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What is Transcendence, How Did it Evolve, and is it Beneficial?

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Some religious traditions, such as Buddhism and Sufism, stress the importance of cultivating transcendence as an important aspect of religious practice. That many individuals, both religious and nonreligious (see Levin & Steele, 2005), report transcendent states only adds to the importance of transcendence as a subject of investigation within the scientific study of religion and beyond. Indeed, its pervasiveness in secular contexts—for example, during experiences of "flow" (Csikszentmihalyi & Nakamura, 2002)—should compel scientists and scholars to treat it as a Hilbert problem of fundamental importance. As such, we lay out three subcomponents of this problem concerning the scientific study of transcendence:

1. What is transcendence?
2. What are the evolutionary antecedents of transcendence?
3. Is transcendence beneficial?

1. What is Transcendence?

The variegated nature of transcendence and its activation in widely differing contexts presents a problem that is more than semantic. This is because defining transcendence in any one way, to the exclusion of others, can canalize the direction of research. Thus, if our definitions are flawed, scholars risk squandering their time chasing non-existent or unimportant constructs, whether in the brain or in individual experience. Neither should we define transcendence too broadly, however—for example, by labeling any joyful or ecstatic experience as "transcendent"—lest we ignore the unique nature of the transcendent experience and its evolution. This is why defining transcendence within the broad confines of semiotic concepts such as "diagrammatic reasoning" and "hypostatic abstraction" (see Robinson, this issue) or as dependent on Bayesian predictive coding (see Schjoedt & Andersen, this issue) should be first

steps rather than endpoints to understanding the unique features of transcendence and its phenomenology.

One starting point is to identify the commonalities and differences between reported experiences of transcendence. Although doing so risks engaging in circular reasoning by selecting what counts as transcendence prior to defining it, focus on peak emotional experiences within established religious traditions can limit the scope of investigation to the very psychological states that require explanation. On this account, as on many others within the psychological sciences, William James was at the vanguard with his landmark *The Varieties of Religious Experience* (James, 2004/1902). According to James, what distinguishes the religious experience is the dissolution of one's sense of "self"alongside psychological absorption in something greater than one's self. To support this construct, James presents an anthology of religious experiences spanning centuries of literature and personal accounts from Western mystics and writers.

This starting definition of transcendence is all the more plausible given its prevalence in Eastern thought. In Buddhism, for example, *annata*, or "non-self," refers to a mental state whose cultivation is necessary for the attainment of nirvana. Selflessness is also amenable to examination in secular contexts of transcendence, as instanced by its co-occurence with the state of "flow" during challenging, skill-dependent athletic or artistic endeavors (Csikszentmihalyi & Nakamura, 2002). Empirically, scientists are already pinpointing the neural correlates of selflessness, as highlighted by fMRI research showing deactivations of the "default mode network"—a brain network believed to be involved in producing one's sense of "self"—during immersive psychedelic experiences (Carhart-Harris et al., 2012). As such, activating selflessness in non-religious communities may help to bring about group solildarity that is not dependent on

supernatural rewards or punishments (see McCaffree and Said, this issue, for questions concerning the function of religious versus secular communities).

Understanding just what transcendence is remains a problem. Although we believe that selflessness is a key aspect of many, if not all, types of transcendent experience, it is probably not a sufficient marker of transcendence (e.g., there is no sense of self during deep sleep or death, yet we would not call these states "transcendent"). Identifying other psychological aspects of transcendence will be a task for scholars spanning multiple disciplines, from religious studies to biochemistry, and will require committed interdisciplinary cooperation.

2. What are the Evolutionary Antecedents of Transcendence?

Recently, Gorelik (2016) advanced an argument that there are at least four types of transcendence, each with its own evolutionary history: (1) social (or ingroup) transcendence, (2) theory of mind (ToM) transcendence, (3) aesthetic transcendence, and (4) epistemic transcendence.

Social transcendence. Music may be unique in its power to produce transcendent states that motivate trust and commitment among group members. This is indicated by the prevalence of rhythmical drumming, swaying, chanting, and singing during the communal rituals of many tribal societies (see Atran, 2002, pp. 171-172, for review). Many modern religious services are likewise infused with musical performance or musical intonation of prayers and written passages. When in a communal setting, music and other stimuli activate emotional states marked by selfless identification with one's ingroup. Indeed, synchronizing body movements to the same rhythm increases likeability between listeners (Launay, Dean, & Bailes, 2014).

Music-activated and other types of social transcendence are often elicited during coming-of-age rituals, seasonal festivals, and attemts to control the weather and foraging success (often

with the aid of psychoactive substances) in shamanic societies (Waida, 1983). Social transcendence may function as a costly commitment signal that enables efficient group behavior via music-induced synchrony. As such, this type of transcendence bears the marks of complex adaptation for group cohesion in an unpredictable environment. Whether it is such an adaptation is a topic for empirical analysis. As suggested by Lenfesty and Fikes (this issue), "polyvagal theory" might explain positive (versus punishment-based) forms of human prosociality as expressions of a physiological "Social Engagement System." Whether social transcendence is an evolved, emotionally-charged subcomponent of this system is both a theoretical and an empirical question. Furthermore, whether music is itself an adaptation to bring about such transcendent states or a byproduct of other adaptations (see Pinker, 1997, pp. 534-535) needs examination.

Shaver's suggestion (this issue) that costly signaling within religious communities functions to increase allocare (i.e., care of children by individuals other than the mother) by co-religionists may help to explain the selective benefits of social transcendence. As a costly emotional signal, social transcendence may ensure that individuals receive childrearing assistance from community members, which may, in turn, help to spread the capacity for social transcendence across generations. A fruitful line of investigation may be to identify the specific facial and bodily signals of social transcendence that receivers use to gauge an individual's commitment to the group.

Theory of Mind transcendence. Humans are exceptionally good at thinking about other human minds. This is because our ancestors evolved in environments surrounded by conspecifics with whom they either competed or cooperated. To survive in this socially complex world, our ancestors evolved a psychological adaptation referred to as "theory of mind" (ToM), which enabled them to "read" the minds of others in order to predict their behavior. There is debate

about whether the activation of ToM during religious or transcendent experiences with gods, angels, demons, etc. is a non-adaptive byproduct of a normally functioning ToM (Barrett, 2000) or whether it is a biological or cultural adaptation for group cohesion enforced by divine rewards and punishments (Norenzayan et al., 2014). Whatever the case, transcendent encounters with a divine presence are commonly reported by mystics and religious figures, from Paul of Tarsus to Teresa of Avila. During such encounters, individuals experience a dissolution of boundaries between their own sense of self and the presence of the divine figure. As Saint Paul, quoted in James, described it: "I live, yet not I, but Christ liveth in me. Only when I become as nothing can God enter in and no differnce between his life and mine remain outsatanding" (James, 2004/1902, p. 362).

Understanding both the antecedents and effects of ToM-activating transcendence, such as the specific methods used to evoke it, the neurocognitive processes involved, whether it is associated with increases in prosociality above and beyond non-transcendent thoughts about the divine, and how it differs from other forms of transcendence are questions that might profitably be investigated as the science of transcedence progresses.

Aesthetic transcendence. Aesthetic transcendence occurs when individuals experience immsersively pleasarable sensations associated with beauty, be it a wondrous sunset, an evocative painting, or an affecting piece of music. Some sights and sounds—say, a hospitable landscape, an attractive face, or life-saving information in story-form—produce the experience of beauty because they were associated with opportunities for survival or reproduction in our ancestral past (Dutton, 2003; Gangestad, Thornhill, & Yeo, 1994; Pinker, 1997, pp. 541-543). Likewise, less-than-hospitable landscapes, such as mountains and oceans, may be considered beautiful because of the human proclivity for exploring heretofore unexplored environments

potentially teeming with resources or reproductive opportunities. Two Hilbert-type questions can be asked here: (1) what (if any) role does beauty play in transcendent experiences, and (2) are aesthetic forms of transcendence functional over and above everyday encounters with beautiful stimuli that do not elicit such immersive responses?

Epistemic transcendence. Nervous systems evolved to receive information from the world, process this information, and faciliate behaviors that make use of this information in reproductively-relevant ways. The dopaminergic reward system likewise evolved to reward reproductively-relevant knowledge acquisition. This is why, at least for humans, learning is often rewarding—not just school learning, but even basic skills and knowledge. For instance, a baby's wondrous laugh at the realization that her foot is responsible for the movement of a toy hints at the presence of an ontogenetic precursor to more mature forms of epistemic transcendence.

Epistemic transcendence is a psychologically rewarding state of knowledge acquisition marked by increased interconnectedness between neural networks across the neocortex and beyond—likely activating emotional circuits in the amygdala and hippocampus, and producing potentially long-term, hormone-mediated mood changes (though much of this is still unknown and is ripe for scientific investigation). In addition to the deactivation of the "self"-associated default mode network, psychedelic experiences are marked by the co-activation of widely dispersed brain areas (Tagliazucchi et al., 2016)—an experience of complete absorption and informational synthesis that may produce lasting effects on personality (Lebedev et al., 2016).

Such moments of transcendence may be akin to "Eureka!" moments in the arts and sciences (see Kuhn, 1962, on "paradigm shifts"), making the study of epistemic transcendence relevant to religious and secular contexts. Also of interest would be a study of how individual-level transcendent experiences—and epistemic experiences, in particular—affect large-scale

social trends in religion, art, science, and government. In particular, systems-modeling may be of use in understanding and predicting the effects of individual-level transcendence on large-scale social movements, with practical applications to the study of the rise of violent religious and political movements undergirded by ideology-infused transcendent states. Some important theoretical and empirical questions with respect to epistemic transcendence include: (1) are these states associated with specific psychological adaptations for rewarding knowledge acquisition (which may be gauged by their effects on life outcomes), (2) are there different forms of epistemic transcendence—e.g., introspective vs. other-oriented, practical vs. intellectual, etc., and (3) what are the neorocognitive correlates of these experiential states?

Identifying and describing the diversity of transcendent experiences and their associated physiology will require significant theoretcial and empricial investment. The varieties of transcendence presented here are not meant to be an exhaustive accounting of the different forms of transcendence, and neither are they meant to represent "natural kinds"—i.e., evolutionarily, physiologically, and experientially distinct mechanisms of transcendence. We believe, however, that the currently proposed antecedents of transcendence at least frame the issue in evolutionary terms. A broad question concerning the evolutionary origins of transcendence is whether each of the different forms of transcendence reflects a unique adaptation or a non-adaptive evolutionary byproduct. Knowing what is similar across transcendent states is likewise an important endeavor. We propose the experience of selflessness as a potential commonality, but there may be others.

3. Is Transcendence Beneficial?

The question of whether (and how) religion—either generally or with respect to its various components—benefits individuals is still a topic of vehement debate. What has garnered less attention is whether transcendent states and peak experiences are beneficial in an

evolutionary sense or, perhaps more pressing, in bringing about individual well-being. Although James hailed the purported salubrious effects of religious experience in his discussion of its "practical fruits" (James, 2004/1902, pp. 230-286), whether those fruits are real is an empirical question.

Bulbulia and colleagues (this issue) suggest that aposematic costly signals—such as human sacrifice in religious communities—may have been an effective means of maintaining and exacerbating social inequality since the rise of agriculture. Are such threat signals made more effective by activating terror-inspiring transcendent states in onlookers? Yet another topic for investigation of the noxious effects of transcendence is its role in promoting intergroup violence. Indeed, instances of transcendence are very often reported in times of warfare among tightly-knit military units (Haidt, 2012, pp. 221-222). According to MacNeill (2004), religious experiences evolved to facilitate self-sacrifice during warfare. Although proposing that the sole function of transcendence is to facilitate group conflict excessively narrows its evolutionary scope, grappling with the relationship between transcendence and group-level violence is pressing in a world threatened by religious extremism. Therefore, naturalistic and experimental observation of the relationship between transcendence and violent behavior is an important area of investigation.

A recent flood of research on the beneficial effects of mindfulness meditation and other Eastern contemplative practices such as yoga suggests that these practices promote psychological well-being. Here too, however, the seeking of transcendence may not be harmless, as indicated by recent attention to terrifying experiences of mindfulness whose debilitating effects may be irreversible (Rocha, 2014). The possibility that malicious gurus and religious leaders might elicit destructive transcendent states in others to benefit their own selfish interests should be

empirically investigated. At the extreme, such states may give rise to outcomes such as those of Jonestown, Waco, and the Heaven's Gate cult. Scholars must therefore examine both the light and the dark side of transcendence.

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