For follow-up, participants will return to the study facility and meet with both monitors again, six months after the second experimental session. In follow-up, primary and secondary outcome measures will be taken, now including the Work and Social Adjustment Scale and Emotional Breakthrough Inventory. Participants will then undergo debriefing, which includes the lowering of the mask and explanation of the study methods and participant groupings. Participants will be asked blinding-integrity questions before and after debrief. They will also provide subjective reflections on the psilocybin experiences and any marked lifestyle changes that followed; these statements will be thematically coded to be correlated with other outcome measures.

Predicted Results

All primary and secondary measures will be taken seven times in total, excluding the Work and Social Adjustment Scale and Emotional Breakthrough Inventory which will only be taken twice. The seven time points are baseline (at the start of the study), pre-experimental

session one (at preparatory session four), post-experimental session one (at integration session one), pre-experimental session two (at integration session four), post-experimental session two (at integration session five), final study session (at integration session eight), and at follow-up (six months after second experimental session). The Work and Social Adjustment Scale and Emotional Breakthrough Inventory will be conducted exclusively at baseline and follow-up.

Primary Outcomes

Concerning the primary outcome measures, there will be a wealth of information to draw from comparisons between groups at different time points of the study. A t-test for the difference between two independent means will be conducted, comparing severity scores along the CAPS-5

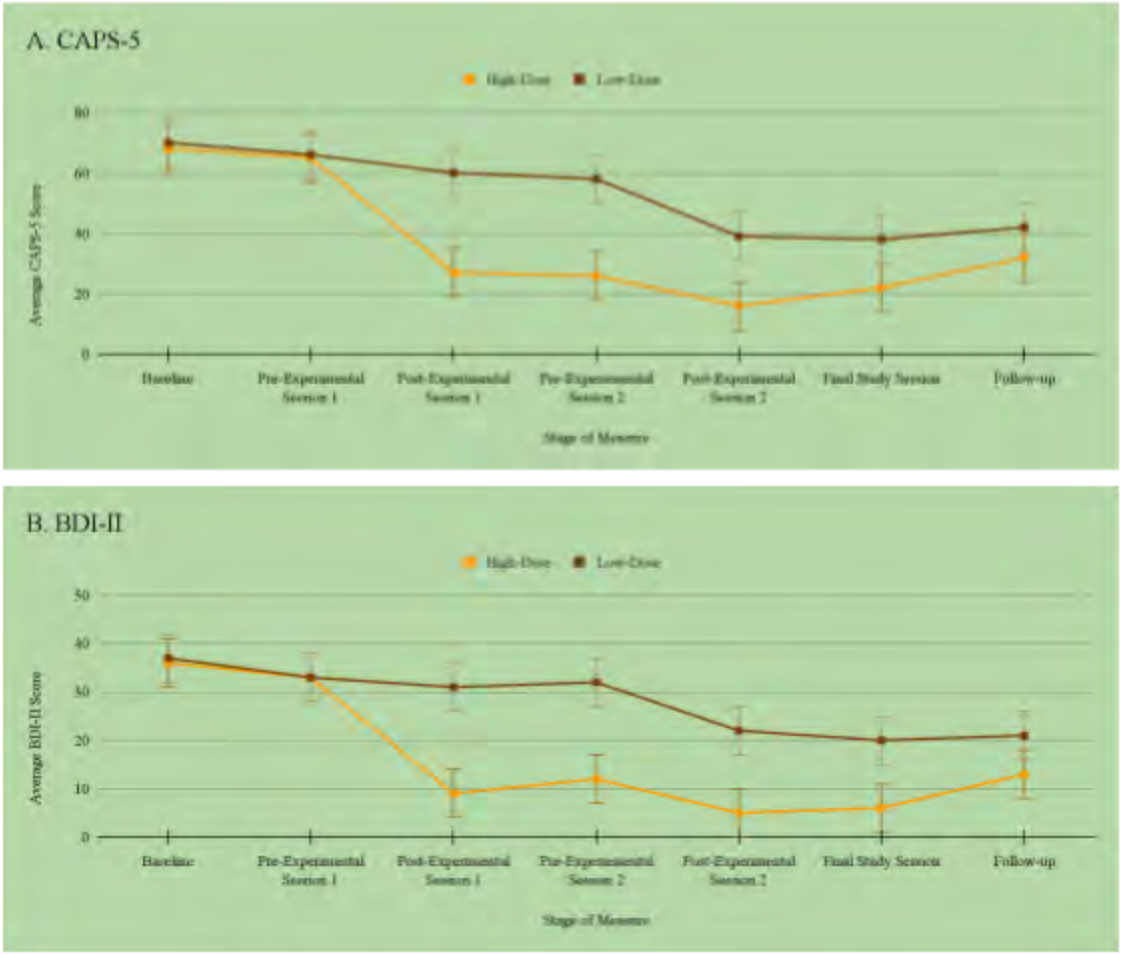

Figure 9. A) Predicted average CAPS-5 score between high-dose and low-dose groups throughout all relevant study time points. B) Predicted average CAPS-5 score between high-dose and low-dose groups throughout all relevant study time points. A&B) Presented with arbitrary constant standard error.

and BDI-II between control (low-dose) and experimental (high-dose) groups. From baseline to the final study session, with an alpha of .05 and sample size of at least 110 participants, the t-test is expected to find a marginally significant difference between groups for average CAPS-5 and BDI-II scores, with lower symptom severity scores in the high-dose psilocybin group than the low-dose. However, conducting the same t-test from baseline to post-experimental session one, it is expected that there will be a largely significant difference between groups for both CAPS-5 and BDI-II due to more acute effects of the drug, with lower scores for the high-dose group . At the six month follow-up, it is expected that there would be a near-significant difference between groups, with lower scores for the high-dose group. More conservative estimates of CAPS-5 scores are provided than those of BDI-II scores due to the lack of available data for psilocybin treatment with PTSD unlike psilocybin treatment with depression.

Secondary Outcomes

The secondary outcomes are evaluated both independently, for the varying impacts psilocybin could have on participants outside of the purview of the primary outcome measures, and jointly with primary outcome measures, for the influence those impacts could have on symptom severity change or vice versa. It is expected that many of the secondary outcome measures, similar to the primary outcome measures, will be dose-dependent; all measures are considered, not only in relation to dosage, but also with scores on the Hallucinogen Rating Scale and the 5-Dimension Altered States of Consciousness to ensure the manipulation was effective. In that, it is expected that the high-dose group will show significantly higher pro-therapeutic change from baseline on the Quality of Life Inventory, Brief Experiential Avoidance Questionnaire, and Spielberger's Trait Anxiety Inventory than the low-dose group at the

post-experimental session one, post-experimental session two, and follow-up time points. The pro-therapeutic change in the Brunel Mood Scale will be significantly higher in the high-dose group than low-dose at the post-experimental session one time point, but not at post-experimental session two nor follow-up. The Suicidal Ideation Attributes Scale will show greater pro-therapeutic changes that do not reach significance in the high-dose group than the low-dose at all time points. The Work and Social Adjustment Scale and Emotional Breakthrough Inventory will show significantly greater pro-therapeutic changes from baseline to follow-up for the high-dose groups as well. As for the Mystical Experience Questionnaire, it is expected that higher scores will also be dose-dependent - so higher for the high-dose group than the low-dose.

In terms of correlation it is expected that higher scores on the Mystical Experience Questionnaire relate to lower scores on the primary outcome measures and to pro-therapeutic outcomes in secondary measures. Higher scores on the Quality of Life Inventory and Work and Social Adjustment Scale will be related with lower primary outcome measures as well. Lower scores Brief Experiential Avoidance questionnaire and Spielberger's Trait Anxiety Inventory will be related to lower scores specifically on the CAPS-5. Higher scores on the Brunel Mood Scale and Emotional Breakthrough Inventory and lower scores on the Suicidal Attributes Scale will all be related to lower scores specifically on the BDI-II. It is recommended that a regression analysis is run to evaluate interacting effects (mediation and moderation) between different constructs represented here.

Reliability Outcomes

Using the Stanford Expectations of Treatment Scale, it is expected that there will be no significant difference in change between groups from baseline to pre-experimental session one,

and pre-experimental session two. Study culture will be recorded for the sake of future research rather than this study, evaluating whether it could interact with outcomes; therefore, no analyses will be conducted for study culture in this study, only thematic coding of responses. Debrief blinding questions will be considered subjectively by independent raters to understand whether there was any doubt about study procedure and the singular treatment arm deception.

Discussion

This study proposal puts forth a comprehensive rationale and procedure for psilocybin-assisted therapy directed at comorbid Post-Traumatic Stress Disorder and depression. Given that no randomized controlled trials have yet been conducted concerning this topic, the procedure is necessarily novel. There are aspects to this study that are relatively untested and therefore leave room for uncertainty and flaws in internal validity, however that is an essential risk in the research process. That being said, it is founded on other psychedelic-assisted therapy methods that have been peer-reviewed and replicated multiple times. Beneath the methods lie a wealth of literature on psilocybin, PTSD, and depression that provide a well-reasoned rationale for research practice. This study will illuminate on the therapeutic potential of psilocybin for PTSD in its whole spectrum of disorder.

Broad Takeaways

The overarching purpose of this proposal is to offer a path for one of the next steps in psychedelic-assisted therapy research. Although PTSD with depression is fraught with complications, psychedelics, specifically psilocybin and LSD, have shown promise in remediating a variety of disorders with different symptom presentations. But beyond general efficacy, psilocybin seems to specifically target some of the neural mechanisms related to PTSD

and depression. If the appropriate precautions are taken in employing a treatment that is, for some, perplexing and stigmatized, then the treatment for PTSD can very well be revolutionized. Small steps informed by good practices will benefit all involved in the mental health field. This proposal is one small step to eventually diversify the treatment options available to those captured by disorder. By testing, for the first time, psilocybin directed at PTSD in a randomized controlled trial, the substance's treatment potential will be more clearly understood and possibly refined. This study frames psilocybin-assisted therapy as effective at treating PTSD and depression symptoms, particularly when administered at higher doses. Additionally, it posits that the high-dose treatment, when compared with low-dose treatment, will significantly improve quality of life, trait anxiety, avoidance, emotional development, and everyday life up to six months after administration. More short term, psilocybin treatment generally will improve mood and suicidal ideation.

Strengths

This study is directed at internal validity, and given its novelty, it will provide a conservative proof of concept for future research. By limiting the participant population through exclusion criteria of trauma type and comorbidity type, it makes it easier to assert that outcome differences between groups and individual participants will be attributable to dosing, this study's manipulation, rather than other uncontrolled variables. As well, controlling for diet and pharmaceutical intake allows the study to better assert that the psychosomatic changes participants undergo will be due to psilocybin, and differences between groups will be due to differential dosing. With a clear pathway from psilocybin to PTSD, any study outcomes will very likely be caused by how and how much psilocybin is administered.

Blinding, is therefore, an important strength to this study procedure. Since participants will not be privy to different treatment arms, there should be no expectancy differential between groups. Additionally, participant blinding integrity will be unlikely to falter given that participants will not recognize that they are blinded. This is expected to show a marked improvement in participant blinding from some other in vivo human psychedelic studies (e.g. Carhart-Harris et al., 2021; Griffiths et al., 2016). Another novel strength of this study is its focus on the therapeutic alliance. Factors such as diversity training, monitor-participant diversity matching, the experiential monitor framework, and holotropic breathwork in the preparatory stage are all expected to contribute to a strong alliance even prior to the study's manipulation. A strong alliance ensures the proper implementation of psilocybin-assisted therapy by reassuring participants in a foreign experience and avoiding any undue anxiety (Johnson et al., 2008).

Novelty, in this study, is just as important as convention. Since it is founded on previous work with psychedelics, facets of the procedure, such as setting formation, specific dosage, and preparatory, experimental, and integration session conduct are built off of pre-existing, tested structures of research. Although employing certain degrees of novelty, this study fits in well with the literature that has already yielded promising results with psychedelics. Yet much of that research with psychedelics, specifically around PTSD, has been done with MDMA. When considering the value of this study, it is important to note that although breakthrough therapy status for PTSD has been designated to MDMA, psilocybin could have benefits that MDMA does not. Psilocybin, although less predictable and stable than MDMA, has greater capacity for ego-dissolution, which this paper argues is an important component to treatment potential for depression particularly, and PTSD potentially. As well, an argument against psilocybin is the

potential it has to circumstantially induce anxiety which can be severely problematic for the treatment of certain individuals with PTSD; however, this study dedicates extensive effort to developing therapeutic alliance and establishing a comfortable setting for the sake of reducing potential anxiety (Krediet et al., 2020). In a more ecological perspective, psilocybin has less potential to cause adverse effects for individuals on SSRIs than MDMA, which supports psilocybin's direction toward depression comorbidity with PTSD. Psilocybin can be harnessed in the right setting with the right procedures and the right people.

Limitations

In research studies, there tends to be something of a zero sum game between strengths and limitations. That proves true in the current study as well, particularly in the dynamic between internal and external validity. Where this study ensures that psilocybin administration, above all else, will be the source of differences in outcome, it sacrifices some of the applicability this manipulation will have to different populations in different settings. Sample restriction, such as only including a specific, singular comorbidity of PTSD rather than its whole range of comorbidities, only including a specific type of trauma, and only drawing from those who have USVA healthcare, will inhibit how generalizable the results of this study will be. In the same vein, necessitating an SSRI taper will limit how externally valid this study can be, considering antidepressants such as SSRIs are a standard of treatment for PTSD and depression; if psilocybin is to be implemented into standard treatment, it will have to take into account the drug-drug interactions that will be controlled for in this study. For the average clinician addressing PTSD and depression, factors like trauma type and other interacting disorders must be contended with

in treatment. In that, this study will not provide a direct route from research to practice, but begins a proof of concept to be reevaluated, improved, and, hopefully, verified by future research.

As with all other research done with psychedelics, study design warrants greater attention to really address the relatively unique problems of expectancy and blinding. The design of this study will make use of low-dose psilocybin as an active placebo to reduce differential expectancy effects across groups and improve blinding integrity generally. However, with the benefits of that design also come hindrances. Chiefly, as mentioned before, low-dose psilocybin might not be the best placebo comparator considering it has the potential to yield large therapeutic effects. This explains the predicted results of non-significant differences between groups on primary outcomes at follow-up; both groups, even the control, may have substantial therapeutic improvement. This maps onto work with low-dose psilocybin that shows not only near-equivalent improvement between low and high doses, but, in rodent study, even greater improvement for low dose than high dose on certain metrics, such as loss of fear conditioning (Catlow et al., 2013; Gasser et al., 2014). The blinding of this study will be particularly directed at participant perspective, but a downside is there will be the opportunity for blinding to falter among the study team, specifically among the monitors. Given that the experiential monitor position is predicated on having experience with altered states of consciousness, it will be expected that most of them will be able to distinguish between the experiences of low and high doses. Monitors, therefore, are likely to lose their blinding and recognize which condition participants are under. This may result in differential treatment by monitors of the different study groups which may result in biased data. There is a balance between blinding and comparison that future researchers must play with in order to glean the most ‘true’ effects of psilocybin in treatment.

Future Research

The research world of psychology still has a lot to learn from psilocybin. This study attempts to push that research into a small portion of the vast territory that is yet unexplored. To draw directly from the limitations of this study, there is a need for more externally valid and blinding-conscious procedures. The next studies must focus on the real-world practice of therapy and how this treatment could exist outside of a study setting where there are fewer variables that are controlled for. As well, if it is the case that the low-dose condition is not significantly distinguishable from the high-dose condition, the low-dose active placebo might not be the best comparator despite its strengths in blinding. Using a non-psilocybin active placebo may be possible if another study procedure is used; namely, a balanced placebo factorial design, in which there are four conditions: the first where participants expect psilocybin and get psilocybin, the second where participants expect psilocybin and get placebo, the third where participants expect placebo and get placebo, and the fourth where participants expect placebo and get psilocybin. The second and fourth conditions involve rather serious deception, so ethical considerations must be made, but this is one feasible method to avoid using psilocybin active placebo (Muthukumaraswamy et al., 2021). Also, in order to avoid monitor biasing, choosing monitors who are less acquainted with psilocybin might prove important to maintaining a double-blind, even if it is at the expense of the comfort provided by the experiential monitor.

Participant sample is something that should be explored extensively as well. Namely, trauma type within the sample should be thoroughly investigated in how it interacts with the treatment. It is unlikely that outcomes would be drastically different between trauma types, and even less likely that it would perform worse in other trauma types considering military

populations experience worse treatment outcomes generally (Straud et al., 2019). Notwithstanding, trauma type is meaningful for symptom presentation and therefore meaningful for direction of treatment. For example, combat trauma more often manifests in hyperarousal and memory intrusion whereas sexual trauma shows higher rates of avoidance and negative mood (Guina et al., 2018). Although these are just minutiae within a broad symptomatology, particulars of symptom presentation are pivotal in formulating adaptable treatment. If it is the case that different trauma types interact differently with this study's methods, the methods should be adjusted accordingly.

Moving away from the specific procedures of this study, looking more broadly at the psychedelic-psychology field, there are two major regions of research that have not been undertaken in randomized controlled trials: different types of psychotherapy and pre-experimental session psychedelic intervention. Addressing the former, most therapy that has been employed alongside a study-based psychedelic administration tends to be non-directive: participants are asked to sit blindfolded and are interacted with mostly for the sake of safety and anxiety reduction (Krediet et al., 2020). Yet there is a whole gamut of psychotherapies that could potentially supplement psychedelic-use more effectively than what is currently practiced. Take, for example, cognitive processing therapy (CPT) for PTSD; with the addition of psilocybin, it might be easier for participants to overcome stuck points and unhealthy cognitive patterns that have developed since a trauma. Moreover, when compared to other psychotherapies, the shorter timespan of cognitive processing therapy might align well with the track of psilocybin administration. Yet, this raises a wealth of intriguing questions. When should psilocybin be administered? In the midst of talk-therapy or a day beforehand? What dosage would work best

for different therapies? Should psilocybin be used in the long term, in microdoses alongside therapy, similar to SSRI-assisted therapies for depression? These questions do not yet have answers, but the hope is that they eventually will.

The account of comfort within psychedelic-assisted therapy has already been touched on conceptually and practically in this study; the components that curate a comfortable setting for participants should be seen as equally valuable to the substance being administered. In an attempt to reduce anxiety before a potentially life-changing experience, rooms are altered and music playlists are created. These unusual variables can be rather consequential for therapeutic outcomes and so they should be accounted for in procedure design (Johnson et al., 2008). Yet comfort is a broad variable and can be targeted through other approaches than just interior design and orchestral intervention. One of note is pre-experimental drug administration. By giving participants a small dose of another psychedelic, such as LSD prior to the experimental session, the participants are less likely to experience unfamiliarity-based anxiety during experimental sessions (Krediet et al., 2020). As well, this has the capacity to improve the therapeutic alliance prior to primary intervention. This study introduced holotropic breathwork as a novel stand-in for such intervention, yet its success in inducing an altered state of consciousness is very much dependent on one's previous experience with meditation which often fluctuates greatly between participants. Therefore, future research should consider a pre-experimental session of hallucinogenic dosing with a substance comparable to the primary intervention in order to improve participant comfort going into that intervention; this poses difficulties in the greater funding and drug approval processes, but it should still be considered as an option.

There is still so much that has not been employed in an experimental setting, often out of an abundance of caution. That caution should not be forgone by any means, but in the case that the current psychedelic-assisted therapy methods do not yield the consistently significant pro-therapeutic results that they are currently, there are a variety of procedural changes that have not yet been attempted and wield great therapeutic potential.

External Import

With high suicide rates and debilitation that halts many aspects of normal living, PTSD has discouraging implications for the individual. With prevalence rates around 7% in the American population, PTSD poses serious issues for the society. With no cessation of traumatic events in sight, effective treatment remains ever-important. Psilocybin has already shown significant therapeutic potential for a wide range of the disordered experience including depression, anxiety, addiction, and obsessive compulsive disorder (Bogenschutz et al., 2015; Carhart-Harris et al., 2016; Castro Santos & Gama Marques, 2021; Johnson et al., 2014; Moreno et al., 2006). Further, psilocybin shows low abuse potential, generally minimal safety concerns, and positive outcomes for individuals outside of disorder (Gukasyan et al., 2022; Johnson et al., 2018; Rucker et al., 2022). With promising evidence, the research will hopefully continue and contribute to the betterment of people's lives. Substances like psilocybin - psychedelics, hallucinogens - defy current Western standards for treatment and medicine. There is a wealth of information to be drawn from the eclectic molecules; whether that is information about the world at large or about how we conceptualize our minds remains to be seen. There is a possibility that psilocybin could alter the way the West considers treatment. Or maybe disorder could be founded

in a singular pattern of cognition that psychedelics help to disrupt (Pollan, 2018). There is no telling at this stage, but research is a helpful tool to figure that out.

This study's focal point is veterans and their combat-related trauma. As already discussed, they have been chosen not only to control for trauma type, but to address a population that is systematically ignored by the government that haphazardly disordered and forgot about them. As shown in the history, war has propelled much of the present understanding of PTSD, but that history was also dominated by rhetoric of malingering and denial. The United States has consistently fallen short of providing the appropriate mental health treatment for those exposed to combat. Since veterans are about two times as likely to develop PTSD, this is a serious problem that rests at the feet of the U.S. government (Friedman, 2019). When the impoverished and disenfranchised of this country are funneled into an overfunded military industrial complex in which they experience repeated traumas amid imperialist campaigns, the responsibility of treatment does not fall on those caught in the cogs, but the ones running the machine. Psilocybin and other psychedelics have shown promise for remediating some of the veteran's mental and existential strife. By funding psychedelic research and providing easy access to the treatment for all who need it, the structures can begin to heal some of the damage they have done.

However, that has not yet been realized. With all psychedelics, other than ketamine (licensed as esketamine for treatment-resistant depression) still listed by the FDA as Schedule 1, veterans and other PTSD-affected populations are left to work with inconsistent treatment. Given the treatment potential that psychedelics have shown for disorder, veterans have taken it unto themselves to seek out the treatment abroad, footing rather expensive travel bills for ayahuasca treatment that their own country will not provide (Israel, 2017). If this country professes to be

concerned with mental health, helping specifically-targeted populations is a good start. Yet in no way should effective treatment ever justify the initial harm done. Actively distressed veterans are victims of a system that has failed them. This distress has created an outcry directed at the system. Even if proper treatment responds to and addresses the distress, there still remains a systemic problem. Confronting PTSD starts with prevention, not treatment. For the veteran population, that means avoiding war where possible; in recent years, in the United States, avoiding war has been more than possible, just not profitable. Psilocybin should be used to improve lives where it can, but it should not be used as a crutch for a failed system. This study advocates for harm reduction; systemic change for the sake of harm prevention must manifest alongside the treatments that offer harm remediation. Although this study is fighting for the responsive side to harm reduction, there is a whole other battle to be fought for prevention, and it starts with reevaluating the systems that are.

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Appendix A
INFORMED CONSENT AGREEMENT

Study Title: *Tripping over Trauma*: A Proposal of Psilocybin-Assisted Therapy for Comorbid Post-Traumatic Stress Disorder and Depression.

Principal investigator: Liam Gomez

Background. The goal of this study is to examine the therapeutic potential of psilocybin-assisted therapy for comorbid PTSD and depression.

What you will do in this study. You will consume the classical psychedelic, psilocybin, twice in the form of gelatin capsules. This will be supplemented by different stages of talk therapy primarily focused on traumatic experience recollection, everyday PTSD/depression symptoms, the psychedelic experience, and any interaction between the psychedelics and recollection or symptoms following treatment. Additionally, you will also be asked to respond to a series of different measures, either self-reported or administered by site staff.

Study time and location. The study will be conducted at John Hopkins University, specifically the John Hopkins Bayview Medical Center. The primary study sessions should take about two months from recruitment to conclusion. This is divided up into one screening, four preparatory sessions, two experimental sessions, and eight integration sessions. There will be a six-month follow-up session as well.

Risks and benefits. Since there will be therapy directed at trauma recollection, there is a chance for major distress. As well, those unfamiliar with psilocybin can experience anxiety amid the psychotropic effects. There is a small chance of psychosis or lasting perceptual changes from psilocybin intake. Throughout the study, monitors will be present to aid through any mental or physical distress. In addition to the monitors, you will have access to a 24-hour hotline if you are experiencing any distress outside of the sessions. This study has the potential benefit to promote recovery in individuals with PTSD and depression, by reducing distressing symptoms or improving quality of life. This study will also provide participants with educational benefits on psychedelic function and treatment, with additional information on non-traditional treatment forms (i.e. holotropic breathwork).

Compensation. All participants will be monetarily compensated for their time. Participants will be given $10 for every preparatory and integration session, as well as the follow-up session. For experimental sessions, participants will be paid $15.

Your rights as a participant. Participation in this study is completely voluntary. You may withdraw at any time with no questions asked, and no penalty; participants will be provided with the remainder of their session-based compensation in the case of withdrawal.

Confidentiality. All measures and audio recordings will be assigned to a participant ID, removed from any personal identifiers. There will be no record of personal identifiers in published materials.

Contact. If you have any questions regarding this study please do not hesitate to ask now or contact Liam Gomez, email: lg9312@bard.edu. If you have any questions regarding participant rights please contact the Institutional Review Board, email: irb@bard.edu.

Consent. By signing below, I am agreeing to participate in this study and affirm that I am at least 18 years old. I am agreeing to be contacted via phone or email to schedule times to participate. I affirm that the research has been explained to me and that I am participating voluntarily, and may withdraw at any time.

_____

Participant name (printed)

_____ _____

Participant signature Date

_____ _____

Researcher signature Date

Appendix B
DEBRIEF

Study title: *Tripping over Trauma*: A Proposal of Psilocybin-Assisted Therapy for Comorbid Post-Traumatic Stress Disorder and Depression.

Principal Investigator: Liam Gomez

Purpose of the study. The purpose of this study is to determine whether psilocybin-assisted therapy was effective at treating PTSD and depression symptoms. This was measured between two different groups: a low-dose group and a high-dose group. It was hypothesized that the high-dose group would show greater reductions in symptoms and better general treatment outcomes than the low-dose group.

Deception. You were not informed that there were two groupings of participants. This meant that one group, without knowing it, was given a higher dose with a hypothesis that it would show greater therapeutic benefit than the lower dose group. This deception was done so that you would not attempt to guess which group you were in based on how intense the psilocybin experience was. If one is aware of what group one is in, there is the potential for that to influence the study results beyond just the treatment. This deception allows a more controlled comparison of the two groups.

Contact. If you have any questions regarding this study please do not hesitate to ask now or contact Liam Gomez, email: lg9312@bard.edu. If you have any questions regarding participant rights please contact the Institutional Review Board, email: irb@bard.edu.

Support. If you experienced absolutely any distress from this study please contact the designated contact monitor ([phone number] and [email]). For any additional support please call the 24-hour confidential crisis support, Veterans Crisis Line, at 1-800-273-8255, text 838255, or chat online at https://www.veteranscrisisline.net/get-help-now/chat/.

Additional information. For any additional information or assistance regarding PTSD and depression, please refer to your personal clinician or the resources at https://www.ptsd.va.gov/.

Appendix C
BUDGET PLAN

Psilocybin supply. With an average cost of about $7 per milligram of synthetic psilocybin and a desired sample size of 110 participants, the cost for two sessions for every participant across the two different dosage groupings will be approximately $23,000.

Participant compensation. Between the $10 for every preparatory, integration, and follow-up session and $15 for every experimental session, compensation for all 110 participants will require approximately $18,000.

Study team compensation. The independent raters responsible for conducting mental and physical health screenings will be paid $18 per hour during screening, in which time spans will greatly fluctuate between individual screenings so an estimate is difficult to determine for each individual. Approximately $6,000 should be allocated for screenings, although that may be subject to change. The clinical monitor will be paid at $22 per hour, the experiential monitor will be paid at $20 per hour, and the general practitioner present during sessions to take safety measures and intervene in the case of adverse events will be paid at $18 per hour. In total, this will cost approximately $204,600. From screening to follow-up, study team compensation will be approximately $210,600.

Appendix D
STATISTICAL PLAN

Confirmatory analysis. The primary analysis that will be conducted to evaluate the efficacy of psilocybin-assisted therapy on PTSD and depression symptom reduction will be a two-tailed *t*-test for the difference between two independent means with an alpha of .05. This will be conducted along the primary outcome measures - the CAPS-5 and BDI-II - attempting to detect a difference between the scores of the low-dose group and the high-dose group from baseline to four different time points of the study: post-experimental session one, post-experimental session two, final study session, and follow-up. For all secondary outcome measures, a two-tailed *t*-test for the difference between two independent means with an alpha of .05 will be used, comparing the change in measure score from baseline to the aforementioned time points between the two different participant groups.

Exploratory analysis. This analysis incorporates the secondary outcome measures and reliability measures (Quality Of Life Inventory, Brunel Mood Scale, Spielberger's Trait Anxiety Inventory, Brief Experiential Avoidance Questionnaire, Suicidal Ideation Attributes Scale, Mystical Experience Questionnaire, Work and Social Adjustment Scale, Emotional Breakthrough Inventory, Hallucinogen Rating Scale, and the 5-Dimension Altered States of Consciousness). Using a correlation matrix with Pearson's *r* correlation coefficient grouped by dosage groupings, any significant relationships between measures will be detected. These measure scores will also be correlated with the primary outcome measure scores at different time points throughout the study. Primary and secondary outcome measures will be grouped by reliability measures scores to detect any failure in manipulation, or differences based upon psilocybin's reported psychotropic effects. As well, primary and secondary outcome measures will be considered in relation to demographic variables.

Appendix E

SCALES AND MEASURES

Measures without available .pdfs are described in text below

Quality of Life Inventory. This is a 32-item scale with three-point rating scale for importance, and six-point rating scale for satisfaction. Its denoted constructs are: Health, Self-Esteem, Goals and Values, Money, Work, Play, Learning, Creativity, Helping, and Love, as well as Friends, Children, Relatives, Home, Neighborhood, Community, and Overall Well-being.

Brief Experiential Avoidance Questionnaire. This is a 15-item scale with a six-point rating scale. The prompts cover a range of avoidance: of pain, of uneasiness, of effort, of upset, of unpleasantness, of discomfort, of emotions, of painful emotions, of feelings, of bad feelings, of upsetting feelings, of fear/anxiety, of unpleasant memories, and of doubts.

Brunel Mood Scale. This is a 24-item scale that asks respondents to rate a list of adjectives on a five-point Likert scale. There are six affective mood dimensions of the scale, all with different subscale items: *Anger*: annoyed, bitter, angry, bad-tempered; *Confusion*: confused, muddled, mixed-up, uncertain; *Depression*: depressed, downhearted, unhappy, miserable; *Fatigue*: worn out, exhausted, sleepy, tired; *Tension*: panicky, anxious, worried, nervous; *Vigor*: lively, energetic, active, alert.

Emotional Breakthrough Inventory. This is a six-item scale, with ratings on a visual analogue scale from 0-100.The items are outlined below (Roseman et al., 2019):

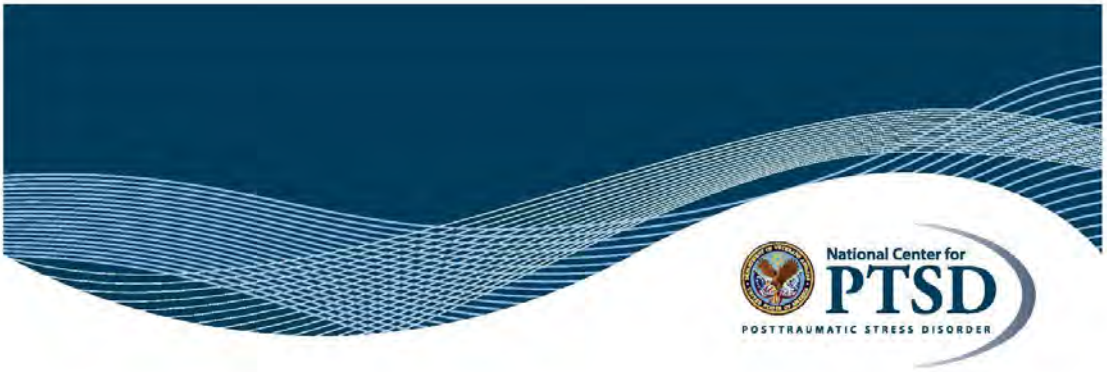
I faced emotionally difficult feelings that I usually push aside.
I experienced a resolution of a personal conflict/trauma.
I felt able to explore challenging emotions and memories.
I was resisting and avoiding challenging feelings throughout, without breakthrough.
I had an emotional breakthrough.
I was able to get a sense of closure on an emotional problem.
I felt emotionally stuck throughout, without breakthrough.
I achieved an emotional release followed by a sense of relief.

Hallucinogen Rating Scale. This is a 71-item scale with each item scored from 0-4 on the degree to which an item was experienced. The items are grouped

according to: *Somaesthesia*: somatic effects; *Affect*: emotion and affect; *Volition*: capacity to willfully interact with the self or environment; *Cognition*: alterations in thought processes or content; *Perception*:change in perceptual experience; *Intensity*: strength of the overall experience.

5D-ASC, BDI-II, CAPS-5, MEQ43, SETS, SIDAS, STAI, and WSAS below

• • •



CLINICIAN-ADMINISTERED PTSD SCALE FOR *DSM-5*

Past Month Version

Version date: 01 May 2015

Reference: Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., & Keane, T. M. (2015). *The Clinician-Administered PTSD Scale for DSM-5 (CAPS-5) – Past Month* [Measurement instrument]. Available from http://www.ptsd.va.gov/

URL: http://www.ptsd.va.gov/professional/assessment/adult-int/caps.asp

Name: _____

Interviewer: _____

Study: _____

ID#: _____

Date: _____

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CAPS-5 Past Month

Instructions:

Standard administration and scoring of the CAPS-5 are essential for producing reliable and valid scores and diagnostic decisions. The CAPS-5 should be administered only by qualified interviewers who have formal training in structured clinical interviewing and differential diagnosis, a thorough understanding of the conceptual basis of PTSD and its various symptoms, and detailed knowledge of the features and conventions of the CAPS-5 itself.

Administration

1. Identify an index traumatic event to serve as the basis for symptom inquiry. Administer the Life Events Checklist and Criterion A inquiry provided on p. 5, or use some other structured, evidence-based method. The index event may involve either a single incident (e.g., "the accident") or multiple, closely related incidents (e.g., "the worst parts of your combat experiences").
2. Read prompts verbatim, one at a time, and in the order presented, EXCEPT:
   a. Use the respondent's own words for labeling the index event or describing specific symptoms.
   b. Rephrase standard prompts to acknowledge previously reported information, but return to verbatim phrasing as soon as possible. For example, inquiry for item 20 might begin: "You already mentioned having problem sleeping. What kinds of problems?"
   c. If you don't have sufficient information after exhausting all standard prompts, follow up ad lib. In this situation, repeating the initial prompt often helps refocus the respondent.
   d. As needed, ask for specific examples or direct the respondent to elaborate even when such prompts are not provided explicitly.
3. In general, DO NOT suggest responses. If a respondent has pronounced difficulty understanding a prompt it may be necessary to offer a brief example to clarify and illustrate. However, this should be done rarely and only after the respondent has been given ample opportunity to answer spontaneously.
4. DO NOT read rating scale anchors to the respondent. They are intended only for you, the interviewer, because appropriate use requires clinical judgment and a thorough understanding of CAPS-5 scoring conventions.
5. Move through the interview as efficiently as possible to minimize respondent burden. Some useful strategies:
   a. Be thoroughly familiar with the CAPS-5 so that prompts flow smoothly.
   b. Ask the fewest number of prompts needed to obtain sufficient information to support a valid rating.
   c. Minimize note-taking and write while the respondent is talking to avoid long pauses.
   d. Take charge of the interview. Be respectful but firm in keeping the respondent on task, transitioning between questions, pressing for examples, or pointing out contradictions.

Scoring

1. As with previous versions of the CAPS, CAPS-5 symptom severity ratings are based on symptom frequency and intensity, except for items 8 (amnesia) and 12 (diminished interest), which are based on amount and intensity. However, CAPS-5 items are rated with a single severity score, in contrast to previous versions of the CAPS which required separate frequency and intensity scores for each item that were either summed to create a symptom severity score or combined in various scoring rules to create a dichotomous (present/absent) symptom score. Thus, on the CAPS-5 the clinician combines information about frequency and intensity before making a single severity rating. Depending on the item, frequency is rated as either the number of occurrences (how often in the past month) or percent of time (how much of the time in the past month). Intensity is rated on a four-point ordinal scale with ratings of *Minimal, Clearly Present, Pronounced*, and *Extreme*. Intensity and severity are related but distinct. Intensity refers to the strength of a typical occurrence of a symptom. Severity refers to the total symptom load over a given time period, and is a combination of intensity and frequency. This is similar to the quantity/frequency assessment approach to alcohol consumption. In general, intensity rating anchors correspond to severity scale anchors described below and should be interpreted and used in the same way, except that severity ratings require joint consideration of intensity and frequency. Thus, before taking frequency into account, an intensity rating of *Minimal* corresponds to a severity rating of *Mild / subthreshold*, Clearly Present corresponds with *Moderate / threshold*, Pronounced corresponds with *Severe / markedly elevated*, and Extreme corresponds with *Extreme / incapacitating*.

2. The five-point CAPS-5 symptom severity rating scale is used for all symptoms. Rating scale anchors should be interpreted and used as follows:

   0 *Absent* The respondent denied the problem or the respondent's report doesn't fit the *DSM-5* symptom criterion.

   1 *Mild / subthreshold* The respondent described a problem that is consistent with the symptom criterion but isn't severe enough to be considered clinically significant. The problem doesn't satisfy the *DSM-5* symptom criterion and thus doesn't count toward a PTSD diagnosis.

   2 *Moderate / threshold* The respondent described a clinically significant problem. The problem satisfies the *DSM-5* symptom criterion and thus counts toward a PTSD diagnosis. The problem would be a target for intervention. This rating requires a minimum frequency of *2 X month* or *some of the time (20-30%)* PLUS a minimum intensity of *Clearly Present*.

   3 *Severe / markedly elevated* The respondent described a problem that is well above threshold. The problem is difficult to manage and at times overwhelming, and would be a prominent target for intervention. This rating requires a minimum frequency of *2 X week* or *much of the time (50-60%)* PLUS a minimum intensity of *Pronounced*.

   4 *Extreme / incapacitating* The respondent described a dramatic symptom, far above threshold. The problem is pervasive, unmanageable, and overwhelming, and would be a high-priority target for intervention.

3. In general, make a given severity rating only if the minimum frequency and intensity for that rating are both met. However, you may exercise clinical judgment in making a given severity rating if the reported frequency is somewhat lower than required, but the intensity is higher. For example, you may make a severity rating of *Moderate / threshold* if a symptom occurs 1 X month (instead of the required 2 X month) as long as intensity is rated *Pronounced or Extreme* (instead of the required *Clearly Present*). Similarly, you may make a severity rating of *Severe / markedly elevated* if a symptom occurs 1 X week (instead of the required 2 X week) as long as the intensity is rated *Extreme* (instead of the required *Pronounced*). If you are unable to decide between two severity ratings, make the lower rating.

4. You need to establish that a symptom not only meets the *DSM-5* criterion phenomenologically, but is also functionally related to the index traumatic event, i.e., started or got worse as a result of the event. CAPS-5 items 1-8 and 10 (reexperiencing, effortful avoidance, amnesia, and blame) are inherently linked to the event. Evaluate the remaining items for trauma-relatedness (TR) using the TR inquiry and rating scale. The three TR ratings are:

   a. ***Definite*** = the symptom can clearly be attributed to the index trauma, because (1) there is an obvious change from the pre-trauma level of functioning and/or (2) the respondent makes the attribution to the index trauma with confidence.

   b. ***Probable*** = the symptom is likely related to the index trauma, but an unequivocal connection can't be made. Situations in which this rating would be given include the following: (1) there seems to be a change from the pre-trauma level of functioning, but it isn't as clear and explicit as it would be for a *Definite*; (2) the respondent attributes a causal link between the symptom and the index trauma, but with less confidence than for a rating of *Definite*; (3) there appears to be a functional relationship between the symptom and inherently trauma-linked symptoms such as reexperiencing symptoms (e.g., numbing or withdrawal increases when reexperiencing increases).

   c. ***Unlikely*** = the symptom can be attributed to a cause other than the index trauma because (1) there is an obvious functional link with this other cause and/or (2) the respondent makes a confident attribution to this other cause and denies a link to the index trauma. Because it can be difficult to rule out a functional link between a symptom and the index trauma, a rating of *Unlikely* should be used only when the available evidence strongly points to a cause other than the index trauma. NOTE: Symptoms with a TR rating of *Unlikely* should not be counted toward a PTSD diagnosis or included in the total CAPS-5 symptom severity score.

5. **CAPS-5 total symptom severity score** is calculated by summing severity scores for items 1-20. NOTE: Severity scores for the two dissociation items (29 and 30) should NOT be included in the calculation of the total CAPS-5 severity score.

6. **CAPS-5 symptom cluster severity scores** are calculated by summing the individual item severity scores for symptoms contained in a given *DSM-5* cluster. Thus, the Criterion B (reexperiencing) severity score is the sum of the individual severity scores for items 1-5; the Criterion C (avoidance) severity score is the sum of items 6 and 7; the Criterion D (negative alterations in cognitions and mood) severity score is the sum of items 8-14; and the Criterion E (hyperarousal) severity score is the sum of items 15-20. A symptom cluster score may also be calculated for dissociation by summing items 29 and 30.

7. **PTSD diagnostic status** is determined by first dichotomizing individual symptoms as *Present* or *Absent*, then following the *DSM-5* diagnostic rule. A symptom is considered present only if the corresponding item severity score is rated 2=*Moderate / threshold* or higher. Items 9 and 11-20 have the additional requirement of a trauma-relatedness rating of *Definite* or *Probable*. Otherwise a symptom is considered absent. The *DSM-5* diagnostic rule requires the presence of least one Criterion B symptom, one Criterion C symptom, two Criterion D symptoms, and two Criterion E symptoms. In addition, Criteria F and G must be met. Criterion F requires that the disturbance has lasted at least one month. Criterion G requires that the disturbance cause either clinically significant distress or functional impairment, as indicated by a rating of 2=*Moderate* or higher on items 23-25.

Criterion A:

Exposure to actual or threatened death, serious injury, or sexual violence in one (or more) of the following ways:

1. Directly experiencing the traumatic event(s).
2. Witnessing, in person, the event(s) as it occurred to others.
3. Learning that the traumatic event(s) occurred to a close family member or close friend. In cases of actual or threatened death of a family member or friend, the event(s) must have been violent or accidental.
4. Experiencing repeated or extreme exposure to aversive details of the traumatic event(s) (e.g., first responders collecting human remains; police officers repeatedly exposed to details of child abuse). Note: Criterion A4 does not apply to exposure through electronic media, television, movies, or pictures, unless this exposure is work related.

[Administer Life Events Checklist or other structured trauma screen]

I'm going to ask you about the stressful experiences questionnaire you filled out. First I'll ask you to tell me a little bit about the event you said was the worst for you. Then I'll ask how that event may have affected you over the past month. In general I don't need a lot of information – just enough so I can understand any problems you may have had. Please let me know if you find yourself becoming upset as we go through the questions so we can slow down and talk about it. Also, let me know if you have any questions or don't understand something. Do you have any questions before we start?

The event you said was the worst was (EVENT). What I'd like for you to do is briefly describe what happened.

Index event (specify): _____

What happened? (*How old were you? How were you involved? Who else was involved? Was anyone seriously injured or killed? Was anyone's life in danger? How many times did this happen?*)

Exposure type:

____ Experienced
____ Witnessed
____ Learned about
____ Exposed to aversive details

Life threat?
NO YES (self ___ other ___)

Serious injury?
NO YES (self ___ other ___)

Sexual violence?
NO YES (self ___ other ___)

Criterion A met?
NO PROBABLE YES

For the rest of the interview, I want you to keep (EVENT) in mind as I ask you about different problems it may have caused you. You may have had some of these problems before, but for this interview we're going to focus just on the past month. For each problem I'll ask if you've had it in the past month, and if so, how often and how much it bothered you.

Criterion B:

Presence of one (or more) of the following intrusion symptoms associated with the traumatic event(s), beginning after the traumatic event(s) occurred:

Item 1 (B1): Recurrent, involuntary, and intrusive distressing memories of the traumatic event(s). Note: In children older than 6 years, repetitive play may occur in which themes or aspects of the traumatic event(s) are expressed.

In the past month, have you had any <u>unwanted memories</u> of (EVENT) while you were awake, so not counting dreams? (Rate 0=Absent if only during dreams)

How does it happen that you start remembering (EVENT)?

[If not clear:] (***Are these <u>unwanted</u> memories, or are you thinking about (EVENT) on purpose?***) (Rate 0=Absent unless perceived as involuntary and intrusive)

How much do these memories bother you?

Are you able to put them out of your mind and think about something else?

[If not clear:] (***Overall, how much of a problem is this for you? How so?***)

<u>Circle:</u> Distress = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How often have you had these memories in the past month?
# of times _____

0 Absent
1 *Mild / subthreshold*
2 *Moderate / threshold*
3 *Severe / markedly elevated*
4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of distress

Moderate = at least 2 X month / distress clearly present, some difficulty dismissing memories

Severe = at least 2 X week / pronounced distress, considerable difficulty dismissing memories

Item 2 (B2): Recurrent distressing dreams in which the content and/or affect of the dream are related to the event(s). Note: In children, there may be frightening dreams without recognizable content.

In the past month, have you had any <u>unpleasant dreams</u> about (EVENT)?

Describe a typical dream. (*What happens?*)

[If not clear:] (***Do they wake you up?***)

[If yes:] (***What do you experience when you wake up? How long does it take you to get back to sleep?***)

[If reports not returning to sleep:] (***How much sleep do you lose?***)

How much do these dreams bother you?

<u>Circle:</u> Distress = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How often have you had these dreams in the past month? # of times _____

0 *Absent*
1 *Mild / subthreshold*
2 *Moderate / threshold*
3 *Severe / markedly elevated*
4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of distress

Moderate = at least 2 X month / distress clearly present, less than 1 hour sleep loss

Severe = at least 2 X week / pronounced distress, more than 1 hour sleep loss

Item 3 (B3): Dissociative reactions (e.g., flashbacks) in which the individual feels or acts as if the traumatic event(s) were recurring. (Such reactions may occur on a continuum, with the most extreme expression being a complete loss of awareness of present surroundings.) Note: In children, trauma-specific reenactment may occur in play.

In the past month, have there been times when you <u>suddenly acted</u> or <u>felt</u> as if (EVENT) were <u>actually happening</u> again?

[If not clear:] (***This is different than thinking about it or dreaming about it – now I'm asking about flashbacks, when you feel like you're actually back at the time of (EVENT), actually reliving it.***)

How much does it seem as if (EVENT) were happening again? (*Are you confused about where you actually are?*)

What do you do while this is happening? (*Do other people notice your behavior? What do they say?*)

How long does it last?

<u>Circle:</u> Dissociation = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How often has this happened in the past month? # of times _____

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of dissociation

Moderate = at least 2 X month / dissociative quality clearly present, may retain some awareness of surroundings but relives event in a manner clearly distinct from thoughts and memories

Severe = at least 2 X week / pronounced dissociative quality, reports vivid reliving, e.g., with images, sounds, smells

Item 4 (B4): Intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).

In the past month, have you gotten <u>emotionally upset</u> when <u>something reminded you</u> of (EVENT)?

What kinds of reminders make you upset?

How much do these reminders bother you?

Are you able to calm yourself down when this happens? (*How long does it take?*)

[If not clear:] (***Overall, how much of a problem is this for you? How so?***)

<u>Circle:</u> Distress = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How often has this happened in the past month? # of times _____

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of distress

Moderate = at least 2 X month / distress clearly present, some difficulty recovering

Severe = at least 2 X week / pronounced distress, considerable difficulty recovering

Item 5 (B5): Marked physiological reactions to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).

In the past month, have you had any physical reactions when something reminded you of (EVENT)?

Can you give me some examples? (*Does your heart race or your breathing change? What about sweating or feeling really tense or shaky?*)

What kinds of reminders trigger these reactions?

How long does it take you to recover?

Circle: Physiological reactivity = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How often has this happened in the past month? # of times _____

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of physiological arousal

Moderate = at least 2 X month / reactivity clearly present, some difficulty recovering

Severe = at least 2 X week / pronounced reactivity, sustained arousal, considerable difficulty recovering

Criterion C:

Persistent avoidance of stimuli associated with the traumatic event(s), beginning after the traumatic event(s) occurred, as evidenced by one or both of the following:

Item 6 (C1): Avoidance of or efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).

In the past month, have you tried to avoid thoughts or feelings about (EVENT)?

What kinds of thoughts or feelings do you avoid?

How hard do you try to avoid these thoughts or feelings? (*What kinds of things do you do?*)

[If not clear:] ***(Overall, how much of a problem is this for you? How would things be different if you didn't have to avoid these thoughts or feelings?)***

Circle: Avoidance = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How often in the past month? # of times _____

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of avoidance

Moderate = at least 2 X month / avoidance clearly present

Severe = at least 2 X week / pronounced avoidance

Item 7 (C2): Avoidance of or efforts to avoid external reminders (people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).

In the past month, have you tried to avoid things that remind you of (EVENT), like certain people, places, or situations?

What kinds of things do you avoid?

How much effort do you make to avoid these reminders? (*Do you have to make a plan or change your activities to avoid them?*)

[If not clear:] ***(Overall, how much of a problem is this for you? How would things be different if you didn't have to avoid these reminders?)***

Circle: Avoidance = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How often in the past month? # of times _____

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of avoidance

Moderate = at least 2 X month / avoidance clearly present

Severe = at least 2 X week / pronounced avoidance

Criterion D:

Negative alterations in cognitions and mood associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two (or more) of the following:

Item 8 (D1): Inability to remember an important aspect of the traumatic event(s) (typically due to dissociative amnesia and not to other factors such as head injury, alcohol, or drugs).

In the past month, have you had difficulty remembering some important parts of (EVENT)? (*Do you feel there are gaps in your memory of (EVENT)?*)

What parts have you had difficulty remembering?

Do you feel you should be able to remember these things?

[If not clear:] (***Why do you think you can't? Did you have a head injury during (EVENT)? Were you knocked unconscious? Were you intoxicated from alcohol or drugs?***) (Rate 0=Absent if due to head injury or loss of consciousness or intoxication during event)

[If still not clear:] ***(Is this just normal forgetting? Or do you think you may have blocked it out because it would be too painful to remember?)*** (Rate 0=Absent if due only to normal forgetting)

Circle: Difficulty remembering = *Minimal* *Clearly Present* *Pronounced* *Extreme*

In the past month, how many of the important parts of (EVENT) have you had difficulty remembering? (*What parts do you still remember?*)
# of important aspects _____

Would you be able to recall these things if you tried?

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = amount of event not recalled / intensity of inability to recall

Moderate = at least one important aspect / difficulty remembering clearly present, some recall possible with effort

Severe = several important aspects / pronounced difficulty remembering, little recall even with effort

Item 9 (D2): Persistent and exaggerated negative beliefs or expectations about oneself, others, or the world (e.g., "I am bad," "No one can be trusted," "The world is completely dangerous," "My whole nervous system is permanently ruined").

In the past month, have you had <u>strong negative beliefs</u> about yourself, other people, or the world?

Can you give me some examples? (*What about believing things like "I am bad," "there is something seriously wrong with me," "no one can be trusted," "the world is completely dangerous"?*)

How strong are these beliefs? (*How convinced are you that these beliefs are actually true? Can you see other ways of thinking about it?*)

<u>Circle:</u> Conviction = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How much of the time in the past month have you felt that way, as a percentage? % of time _____

Did these beliefs start or get worse after (EVENT)? (*Do you think they're related to (EVENT)? How so?*) <u>Circle:</u> Trauma-relatedness = *Definite* *Probable* *Unlikely*

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of beliefs

Moderate = some of the time (20-30%) / exaggerated negative expectations clearly present, some difficulty considering more realistic beliefs

Severe = much of the time (50-60%) / pronounced exaggerated negative expectations, considerable difficulty considering more realistic beliefs

Item 10 (D3): Persistent, distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others.

In the past month, have you <u>blamed yourself</u> for (EVENT) or what happened as a result of it? Tell me more about that. (*In what sense do you see yourself as having caused (EVENT)? Is it because of something you did? Or something you think you should have done but didn't? Is it because of something about you in general?*)

What about <u>blaming someone else</u> for (EVENT) or what happened as a result of it? Tell me more about that. (*In what sense do you see (OTHERS) as having caused (EVENT)? Is it because of something they did? Or something you think they should have done but didn't?*)

How much do you blame (YOURSELF OR OTHERS)?

How convinced are you that (YOU OR OTHERS) are truly to blame for what happened? (*Do other people agree with you? Can you see other ways of thinking about it?*)

(Rate 0=Absent if only blames perpetrator, i.e., someone who deliberately caused the event and intended harm)

<u>Circle:</u> Conviction = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How much of the time in the past month have you felt that way, as a percentage? % of time _____

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of blame

Moderate = some of the time (20-30%) / distorted blame clearly present, some difficulty considering more realistic beliefs

Severe = much of the time (50-60%) / pronounced distorted blame, considerable difficulty considering more realistic beliefs

Item 11 (D4): Persistent negative emotional state (e.g., fear, horror, anger, guilt, or shame).

In the past month, have you had any <u>strong negative feelings</u> such as fear, horror, anger, guilt, or shame?

Can you give me some examples? (*What negative feelings do you experience?*)

How strong are these negative feelings?

How well are you able to manage them?

[If not clear:] ***(Overall, how much of a problem is this for you? How so?)***

<u>Circle:</u> Negative emotions = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How much of the time in the past month have you felt that way, as a percentage? % of time _____

Did these negative feelings start or get worse after (EVENT)? (*Do you think they're related to (EVENT)? How so?*)

<u>Circle:</u> Trauma-relatedness = *Definite* *Probable* *Unlikely*

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of negative emotions

Moderate = some of the time (20-30%) / negative emotions clearly present, some difficulty managing

Severe = much of the time (50-60%) / pronounced negative emotions, considerable difficulty managing

Item 12 (D5): Markedly diminished interest or participation in significant activities.

In the past month, have you been <u>less interested</u> in <u>activities</u> that you used to enjoy?

What kinds of things have you lost interest in or don't do as much as you used to? (*Anything else?*)

Why is that? (Rate 0=Absent if diminished participation is due to lack of opportunity, physical inability, or developmentally appropriate change in preferred activities)

How strong is your loss of interest? (*Would you still enjoy (ACTIVITIES) once you got started?*)

<u>Circle:</u> Loss of interest = *Minimal* *Clearly Present* *Pronounced* *Extreme*

Overall, in the past month, how many of your usual activities have you been less interested in, as a percentage? % of activities _____

What kinds of things do you still enjoy doing?

Did this loss of interest start or get worse after (EVENT)? (*Do you think it's related to (EVENT)? How so?*)

<u>Circle:</u> Trauma-relatedness = *Definite* *Probable* *Unlikely*

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = percent of activities affected / intensity of loss of interest

Moderate = some activities (20-30%) / loss of interest clearly present but still has some enjoyment of activities

Severe = many activities (50-60%) / pronounced loss of interest, little interest or participation in activities

Item 13 (D6): Feelings of detachment or estrangement from others.

In the past month, have you felt distant or cut off from other people?

Tell me more about that.

How strong are your feelings of being distant or cut off from others? (*Who do you feel closest to? How many people do you feel comfortable talking with about personal things?*)

Circle: Detachment or estrangement =
Minimal *Clearly Present* *Pronounced* *Extreme*

How much of the time in the past month have you felt that way, as a percentage? % of time _____

Did this feeling of being distant or cut off start or get worse after (EVENT)? (*Do you think it's related to (EVENT)? How so?*)
Circle: Trauma-relatedness = *Definite* *Probable* *Unlikely*

0 *Absent*
1 *Mild / subthreshold*
2 *Moderate / threshold*
3 *Severe / markedly elevated*
4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of detachment or estrangement

Moderate = some of the time (20-30%) / feelings of detachment clearly present but still feels some interpersonal connection

Severe = much of the time (50-60%) / pronounced feelings of detachment or estrangement from most people, may feel close to only one or two people

Item 14 (D7): Persistent inability to experience positive emotions (e.g., inability to experience happiness, satisfaction, or loving feelings).

In the past month, have there been times when you had difficulty experiencing positive feelings like love or happiness?

Tell me more about that. (*What feelings are difficult to experience?*)

How much difficulty do you have experiencing positive feelings? (*Are you still able to experience any positive feelings?*)

Circle: Reduction of positive emotions =
Minimal *Clearly Present* *Pronounced* *Extreme*

How much of the time in the past month have you felt that way, as a percentage? % of time _____

Did this trouble experiencing positive feelings start or get worse after (EVENT)? (*Do you think it's related to (EVENT)? How so?*)
Circle: Trauma-relatedness = *Definite* *Probable* *Unlikely*

0 *Absent*
1 *Mild / subthreshold*
2 *Moderate / threshold*
3 *Severe / markedly elevated*
4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of reduction in positive emotions

Moderate = some of the time (20-30%) / reduction of positive emotional experience clearly present but still able to experience some positive emotions

Severe = much of the time (50-60%) / pronounced reduction of experience across range of positive emotions

Criterion E:

Marked alterations in arousal and reactivity associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two (or more) of the following:

Item 15 (E1): Irritable behavior and angry outbursts (with little or no provocation) typically expressed as verbal or physical aggression toward people or objects.

In the past month, have there been times when you felt especially irritable or angry and showed it in your behavior?

Can you give me some examples? (*How do you show it? Do you raise your voice or yell? Throw or hit things? Push or hit other people?*)

Circle: Aggression = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How often in the past month? # of times _____

Did this behavior start or get worse after (EVENT)? (*Do you think it's related to (EVENT)? How so?*) Circle: Trauma-relatedness = *Definite* *Probable* *Unlikely*

0 *Absent*
1 *Mild / subthreshold*
2 *Moderate / threshold*
3 *Severe / markedly elevated*
4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of aggressive behavior

Moderate = at least 2 X month / aggression clearly present, primarily verbal

Severe = at least 2 X week / pronounced aggression, at least some physical aggression

Item 16 (E2): Reckless or self-destructive behavior.

In the past month, have there been times when you were taking more risks or doing things that might have caused you harm?

Can you give me some examples?

How much of a risk do you take? (*How dangerous are these behaviors? Were you injured or harmed in some way?*)

Circle: Risk = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How often have you taken these kinds of risks in the past month?
# of times _____

Did this behavior start or get worse after (EVENT)? (Do you think it's related to (EVENT)? How so?) Circle: Trauma-relatedness = *Definite* *Probable* *Unlikely*

0 *Absent*
1 *Mild / subthreshold*
2 *Moderate / threshold*
3 *Severe / markedly elevated*
4 *Extreme / incapacitating*

Key rating dimensions = frequency / degree of risk

Moderate = at least 2 X month / risk clearly present, may have been harmed

Severe = at least 2 X week / pronounced risk, actual harm or high probability of harm

Scoring

Total SIDAS scores are calculated as the sum of the five items, with controllability reverse scored (10=0, 9=1, ..., 0=10). Total scores range from 0 to 50.

Norms & psychometric properties

Sensitivity and specificity: The SIDAS has been validated in an online survey of community-based Australian adults (18+). In this sample (n=1,352), a cut-off of 1 had sensitivity of 85.5% for suicide plans and 84.0% for suicide attempts (with 67.1% and 63.6% specificity, respectively). However, high specificity is needed to identify individuals most likely to engage in suicidal behaviour. Scores ≥21 had 95.8% specificity for presence of a suicide plan in the past year and 94.9% specificity for presence of preparation/attempt in the past year (with 39.6% and 50.0% sensitivity, respectively). Based on these results, any ideation would be indicative of risk for suicidal behaviour, while a cut-off of 21 on the SIDAS may be used to indicate high risk of suicidal behaviour.

Internal consistency: The SIDAS had high internal consistency (Cronbach alpha = 0.91).

Factor structure: In the full sample (n=1,352), all five items loaded on a single factor with an eigenvalue of 3.8 and accounting for 75.5% of total variance. In the sample with suicidal thoughts (n=560), the single factor had an eigenvalue of 3.3 and accounted for 65.5% of total variance. All items had absolute factor loadings greater than 0.6, indicating that the attributes of suicidal ideation measured appear to contribute to a unidimensional construct of suicidal ideation.

Convergent validity: The SIDAS total score had good convergent validity with the Columbia-Suicide Severity Rating Scale frequency item (r=0.61), duration item (r=0.50), and controllability item (r=0.44). Similarly, the SIDAS had good convergent validity with the Patient Health Questionnaire 9 (r=0.65), General Anxiety Disorder 7 (r=0.58), and Insomnia Severity Index (r=0.40).

Key references

Van Spijker, B.A.J., Batterham, P.J., Calear, A.L., Farrer, L., Christensen, H., Reynolds, J. & Kerkhof, A.J.F.M. (2014). The Suicidal Ideation Attributes Scale (SIDAS): Community-based validation study of a new scale for the measurement of suicidal ideation. Suicide and Life-Threatening Behavior, 44 (4), 408-419.

Item 17 (E3): Hypervigilance.

In the past month, have you been especially alert or watchful, even when there was no specific threat or danger? (*Have you felt as if you had to be on guard?*)

Can you give me some examples? (*What kinds of things do you do when you're alert or watchful?*)

(If not clear:) (***What causes you to react this way? Do you feel like you're in danger or threatened in some way? Do you feel that way more than most people would in the same situation?***)

Circle: Hypervigilance = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How much of the time in the past month have you felt that way, as a percentage? % of time _____

Did being especially alert or watchful start or get worse after (EVENT)? (*Do you think it's related to (EVENT)? How so?*)

Circle: Trauma-relatedness = *Definite* *Probable* *Unlikely*

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of hypervigilance

Moderate = some of the time (20-30%) / hypervigilance clearly present, e.g., watchful in public, heightened awareness of threat

Severe = much of the time (50-60%) / pronounced hypervigilance, e.g., scans environment for danger, may have safety rituals, exaggerated concern for safety of self/family/home

Item 18 (E4): Exaggerated startle response.

In the past month, have you had any strong startle reactions?

What kinds of things made you startle?

How strong are these startle reactions? (*How strong are they compared to how most people would respond? Do you do anything other people would notice?*)

How long does it take you to recover?

Circle: Startle = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How often has this happened in the past month? # of times _____

Did these startle reactions start or get worse after (EVENT)? (*Do you think it's related to (EVENT)? How so?*)

Circle: Trauma-relatedness = *Definite* *Probable* *Unlikely*

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of startle

Moderate = at least 2 X month / startle clearly present, some difficulty recovering

Severe = at least 2 X week / pronounced startle, sustained arousal, considerable difficulty recovering

Item 19 (E5): Problems with concentration.

In the past month, have you had any problems with concentration?

Can you give me some examples?

Are you able to concentrate if you really try?

[If not clear:] ***(Overall, how much of a problem is this for you? How would things be different if you didn't have problems with concentration?)***

Circle: Problem concentrating = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How much of the time in the past month have you had problems with concentration, as a percentage? % of time _____

Did these problems with concentration start or get worse after (EVENT)? (*Do you think they're related to (EVENT)? How so?*)

Circle: Trauma-relatedness = *Definite* *Probable* *Unlikely*

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of concentration problems

Moderate = some of the time (20-30%) / problem concentrating clearly present, some difficulty but can concentrate with effort

Severe = much of the time (50-60%) / pronounced problem concentrating, considerable difficulty even with effort

Item 20 (E6): Sleep disturbance (e.g., difficulty falling or staying asleep or restless sleep).

In the past month, have you had any problems falling or staying asleep?

What kinds of problems? (*How long does it take you to fall asleep? How often do you wake up in the night? Do you wake up earlier than you want to?*)

How many total hours do you sleep each night?

How many hours do you think you should be sleeping?

Circle: Problem sleeping = *Minimal* *Clearly Present* *Pronounced* *Extreme*

How often in the past month have you had these sleep problems?
# of times _____

Did these sleep problems start or get worse after (EVENT)? (*Do you think they're related to (EVENT)? How so?*)

Circle: Trauma-relatedness = *Definite* *Probable* *Unlikely*

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of sleep problems

Moderate = at least 2 X month / sleep disturbance clearly present, clearly longer latency or clear difficulty staying asleep, 30-90 minutes loss of sleep

Severe = at least 2 X week / pronounced sleep disturbance, considerably longer latency or marked difficulty staying asleep, 90 min to 3 hrs loss of sleep

Criterion F:

Duration of the disturbance (Criteria B, C, D, and E) is more than 1 month.

Item 21: Onset of symptoms.

[If not clear:] **When did you first start having (PTSD SYMPTOMS) you've told me about?** (*How long after the trauma did they start? More than six months?*)	*Total # months delay in onset* _____ *With delayed onset (> 6 onths)?* *NO YES*

Item 22: Duration of symptoms.

[If not clear:] **How long have these (PTSD SYMPTOMS) lasted altogether?**	*Total # months duration* _____ *Duration more than 1 month?* *NO YES*

Criterion G:

The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Item 23: Subjective distress.

Overall, in the past month, how much have you been bothered by these (PTSD SYMPTOMS) you've told me about? [Consider distress reported on earlier items]	0 *None* 1 *Mild, minimal distress* 2 *Moderate, distress clearly present but still manageable* 3 *Severe, considerable distress* 4 Extreme, incapacitating distress

Item 24: Impairment in social functioning.

In the past month, have these (PTSD SYMPTOMS) affected your relationships with other people? How so? [Consider impairment in social functioning reported on earlier items]	0 *No adverse impact* 1 *Mild impact, minimal impairment in social functioning* 2 *Moderate impact, definite impairment but many aspects of social functioning still intact* 3 *Severe impact, marked impairment, few aspects of social functioning still intact* 4 *Extreme impact, little or no social functioning*

Item 25: Impairment in occupational or other important area of functioning.

[If not clear:] **Are you working now?** [If yes:] **In the past month, have these (PTSD SYMPTOMS) affected your work or your ability to work? How so?** [If no:] **Why is that?** *(Do you feel that your (PTSD SYMPTOMS) are related to you not working now? How so?)* [If unable to work because of PTSD symptoms, rate at least 3=Severe. If unemployment is not due to PTSD symptoms, or if the link is not clear, base rating only on impairment in other important areas of functioning] **Have these (PTSD SYMPTOMS) affected any other important part of your life?** [As appropriate, suggest examples such as parenting, housework, schoolwork, volunteer work, etc.] **How so?**	0 *No adverse impact* 1 *Mild impact, minimal impairment in occupational/ other important functioning* 2 *Moderate impact, definite impairment but many aspects of occupational/other important functioning still intact* 3 *Severe impact, marked impairment, few aspects of occupational/other important functioning still intact* 4 *Extreme impact, little or no occupational/other important functioning*

Global Ratings

Item 26: Global validity.

Estimate the overall validity of responses. Consider factors such as compliance with the interview, mental status (e.g., problems with concentration, comprehension of items, dissociation), and evidence of efforts to exaggerate or minimize symptoms.	0 *Excellent, no reason to suspect invalid responses* 1 *Good, factors present that may adversely affect validity* 2 *Fair, factors present that definitely reduce validity* 3 *Poor, substantially reduced validity* 4 *Invalid responses, severely impaired mental status or possible deliberate "faking bad" or "faking good"*

Item 27: Global severity.

Estimate the overall severity of PTSD symptoms. Consider degree of subjective distress, degree of functional impairment, observations of behaviors in interview, and judgment regarding reporting style.	0 *No clinically significant symptoms, no distress and no functional impairment* 1 *Mild, minimal distress or functional impairment* 2 *Moderate, definite distress or functional impairment but functions satisfactorily with effort* 3 *Severe, considerable distress or functional impairment, limited functioning even with effort* 4 *Extreme, marked distress or marked impairment in two or more major areas of functioning*

Item 28: Global improvement.

Rate total overall improvement since the previous rating. Rate the degree of change, whether or not, in your judgment, it is due to treatment.	0 *Asymptomatic* 1 *Considerable improvement* 2 *Moderate improvement* 3 *Slight improvement* 4 *No improvement* 5 *Insufficient information*

Specify whether with dissociative symptoms: The individual's symptoms meet the criteria for posttraumatic stress disorder, and in addition, in response to the stressor, the individual experiences persistent or recurrent symptoms of either of the following:

Item 29 (1): Depersonalization: Persistent or recurrent experiences of feeling detached from, and as if one were an outside observer of, one's mental processes or body (e.g., feeling as though one were in a dream; feeling a sense of unreality of self or body or of time moving slowly).

In the past month, have there been times when you felt as if you were separated from yourself, like you were watching yourself from the outside or observing your thoughts and feelings as if you were another person? [If no:] (***What about feeling as if you were in a dream, even though you were awake? Feeling as if something about you wasn't real? Feeling as if time was moving more slowly?***) **Tell me more about that.** **How strong is this feeling?** (*Do you lose track of where you actually are or what's actually going on?*) **What do you do while this is happening?** (*Do other people notice your behavior? What do they say?*) **How long does it last?** Circle: Dissociation = *Minimal* *Clearly Present* *Pronounced* *Extreme* [If not clear:] (***Was this due to the effects of alcohol or drugs? What about a medical condition like seizures?***) [Rate 0=Absent if due to the effects of a substance or another medical condition] **How often has this happened in the past month?** # of times _____ **Did this feeling start or get worse after (EVENT)?** (*Do you think it's related to (EVENT)? How so?*) Circle: Trauma-relatedness = *Definite* *Probable* *Unlikely*	0 *Absent* 1 *Mild / subthreshold* 2 *Moderate / threshold* 3 *Severe / markedly elevated* 4 *Extreme / incapacitating* ***Key rating dimensions* = *frequency / intensity of dissociation*** **Moderate** = at least 2 X month / dissociative quality clearly present but transient, retains some realistic sense of self and awareness of environment **Severe** = at least 2 X week / pronounced dissociative quality, marked sense of detachment and unreality

Item 30 (2): Derealization: Persistent or recurrent experiences of unreality of surroundings (e.g., the world around the individual is experienced as unreal, dreamlike, distant, or distorted).

In the past month, have there been times when things going on around you seemed unreal or very strange and unfamiliar?

[If no:] (***Do things going on around you seem like a dream or like a scene from a movie? Do they seem distant or distorted?***)

Tell me more about that.

How strong is this feeling? (*Do you lose track of where you actually are or what's actually going on?*)

What do you do while this is happening? (*Do other people notice your behavior? What do they say?*)

How long does it last?

Circle: Dissociation = *Minimal* *Clearly Present* *Pronounced* *Extreme*

[If not clear:] (***Was this due to the effects of alcohol or drugs? What about a medical condition like seizures?***) [Rate 0=Absent if due to the effects of a substance or another medical condition]

How often has this happened in the past month? # of times _____

Did this feeling start or get worse after (EVENT)? (*Do you think it's related to (EVENT)? How so?*)

Circle: Trauma-relatedness = *Definite* *Probable* *Unlikely*

0 *Absent*

1 *Mild / subthreshold*

2 *Moderate / threshold*

3 *Severe / markedly elevated*

4 *Extreme / incapacitating*

Key rating dimensions = frequency / intensity of dissociation

Moderate = at least 2 X month / dissociative quality clearly present but transient, retains some realistic sense of environment

Severe = at least 2 X week / pronounced dissociative quality, marked sense of unreality

CAPS-5 SUMMARY SHEET

Name: _____ ID#: _____ Interviewer: _____ Study: _____ Date: _____

A. Exposure to actual or threatened death, serious injury, or sexual violence	
Criterion A met?	0 = NO 1 = YES

B. Intrusion symptoms (need 1 for diagnosis)		Past Month
Symptom	*Sev*	*Sx (Sev ≥ 2)?*
(1) B1 – Intrusive memories		0 = NO 1 = YES
(2) B2 – Distressing dreams		0 = NO 1 = YES
(3) B3 – Dissociative reactions		0 = NO 1 = YES
(4) B4 – Cued psychological distress		0 = NO 1 = YES
(5) B5 – Cued physiological reactions		0 = NO 1 = YES
B subtotals	*B Sev =*	*#B Sx =*

C. Avoidance symptoms (need 1 for diagnosis)		Past Month
Symptom	*Sev*	*Sx (Sev ≥ 2)?*
(6) C1 – Avoidance of memories, thoughts, feelings		0 = NO 1 = YES
(7) C2 – Avoidance of external reminders		0 = NO 1 = YES
C subtotals	*C Sev =*	*#C Sx =*

D. Cognitions and mood symptoms (need 2 for diagnosis)		Past Month
Symptom	*Sev*	*Sx (Sev ≥ 2)?*
(8) D1 – Inability to recall important aspect of event		0 = NO 1 = YES
(9) D2 – Exaggerated negative beliefs or expectations		0 = NO 1 = YES
(10) D3 – Distorted cognitions leading to blame		0 = NO 1 = YES
(11) D4 – Persistent negative emotional state		0 = NO 1 = YES
(12) D5 – Diminished interest or participation in activities		0 = NO 1 = YES
(13) D6 – Detachment or estrangement from others		0 = NO 1 = YES
(14) D7 – Persistent inability to experience positive emotions		0 = NO 1 = YES
D subtotals	*D Sev =*	*#D Sx =*

E. Arousal and reactivity symptoms (need 2 for diagnosis)		Past Month
Symptom	*Sev*	*Sx (Sev ≥ 2)?*
(15) E1 – Irritable behavior and angry outbursts		0 = NO 1 = YES
(16) E2 – Reckless or self-destructive behavior		0 = NO 1 = YES
(17) E3 – Hypervigilance		0 = NO 1 = YES
(18) E4 – Exaggerated startle response		0 = NO 1 = YES
(19) E5 – Problems with concentration		0 = NO 1 = YES
(20) E6 – Sleep disturbance		0 = NO 1 = YES
E subtotals	*E Sev =*	*#E Sx =*

PTSD totals	Past Month	
Totals	*Total Sev*	*Total # Sx*
Sum of subtotals (B+C+D+E)		

F. Duration of disturbance	Current
(22) Duration of disturbance ≥ 1 month?	0 = NO 1 = YES

G. Distress or impairment (need 1 for diagnosis)	Past Month	
Criterion	*Sev*	*Cx (Sev ≥ 2)?*
(23) Subjective distress		0 = NO 1 = YES
(24) Impairment in social functioning		0 = NO 1 = YES
(25) Impairment in occupational functioning		0 = NO 1 = YES
G subtotals	*G Sev =*	*#G Cx =*

Global ratings	Past Month
(26) Global validity	
(27) Global severity	
(28) Global improvement	

Dissociative symptoms (need 1 for subtype)	Past Month	
Symptom	*Sev*	*Sx (Sev ≥ 2)?*
(29) 1 – Depersonalization		0 = NO 1 = YES
(30) 2 – Derealization		0 = NO 1 = YES
Dissociative subtotals	*Diss Sev =*	*#Diss Sx =*

PTSD diagnosis	Past Month
PTSD PRESENT – ALL CRITERIA (A-G) MET?	0 = NO 1 = YES
With dissociative symptoms	0 = NO 1 = YES
(21) With delayed onset (≥ 6 months)	0 = NO 1 = YES

BDI - II

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully. And then pick out the one statement in each group that best describes the way you have been feeling during the past two weeks, including today. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness
   0. I do not feel sad.
   1. I feel sad much of the time.
   2. I am sad all the time.
   3. I am so sad or unhappy that I can't stand it.

2. Pessimism
   0. I am not discouraged about my future.
   1. I feel more discouraged about my future than I used to.
   2. I do not expect things to work out for me.
   3. I feel my future is hopeless and will only get worse.

3. Past Failure
   0. I do not feel like a failure.
   1. I have failed more than I should have.
   2. As I look back, I see a lot of failures.
   3. I feel I am a total failure as a person.

4. Loss of Pleasure
   0. I get as much pleasure as I ever did from the things I enjoy.
   1. I don't enjoy things as much as I used to.
   2. I get very little pleasure from the things I used to enjoy.
   3. I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings
   0. I don't feel particularly guilty.
   1. I feel guilty over many things I have done or should have done.
   2. I feel quite guilty most of the time.
   3. I feel guilty all of the time.

6. Punishment Feelings
   0. I don't feel I am being punished.
   1. I feel I may be punished.
   2. I expect to be punished.
   3. I feel I am being punished.

7. Self-Dislike
   0. I feel the same about myself as ever.
   1. I have lost confidence in myself.
   2. I am disappointed in myself.
   3. I dislike myself.

8. Self-Criticalness
   0. I don't criticize or blame myself more than usual.
   1. I am more critical of myself than I used to be.
   2. I criticize myself for all of my faults.
   3. I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes
   0. I don't have any thoughts of killing myself.
   1. I have thoughts of killing myself, but I would not carry them out.
   2. I would like to kill myself.
   3. I would kill myself if I had the chance.

10. Crying
   0. I don't cry anymore than I used to.
   1. I cry more than I used to.
   2. I cry over every little thing.
   3. I feel like crying, but I can't.

11. Agitation
   0. I am no more restless or wound up than usual.
   1. I feel more restless or wound up than usual.
   2. I am so restless or agitated, it's hard to stay still.
   3. I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest
   0. I have not lost interest in other people or activities.
   1. I am less interested in other people or things than before.
   2. I have lost most of my interest in other people or things.
   3. It's hard to get interested in anything.

13. Indecisiveness
   0. I make decisions about as well as ever.
   1. I find it more difficult to make decisions than usual.
   2. I have much greater difficulty in making decisions than I used to.
   3. I have trouble making any decisions.

14. Worthlessness
   0. I do not feel I am worthless.
   1. I don't consider myself as worthwhile and useful as I used to.
   2. I feel more worthless as compared to others.
   3. I feel utterly worthless.

15. Loss of Energy
   0. I have as much energy as ever.
   1. I have less energy than I used to have.
   2. I don't have enough energy to do very much.
   3. I don't have enough energy to do anything.

16. Changes in Sleeping Pattern
- 0. I have not experienced any change in my sleeping.
- 1a I sleep somewhat more than usual.
- 1b I sleep somewhat less than usual.
- 2a I sleep a lot more than usual.
- 2b I sleep a lot less than usual.
- 3a I sleep most of the day.
- 3b I wake up 1-2 hours early and can't get back to sleep.

17. Irritability
- 0. I am not more irritable than usual.
- 1. I am more irritable than usual.
- 2. I am much more irritable than usual.
- 3. I am irritable all the time.

18. Changes in Appetite
- 0. I have not experienced any change in my appetite.
- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.
- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.
- 3a I have no appetite at all.
- 3b I crave food all the time.

19. Concentration Difficulty
- 0. I can concentrate as well as ever.
- 1. I can't concentrate as well as usual.
- 2. It's hard to keep my mind on anything for very long.
- 3. I find I can't concentrate on anything.

20. Tiredness or Fatigue
- 0. I am no more tired or fatigued than usual.
- 1. I get more tired or fatigued more easily than usual.
- 2. I am too tired or fatigued to do a lot of the things I used to do.
- 3. I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex
- 0. I have not noticed any recent change in my interest in sex.
- 1. I am less interested in sex than I used to be.
- 2. I am much less interested in sex now.
- 3. I have lost interest in sex completely.

Total Score: _____

State-Trait Anxiety Inventory for Adults™

Instrument and Scoring Key

Developed by Charles D. Spielberger
in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

Published by Mind Garden, Inc.

info@mindgarden.com
www.mindgarden.com

SELF-EVALUATION QUESTIONNAIRE STAI Form Y-1
Please provide the following information:

Name_____Date_____S_____
Age_____ Gender (*Circle*) **M** **F** T_____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right* now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	1	2	3	4
2. I feel secure	1	2	3	4
3. I am tense	1	2	3	4
4. I feel strained	1	2	3	4
5. I feel at ease	1	2	3	4
6. I feel upset	1	2	3	4
7. I am presently worrying over possible misfortunes	1	2	3	4
8. I feel satisfied	1	2	3	4
9. I feel frightened	1	2	3	4
10. I feel comfortable	1	2	3	4
11. I feel self-confident	1	2	3	4
12. I feel nervous	1	2	3	4
13. I am jittery	1	2	3	4
14. I feel indecisive	1	2	3	4
15. I am relaxed	1	2	3	4
16. I feel content	1	2	3	4
17. I am worried	1	2	3	4
18. I feel confused	1	2	3	4
19. I feel steady	1	2	3	4
20. I feel pleasant	1	2	3	4

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Name_____ Date_____

DIRECTIONS

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you *generally* feel.

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21. I feel pleasant	1	2	3	4
22. I feel nervous and restless	1	2	3	4
23. I feel satisfied with myself	1	2	3	4
24. I wish I could be as happy as others seem to be	1	2	3	4
25. I feel like a failure	1	2	3	4
26. I feel rested	1	2	3	4
27. I am "calm, cool, and collected"	1	2	3	4
28. I feel that difficulties are piling up so that I cannot overcome them	1	2	3	4
29. I worry too much over something that really doesn't matter	1	2	3	4
30. I am happy	1	2	3	4
31. I have disturbing thoughts	1	2	3	4
32. I lack self-confidence	1	2	3	4
33. I feel secure	1	2	3	4
34. I make decisions easily	1	2	3	4
35. I feel inadequate	1	2	3	4
36. I am content	1	2	3	4
37. Some unimportant thought runs through my mind and bothers me	1	2	3	4
38. I take disappointments so keenly that I can't put them out of my mind	1	2	3	4
39. I am a steady person	1	2	3	4
40. I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

State-Trait Anxiety Inventory for Adults™

Scoring Key

Developed by Charles D. Spielberger
in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

Published by Mind Garden, Inc.

info@mindgarden.com
www.mindgarden.com

State-Trait Anxiety Inventory for Adults Scoring Key (Form Y-1, Y-2)

Developed by Charles D. Spielberger in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

To use this stencil, fold this sheet in half and line up with the appropriate test side, either Form Y-1 or Form Y-2. Simply total the scoring **weights** shown on the stencil for each response category. For example, for question **#** 1, if the respondent marked 3, then the **weight** would be **2**. Refer to the manual for appropriate normative data.

Form Y-1	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1.	4	3	2	1
2.	4	3	2	1
3.	1	2	3	4
4.	1	2	3	4
5.	4	3	2	1
6.	1	2	3	4
7.	1	2	3	4
8.	4	3	2	1
9.	1	2	3	4
10.	4	3	2	1
11.	4	3	2	1
12.	1	2	3	4
13.	1	2	3	4
14.	1	2	3	4
15.	4	3	2	1
16.	4	3	2	1
17.	1	2	3	4
18.	1	2	3	4
19.	4	3	2	1
20.	4	3	2	1

Form Y-2	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21.	4	3	2	1
22.	1	2	3	4
23.	4	3	2	1
24.	1	2	3	4
25.	1	2	3	4
26.	4	3	2	1
27.	4	3	2	1
28.	1	2	3	4
29.	1	2	3	4
30.	4	3	2	1
31.	1	2	3	4
32.	1	2	3	4
33.	4	3	2	1
34.	4	3	2	1
35.	1	2	3	4
36.	4	3	2	1
37.	1	2	3	4
38.	1	2	3	4
39.	4	3	2	1
40.	1	2	3	4

State-Trait Anxiety Inventory for Adults™ (Short Form)

Instrument and Scoring Key

Developed by Charles D. Spielberger
in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

Published by Mind Garden, Inc.

info@mindgarden.com
www.mindgarden.com

Self-Evaluation Questionnaire
STAIAD Short Form Y-1

Please provide the following information:

Name_____Date_____S____

Age_____ Gender (*Circle*) **M** **F** T____

Directions: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel ***right*** now, that is, ***at this moment***. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best. Use the following scale:

NOT AT ALL – SOMEWHAT – MODERATELY SO – VERY MUCH SO

		NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1.	I feel calm	1	2	3	4
2.	I am tense	1	2	3	4
3.	I feel at ease	1	2	3	4
4.	I am presently worrying over possible misfortunes	1	2	3	4
5.	I feel frightened	1	2	3	4
6.	I feel nervous	1	2	3	4
7.	I am jittery	1	2	3	4
8.	I am relaxed	1	2	3	4
9.	I am worried	1	2	3	4
10.	I feel steady	1	2	3	4

SELF-EVALUATION QUESTIONNAIRE

STAIAD Short Form Y-2

Name_____Date_____

Directions: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you ***generally*** feel.

Use the following scale:

ALMOST NEVER – SOMETIMES – OFTEN – ALMOST ALWAYS

		ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
11.	I feel nervous and restless	1	2	3	4
12.	I feel satisfied with myself	1	2	3	4
13.	I wish I could be as happy as others seem to be	1	2	3	4
14.	I feel like a failure	1	2	3	4
15.	I worry too much over something that really doesn't matter	1	2	3	4
16.	I lack self-confidence	1	2	3	4
17.	I feel secure	1	2	3	4
18.	I feel inadequate	1	2	3	4
19.	I am a steady person	1	2	3	4
20.	I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

State-Trait Anxiety Inventory for Adults™ (Short Form)

Scoring Key

Developed by Charles D. Spielberger
in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

Published by Mind Garden, Inc.

info@mindgarden.com
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State-Trait Anxiety Inventory for Adults Short Form Scoring Key (Short Form Y-1, Short Form Y-2)

Developed by Charles D. Spielberger in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

To use this stencil, line up with the appropriate test side, either Short Form Y-1 or Short Form Y-2. Simply total the scoring **weights** shown on the stencil for each response category. For example, for question # 1, if the respondent marked 3, then the **weight** would be **2**. Refer to the State Trait Anxiety Inventory for Adults manual for appropriate normative data.

Short Form Y-1

		NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1.	**I feel calm**	**4**	**3**	**2**	**1**
2.	I am tense	1	2	3	4
3.	**I feel at ease**	**4**	**3**	**2**	**1**
4.	I am presently worrying over possible misfortunes	1	2	3	4
5.	I feel frightened	1	2	3	4
6.	I feel nervous	1	2	3	4
7.	I am jittery	1	2	3	4
8.	**I am relaxed**	**4**	**3**	**2**	**1**
9.	I am worried	1	2	3	4
10.	**I feel steady**	**4**	**3**	**2**	**1**

Short Form Y-2

		ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
11.	I feel nervous and restless	1	2	3	4
12.	**I feel satisfied with myself**	**4**	**3**	**2**	**1**
13.	I wish I could be as happy as others seem to be	1	2	3	4
14.	I feel like a failure	1	2	3	4
15.	I worry too much over something that really doesn't matter	1	2	3	4
16.	I lack self-confidence	1	2	3	4
17.	**I feel secure**	**4**	**3**	**2**	**1**
18.	I feel inadequate	1	2	3	4
19.	**I am a steady person**	**4**	**3**	**2**	**1**
20.	I get in a state of tension or turmoil as I think over my recent concerns and interests	1	2	3	4

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If your research uses an online survey platform other than the Mind Garden Transform survey system, you will need to meet Mind Garden's requirements by following the procedure described at mindgarden.com/mind-garden-forms/58-remote-online-use-application.html.

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State-Trait Anxiety Inventory for Adults

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Citation of the instrument must include the applicable copyright statement listed below.
Sample Items:

I feel at ease
I feel upset
I lack self-confidence
I am a steady person

Sincerely,

Robert Most
Mind Garden, Inc.
www.mindgarden.com

» Research » Tools & resources » Suicidal Ideation Attributes Scale (SIDAS)

Suicidal Ideation Attributes Scale (SIDAS)

Usage: No permission required - please cite reference

The SIDAS is designed to screen individuals in the community for presence of suicidal thoughts and assess the severity of these thoughts. It consists of five items, each targeting an attribute of suicidal thoughts: frequency, controllability, closeness to attempt, level of distress associated with the thoughts and impact on daily functioning. Responses are measured on a 10-point scale. Items are coded so that a higher total score reflects more severe suicidal thoughts.

Suicidal ideation attributes scale

In the past month, how often have you had thoughts about suicide? (0 = Never, 10 = Always)

0	1	2	3	4	5	6	7	8	9	10

In the past month, how much control have you had over these thoughts? (0 = No control, 10 = Full control)

0	1	2	3	4	5	6	7	8	9	10

In the past month, how close have you come to making a suicide attempt? (0 = Not close at all, 10 = Made an attempt)

0	1	2	3	4	5	6	7	8	9	10

In the past month, to what extent have you felt tormented by thoughts about suicide? (0 = Not at all, 10 = Extremely)

0	1	2	3	4	5	6	7	8	9	10

In the past month, how much have thoughts about suicide interfered with your ability to carry out daily activities, such as work, household tasks or social activities? (0 = Not at all, 10 = Extremely)

0	1	2	3	4	5	6	7	8	9	10

Note: Respondents who respond "0 – Never" to the first item skip all remaining items and score a total of zero.

Serenity Programme™ - www.serene.me.uk - Work and Social Adjustment Scale - WSAS

Work and Social Adjustment Scale (WSAS)

Identifier _____ Date _____

People's problems sometimes affect their ability to do certain day-to-day tasks in their lives. To rate your problems look at each section and determine on the scale provided how much your problem impairs your ability to carry out the activity. This assessment is not intended to be a diagnosis. If you are concerned about your results in any way, please speak with a qualified health professional.

If you're retired or choose not to have a job for reasons unrelated to your problem, tick here ☐

	0 Not at all	1	2 Slightly	3	4 Definitely	5	6 Markedly	7	8 Very severely
1	Because of my [problem] my **ability to work** is impaired. '0' means 'not at all impaired' and '8' means very severely impaired to the point I can't work.								0
2	Because of my [problem] my **home management** (cleaning, tidying, shopping, cooking, looking after home or children, paying bills) is impaired.								0
3	Because of my [problem] my **social leisure activities** (with other people e.g. parties, bars, clubs, outings, visits, dating, home entertaining) are impaired.								0
4	Because of my [problem], my **private leisure activities** (done alone, such as reading, gardening, collecting, sewing, walking alone) are impaired.								0
5	Because of my [problem], my ability to form and maintain **close relationships** with others, including those I live with, is impaired.								0

Print Form Clear Form Total WSAS score = 0

The maximum score of the WSAS is 40, lower scores are better. Privacy - please note - this form does not transmit any information about you or your assessment scores. If you wish to keep your results, either print this document or save this file locally to your computer. If you click 'save' before closing, your results will be saved in this document. These results are intended as a guide to your health and are presented for educational purposes only. They are not intended to be a clinical diagnosis. If you are concerned in any way about your health, please consult with a qualified health professional.

"A WSAS score above 20 appears to suggest moderately severe or worse psychopathology. Scores between 10 and 20 are associated with significant functional impairment but less severe clinical symptomatology. Scores below 10 appear to be associated with subclinical populations. Whether such a pattern will generalise to other disorders (apart from OCD and depression) remains to be tested."

Mundt, J. C., I. M. Marks, *et al.* (2002). "The Work and Social Adjustment Scale: A simple measure of impairment in functioning." *Br. J. Psychiatry* 180: 461-4.

Pahnke-Richards Mystical Experience Questionnaire

There are 100 items in the States of Consciousness Questionnaire (SoCQ). Forty-three items on the SoCQ comprise the Pahnke-Richards Mystical Experience Questionnaire, which provides scale scores for each of seven domains of mystical experiences:

1. Internal Unity (6 items);
2. External Unity (6 items);
3. Transcendence of Time and Space (8 items);
4. Ineffability and Paradoxicality (5 items);
5. Sense of Sacredness (7 items);
6. Noetic Quality (4 items); and
7. Deeply-Felt Positive Mood (7 items).

The remaining 57 items in the SoCQ questionnaire served as distractor items and were not scored. Scores on each scale are expressed as a proportion of the maximum possible score. Numbers associated with each item indicate the numerical sequence of the items on the original SoCQ.

Instructions: Looking back on the extended session you have just experienced, please rate the degree to which at any time during that session, you experienced the following phenomena. In making each of your ratings, use the following scale:

0 – none; not at all.
1 – so slight cannot decide
2 – slight
3 – moderate
4 -- strong (equivalent in degree to any previous strong experience or expectation of this description)
5 – extreme (more than ever before in my life and stronger than 4)

I. Internal Unity

26. Loss of your usual identity.
35. Freedom from the limitations of your personal self and feeling a unity or bond with what was felt to be greater than your personal self.
41. Experience of pure Being and pure awareness (beyond the world of sense impressions).
54. Experience of oneness in relation to an "inner world" within.
77. Experience of the fusion of your personal self into a larger whole.
83. Experience of unity with ultimate reality.

II. External Unity

14. Experience of oneness or unity with objects and/or persons perceived in your surroundings
27. With eyes open, seeing something in your surroundings more and more intensely and then feeling as though you and it become one.
47. Experience of the insight that "all is One".
51. Loss of feelings of difference between yourself and objects or persons in your surroundings.
62. Intuitive insight into the inner nature of objects and/or persons in your surroundings.
74. Awareness of the life or living presence in all things.

III. Transcendence of Time and Space

2. Loss of your usual sense of time.
12. Feeling that you experienced eternity or infinity.
15. Loss of your usual sense of space.
29. Loss of usual awareness of where you were.
34. Sense of being "outside of" time, beyond past and future.
42. Feeling that you have been "outside of" history in a realm where time does not exist.
48. Being in a realm with no space boundaries.
65. Experience of timelessness.

IV. Ineffability and Paradoxicality

6. Sense that the experience cannot be described adequately in words.
19. Experience of a paradoxical awareness that two apparently opposite principles or situations are both true.
23. Feeling that you could not do justice to your experience by describing it in words.
59. Sense that in order to describe parts of your experience you would have to use statements that appear to be illogical, involving contradictions and paradoxes.
86. Feeling that it would be difficult to communicate your own experience to others who have not had similar experiences.

V. Sense of Sacredness

5. Experience of amazement.
8. Sense of the limitations and smallness of your everyday personality in contrast to the Infinite.
31. Sense of profound humility before the majesty of what was felt to be sacred or holy.
36. Sense of being at a spiritual height.
55. Sense of reverence.
73. Feeling that you experienced something profoundly sacred and holy.
80. Sense of awe or awesomeness.

VI. Noetic Quality

3. Feeling that the consciousness experienced during part of the session was more real than your normal awareness of everyday reality.
9. Gain of insightful knowledge experienced at an intuitive level.
22. Certainty of encounter with ultimate reality (in the sense of being able to "know" and "see" what is really real) at some time during your session.
69. You are convinced now, as you look back on your experience, that in it you encountered ultimate reality (i.e. that you "knew" and "saw" what was really real).

VII. Deeply-Felt Positive Mood

10. Experience of overflowing energy.
18. Feelings of tenderness and gentleness.
30. Feelings of peace and tranquility.
43. Experience of ecstasy.
50. Feelings of exaltation.
60. Feelings of universal or infinite love.
87. Feelings of joy.

Source: RR Griffiths, R.R., WA Richards, W.A., U McCann, U., & R Jesse, R., (2006), "Psilocybin can occasion mystical-type experiences having substantial and sustained personal meaning and spiritual significance". *Psychopharmacology*, 187(3), 268-83; commentaries on pp. 284-292. Available on the Council of Spiritual Practices' Psilocybin Research page (pdf).

5D-ASC

OB

1) I had the feeling everything around me was somehow unreal.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

2) I felt as though I were floating.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

3) The boundary between myself and my surroundings seemed to blur.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

4) I felt totally free and released from all responsibilities.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

5)I had the feeling that I had been transferred to another world.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

6) It seemed to me that there were no more conflicts and contradictions in the world.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

7) It seemed to me as though I did not have a body anymore.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

8) I felt very happy and content for no outward reason.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

9) I could have sat for hours looking at something.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

10) I was completely indifferent toward everything.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

11) I experienced past, present and future as a oneness.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

12) It seemed to me that my environment and I were one.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

13) It seemed to me that I was dreaming.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

DED

14) 1 had difficulty in distinguishing important from unimportant things.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

15) My thinking was constantly being interrupted by insignificant thoughts

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

16) My own feelings seemed strange to me. as though they did not belong to me.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

17) 1 felt tormented without knowing exactly why.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

18) 1 felt like a robot.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

19) My surroundings seemed peculiarly strange to me.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

20) 1 felt threatened without realizing by what.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

21) 1 had the feeling that I no longer had a will of my own.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

22) 1 was afraid without being able to say exactly why.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

23) 1 felt like a marionette.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

24) Everything around me was happening so fast that I no longer could follow what was really going on.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

25) 1 stayed frozen in a very unnatural position for quite a long time.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

26) 1 had difficulty making even the smallest decision.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

27) 1 felt as though I were paralyzed.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

28) Things around me appeared distorted to me.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

29) Time passed more slowly than usual.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

30) 1 was not able to complete a thought: my thoughts repeatedly become disconnected.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

31) 1 felt isolated from everything and everyone.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

32) It seemed to me that I no longer had any feelings.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

33) It seemed to me as though there were an invisible wall between me and my surroundings.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

34) I observed myself as though I were a stranger.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

35) 1 felt a total emptiness in my head.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

VR

36) So many thoughts and feelings assailed me at once that I became confused.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

37) I saw lights or flashes of light in total darkness or with closed eyes.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

38) I saw scenes rolling by like in a film in total darkness or with my eyes closed.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

39) Objects around me engaged me emotionally much more than usual.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

40) Things around me appeared to be bigger than usual.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

41) Things around me had a new, strange meaning for me.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

42) I saw colours before me in total darkness or with closed eyes.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

43) I saw things that I know were not real.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

44) I saw regular patterns in complete darkness or with closed eyes.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

45) Something occurred to me and I did not know whether I had dreamt or actually experienced it.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

46) I had dreamt or actually experienced it.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

47) I saw strange things, which I now know were not real.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

48) Everyday things gained a special meaning for me.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

49) Sounds seemed to influence what I saw.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

50)The colours of the things I saw were changed by sounds and noises.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

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51) Sounds and noises sounded different than usual.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

52) Time passed faster than usual.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

53) I simply could not get rid of some unimportant thought.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

54) I became conscious of another 'I" being hidden behind my usual 'I"

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

55) The ground I was standing on seemed to be swaying.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

56) My ears were buzzing.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

57) I could not remember what had happened two hours earlier.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

58) I had the vague feeling that something important would happen to me.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

59) Parts of my body seemed no longer to belong to me.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

60) I had the feeling my limbs were larger than usual.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

61) I was convinced that I had experienced the same situation before.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

62) Things around me had a different smell than usual.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

63) I was tired and exhausted but at the same time wide awake.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

64) It seemed that I had once dreamed what 1 was experiencing.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

65) I perceived peculiar relationships between widely diverging matters.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

66) I had trouble distinguishing between what I imagined and what I really experienced.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

67) I no longer knew where I actually was.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

68) I had the feeling I could think faster or more clearly than usual.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

69) So many thoughts came to my mind that I no longer was able to organize them properly.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

70) I was too wide awake and too sensitive.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

71) I had the impression that everything occurring around me was related to me.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

72) I had the feeling that I could no longer control the movements of my body.

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

73) I felt influenced by electric currents. rays. or hypnosis

Opposite of what I felt Close to what I felt Good description what I felt

1 2 3 4 5 6 7 8 9 10

Pre-Treatment Assessment Form

*Gender:*_____ *Age:*_____ *Today's Date:*___/___/_____ *Participant #:*_____

Instructions: The following questions are about a treatment you will soon receive. We want to know how you think you will respond to that treatment. Please indicate how much you agree with each statement by filling in the appropriate circle. For example, if you *strongly disagree* with a statement, fill in the circle on the far left. If you *strongly agree* with a statement, fill in the circle on the far right.

Your answers will be kept confidential, and will not be seen by the clinicians involved in your treatment. Your responses to these questions will not affect the treatment you receive in any way. We realize it may be difficult for you to guess how you will respond to a new treatment. If you are unsure about any statement, please give the best guess you can. There are no right or wrong answers.

	Strongly Disagree	*Moderately Disagree*	*Slightly Disagree*	*Neither Agree Nor Disagree*	*Slightly Agree*	*Moderately Agree*	*Strongly Agree*
1. This treatment will be completely effective	O	O	O	O	O	O	O
2. I am worried about my treatment.	O	O	O	O	O	O	O
3. My condition will be completely resolved after treatment	O	O	O	O	O	O	O
4. I have fears about this treatment	O	O	O	O	O	O	O
5. I have complete confidence in this treatment	O	O	O	O	O	O	O
6. I am nervous about the negative effects of this treatment	O	O	O	O	O	O	O

7. What treatment are you going to receive?

_____

8. What specific benefits (if any) do you expect to receive from this treatment?

_____

9. What specific harms or negative side-effects (if any) do you think may occur because of this treatment?

_____

10. Have you ever received this treatment before? ☐ Yes ☐ No