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# Psilocybin with Acceptance and Commitment Therapy (ACT) for the Treatment of Social Anxiety Disorder (SAD)

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# Psilocybin with Acceptance and Commitment Therapy (ACT) for the Treatment of Social Anxiety Disorder (SAD)

by

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**Abstract**

Social Anxiety Disorder (SAD) is a debilitating mental health condition characterized by an overwhelming fear and anxiety of social rejection that can lead to chronic patterns of social behavioral avoidance. Despite the existence of traditional efficacious treatments, a significant number of individuals either do not respond to treatment or experience a recurrence of symptoms over extended periods, spanning 10-12 years. Acceptance and Commitment Therapy (ACT), a form of acceptance-based behavioral therapy considered part of the "third wave" of cognitive behavioral therapies, has shown promising results in early studies, comparable to those of Cognitive Behavioral Therapy (CBT) that is considered the first-line treatment for SAD. When combined with Psychedelic-Assisted Psychotherapy (PAP), ACT may offer a viable efficacious alternative. This combination has the potential to improve therapeutic outcomes by addressing the underlying emotional and behavioral patterns that perpetuate SAD through a biopsychosocial approach. This paper examines the theoretical basis, practical considerations, and potential challenges associated with this innovative treatment approach.

Keywords: social anxiety disorder, acceptance and commitment therapy, psilocybin, psychotherapy, treatment

**Psilocybin with Acceptance and Commitment Therapy (ACT) for the Treatment of Social Anxiety Disorder (SAD)**

Humans have long been understood as a communal species that have a strong innate desire for social interaction and perceived connectedness. Substantial amounts of supporting evidence have been compiled over the years, demonstrating that unmet social needs are correlated with a large number of behavioral and health problems, including tobacco use, increased likelihood of mortality for social isolation, cardiovascular disease, increased all-cause mortality (Leigh-Hunt et al., 2017), personality disorders, psychoses, impaired cognitive performance, cognitive decline over time, increased risk of Alzheimer's disease, increased depressive symptoms, diminished executive control, and suicide (Hawkley & Cacioppo, 2010; Ellard et al., 2022). However, social anxiety, the fear of negative evaluation in social interactions, is simultaneously believed to be a commonly experienced phenomenon across human population demarcations (Bar-Haim et al., 2007). This fear can become severe and persistent resulting in a chronic pattern diagnosed as social phobia or social anxiety disorder (SAD), in which those diagnosed frequently display social avoidant behaviors (Morrison & Heimberg, 2013). Anxiety can be advantageous, serving as an adaptive mechanism that allows for the formulation of an early state of readiness to respond defensively to a detected potential threat. However, phobias and other anxiety disorders expose how this defense system can become hyper-attuned, chronically biased, and hyperactivated. When left untreated, research has shown this condition to be correlated to individuals struggling with moderate to severe financial dependencies, personal perceptions of major disability and suffering, negative impacts on education and financial outcomes through the avoidance of social areas, significant negative social role impacts, and increased suicidal ideation and behavior (Mendlowicz & Stein, 2000; Rose & Tadi, 2022). Those

diagnosed with SAD are observed to construct behavioral patterns with the goal of avoiding social rejection rather than creating or fostering social connection and support systems to promote their growth and development.

Currently, a substantial amount of research has been found to support the efficacy of multiple psychotherapeutic modalities which reduce symptoms of SAD when compared to control or wait list groups. Commonly utilized modalities include Cognitive Behavioral Therapy (CBT), Mindfulness Based Stress Reduction (MBSR), Imagery Rescripting, Task Concentration Training, and Acceptance and Commitment Therapy (ACT) (Morrison & Heimberg, 2013). However, when reviewing decades of empirical research, data indicates low probabilities of long-term recovery with high rates of recurrence over 12-year spans (Bruce et al., 2005). Due to increasing awareness of the diffuse and numerous ways in which SAD can negatively impact psychosocial health in combination with poor prognosis of recovery without relapse, studies investigating alterations to existing modalities or interventions is warranted. Through a review of the relevant literature, this research aims to investigate how combining two treatment methods, a psychotherapy that has garnered support in the treatment of SAD, ACT, in conjunction with a novel therapy for SAD, Psilocybin Assisted Psychotherapy (PAP), may provide an efficacious intervention for use in treatment resistant cases, while also reducing rates and severity of symptom recurrence post intervention.

## Social Anxiety Disorder

### Diagnosis

When suggesting alternative methods of treatment for SAD, it is imperative to appreciate the mechanisms through which it is perpetuated and resistant to existing interventions. When doing so, it is also important to be aware of the limits of the prevailing comprehension of SAD, as well

as the limitations of the definition and diagnostic criteria as delineated by the current Diagnostic and Statistical Manual of Mental Disorders, the DSM-5. A distinct diagnosis specifically referencing social anxiety did not appear until the third edition of the DSM published in 1980 and was categorized as social phobia under the umbrella category of anxiety disorders. The DSM-IV further refined this diagnosis with the addition of subtypes generalized, specific, and performance-only (American Psychiatric Association, 1980; American Psychiatric Association, 1994). In the DSM-5, this was renamed Social Anxiety Disorder (SAD), and its subtypes were replaced with classifications based upon severity across varying social situations (American Psychiatric Association, 2013).

A clinical diagnosis of SAD is provided when reported symptoms match the criteria delineated by the current DSM-5. Among these criteria are fear and or anxiety that is almost always out of proportion to the actual threat imposed regarding social situations where the individual could be scrutinized or negatively evaluated. As a result of the disproportionate amount of fear experienced, the individual engages in defensive behaviors and either avoids or endures social situations with intense fear or anxiety. Symptoms of fear, anxiety, or avoidance must last for a minimum of 6 months, and for diagnostic purposes, must not be attributable to either physiological effects from substances or better explained by another medical or mental condition (American Psychiatric Association, 2013). There are 23 validated and commonly used instruments available to practitioners to evaluate various aspects of SAD, such as the intensity and frequency of experienced effects resulting from social avoidant behaviors (Osório et al., 2012). Clinician administered self-rating instruments are the most commonly utilized format with the Liebowitz Social Anxiety Scale (LSAS), having had the most comprehensive evaluation of its psychometric properties and is the most frequently used self-rating tool (Osório et al.,

2012, Osório et al., 2011). The LSAS has been shown to provide reliable measurements of social anxiety with high internal consistency and a Cronbach's alpha of 0.96 (Heimberg et al., 1999). However, when investigating a sample of 9,282 English speakers, researchers found that roughly 75% of those diagnosable with SAD are not utilizing mental health care services for the condition (Wang et al., 2005). Studies that were conducted to understand the existing barriers to care utilizing self-reports revealed significant apprehensions around logistical and financial accessibility. However, perceptions of shame and stigma from providers were found to be the most cited barriers (Goetter et al., 2020). The discrepancy between the availability of efficacious diagnostic instruments and their utilization showcases the ways in which anxiety disorders like SAD can remain concealed while continuing to negatively impact those it besets. Avoidance of social situations in which an individual could be evaluated, such as the clinical assessment that is necessary to direct and implement therapeutic interventions, is hallmark to the condition and definition of SAD.

While there have been recent updates and expansions to the understanding of SAD, such as the relatively recent acknowledgment of the impact of the sociocultural context (Heimberg et al., 2014), critiques of the existing model still exist. For instance, utilizing a general population sample who reported lifetime social anxiety, one study discovered increased predictive ability when altering conceptions of SAD to a dimensional diagnosis with a continuum of impairment when compared to the currently accepted categorical "all or nothing" form (Ruscio, 2010). Additionally, researchers have found individuals suffering from subthreshold forms of anxiety, including social anxiety, who reported negative impacts to their quality of life. These negative impacts were then seen to improve when individuals were administered a variety of interventions ranging from pharmacological to psychotherapeutic (Mendlowicz & Stein, 2000). In both cases,

researchers highlighted how existing ambiguity resulting from a diagnosis that does not aptly capture the individually experienced degree of impact of the condition on daily functioning, limits the availability of effective treatments.

**Pathophysiology**

Current approaches to appreciate and understand SAD's self-maintenance span external presentations, and internal variations in physiology. These alterations can impair or produce altered responses to both internal and external stimuli. Modern methods utilized include analysis of behavioral observations, cognitive biases both implicit and explicit (Morrison & Heimberg, 2013), attentional biases (Bar-Haim et al., 2007; Sagliano et al., 2014), physiological feedback loops (Bruce et al., 2005), and variations of neural circuitry (Manning et al., 2015; Klawonn & Malenka, 2019; Hiser & Koenigs, 2018; Shin & Liberzon, 2010) when compared to those who do not meet the diagnostic criteria. Although with the advancement of imaging techniques that are able to capture neural activity and connectivity while being exposed to stimuli such as functional magnetic resonance imaging (fMRI), differences in neural activation and connectivity in particular have been gaining significant attention as potential mechanisms for the creation and maintenance of an internal architecture that is resistant to psychotherapeutic intervention, as well as being an area of opportunity for treatment focus. Meta-analysis of neuroimaging studies of participants diagnosed with SAD are beginning to locate areas with repeated altered patterns of neural activity when compared to healthy controls (Etkin & Wager, 2007; Manning et al., 2015).

Structures that are commonly observed to have increases or decreases of neuronal activity and or connectivity include the amygdala, insula, anterior cingulate cortex (ACC), nucleus accumbens (NAcc), and both the ventromedial prefrontal cortex (vmPFC) as well as the dorsolateral prefrontal cortex (DLPFC) (Manning et al., 2015; Hiser & Koenigs, 2018; Etkin &

Wager, 2007). In addition, commonalities have been observed between those found to be "anxiety-prone" and those diagnosed with SAD in that they demonstrated increased or hyperactivation of what have been commonly referred to as "fear circuits" providing an additional possible biological pathway in which anxiety conditions can be observed and understood (Etkin & Wager, 2007). Hyperactivation of the fear circuit often includes increased activity in the insula, amygdala, and the NAcc and has been observed as playing various roles in the process of perceiving and reacting to fear across human and animal studies (Shin & Liberzon, 2010; Etkin and Wager, 2007). It has been hypothesized that once these alterations in the neural circuitry are formed, they may be predisposing individuals towards anxiety in several ways such as a positive feedback loop (Kenwood et al., 2021) that can then significantly exacerbate and perpetuate the initially experienced anxiety.

Individuals may experience an excessive appreciation and incorporation of aversive stimuli, that then leads to experiences of increased perceived risk. A general understanding among theorists posits that attentional biases or the preferential detection of threat related aversive stimuli in comparison to positive or neutral cues is associated with both trait anxiety and anxiety disorders such as SAD (Veerapa et al., 2020; Morrison & Heimberg, 2013; Bar-Haim et al., 2007; Sagliano et al., 2014). Meta-analyses investigating the presence of such attentional biases have repeatedly found significant low-to-medium effect threat-related biases in anxious individuals that were not seen in those who are non-anxious (Bar-Haim et al, 2007). Models proposed to explain biases towards threatening cues group them into the following categories of facilitated attention or early detection of stimuli, difficulty in disengagement where the individual spends more time focused on threatening stimuli, and attentional avoidance when an individual diverts their attention away from threatening cues (Cisler & Koster, 2010; Veerapa et

al., 2020; Morrison & Heimberg, 2013; Sagliano et al., 2014; Bar-Haim et al., 2007). Non-anxious individuals have also been seen exhibiting attentional threat biases in both difficulty in disengagement with high threat cues and attentional avoidance with low threat cues (Sagliano et al., 2014). However, it has been conjectured that these observations capture the potential adaptive nature of attentional threat biases. Difficulties in disengagement in the presence of high threat cues may facilitate appropriate protective and defensive responses. While attentional avoidance with low threat cues, may be a preservative response aimed at managing anxiety levels and may allow the individual to adaptively conserve resources when they may not be warranted. Supporting these findings, two of the areas often seen with abnormal levels of activation or connection in individuals diagnosed with SAD are the bilateral anterior insula and bilateral dorsal anterior cingulate cortex (dACC) that are also consistently seen and believed to be critical in the salience network (Pannekoek et al., 2013). The salience network is thought to be responsible for bidirectionally switching brain activity from internal to external stimuli in order to appropriately direct behavior (Perini et al., 2018). It has been proposed that increased connectivity between and in these areas could cultivate exaggerated perceptions of stimuli that are self-referential and necessitate focused cognitive attention.

Differences in circuity may also reinforce an inability to downregulate physiological or emotional states. Studies investigating emotional regulation in individuals with anxiety disorders like SAD have found a correlation particularly between social anxiety and impaired ability to manage emotions. Meta-analysis investigating differences in neural recruitment during reappraisal, a form of emotional regulation, did find decreased activation in the dorsal medial prefrontal cortex (dmPFC) and the dACC in individuals with anxiety disorders relative to healthy controls (Kenwood et al., 2021). In addition, researchers also found that individuals with SAD

report less attention paid to their emotions, have increased difficulty describing their emotions, and were less expressive of positive emotions when compared to other anxiety disorders like general anxiety disorder (Mennin et al., 2009). This inability may predispose individuals with SAD to increased exposure to interpersonal conflicts as emotional regulation abilities have been shown to be negatively correlated to relationship conflicts (Lopes et al., 2010). It also supports cognitions that becoming anxious is inevitable when the stimuli are present, fostering a persistent state of readiness or hypervigilance. A meta-analysis of anxiety disorders has found that anxious individuals spend more resources and time remaining in a hypervigilant state to scan their environment for potentially threatening cues (Kenwood et al., 2021). Two areas that are often implicated by researchers as a possible means of maintaining a hypervigilant state are the insula and dACC. The insula is important to socio-emotional behavior as it plays a critical role in the regulation of the autonomic nervous system, and processing of negative emotions that may occur during social engagement (Etkin & Wager, 2007). This is thought to be done by the insula's placement as a major hub in the processing of visceral information, and subsequent integration of this information with overall ongoing neural activity to produce interoception or sensation of internal bodily signals (Uddin et al., 2017). The insula in conjunction with the dACC have been suggested as playing a substantial role in the affective pain system as both structures become active during the processing of exclusion, romantic rejection, and negative social evaluation (Meyer et al., 2015). Imaging studies have supported both arguments through findings of positive correlations and predictive quality of changes in insular activity to differences in interoceptive sensitivity and reported negative emotional experience (Knutson et al., 2013). These findings also support current prominent affective theories such as Social Constructionist and Appraisal theory as interoception is thought to be a necessary process for the conscious appreciation of an

emotional experience (Lange et al., 2020). However, in more recent years, studies did not elucidate differences in dACC and insular activity when participants were exposed to feedback of both positive and negative quality. Instead, a difference was seen when feedback was personally directed or other-directed suggesting that these two structure's activations may rely more on the need for directing self-referential attention rather than responding to noxious material. The extension of this theory to explain the increased activation in these neural areas is supported by repeated findings of individuals with anxiety disorders extending the negative attributional bias to themselves in that they endorse more negative self-referential traits than positive when compared to healthy controls (Kenwood et al., 2021). The insular functions of self-awareness and interoception are also critical to social cognition and expressions of empathy. Imaging studies of individuals with insular localized lesions captured impaired abilities to recognize facial expressions of disgust, fear, happiness, and surprise (Etkin & Wager, 2007; Shin & Liberzon, 2010). Additional studies have observed insular activity, notably the areas often associated with physical pain distress, occurring when simply viewing other people experiencing pain (Uddin et al., 2017) demonstrating the socially adaptive and beneficial processes undertaken by the insula. Historically this has led emotion or affective researchers to theorize of a consistent relationship between perceived emotional experiences and the concurrent physiological response. These theories have been supported by findings that those with reported higher anxiety also displayed increased physiological activation such as increased heart rate, and or skin conductance levels (Davidson et al., 2000). However, in review, the studies completed found small statistically significant effects between SAD and control groups that have not been consistently repeatable in recent studies (Mauss et al., 2004). What findings remained consistent and were repeatable throughout both these and newer studies were reported experiences of

elevated anxiety by the SAD group when compared to control groups, emphasizing the impact of cognitive processing on experiences of fear and anxiety (Mauss et a., 2004; Davidson et al., 2000; Constantinou et al., 2021). This demonstrates the possibility that overestimation of potential threat by the hyperactivation of neural areas responsible for processing internal activity feeds into heightened emotional experience that is resistant to attenuation and motivates the individual to form negatively biased cognitions that reinforce behaviors maintaining a state of hypervigilance.

The supported cognition of inevitable anxiety in the face of possible social rejection can then in turn reinforce the notion that the situation will bring about an aversive experience and fortifies defensive behaviors of situational avoidance. Anxiety can be adaptively and healthily leveraged, through its application in determining through past learning experiences, to determine the likelihood of potential results. However, the learning processes regarding threat have been seen to be impacted in SAD when using conditioning paradigms. In conditioning paradigms neutral stimuli are repeatedly paired with negative or aversive outcomes to produce a conditioned response to the now conditioned stimuli. After this association has been formed, the conditioned stimulus is presented in the absence of the aversive outcome, in which individuals with anxiety conditions like SAD demonstrated a resistance to fear extinction or the separation of anticipation of the aversive outcome when the stimulus is present (Kenwood et al., 2022). The neural areas speculated as playing a significant role in the fear extinction process include the ventromedial prefrontal cortex (vmPFC) and amygdala. Amygdala activity has consistently been seen during the formation of fears. The vmPFC has been observed to be recruited during the extinction phase (Kim et al., 2011), and decreased activity has been observed in this area in cases of extinction failure (Kenwood et al., 2022). Interestingly both areas have been shown to have

altered activity during fear formation and extinction training in individuals diagnosed with SAD (Kim et al., 2011), although it should be noted that there are discrepancies between studies on the nature and form of these alterations (Gold et al., 2017). The amygdala is one of the most observed hyperactive regions when investigating the physical manifestations of anxiety conditions including SAD. The number of studies centering on insular and prefrontal cortex (PFC) activity within anxiety conditions is limited in comparison, but they illustration that insular and PFC activity are substantively interconnected to the amygdala where a sizable amount of literature has captured its hyperactivity as playing a substantial role in the maintenance of anxiety disorders (Etkin and Wager, 2007). Current frameworks aimed at understanding and mapping out emotional regulation pathways show PFC activity can exert an inhibitory effect on the amygdala during emotional regulation as well as the ACC during emotional suppression (Kim et al., 2011). These findings demonstrate a possible biological pathway for the maintenance of SAD in that these individuals may have a diminished top-down inhibitory pathway for the appreciation of threat and its concomitant manifestation of fear and or anxiety. Furthermore, connectivity in areas associated with reward-based decision making such as the vmPFC, Nacc, and ACC have been seen to be decreased in individuals with SAD (Manning et al., 2015). These findings allude to potential decreased perceptions of reward when engaging in social interactions that would not only decrease motivation to engage in social interactions but would support behaviors of avoidance of a potentially aversive outcome. Enacted behavioral avoidance then closes the positive feedback loop and deprives the individual of the possibility of learning that the stimuli do not always lead to aversive experiences.

**Current Interventions**

Interventions currently utilized to treat SAD are thought to reduce the activity of the amygdala, an area that has long been associated as displaying increased activity in those diagnosed with a variety of anxiety and fear-based conditions (Mannine et al., 2015). In addition, they are thought to synchronously increase connectivity of the amygdala to the PFC that has been indicated in past empirical studies as playing a large role in the modulation of social and affective control and behavior (Hiser & Koenigs, 2018). Therapies are thought to facilitate these changes through the use of recognition techniques and self-regulatory behaviors, which allow individuals to become aware of when they may be experiencing an amplified threat appraisal, and allow them to choose their response, instead of responding in a reactive manner (Morrison & Heimberg, 2013). However, in cases of severe fear responses that warrant a diagnosis of SAD, intervention resistance and condition persistence have been reported (Bruce et al., 2005; Keller, 2006). Current methods include pharmacotherapy, psychotherapy, or a combination of both as arranged through the collaboration of the practitioner's and individual's discretion.

There is a growing body of literature to support the use of pharmacological interventions for the treatment of SAD. While the pathophysiology of SAD has not fully been elucidated, the neural areas thought of as maintaining the condition span the serotonergic, dopaminergic, and noradrenergic systems suggesting the use of pharmacotherapy as an efficacious intervention. Present recommendations encompass selective serotonin reuptake inhibitors (SSRIs), serotonin and norepinephrine reuptake inhibitors (SNRIs), monoamine oxidase inhibitors (MAOIs), reversible inhibitors of monoamine oxidase A (RIMAs), benzodiazepines, and anticonvulsants with gamma-amino butyric acid (GABA) analogues (Williams et al., 2017). As a result of relatively lower risk of aversive side effects and placebos marked inferiority when compared in

randomized controlled trials (RCTs), SSRIs like paroxetine or the SNRI venlafaxine (Canton et a., 2012), are currently considered to be primary recommendations in many cases (Williams et al., 2020). MAOIs may be recommended in cases when a patient does not respond to SSRIs or SNRIs, however researchers and clinicians alike advocate for caution when prescribing from this class due to its commonly recognized risks of interaction between food and drugs as well as its notable side effect profile associated with higher doses (Canton et al., 2012).

Psychological therapies have been found throughout both early and uncontrolled studies, to more recent large and high-quality RCTs to be an efficacious intervention for the treatment of SAD (Canton et al., 2012; Acarturk et al., 2009). Modern modalities employed may include a single modality or mixed modality of CBT, Interpersonal Therapy (IPT), MBSR, psychodynamic therapy, exposure, and social skills training. CBT is considered the first-line or "gold standard" treatment due to its repeated demonstration of efficacy in numerous RCTs when compared to alternative psychotherapies (Acarturk et al., 2009). CBT is speculated to reduce symptoms of social anxiety through its targeting of what are thought to be maladaptive beliefs and cognitions, provision of alternative adaptive coping strategies and skills, education around managing emotions and distorted cognitions, and providing training on adaptive anticipatory processing (Abdollahi et al., 2019). CBT has been seen to be effective when administered 1-2 times a week over a span of 4-12 weeks with response rates between 50-65% when compared to wait list and placebo control groups that had a 32% response rate (Leichsenring & Leweke, 2017; Abdollahi et al., 2019). In recent years researchers have investigated the components that comprise CBT of exposure, cognitive restructuring, relaxation, and social skills training, and which may be more or less effective. Regardless of whether each component was included or not, statistically significant differences in individual responses to treatment were not seen. While this could

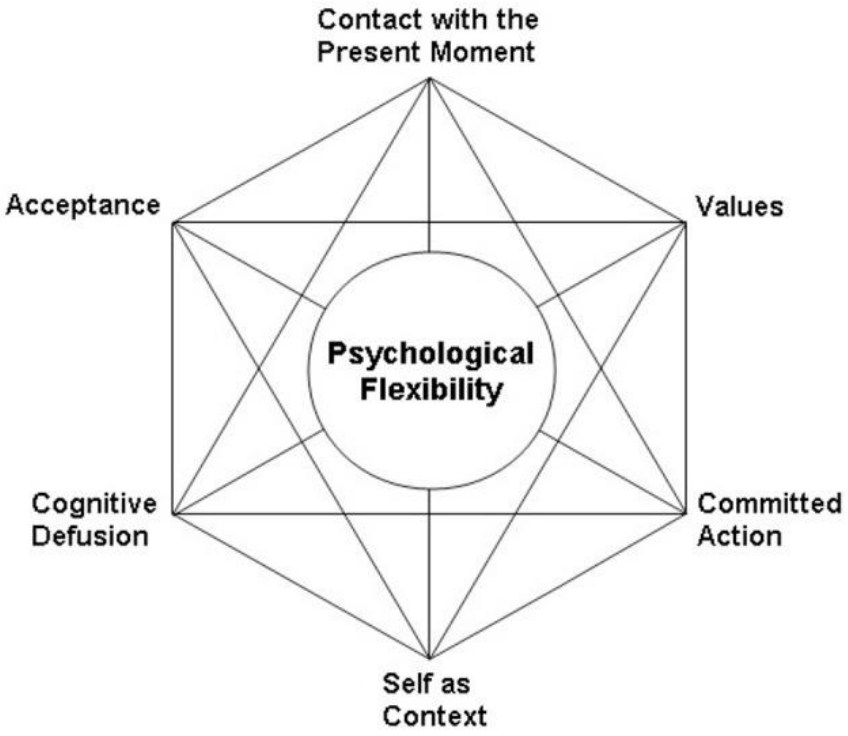
indicate the possibility of any psychotherapeutic being effective in the treatment of SAD, CBT has been seen in numerous RCTs to provide equal if not greater improvements when compared to other modalities such as MBSR (Canton et al., 2012) thereby maintaining its status for many clinicians as a first-line modality. However, there is a growing number of studies suggesting the potential for new therapeutic approaches, sometimes termed "third wave" cognitive behavioral approaches such as ACT, may be just as efficacious.

ACT, developed by Steven Hayes, builds upon many of the core features of CBT with the addition of an emphasis on development of awareness and acceptance of thoughts, feelings, sensations, often seen in Mindfulness-Based CBT. However, ACT goes further into the behavioral realm in that it also insists that the individual explores and identifies their personal values as well as what values-based action would look like to them. When directly compared, ACT has been seen to provide similar results to CBT when utilized to treat a variety of anxiety disorders (Arch et al., 2012), generalized anxiety disorder (Stefan et al., 2018), and SAD (Niles et al., 2016). Similarly to CBT, ACT requires that patients are assessed then guided by providers on how to become aware of their thoughts and beliefs as a non-judgmental observer, and how these thoughts and beliefs may be impacting subsequent behavior. However, unlike CBT, ACT does not target the reduction of aversive stimuli in the form of thoughts, feelings, and experiences. Instead, ACT aims to reduce an individual's experiential avoidance by fostering ongoing non-judgmental interactions with their internal and external environments through psychological flexibility. Psychological flexibility under ACT is fostered through the development of six core processes that make up the "Hexaflex" model (Figure 1) of: present-moment awareness, acceptance of one's experiences, defusion from the literal belief in one's

thoughts, values clarification, values-based committed action, and self as context or a flexible understanding of the experience of self (Sloshower et al., 2020).

**Figure 1**

*The Hexaflex model of ACT*




*Note.* The Hexaflex model visually represents the core processes of ACT. These components synergistically promote psychological flexibility, a central tenet of ACT, which posits that inflexibility underlies psychopathology. Adapted from "Acceptance and Commitment Therapy for the Treatment of Music Performance Anxiety: A Pilot Study with Student Vocalists" by D. G. Juncos, G. A. Heinrichs, P. Towle, K. Duffy, S. M. Grand, M. C. Morgan, J. D. Smith, and E. Kalkus, 2017, *Frontiers in Psychology*, 108, p. 3 (https://doi.org/10.3389/fpsyg.2017.00986). 

The underlying foundation of ACT assumes that humans will naturally experience disturbing thoughts, emotions, and feelings. However, when individuals try to control, change, or avoid the experience, it is often ineffective and can intensify their perception of how aversive it is, therefore reinforcing avoidance-based behaviors. This has been supported by studies in which ACT has been associated with greater decreases in negative cognitions when compared to CBT, and most profoundly near the beginning of treatment. It has been suggested that focusing on the content of negative thoughts or feelings may assist in maintaining rumination cycles (Niles et al., 2014). Heightened levels of negative rumination have been postulated as one of the key cognitive features that maintain SAD and has been seen to be positively associated with increased negative self-appraisal and increased perception of social anxiety (Chen et al., 2012). Additionally, it has been theorized that the degree of non-judgmental experiential acceptance moderates the degree of behavioral disruption in SAD in that low acceptance activates experiential control behaviors that initiates the positive feedback loop of increased awareness, anxiety, and avoidance seen in SAD (Norton et al., 2014). ACT seeks to promote psychological flexibility by helping individuals change how they relate to and interact with their internal experiences, rather than focusing on altering the content or form of those experiences (Zhang et al., 2017). Psychological flexibility has been defined by Hayes as “contacting the present moment as a conscious human being, fully… and persisting with or changing a behavior in the service of chosen values” (Yanden et al., 2022). The target of ACT rather than reduction of behaviors, is to promote positive health behavior change through persistent and committed actions that serve the individual’s personally chosen values and goals.

## Psilocybin

### Therapeutic Utilization

Psilocybin has recently been revisited in mental health research as a possible supplemental substance to psychotherapy for chronic and severely impactful conditions such as PTSD, major depressive disorder, anxiety, and substance use disorders (SUD) (Stauffer et al., 2021). Psychedelics have been ingested for hundreds and potentially thousands of years in religious and ritualistic settings to elicit mental states that promote healing and connection (MacCallum et al., 2022; Yanden et al., 2022). Preliminary empirical studies have shown promising results of not only significant reductions in symptoms by psychiatric measurements but increases in reported perceptions of well-being with those diagnosed with depression showing the most dramatic improvements (Thomas et al., 2017). These changes have been postulated to be due to increased cognitive flexibility and increased perceptions of closeness with therapeutic providers which has historically played a monumental role in the efficacy of psychological interventions (Stauffer et al., 2021). Cognitive flexibility, the ability to aptly modify cognitive and behavioral activity to respond to internal and external environments with beneficial and adaptive responses, has been seen to be negatively correlated with high levels of anxiety (Wilson et al., 2018). Observations of individuals with high anxiety, compared to those with low anxiety, do not consistently across studies show diminished cognitive flexibility during the learning phases. However, high anxiety individuals, have repeatedly been observed to display decreased cognitive flexibility through a decreased ability in overcoming the learned bias, (Wilson et al., 2018). Measures of cognitive flexibility have also been seen to be able to predict both the degree of decrease of subjective distress when using cognitive restructuring techniques, as well as therapeutic provider ratings of cognitive restructuring ability post CBT interventions

(Johnco et al., 2014). Supporting the observed increase in psychological flexibility, researchers have found that studies utilizing psilocybin were correlated with increased activation of the PFC and overall global neural connectivity with decreased activation of the amygdala as well as the default mode network (DMN) that has been identified as playing a key role in rumination processes (Felsch & Kuypers, 2022). Researchers have also found that participants diagnosed with severe to major depression experienced improvements in their depression symptomatology post a high dose psilocybin (25mg) session as well as displayed decreased functional connectivity between the vmPFC and amygdala during face processing tasks, most profoundly when viewing fearful and neutral faces (Mertens et al., 2020). These changes were also found to be predictive of rumination both 1 day and 1 week post treatment, while no increases were observed in anxiety. Because of the divergent nature of these imaging findings in comparison to previous studies observing the amygdala and prefrontal connectivity in anxiety-based conditions, researchers postulated that decreases in both rumination and functional connectivity may be due to the experiential nature of psilocybin when compared to traditional antidepressant psychopharmaceuticals. This difference suggested is that psilocybin may support emotional acceptance processing while decreasing avoidance-based behaviors rather than diminishing the emotional potency in the form of emotional-muting that has been reported by individuals taking antidepressants (Mertens et al., 2020). These findings have led researchers to suggest that SSRIs may increase passive coping by increasing the individual's tolerance of aversive emotional experiences through inhibition of stress circuitry. While psilocybin is postulated to instead increase active coping through alterations in the individual's relationship with aversive emotional experiences through excitatory pathways in high-level association cortices, the neural areas

responsible for complex processing of incoming information that ultimately generates behavior (Zeifman et al., 2023).

In another study observing differences in neural connectivity post a high psilocybin dose (25mg/70kg), researchers saw increased activity in both the dorsolateral prefrontal cortex (DLPFC) and the medial orbitofrontal cortex (MOFC) with decreased reactivity of the amygdala when participants were exposed to emotionally conflicting experiences (Barrett et al., 2020). Positive affect was also increased with decreases in negative affect 1 week after psilocybin dosing but returned close to baseline at 1 month post. This finding is thought to support previous research suggesting a top-down regulation of the DLPFC on the amygdala particularly in relation to negative affect, and how psilocybin may be utilized to support this functionality through the propagation of a neuroplastic period. Psilocybin has been observed to enhance neuroplasticity through its action as an agonist at serotonin, also known as 5-hydroxytryptamine (5-HT), receptors specifically the 5-$HT_{2A}$ (Calder & Hasler, 2022). This period of neuroplasticity is believed to account for the effects that persist beyond a week, even after psilocybin has been metabolized and any remaining temporary effects are expected to have dissipated. Due to the known half-life of three hours for the dosage given (Barrett et a., 2020). The exact chemical pathway in which stimulation of 5-$HT_{2A}$ receptors influences neuroplastic mechanisms is not fully understood but has been observed in both animal and human models (Calder & Hasler, 2022). Neural areas seen with high densities of 5-$HT_{2A}$ receptors include areas implicated in memory formation and retrieval, attention, cognitive control, perceptual awareness, and consciousness (de Veen, et al., 2017). Emerging data suggests that even modest doses of psilocybin could enhance positive affects while dampening the processing of negative emotional and social stimuli such as threat-related images including negative facial expression and

instances of social rejection primarily through the activation of 5-$HT_{2A}$ receptors. Studies have demonstrated that psilocybin dosing can decrease the recognition of negative facial expression in the reading the mind in the eyes test. (Pokorney et al., 2017). Stimulation of 5-$HT_{2A}$ receptors when compared to placebos has also been shown to attenuate threat signaling from the amygdala to the visual cortex, that has been conjectured to be the cause of decreased behavioral and electrochemical reactions in response to threat stimuli post therapeutically dosed psilocybin (Kraehenmann et a., 2015). Hyperactivity between the amygdala and visual cortex have also been theorized as playing a significant role in the maintenance of visual threat biases, as attenuation of this connection has been seen when experimental participants become habituated to visually threatening stimuli (Herrington et al., 2011).

**Psilocybin Assisted Psychotherapy (PAP)**

Unlike standard pharmacological options, researchers have identified additional factors that necessitate consideration when utilizing psilocybin in a therapeutic setting due to its primary risk factors being psychological in nature rather than physiological (Johnson et al., 2008). While there have been physiological symptoms observed of dizziness, weakness, tremors, nausea, vomiting, and transient increases in blood pressure and heart rate, these are seen with high doses of psilocybin that incur profound psychological effects (Johnson et al., 2008; Perkins et al., 2021). Because psychological distress and psychosis are the more severe potential side effects it is strongly recommended that participants are thoroughly screened, and a detailed history captured by providers prior to use. Histories of schizophrenia, psychosis, bipolar disorder, and borderline personality disorder are considered contraindicated for psilocybin use (MacCallum et al., 2022). It should also be noted that many traditional pharmacological options also impact serotonergic systems such as tricyclic antidepressants, MAOIs and SSRIs. It is therefore

generally recommended that participants taper off these medications with a washout period to reduce the possibility of pharmacodynamic interactions that may increase risk of adverse effects, such as serotonin syndrome, which can be lethal (MacCallum et al., 2022).

Another factor that has been found to be of crucial importance is what has been colloquially termed the “set and setting”. The “set” commonly refers to the individual’s expectations, intentions, and preparation prior to psilocybin ingestion (Hartogsohn, 2016). Supporting this theory, researchers have found that lower levels of preoccupation with daily concerns, and willingness to ‘surrender’ or willfully release goals and preferences when taking psilocybin have been shown to be predictive of positive outcomes (Perkins et al., 2021). The “setting” includes both the physical and social environment in which psilocybin is taken in. When set and setting were either purposely altered in non-supportive ways or neglected, researchers saw significantly decreased benefits (Carhart-Harris et al., 2018). In attempts to better understand the risks involved with the ingestion of psilocybin, researchers surveyed 1,993 participants who had taken psilocybin in a non-therapeutic setting and went through a psychologically difficult or challenging experience during the acute phase. In result they found markedly increased reported rates and severity of both acute and persistent adverse effects of 11% compared to 0.9% having put themselves or others at risk of physical harm, 7.6% compared to 0.9% sought treatment for psychological symptoms that they attributed to psilocybin ingestion, and the following were not seen in laboratory settings of 2.6% behaving in violent or physically aggressive manners, and 2.7% sought medical help during acute ingestion phase (Carbonaro et al., 2016). This has led researchers to theorize that a large portion of the success seen in studies examining PAP is due to the interaction between concurrent psychotherapy and the pharmacological action of psilocybin

(Kisley et al., 2023). When providing psilocybin in a therapeutic setting, providers typically follow a three-step process that includes a preparation, treatment, and post-treatment phase.

The preparation phase, also called the pretreatment sessions, is provided prior to ingestion of psilocybin. The purpose or goal of this phase is multifaceted in that it aims to prepare the individual for the treatment phase, as well as build a robust and trusting therapeutic alliance to reduce risk of adverse events during treatment. While the length and number of sessions has been seen to vary, a discussion of psilocybin's effects is consistent across PAP studies (Horton et al., 2021). It has been recommended that providers during the preparation phase, discuss the possibility of challenging emotions arising during treatment and the benefits of participants confronting these difficult experiences rather than avoiding them (Zeifman et al., 2023). It is also prevalent in most studies for providers to engage the individual in a discussion of their life experiences, the presenting problem, and goals or intentions for treatment (Horton et al., 2021). By the end of this phase, it is hoped that a strong and supportive therapeutic alliance has been created and that a "set" of non-judgmental curiosity and experiential acceptance, with self-endorsed identified goals, has been robustly fostered within the participant.

Psilocybin is dosed only during the next phase termed the treatment or acute phase. Dosages seen to be administered in research trials range between studies from 0.1mg/kg in low dose sessions to 0.6mg/kg (Horton et al., 2021; Santos & Marques, 2021). Although a fixed dosage of 25mg has recently been validated for use in trials investigating the use of psilocybin, due to no difference being found in psychedelic effects when comparing weight-based doses of 0.28mg/kg and 0.43mg/kg (MacCallum et al., 2022). Being observant to the "setting" the treatment phase typically occurs in a dimly lit room, often with attractively designed décor that is attentive to potentially explicit or implicit priming but often mimics that of a living room (Horton et al.,

2021; Carhart-Harris et al., 2018). Prior to administration, participants are guided to lie down and asked to put on an eye mask or shades. Two mental health providers often termed as “guides” or “sitters” accompany the participant, providing non-judgmental, nondirected support often in combination with music therapy to assist in emotional processing. Similarly to music therapy, music during the acute phase of PAP is thought to assist in the enhancement of an emotional release while still providing a loose framework and guidance for the experience (Kaelen et al., 2017). Throughout the session the care providers supervise the participants physical and psychological wellbeing by compassionately and gently supporting the participant to focus both their attention and intentions on their inner experience and journey (Horton et al., 2021; Zeifman et al., 2023). This type of support has been shown in studies to facilitate transformative mystical psychedelic experiences (Horton et al., 2021) that have been shown to mediate the therapeutic effects of psilocybin (Santos & Marques, 2021). However, some studies have shown words and conversation to be a negative predictor of psilocybin induced mystical experience and emphasizes the use of music and a stringently controlled auditory environment (Perkins et al., 2021). Psychological support may also be provided through physical reassurance using supportive touch, reality orientation, and interpersonal support with non-judgmental empathic listening.

Following the psilocybin treatment phase, care providers in most studies engage the participant in a post-treatment or integration phase. The length and number of sessions when present differs across studies, but all heavily center on a discussion of the participants’ experience during the treatment phase. During the integration phase care providers assist participants in the formation of a cohesive narrative of their psilocybin experience. Participants are guided on how to meaningfully integrate emotional experiences and psychological insights

that occurred during the treatment phase into their everyday existence to support the goals identified during the pretreatment phase (Zeifman et al., 2023). Varying psychotherapies have been used both prior and post treatment to foster the therapeutic alliance as well as support directed post event processing to enhance the long-term effectiveness of psilocybin.

**Psilocybin with ACT for SAD**

Currently no studies have been able to elucidate which psychotherapies work best during PAP, but preliminary findings suggest modalities that align with support provided during the treatment phase may maximize the benefits of its use (Horton et a., 2021). However, with the resurgence of PAP in RCTs, proposals have been made to investigate the use of third wave CBTs like ACT, due to the ways in which their conceptual overlaps can be harnessed to support therapeutic treatment (Sloshower et al., 2020). Many of the key overlaps exist in ACTs aim of developing psychological flexibility through the "Hexaflex" model (Figure 1) and the ways in which it may not only support the immediate processing of but may also support long-term benefits of the psychedelic experience.

The preparation phase in which providers are tasked with collecting the participant's history and discussing the possible effects of psilocybin that they may experience during the acute phase, provides a favorable and synergistic opportunity in which psychoeducation and skills training through an ACT lens could be provided. During this time the participant could be introduced and guided in the exploration of their personally meaningful values, as well as how their current behavior may or may not support them. They could also be supported to begin investigating what committed action to supporting the chosen values would look like to them, as well as identifying existing barriers. Participants can also be assisted throughout this phase in the cultivation of skills to maintain and be aware of and accept contact with the present moment.

Providers can also present psychoeducation around concepts such as cohesion to literal interpretations of thoughts, and the maintenance of conceptualized self in comparison to self as context. Both concepts have been observed limiting psychological flexibility and thought to be a source of psychological distress (Sloshower et al., 2019). In addition, conceptualization of the self as observer should also be introduced during this time to create space for a consistent self among thoughts, feelings, and behavior to support value-based behaviors.

In the acute phase, providers can continue to provide non-judgmental support while compassionately and gently requesting participants to bring their attention to their inner journey. Researchers assert that using this methodology, participants can employ skills built during the preparation phase of acceptance of experience, and self as context to reduce avoidance of experiences like ego dissolution that has been supportive of positive effects following PAP (Chambers et al., 2023). Additionally, skills of maintenance the with present moment can be relied on by the participant to focus on their experience of the inner journey rather than becoming enmeshed in or avoid aversive feelings that may arise during the acute phase. Skills and psychoeducation provided through an ACT lens in the preparation phase may aid participants in fully engaging in their psilocybin experience.

Following the acute phase, providers can assist participants throughout the integration phase to accept things that happened during psilocybin experience. This can be done by placing them in a way that is cohesive to values and value-based behavior to bolster long-term self-motivated effects post psilocybin. Challenging moments that were experienced during the acute phase can be leveraged by providers to investigate areas of the “Hexaflex” model (Figure 1) that may need more time and focus in remaining therapy sessions. Psilocybin experiences can also be

leveraged as lived experiential groundwork for participants to evoke in real life situations to reinforce cognitions of situational engagement rather than avoidance as beneficial.

## Conclusion

Based on this research, the use of psilocybin in combination with a supportive non-judgmental psychotherapy such as ACT that is grounded in promoting psychological flexibility is supported. This argument is especially compelling when discussing interventions that show high effectiveness in treating conditions that are resistant to interventions, significantly impair one's emotions, and hinder their ability to form therapeutic relationships, such as SAD. Through the promotion of cognitive recognition of increased threat appraisal, attentional biases, and social avoidant feed-back loops via increased psychological flexibility in conjunction with augmented global neural connectivity, and reduction in anxiety provoking neural activity, PAP with ACT offers a possible efficacious treatment that could support long term-recovery with reduction of symptom recurrence of SAD.

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