The Varieties of Self-Transcendent Experience

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Various forms of self-loss have been described as aspects of mental illness (e.g., depersonalization disorder), but might self-loss also be related to mental health? In this integrative review and proposed organizational framework, we focus on self-transcendent experiences (STEs)—transient mental states marked by decreased self-salience and increased feelings of connectedness. We first identify common psychological constructs that contain a self-transcendent aspect, including mindfulness, flow, peak experiences, mystical-type experiences, and certain positive emotions (e.g., love, awe). We then propose psychological and neurobiological mechanisms that may mediate the effects of STEs based on a review of the extant literature from social psychology, clinical psychology, and affective neuroscience. We conclude with future directions for further empirical research on these experiences.

Keywords: self-transcendence, mindfulness, flow, positive emotions, awe

. . . we can experience union with something larger than ourselves and in that union find our greatest peace.

—(William James, *The Varieties of Religious Experience*)

Under certain circumstances, the subjective sense of one's self as an isolated entity can temporarily fade into an experience of unity with other people or one's surroundings, involving the dissolution of boundaries between the sense of self and "other." Such transient mental states of decreased self-salience and increased feelings of connectedness are described here as *self-transcendent experiences* (STEs). These temporary mental states are proposed to be experienced along a spectrum of intensity that ranges from the routine (e.g., losing yourself in music or a book), to the intense and potentially transformative (e.g., feeling connected to everything

and everyone), to states in between, like those experienced by many people while meditating or when feeling awe.

Consider the following accounts of STEs:

I felt myself one with the grass, the trees, birds, insects, everything in Nature. I exalted in the mere fact of existence, of being part of it all . . . I knew so well the satisfaction of losing self in a perception of supreme power and love . . .

—(as quoted in James, 1985/1902, pp. 364–365)

I lost the boundary to my physical body. I had my skin, of course, but I felt I was standing in the center of the cosmos.

—(as quoted in Watts, 1957, p. 121).

. . . I could no longer clearly discern the physical boundaries of where I began and where I ended. I sensed the composition of my being as that of a fluid rather than that of a solid. I no longer perceived myself as a whole object separate from everything.

—(Taylor, 2008, p. 42)

In each account, an aspect of consciousness usually taken for granted—the sense of being a bounded, separate self—is conspicuously absent. Each author (a Christian experiencing God's presence, a Buddhist experiencing enlightenment, and a secular neuroscientist having a stroke) describes fading self-boundaries and a sense of unity with other people and objects. Many similar descriptions can be found throughout history and across many cultures (Haidt, 2006, ch. 9; James, 1902; Newberg & d'Aquili, 2008; Underhill, 1913; Yaden, McCall, & Ellens, 2015). STEs remain common, with around one third of people in samples from multiple cultures reporting intense experiences of unity with other people and their surroundings (Hood, Hill, & Spilka, 2009, pp. 343–347).

Variability in the intensity of perceived unity is apparent in several common psychological constructs that researchers have claimed contain degrees of self-transcendence. These "varieties of self-transcendent experience" include: the states of mindfulness (Davidson et al., 2003; Kabat-Zinn, 1994), flow (Csikszentmihalyi, 1991), self-transcendent positive emotions such as love and awe (Haidt, 2003; Haidt & Morris, 2009; Keltner & Haidt, 2003; Van Cappellen, & Rime, 2014), peak experiences (Maslow, 1964), and "mystical" experiences (Hood, 1975, 2003; James, 1902; Newberg & d'Aquili, 2000). Each of these otherwise quite different constructs has been described in theoretical writing and in psychometric scales as having aspects related to reduced self-salience and/or enhanced connectedness.

The designation "self-transcendent experience" (STE) works best for our purposes because it captures a spectrum of intensities in addition to remaining neutral regarding secular or spiritual connotations. However, empirical research on STEs is proceeding under a number of different labels, including: hypoegoic states (Leary & Guadagno, 2011), transpersonal experiences (Grof, 1972; Tart, 2006), unitary experiences (Newberg & d'Aquili, 2000), quantum change (Miller & Bacag, 2001), religious experiences (James, 1902), spiritual experiences (Kass et al., 1991), sacred moments (Lomax, Kripal, & Pargament, 2011), epiphanic experiences (Pawelski, 2007), ecstatic experiences (Laski, 1961), anomalous experiences (Cardena, Lynn, & Krippner, 2000), nondual awareness (Josipovic, 2014) near death experiences (Blackmore, 1996), mystical experiences (Hood et al., 2001; James, 1902; Newberg & d'Aquili, 2008; Wulff, 2000), and the closest to a catch-all term "religious, spiritual, and mystical experiences" (RSME; Beauregard, 2011)—among others (see Hood, Hill, & Spilka, 2009). Here, STE refers specifically to the aspects of decreased self-salience and increased feelings of connectedness to other people and one's surroundings, though we acknowledge overlap with many of the terms listed above.

Historically, James's *The Varieties of Religious Experience* brought STEs (mystical experiences, in particular) and various other profound inner experiences into mainstream psychological discussion. James articulated the psychological value of experiencing states of unity (see the quote that begins this article). However, this early, largely positive attention was followed by decades of pathologization from the psychoanalytic perspective and neglect from the behaviorist perspective (Belzen & Hood, 2006). Freud, for example, speculated that "oceanic feelings of oneness" were likely neurotic regressions to the womb and a symptom of psychopathology (Freud, 1930/2002).

More recently, intense STEs (e.g., mystical and peak experiences) have been the subject of empirical research in social psychology, clinical psychology, cognitive science, and neuroscience (Boyer, 2003; Haidt, 2012; Hood, Hill, & Spilka, 2009; Newberg & Iversen, 2003). Simultaneously, other more common STEs (e.g., mindfulness, awe) are routine subjects of empirical research in cognitive, clinical, affective, and social psychology (e.g., Shiota, Keltner, & Mossman, 2007; Vago & Silbersweig, 2012; Van Cappellen, & Rimé, 2014). There may indeed be a spectrum of intensity along which one may experience an STE, where states like awe or mindfulness may be on the lower part of the spectrum—while peak or mystical experiences may be higher on the spectrum insofar as they are felt to be more salient, visceral, and memorable experiences.

Pathological manifestations of alterations to the sense of self have been formalized within the dissociative cluster of the *DSM* as depersonalization disorder (Bernstein & Putnam, 1986; Simeon & Abugel, 2006; Simeon et al., 2014), now referred to as depersonalization/derealization disorder (DDD) in the *DSM-V*. While a technical definition of "the self" is not given in the *DSM*, the feeling of an "unreal or absent self" is described as a primary symptom. Efforts to identify which particular aspects of the self are diminished in DDD have been attempted (Simeon et al., 2014); yet, the *DSM* relies on the subjective report surrounding changes to the sense of self that are nonspecific.

Some experiences of self-loss may have a mix of positive and pathological aspects, which may sometimes require psychotherapeutic care (Lukoff, Lu, & Turner, 1992). However, our review suggests that STEs are more often associated with positive outcomes such as well-being and prosocial behavior—and more intense STEs are sometimes counted among life's most meaningful moments. We propose that a qualified consensus has emerged that, on the whole, Freud was wrong and James was right regarding the positive psychological potential of STEs.

Scope of STEs

The "sense of self" we conceptualize as being transcended during STEs is not yet clear and likely involves multiple self-related processes. In practical terms, we refer here to the "sense of self" that is described by other researchers in both theoretical writings and scales used to measure self-transcendent constructs. Generally, this notion of self-diminishment and/or connectedness in the literature appears to be based first on phenomenological reports and is then retained due to the predictive validity of items in scales that refer to these subjective qualities. However, the particular aspects of the self that are altered in instances of STE—whether it is self-awareness, self-appraisal, self-construal, self-evaluation, self-perception, self-reference, or any number of dozens of such self-relevant constructs (Baumeister & Finkel, 2010)—is a question for future empirical work (Baumeister & Exline, 2002; Hood, 2002). The lack of specificity regarding fine-grained definitions of the self in the context of STEs may indicate that a more generalized, folk psychological sense of self is involved (Bloom, 2010; Gelman, 2003; Gillihan & Farah, 2005; Newman, Bloom, & Knobe, 2014). However, here we base our review on the observation that other researchers have referred to a diminished, more unified, or otherwise altered sense of self in theoretical writing on, and in psychometric scales meant to measure, a number of psychological constructs.

Self-transcendence, in the term's most general sense, is often used by others to describe a generalized reduction of self-centeredness and selfish motivations. Many religious, spiritual, and philosophically secular moral systems, for example, advocate self-transcendent ideals that prioritize serving others above the self (Shariff, Norenzayan, & Henrich, 2010). Here, however, our interest is exclusively on phenomenological *experiences* of self-transcendence—not beliefs, values, or orientations (though these are likely influenced by STE).

Our definition of STE—transient mental states of decreased self-salience and/or increased feelings of connectedness—includes two broad complementary subcomponents worth decomposing: (a) an "annhilational" component, which refers to both the dissolution

of the bodily sense of self accompanied by reduced self- boundaries and self-salience; and (b) a "relational" component, which refers to the sense of connectedness, even to the point of oneness, with something beyond the self, usually with other people and aspects of one's environment or surrounding context. Both of these components can occur to varying degrees, and though it remains an open question for future empirical work, these aspects may sometimes vary with a degree of independence from one another.

The spectrum of intensity in perceived self-transcendent unity has been called the *unitary continuum* (Newberg & d'Aquili, 2000) and can be characterized by a phenomenology of varying degrees of intensity during temporary experiences of self-diminishment and increased connectedness. This dimension may be captured by the extent to which one feels boundaries fall away between oneself and the surrounding environment. This dimension can be demonstrated by a commonly used measure to assess the degree to which an individual feels connected to other people or one's environment (Aron, Aron, & Smollan, 1992; see Figure 1).

Self-transcendence has been variously conceptualized in the psychological literature in ways that are *not* relevant to our definition. Erickson (1982) described self-transcendence as a *non-ego-centric understanding* of the world. Although our conception of STE may involve a decreasingly ego-centric spatial frame of reference, it does not assume that there is a change in one's conceptual understanding of a self-centered perspective on the world. Frankl (1966) referred to self-transcendence as a *prioritization of other people* over self-focus. Although we suggest that altruistic motivation may result from STEs, such other-prioritized behavior or thinking is not involved during the STE. Self-transcendence is also sometimes construed as a *value* emphasizing universalism and benevolence (Schwartz, 1999) and set opposite to self-enhancement values focused on personal power-seeking. Kesebir and Diener (2013) observed that there are *virtues and character strengths* (Peterson & Seligman, 2004) that have an other-focused, self-transcendent aspect (e.g., gratitude and love). Reed's (1991) self-transcendence scale involves a broad array of items arranged around the notion of a process of *expanding concern beyond the self* for close others, caretakers, one's community, and one's existence in general. Although such prosocial attitudes and motivations may result from an STE, they are not part of the transient state of STE we describe here. Other approaches describe

self-transcendence as a *personality factor* (Piedmont, 1999), or a *developmental process* involving a maturing capacity for meaningful connection (Levenson, Jennings, Aldwin, & Shiraishi, 2005; Tornstam, 2005). A few approaches describe long-term alterations to self-processes called *selflessness* (Dambrun & Ricard, 2011; Davis & Vago, 2013), whereas here we focus on brief mental states. The self-transcendence subscale of the Temperament and Character Inventory (TCI; Cloninger, Svrakic, & Przybeck, 1993) operationalizes self-transcendence as a trait-like tendency to both *believe* and *feel* that one is part of, rather than apart from, the universe as a whole (Garcia-Romeu, 2010). For our purposes, each of these characterizations of self-transcendence may be predisposing factors for, or outcomes of, STEs but are not exclusively *experiences*—and are therefore not STEs.

Additionally, STEs do *not* refer to cases in which people make *errors about a highly specific aspect of their bodily boundaries*. For example, STEs are not related to perceiving an imaginary appendage, or a "phantom limb" (Ramachandran & Rogers-Ramachandran, 1996). Further, STEs do not refer to anomalous cases of *confusions of reference*, such as mistakenly tying someone else's shoe instead of one's own (Baumeister & Exline, 2002). While these characterizations of self-transcendence demonstrate the malleability of representations of one's sense of self and one's bodily boundaries, they do not carry the temporary cognitive or perceptual changes associated with the more gestalt experience of decreased self-salience and increased perceived connection indicative of our definition of STEs.

Finally, STEs do *not* consist of *practices or activities* that may induce experiences of self-transcendence. Such practices include meditation, prayer, yoga, music, dancing, ingesting psychoactive substances, and many more (Yaden et al., 2016b). While such practices, rituals, and activities capable of eliciting STEs are clearly important for the study of these mental states, they would not themselves be considered STEs. The self-transcendent constructs described in the next section are *mental states* and should not be confused with their antecedents or outcomes.

STE in Common Psychological Constructs

Researchers have described a self-transcendent aspect in a number of common psychological constructs, though, as noted, these constructs are otherwise more different than alike. Mindfulness
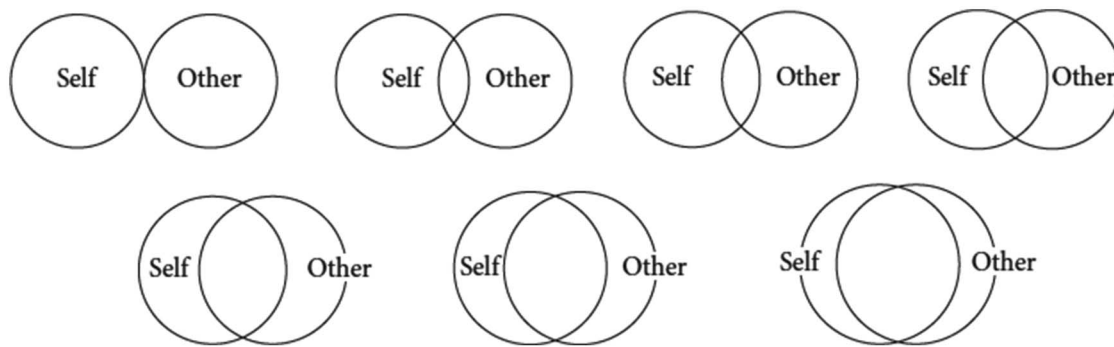

Figure 1. The Inclusion of Other in Self Scale illustrates the continuous nature of feelings of unity (Aron, Aron, & Smollan, 1992).

(Davidson et al., 2003; Kabat-Zinn, 1994), for example, is a very different mental state than awe (Keltner & Haidt, 2003). However, according to theoretical writings on and scales meant to measure these constructs, both share a subjective sense of decreased self-salience and an increased sense of connectedness with other people and one's environment.

Each of the following constructs meet four criteria. First, the construct must be relatively common in psychological research, cited at least 1,000 times. Second, the construct must describe a mental state (not, e.g., a behavioral trigger). Third, a self-transcendent aspect must have been explicitly described in theoretical writing about the construct. Fourth, a common scale used to measure the construct must include one or more items that explicitly mention reduced self-salience and/or an increased sense of environmental or social connection. While each of the following constructs meet this criteria, they are otherwise quite distinct; however, we propose that they share a family resemblance (Wittgenstein, 1953), and are related to one another due to their shared self-transcendent aspect. Furthermore, these constructs have been associated with more positive than negative outcomes in empirical research; none are included in the *DSM*. For each of these so-called "varieties of self-transcendent experience," we define and describe each construct, identify its self-transcendent aspect, and briefly review research on its outcomes.

Mindfulness

In contemporary contexts, the state of mindfulness is commonly defined as moment-to-moment, open, nonjudgmental awareness, with formal and informal practices associated with its cultivation (Davidson et al., 2003; Jha, Krompinger, & Baime, 2007; Kabat-Zinn, 1994). The self-transcendent component of mindfulness has recently been more explicitly acknowledged with the "S-ART" framework of mindfulness, an acronym that includes "self-awareness" and "self-regulation" and, crucially, "self-transcendence" (Vago & Silbersweig, 2012).

Vago and Silbersweig (2012) describe how the practices associated with cultivating the state of mindfulness lead to changes across dimensions of self-processing, such as the development of self-other relations that transcends self-focused needs and increases prosocial skills like empathy and altruistic behavior. The feeling that one is an outside observer to one's own self is sometimes referred to as "decentering" in the mindfulness literature (Brown, Ryan, & Creswell, 2007; Holzel et al., 2011; Vago & Silbersweig, 2012), allowing the meditation practitioner to reduce strong identification with thoughts and emotions. Vago and Zeidan (2016) further elaborate on this self-transcendent aspect by describing how advanced mindfulness practitioners may experience states of nondual awareness, in which the self-other distinction is dissolved. The Toronto Mindfulness Scale (Lau et al., 2006) asks participants to rate the extent to which they agree with the statement "I experienced myself as separate from my changing thoughts and feelings." Holzel et al. (2011) elaborate on this component of mindfulness: "In place of the identification with the static self, there emerges a tendency to identify with the phenomenon of 'experiencing' itself."

The state of mindfulness can be cultivated through meditation practices taught in the context of mindfulness-based interventions (MBIs) such as mindfulness based stress reduction (MBSR; Da-vidson et al., 2003). Such MBIs are associated with a number of psychological benefits, including improved well-being and self-regulation (Baer, 2003; Davidson & McEwen, 2012; Goyal et al., 2014). Furthermore, Mindfulness training has been shown to increase prosocial behavior (Condon, Desbordes, Miller, & DeSteno, 2013; Leiberg et al., 2011; Weng et al., 2013). For example, Condon, Desbordes, Miller, and DeSteno (2013) demonstrated that a session of mindfulness practice increased the likelihood of an altruistic response to a suffering stranger.

Flow

Flow is a mental state of focused absorption in an interesting and challenging task (Csikszentmihalyi, 1991; Moneta & Csikszentmihalyi, 1996). In flow, the self is said to fade away while merging with the activity one is engaged in and then to re-emerge having benefited from the experience (Csikszentmihalyi, 1991). In the "loss of self-consciousness" factor of the Flow State Scale (Jackson & Marsh, 1996) the following item appears: "I was not worried about what others may have been thinking of me." To this point, Csikszentmihalyi (1991) writes "one item that disappears from awareness deserves special mention, because in normal life we spend so much time thinking about it: our own self" (p. 62).

Flow can be elicited by tasks that are perceived by participants as both interesting and challenging (Ghani & Deshpande, 1994). Despite (or perhaps because of) the element of challenge, the state of flow is often described as "autotelic"—an enjoyable end unto itself (Csikszentmihalyi, 1991; Peterson, 2006)—and is featured prominently in well-being theory as a component of "engagement" (Seligman, 2011). While flow is generally described as devoid of emotion, it often prompts positive emotion afterward (Csikszentmihalyi & LeFevre, 1989; Jackson, 2000; Rogatko, 2009). The regular experience of flow has been associated with higher self-determination and intrinsic motivation (Kowal & Fortier, 1999). While flow may represent an exception to the general tendency of STEs to increase prosocial behavior, this has not yet been tested. However, one study showed that people enjoy experiencing flow with others more than alone, implying that it is not antithetical to social connection (Walker, 2010).

Self-Transcendent Positive Emotions

Positive emotions are mental states associated with genuine, "Duchenne" smiling (Ekman, 1992), approach behavior (Cacioppo, Gardner, & Berntson, 1999; Davidson, 1993), and are usually felt to be enjoyable (Fredrickson, 2001). A subset of positive emotions has a self-transcendent quality. These "self-transcendent positive emotions" (sometimes also called "moral emotions" or "other praising emotions") are: elevation, compassion, admiration, gratitude, love, and awe (Algoe & Haidt, 2009; Haidt, 2003a, 2003b; Haidt & Morris, 2009; Van Cappellen & Rimé, 2014). Scales measuring positive emotions, such as the modified Differential Emotion Scale (Fredrickson, Tugade, Waugh, & Larkin, 2003) often simply provide the name of an emotion (e.g., "joyful," "grateful," "love") and participants are asked to rate the degree to which they felt this emotion. Other research (e.g., Waugh & Fredrickson, 2006) provides the link between positive emotions and self-other overlap (Aron, Aron, &

Smollan, 2002). In a discussion of the self-transcendent aspect of positive emotions, Fredrickson (2009) observes "feelings of oneness are often tied to other people—but not always. We can also feel oneness with nature" (p. 71).

In laboratory settings, self-transcendent positive emotions are often elicited using mood induction stimuli such as watching a short film (Westermann, Spies, Stahl, & Hesse, 1996). Self-transcendent positive emotions have been shown to increase social connectedness and some, such as gratitude, compassion, and elevation, have been shown to increase the desire to help others (Algoe & Haidt, 2009) and to cause altruistic behavior (Schnall, Roper, & Fessler, 2010). In one study of students entering college, the quantity of positive emotions was associated with the degree of connection students felt toward their new roommates, as measured by Aron's Inclusion of Other in the Self Scale (Figure 1; Waugh & Fredrickson, 2006). When generated through the practice of "loving-kindness" meditation, self-transcendent positive emotions can also play a role in reducing depression and increasing well-being (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008).

Awe

Awe, also considered a self-transcendent positive emotion, can have a particularly intense self-transcendent quality. Awe includes notable perceptual changes, for example it has been shown to alter one's sense of time (Rudd, Vohs, & Aaker, 2012). Awe may result from the perception of, and need to accommodate, vastness (Keltner & Haidt, 2003). This vastness can come in a perceptual form, like viewing the northern lights, or a conceptual form, like one's first encounter with a theory that seems to explain almost everything (Yaden et al., 2016a). Participants of one study by Piff, Dietze, Feinberg, Stancato, and Keltner (2015) were administered items to assess how awe changes the sense of self with items such as "I feel small or insignificant," and "I feel the presence of something greater than myself." Piff et al. (2015) summarize research on awe and the sense of self as such: "These lines of research on awe, self-categorization, and feelings of smallness indicate that awe can significantly alter the self-concept, in ways that reflect a shift in attention toward larger entities and diminishment of the individual self."

Awe can be induced through proximity to physical vastness. For example, studies have used stimuli such as groves of tall trees to elicit experiences of awe in participants (Piff, Dietze, Feinberg, Stancato, & Keltner, 2015). Virtual reality can also be used to simulate proximity to vastness (Chirico, Yaden, Riva, & Gagglioli, 2016; Chirico et al., in press). Other induction methods include reading or writing about experiences of awe (Shiota, Keltner, & Mossman, 2007, listening to music, or viewing awe-inspiring images (Prade & Saroglou, 2016). Altruistic behavior and well-being can result from the experience of awe (Rudd, Vohs, & Aaker, 2012; Van Cappellen et al., 2013). In one series of studies, participants who received awe inductions experienced a diminishment of the self and an increase in prosocial concerns and behaviors, including generosity on an economic distribution task (Piff et al., 2015).

Peak Experiences

Peak experiences were named by Maslow (1964) to describe STEs and other transformative experiences reported during inter-views with individuals classified as highly functioning, or "self-actualized." Peak experiences typically include a feeling of merging with the universe (which may or may not include God or other supernatural concepts). Maslow effectively continued the intellectual tradition exemplified by Bucke's (1901) "cosmic consciousness," of demonstrating that experiences involving intense feelings of self-transcendence can be interpreted in secular as well as religious/spiritual terms. The Peak Scale (Mathes, Zevon, Rotter, & Joerger, 1982) includes items related to self-transcendence such as "I have had an experience that made me extremely happy and, at least temporarily, helped me to appreciate wholeness, unity, and integration to a greater degree than I usually do." This self-transcendent aspect is often primary in descriptions of the peak experiences of self-actualized individuals: "These same people, the strongest egos ever described and the most definitely individual, were also precisely the ones who could be most easily ego-less, self-transcending . . ." (Maslow, 1968, p. 155).

Peak experiences are typically measured over the course of a lifetime, as they are rather rare events. Most research, following the popular conception of peak experiences, has focused on intense positive emotion (i.e., Panzarella, 1980) but Maslow clearly described a dimension of self-transcendent unity in these experiences (Davis, Lockwood, & Wright, 1991; Wuthnow, 1978). While positive emotion and unity are both often described as aspects of peak experiences, the unity component of peak experiences has been described as more primary than positive affect (Mathes, Zevon, Rotter, & Joerger, 1982). Besides Maslow's hypothesized association of peak experiences with self-actualization, peak experiences have been empirically shown to positively correlate with well-being (Margoshes & Litt, 1966; Mathes et al., 1982), meaning in life (Magen, 1996), and empathic behavior (Olson et al., 1998; Wilson & Spencer, 1990).

Mystical Experiences

Mystical experiences are a particularly intense variety of STE. Some people report that during mystical experiences the sense of self can fall away entirely, creating a distinction-less sense of unity with one's surroundings (Hood, 2002; James, 1902; Newberg & d'Aquili, 2000; Stace, 1960), though descriptions of mystical experiences also appear to vary across cultural contexts (Katz, 1978). James (1902) noted that mystical experiences involved: transiency (they are brief), ineffability (they are difficult or impossible to fully describe in language), passivity (they feel overwhelming), and have a noetic quality (they feel real; Yaden et al., 2017). In addition to the dramatic changes to one's sense of self, mystical experiences can change other fundamental aspects of consciousness, such as the senses of time and space (Hood, 1975; James, 1902; MacLean, Leoutsakos, Johnson, & Griffiths, 2012; Newberg & d'Aquili, 2008).

Despite their esoteric connotations and supposed ineffability, mystical experiences are measurable through several methods. Written accounts of mystical experiences have been analyzed using qualitative (Belser, in press) and quantitative means (Yaden et al., 2015). Several single item questions have been used in large-scale surveys over the years (e.g., Gallup), which focus on different aspects of mystical experiences (Hood, Hill, & Spilka, 2009). Scales have also been developed to standardize the measure of mystical experiences. Foremost among these is the Mysticism

Scale (M-Scale; Hood, 1975), which operationalizes James's characterization of mystical experiences and includes items such as "I have had an experience in which I realized the oneness of myself with all things." Hood (1975) describes the "Ego Quality" factor of this scale as referring to "the experience of a loss of sense of self while consciousness is nonetheless maintained. The loss of self is commonly experienced as an absorption into something greater than the mere empirical ego (p. 31)."

More recently, the Mystical Experience Questionnaire (MEQ; MacLean et al., 2012) was developed to measure single mystical experiences facilitated by the psychedelic substance psilocybin in laboratory settings. Both Hood's and MacLean's scales rely heavily upon James's (1902) and Stace's (1960) phenomenological elucidation of mystical experience, and the two significantly positively correlate with one another. Given the strong correlation between these two measures it appears that experiences occasioned by psilocybin are comparable with those that occur in other settings whether deliberately facilitated or occurring apparently spontaneously (Hood, 2014; Yaden et al., 2016b).

Psychopharmacology research is making breakthrough progress on inducing mystical experiences in laboratory settings. Researchers at Johns Hopkins University (Griffiths, Richards, McCann, & Jesse, 2006, 2008) replicated Pahnke's (1966) classic "Good Friday Experiment," in which students were administered psilocybin during a Good Friday religious service, with the rationale that such substances have been used for centuries in many cultures to induce intense experiences that were typically interpreted through a religious worldview (Grob & de Reios, 1994; Grob et al., 2011). Griffiths, Richards, McCann, and Jesse (2006) improved on Pahnke's study by utilizing a double-blind, between groups, crossover design with an active control. In this study, two thirds of participants who were administered psilocybin met the criteria for a mystical experience. Additionally, about two thirds of the participants rated their experience *among the top five most meaningful moments of their entire lives* (alongside events like childbirth and marriage; see Figure 2). We suggest that the frequently observed increase in the sense of meaning in life is an important and understudied outcome that many STEs may have in common.

Psychological outcomes associated with mystical experiences (elicited by psilocybin) include increased positive attitudes about one's life and self, positive mood, altruistic social effects, positive behavior change, meaning in life, and life satisfaction (Griffiths et al., 2008, 2006; Streib & Hood, 2016; Yaden et al., 2016b). These beneficial effects have been shown to last at least 18 months after a laboratory session (Griffiths et al., 2008). Indeed, the empirical evidence supports James's supposition that mystical experiences are often lasting, positively transformative moments that rank among the most meaningful of one's life (Miller & Bacag, 2001). A growing body of evidence suggests that STEs can consist of deeply meaningful and positively valenced moments; however, research has also identified pathological manifestations of self-loss worth considering.
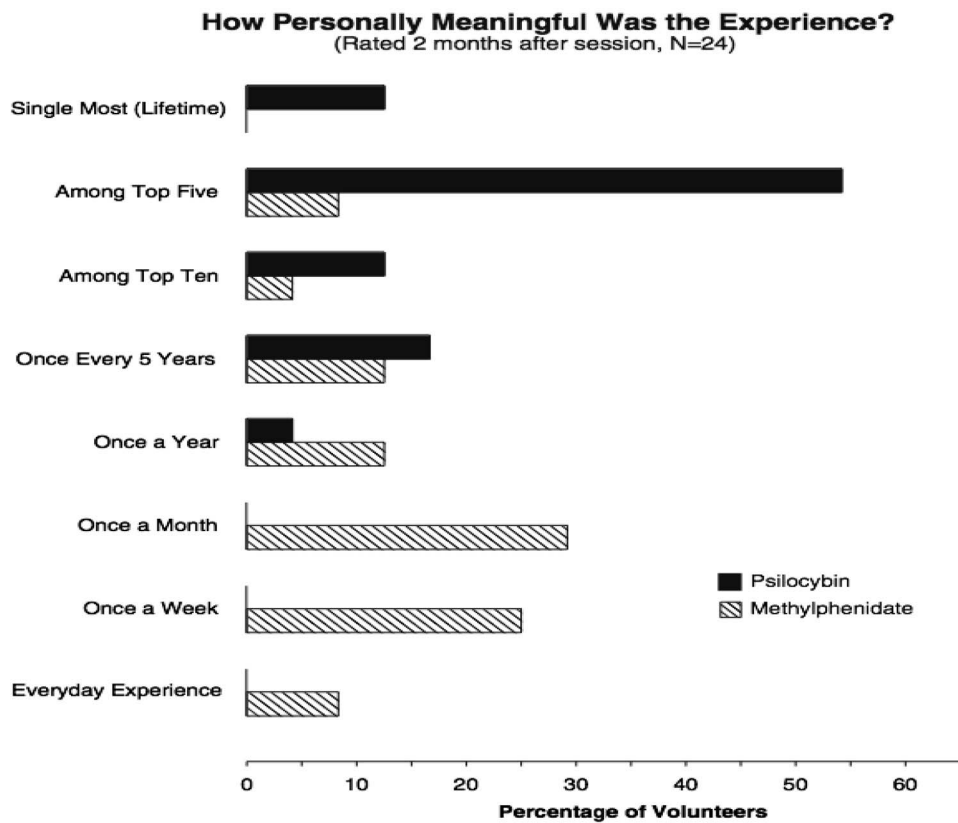

How Personally Meaningful Was the Experience?
(Rated 2 months after session, N=24)

Figure 2.   About two thirds of participants who received psilocybin reported a mystical experience that ranked among the top five most meaningful moments in their lives.

Positive and Pathological Experiences

STEs are often associated with positive outcomes; however, pathological instances of self-loss have also been studied and codified into diagnostic categories. This relationship is most apparent under the *DSM* dissociative cluster in "Depersonalization"—the sense of detachment from one's usual sense of self (Michal et al., 2011; Simeon et al., 2014). While depersonalization episodes involve changes to one's sense of self that can also involve one's bodily and self boundaries, such episodes (which are not rare in the normal population) typically involve a sense of remoteness and alienation from other people and one's environment (Sierra, Baker, Medford, & David, 2005). In other words, depersonalization episodes may involve the annhilational aspect but not the relational aspect of STEs, although this supposition has not yet been tested empirically.

A sense of self-loss is also apparent in some cases of schizophrenia (Ferri et al., 2012) and in certain psychotic states (e.g., Atwood, Orange, & Stolorow, 2002). In these cases, the usual sense of one's self seems to fade away in the context of distress, producing maladaptive consequences frequently requiring therapeutic care. Notably, in these and other diagnostic categories, the sense of self is not technically defined. There are, of course, hundreds of definitions for the self in the psychological literature (Baumeister, 1991), including important cross-cultural differences (Mosig, 2006)—yet diagnostic categories involving the self seem to rest more on self-reports from patients about their "sense of self" feeling diminished or absent. Further conceptual and empirical work is warranted regarding what is meant by "self" in such states.

While these instances of psychopathology seem to also involve the subjective sense of self-loss, it is as of yet unclear how they relate to other, more positive experiences of self-loss, such as the varieties of STE described previously. It has been shown, however, that individuals who report mystical experiences are no more likely to have tendencies toward psychoticism or neuroticism than the normal population (Caird, 1987). Self-loss should thus be considered an alteration of consciousness with potentially pathological or positive consequences. As pathological instances have received much more attention, our focus here is on positive instances.

Pathological and positive forms of STE can also overlap, blurring the lines between these usually too-simple categories (Lukoff, Lu, & Turner, 1992; see Figure 3). STEs can, for example, play a part in healing or resolving periods of suffering (Pargament, Koenig, Tarakeshwar, & Hahn, 2004). Constructs such as posttraumatic growth (PTG) and postecstatic growth (PEG) make clear that psychological growth is possible after extremely positive (Roepke, 2013) or extremely negative experiences (Roepke, 2014; Tedeschi & Calhoun, 1996, 2004)—and the more intense forms of STEs represent visceral subjective events that could potentially fall into either category. Clear classification of intense STEs is difficult in cases that contain both anxiety-provoking and growth-promoting content, leaving some experiences with qualified positive outcomes—as in cases in which the experience was difficult, yet ultimately positive.

Additionally, the reduced self-salience during STEs has led to a misconception that they may undermine one's sense of agency (Deikman, 1977, p, 214). This view, however, generally rests on a misunderstanding of agency. Agency does not consist of a constant focus on and reification of the self, but rather is defined by the belief in one's capacity for action (Bandura, 1989). This nuance supports the perspective that agency is theoretically orthogonal to the changes to one's sense of self during STEs. Although, some researchers have claimed that the relationship between STEs and agency is better understood as one of reciprocal reinforcement insofar as STEs can enhance agentic behavior and agency may enhance the capacity for STEs—a pattern that might be called a virtuous cycle (Csikszentmihalyi, 1991; Haimerl & Valentine, 2001; Leary & Guadagno, 2011).

An underdeveloped area of research is how one's belief-based interpretation of their STE may influence its effects. Some scholars have suggested that religious or spiritual interpretations may make such experiences more profound or easier to integrate into one's life (e.g., Zaehner, 1961), while others downplay any interpretations as a mere linguistic gloss, mostly lacking in causal efficacy (e.g., Forman, 1998). The precise roles that interpretation, beliefs, and cultures play in moderating outcomes of STEs are unknown. It is clear, however, that the impact of the interpretation or meaning one ascribes to their experience is an important area for further empirical research and essential for a robust understanding of STEs and related intense subjective experiences.

The *DSM* obliquely acknowledges another potential pathological manifestation of STEs through a diagnostic code for "religious and spiritual problems" (diagnostic code V62.89; Lukoff, Lu, & Turner, 1992). However, this code focuses more on conversions or questioning related to one's belief system, so would only apply in cases where STEs alter one's belief system, resulting in maladaptive behavior.

In general, the positive psychological potential of STEs apparent in the self-transcendent constructs reviewed in the previous section, has yet to be adequately empirically elaborated or explained. Positive psychology, the study of well-being (Gable & Haidt, 2005; Seligman & Csikszentmihalyi, 2000), which includes investigating salutogenic mental states, may offer a useful lens through which to explore and empirically inquire into the relationship between aspects of STEs, well-being, and other aspects of mental
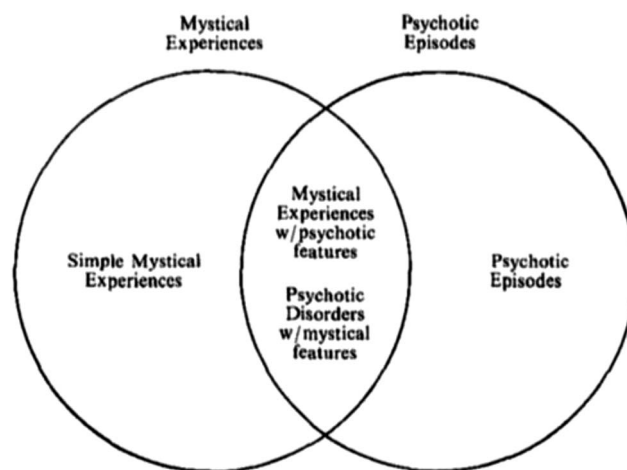

Figure 3. Positive and pathological forms of STE are generally distinct, yet they can also overlap (Lukoff, Lu, & Turner, 1992).

health. The next section discusses candidate mechanisms through which some effects of STEs may be mediated.

Dimensions of Unity

Research in psychology and affective neuroscience can help explain the triggers, neurobiological underpinnings, and outcomes of STEs. As described here, STEs contain two subcomponents: (a) reduced self-salience—fading bodily and social boundaries and (the "annihilational component"); and (b) connection to other people and things in the environment beyond the self (the "relational component"). Logically, these two components seem related, as when a raindrop falls into the ocean it simultaneously ceases to be a single drop when it becomes part of the ocean. However, it may be possible that experiences can occur with more of one aspect than another, or perhaps with only one aspect—this is, we suggest, an important area for future empirical study. Further, the annihilational and relational components likely convey psychological benefits of STEs through different processes and underlying neurobiological systems. Specifically, we suggest that the annihilational component may reduce negative aspects of excessive self-focus while the relational component likely involves processes related to perceived social connection.

The Annhilational Component

The annhilational component describes the subjective experience of self-loss. As noted previously, "the self" is a classically difficult to define concept in psychology (Baumeister, 1991). Phenomenologically speaking, however, many people report that their "sense of self" and/or self-boundaries temporarily disappear during their STEs. The term *hypoegoic state* (Leary & Guadagno, 2011) captures well the reduced self-salience of the annhilational component of STEs, as hypoegoic states are defined by a relative *lack* of self-awareness, self-differentiation, and self-centered motives. This emphasis on self-loss is motivated by a view that the self is often a source of anxiety, as articulated in *The Curse of the Self* (Leary, 2004).

Substantial clinical research supports the view that excessive self-focus is associated with a number of negative outcomes. This is apparent in the self-centered ruminations of depression (Ingram, 1990; Lemogne et al., 2010; Lyubomirsky & Nolen-Hoeksema, 1995; Pyszczynski & Greenberg, 1987; Watkins & Teasdale, 2001), the hyper self-awareness of anxiety (Epel et al., 2009; Mellings & Alden, 2000; Woody, Chambless, & Glass, 1997), and the narrow self-focus of negative emotions (Fredrickson, 2001). Excessive self-focus is also present in the so-called "self-conscious emotions" of shame and guilt (Lewis, 2000) as well as the bodily boundary reinforcing functions of disgust (Rozin, Nemeroff, Horowitz, Gordon, & Voet, 1995). Thus, STEs may confer some of their benefits by *reducing* excessive self-focus.

Neuroimaging research is converging on certain brain regions and network interactions that may mediate the subjective sense of self-loss. For example, decreased metabolic activity in the superior parietal lobe was observed in advanced meditators and nuns who reported intense feelings of unity while being scanned using single photon emission computed tomography (SPECT; Newberg et al., 2001; see Figure 4). Evidence from both meditation and psychedelic research suggest that a GABA-mediated inhibition of tha-
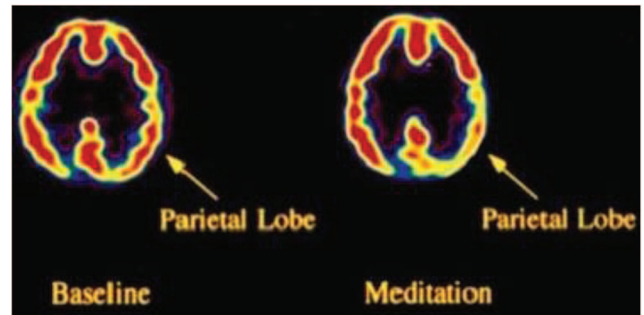

Figure 4. SPECT brain scans of advanced meditation practitioners at baseline and while meditating. During peak feelings of unity while meditating, decreased activation was observed in parietal regions such as the posterior superior parietal lobe (Newberg et al., 2001). See the online article for the color version of this figure.

lamic regions could result in a deafferentation (reduction of neural flow) to these parietal regions, which are associated with spatial body awareness (Newberg et al., 2001; Newberg & Iversen, 2003). Inhibition to such parietal regions could reduce the brain's capacity to represent bodily boundaries, as these regions are typically associated with modeling one's egocentric position in space and distinctions between self and nonself (Farrer & Frith, 2002).

Other imaging studies on subjects reporting mystical-type experiences have likewise found decreases in (superior and inferior) parietal functioning (Azari et al., 2001; Beauregard & Paquette, 2006; Johnstone et al., 2012). So-called "out of body experiences" have been shown to be associated with alterations in the nearby temporo-parietal junction (TPJ; Blanke & Arzy, 2005). Additionally, lesions in the (inferior) parietal regions and right angular gyrus increase the propensity for self-transcendent experience (Urgesi, Aglioti, Skrap, & Fabbro, 2010; see Figure 5). The role of the parietal lobe in representing self-other boundaries and egocentric spatial awareness, as well as the findings implicating this region reviewed above, suggest this region is critically involved in STEs.

In general, evidence from clinical psychology demonstrates certain negative aspects of excessive self-focus—and neuroscience research suggests that STEs are at least partly mediated by inhibiting the superior and inferior parietal cortices, regions responsible for modeling bodily and self boundaries. STEs may, then, confer some of their benefits by providing a temporary reprieve from the sense of one's self. This line of reasoning emphasizes how most fears and anxieties come from the prospect of damage to one's physical or social self. Therefore, when the self temporarily disappears, so too may some of these fears and anxieties.

The Relational Component

The relational component of STEs describes the subjective sense of connectedness with other people and objects in one's environment. As previously mentioned, self/other overlap describes states of interpersonal connection (Aron & Aron, 2000) and is commonly measured by the Inclusion of Other in Self Scale (IOS; Aron, Aron, & Smollan, 1992; see Figure 1). This instrument presents respondents with two circles that overlap to varying degrees (the first labeled "self" and the second labeled "other").
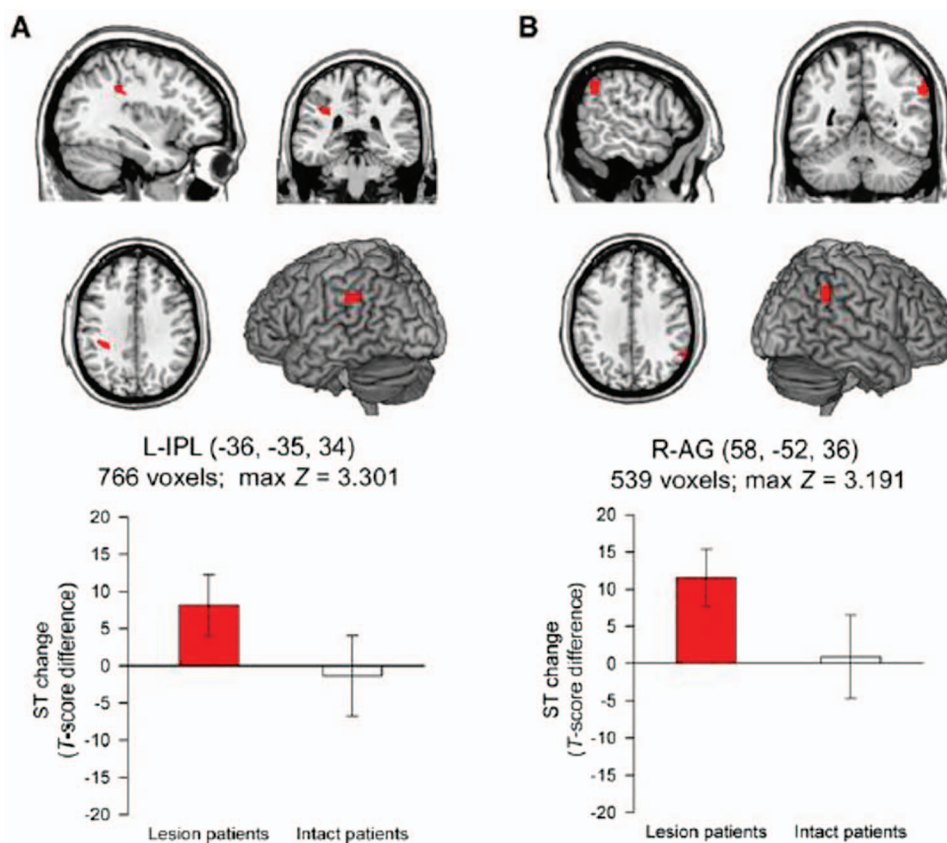
Figure 5. Brain lesions from removing cancerous tumors in patients resulted in increased self-transcendence (as measured by the TCI) when parietal (but not anterior) regions were affected (ST = self-transcendence; Urgesi et al., 2010). See the online article for the color version of this figure.

Participants are then asked to indicate how connected they feel to other people. This construct is informed by "self-expansion theory" (Aron & Aron, 2000), which postulates that one's sense of self can be expanded to include, or feel a sense of unity with, other people and one's environment. While it is usually used in a more cognitive, long-term sense of expanding one's sense of identity to include close others into one's sense of self, in STEs a similar process may occur in a brief, viscerally subjective manner.

Self/other overlap indicates a perception of social connection with other individuals or other groups. On the individual level, Aron, Aron, Tudor, and Nelson (1991) has shown that when subjects are asked to anonymously distribute money, they do so about equally between themselves and others with high self/other overlap, but more selfishly with those with less self/other overlap. The degree of self/other overlap reported also predicts closeness and intimacy in romantic relationships (Aron & Fraley, 1999). Inclusion of others into the self can also extend to groups of people (Smith, Coats, & Walling, 1999; Tropp & Wright, 2001), with implications for turning other individuals from out-group to in-group members. This group-level self/other overlap and has been put forth as a key factor in reducing racial prejudice (Davies, Tropp, Aron, Pettigrew, & Wright, 2011). This sense of connectedness to a group comports well with the deep sense of connectedness with others described during STEs.

Substantial clinical research supports the view that isolation and social exclusion—the complete lack of self/other overlap—is associated with negative outcomes such as anxiety, depression, and suicide (Baumeister & Tice, 1990; Cacioppo et al., 2006). Perceived social connection, on the other hand, has been proposed as a basic human drive and linked with a number of beneficial mental and physical health outcomes (Baumeister & Leary, 1995; Gable, Reis, Impett, & Asher, 2004; Seppala, Rossomando, & Doty, 2013). Social connectedness figures prominently in several theories of well-being, including "relatedness" in Ryff's theory of well-being (Ryff & Keyes, 1995) and "positive relationships" in well-being theory (Seligman, 2011). Processes related to perceived social inclusion and connection through self/other overlap may represent primary mechanisms through which the psychological benefits of STEs are conferred.

Neuroscience and psychophysiology research are converging on brain regions and physiological processes related to self/other overlap and perceived social connection. For example, the neuropeptides oxytocin (OXT) and arginine vasopressin (AVP) have been associated with perceived social connection, though the magnitude of this effect and how wide the scope of this social connection extends are the subject of ongoing debate (Heinrichs, von Dawans, & Domes, 2009). Some researchers suggest these neuropeptides may underlie STEs due to their proliferation in brain

regions associated with STEs (Grigorenko, Warren, Lerner, & Phelps, 2011; Landgraf & Neumann, 2004). Silvers and Haidt (2008) found that lactating women who watched a morally elevating video were more likely to secrete breast milk (a physiological process associated with oxytocin release) and to nurse their infants than were lactating women in the control group (who watched a comedy video).

Furthermore, oxytocin release may be tied to vagal tone (Kok & Fredrickson, 2010), which has been implicated in a wide range of outcomes related to perceived social connection (Carter et al., 2008; Kemp et al., 2012). The vagus nerve is activated during self-transcendent positive emotions like awe, compassion, gratitude, and love, suggesting a potential mechanism underlying STEs (Kok et al., 2013; Kok & Fredrickson, 2010; Porges, 2007; Thayer et al., 2012). Keltner (2009) observes that those with healthy vagal tone are more other-focused, and "showed an increased propensity for transformative experiences of the sacred" (p. 242).

Neurologically, STEs may also activate social–cognitive processes related to theory of mind, mentalization, and mind perception. These cognitive processes are involved in, roughly speaking, perceiving (mind perception), prioritizing (mentalization), and representing (theory of mind) the mental states of other people. Parietal regions associated with STEs, like the inferior parietal lobe and tempero-parietal junction, have been closely connected to theory of mind and mentalization (Decety & Chaminade, 2003; Frith & Frith, 2012). Further, brain regions that represent the self and brain regions that represent other people are largely shared, leading some (i.e., Zaki & Ochsner, 2011) to theorize that self/other overlap could occur through alterations to these shared underlying brain networks. While speculative, STEs may gain some of their prosocial outcomes through activation in these regions related to social cognition. Theoretical work linking mind perception, theory of mind, and mentalization to altruistic behavior (e.g., Batson et al., 2003; de Waal, 2008) is supported by recent cognitive neuroscience research (Amodio & Frith, 2006; Van Overwalle & Baetens, 2009). For example, activation of brain regions associated with mentalization predicts donation behaviors (Waytz, Zaki, & Mitchell, 2012) and other forms of costly prosocial behavior (Telzer, Masten, Berkman, Lieberman, & Fuligni, 2011). Furthermore, mentalization is associated with processes related to social connection such as liking other people and seeing other people as more similar to one's self (Kozak, Marsh, & Wegner, 2006; Zaki, & Ochsner, 2012). The connective component of STEs may be mediated by some of these processes.

In general, some of the benefits of STEs may derive from increased perceived social connection. This may occur through two major mechanisms. First, increased self/other overlap accompanied by neuropeptides like oxytocin and vasopressin as well as alterations to parasympathetic activity and vagal tone. Second, social–cognitive processes related to mind perception, theory of mind, and mentalization may be increased. These candidate processes could potentially lead to more perceived similarity to and connection with other people, thus increasing well-being and prosociality.

Social and Spatial Unity

The relational component of STEs may extend beyond interpersonal domains to include one's spatial environment. The theory of "allo-inclusive identity" (Leary, Tipsord, & Tate, 2008) suggests that people can experience self/other overlap with their spatial environment, in some cases including all of existence. Supporting this view, a linguistic analysis study investigating written descriptions of mystical experiences found that participants who scored highest on a mystical experience measure used more "inclusive" language, with words indicating social connection (we, both, together) *and* spatial connection (close, all, everything; Yaden et al., 2015). Additionally, neuroimaging studies have found that temporal, spatial, and social distance may be mediated by very similar brain processes (Parkinson, Liu, & Wheatley, 2014). In other words, during STEs, people may feel deeply connected to other people (their social environment) as well as objects around them (their spatial environment).

This feeling of unity may result in attributing social qualities to one's spatial environment - a social/spatial conflation. The theory of "existential theory of mind" (Bering, 2002) describes the tendency for people to perceive mind and intention in—or mentalize—the world at large. Notably, this kind of perception of "mind-at-large" has been indirectly observed during a number of STEs. For example, mindfulness practitioners reported an increase in spiritual beliefs after mindfulness meditation training (Shapiro, Schwartz, & Bonner, 1998). Participants who experienced self-transcendent positive emotions were more likely to endorse items about the essential benevolence of the universe (Saroglou, Buxant, & Tilquin, 2008; Van Cappellen & Rimé, 2014; Van Cappellen & Saroglou, 2012). Likewise, awe has been shown to increase agency detection in ambiguous stimuli (Valdesolo & Graham, 2014). Peak experiences are theoretically associated with beliefs about the goodness of the world (Maslow, 1968) and mystical experiences are correlated with higher levels spirituality (Yaden et al., 2017). Addressing this general finding, Hood (1994) writes "The fact that both self and nonpersonal objects can be united leads to the claim of an inner subjectivity to all, itself extensively discussed in the conceptual literature on mysticism" (p. 289).

Blurring the lines between the social and the spatial, or perceiving the social in the spatial, may be another way to increase perceived social connection—and thus increase well-being. While the tendency to overperceive mind in one's environment in this way is sometimes associated with schizotypy (Gray, Jenkins, Heberlein, & Wegner, 2011), perceiving social connection in one's spatial environment may nonetheless have underexplored positive outcomes. For example, William James observed that one outcome from mystical experiences can be the feeling of being at home in the universe (as cited in Sagan & Druyan, 2011, p. 333). Similarly, Einstein remarked that one of the most important questions that one can ask is whether the universe is a "friendly place" (Goldman, 2002). STEs may provide both a temporary, yet emphatic "yes!" in answer to Einstein's question and turn, for a while, a threatening universe into a warmer and more inviting home.

Evolutionary Considerations

The selflessness, connectedness, and prosocial feelings that STEs often promote raise the question of whether the human capacity for experiences of self-transcendence is an adaptation shaped by natural selection, or whether it is a byproduct or "spandrel" that emerged as evolution was shaping human nature in other ways. And if it is an adaptation, is it an adaptation that helps

individuals compete with other individuals, or an adaptation that helps groups compete with other groups?

On the individual level, STEs would seem, on their face, to make individuals weaker and more vulnerable. One could imagine a number of scenarios in which one is left defenseless and incapacitated or open to manipulation by an excess of fellow feeling. This view is compatible with the perspective that religion and spirituality are "memes," or ideas that prey like parasites on aspects of human psychology (Barrett, 2000; Boyer, 2003; Guthrie, 1993). According to this perspective, STEs are merely "sensory pageantry," or unusual sensory experiences that happen to reinforce religious and spiritual beliefs by making their presentation more memorable (Barrett, 2000). This line of reasoning would lead to the conclusion that STEs are a spandrel—a byproduct of another adaptation which conferred no advantage of its own.

The main survival advantage that STEs may have conferred on individuals, as suggested by the existing literature, is that they may have helped individuals to change their relationships, or learn about potential relational partners, in ways that optimized an individual's social investments and alliances (Henrich & Gil-White, 2001). For example, the capacity to feel the self-transcendent emotion of elevation might lead one to be more trusting toward people who are indeed trustworthy. Additionally, the capacity to feel gratitude does seem to motivate people to act in ways that strengthen beneficial relationships (Algoe, Haidt, & Gable, 2008). However, we grant that this is highly speculative, and we doubt that STEs evolved by the ordinary sort of evolutionary processes often said to have shaped other emotions that conferred survival advantages on individuals (for a review, see: Keltner, Haidt, & Shiota, 2006).

The benefits to groups are easier to trace: STEs often foster trust and group cohesiveness. In his study of Aborigines, Durkheim (2013) concluded that experiences like STEs form an important core of tribal life. Anthropologist Fiske (1992) suggests that rituals that produce self-transcendent experiences of commonality may have helped to facilitate communal sharing, a fundamental form of social life. Multilevel selection theory acknowledges the highly social, group-ish qualities of human beings by positing that selection occurs at the individual (within-group) and group (between-groups) levels (Wilson & Wilson, 2007).

Extending this literature explicitly to STEs, Haidt (2012) proposed "The Hive Hypothesis." According to this view (which builds on Wilson, 2002), STEs may have emerged originally as spandrels or neurological accidents, but once present, they conferred an advantage on groups that developed cultural innovations that harnessed them, such as forms of group ritual and religious worship that increased trust and the ability to engage in coordinated action within a group or tribe. That is, the temporary "all for one, one for all" subjective quality of STEs may have helped foster more cohesive groups, which outcompeted less cohesive groups. Several authors have argued that religions evolved (culturally) and spread in part because they conferred such advantages on groups (Wilson, 2002; Wright, 2010). On this view, the human capacity for STEs may have been shaped by a process of multilevel selection, including some degree of group level selection. However, whether the group-level process (if it occurred at all) involved exclusively cultural group selection (Atran & Henrich, 2010) or cultural group selection that had some effect on genes as well (Haidt, 2012) cannot be known at present.

Future Directions

Applications involving STEs are increasing at a rate faster than our understanding of their underlying mechanisms. Mindfulness, for example, is one of the fastest growing interventions in health care and psychotherapy (Vago & Silbersweig, 2012); yet, the extent to which intense or even pathological forms of self-loss occur in contemporary settings of mindfulness practice remains unclear. Self-transcendent positive emotions, flow, and awe are promoted as avenues to increased well-being (Fredrickson, 2009; Keltner, 2009; Seligman, 2011). Intense, mystical experiences can now be induced in laboratory settings through psychopharmacological interventions (Griffiths et al., 2006, 2008). STEs can also be induced through various meditation and prayer practices (Newberg et al., 2001), retreats (Hood, 1975), and perhaps eventually, through noninvasive brain stimulation (Yaden, Iwry, & Newberg, 2016). Further research is necessary in order to establish efficacy, contraindications, and implications of STEs for therapeutic purposes.

STEs, like many psychological constructs, are likely nonmonotonic (Grant & Schwartz, 2011). In other words, as with most psychological constructs, there can be too much of a good thing. Practical wisdom (Schwartz & Sharpe, 2010) is required to sensibly study or facilitate STEs, especially in light of failings of common sense and professional ethics in decades past, specifically related to early psychedelic research (Baumeister & Placidi, 1983). However, some have argued that the relative lack of settings for the facilitation of STEs in contemporary secular society is historically anomalous (Ehrenreich, 2006; Grob & de Reios, 1994; Haidt, 2006). This view, combined with the promising outcomes outlined through this review, provide some justification for testing the application of STEs in a sensible and evidence-based manner.

Finally, STEs represent instances in which basic aspects of consciousness are profoundly affected. The senses of time, space, mind perception, and self can all be influenced during STEs. Perhaps we can understand more about the presence of these fundamental aspects of consciousness by studying instances of their alteration or absence.

Conclusion

STEs are more than mere psychological anomalies; they are often reported to be profoundly positive. On the surface, there is little reason to suspect that losing one's sense of self would be anything other than negative—terrifying even. Indeed, there is some variability in the emotional valence and outcomes associated with these experiences. Pathological manifestations of STEs exist and are codified in the DSM, such as depersonalization disorder and psychotherapeutic care is sometimes required to integrate particularly intense STEs. However, a qualified consensus has emerged that positive instances of STEs are common and worthy of further investigation.

More intense STEs, like peak or mystical experiences, appear capable of generating positive effects on well-being and altruistic behavior that can last for many months (e.g., Griffiths et al., 2008). Compared with, to cite just one example of small and short-lived intervention effects, the generally poor record of moral education courses lasting a semester in causing measurable change (e.g., Waples, Alison, Murphy, Connelly, & Mumford, 2009), these

reported long-lasting changes are striking, and potentially important.

In closing, we suggest that an element of self-transcendent experience can be found in a number of common psychological constructs and that while pathological manifestations of this kind of experience exist, STEs appear also to be potent sources of well-being and prosocial behavior. Experiences of self-transcendence, then, do seem to provide some of life's most positive and meaningful experiences, and, as James claimed, may comprise some of our moments of "greatest peace."

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