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Mindfulness Training Encourages Self-Transcendent States via Decentering

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Data Sharing Statement

De-identified study data will be made available to qualified researchers at the time of publication and after approval of a formal data request. Contact the corresponding author with data requests.

Abstract

Self-transcendence is theorized to be a core, mechanism of mindfulness. Yet, no known empirical study has investigated the process by which self-transcendent experiences emerge in novice practitioners. To address this gap, this study explored whether changes in decentering in response to mindfulness training translated into increases in self-transcendence over the course of five mindfulness training sessions. Participants (N=26) were randomly allocated to either a mindfulness training condition or an active listening condition. Results indicated that mindfulness training increased both decentering (p=.023) and self-transcendence (p=.001) relative to the active listening condition. Furthermore, greater decentering at the mid-point of training predicted greater self-transcendence at the training's end, suggesting that those participants that become better able to non-reactively observe their thoughts, feelings and physical sensations while meditating were also more likely to experience self-transcendence. This study provides the first empirical evidence that mindfulness training can cultivate self-transcendent experiences through the process of decentering from internal phenomena.

Key Words: Self-Transcendence, Decentering, Mindfulness

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1. Introduction

Mindfulness is often defined in secular contexts as being intentionally aware of the present moment in a non-judgmental manner (Kabat-Zinn, 1994). Evidence indicates that cultivating mindfulness through mindfulness trainings is linked with a host of psychological and physical health benefits for healthy adults (Chiesa & Serretti, 2009; Khoury et al., 2015). Mechanistically, mindfulness training is thought to confer these benefits by improving 1) self-awareness and 2) self-regulation, while also 3) altering the practitioners sense of self, or encouraging self-transcendence (Hölzel et al., 2011; Vago & Silbersweig, 2012). Accumulating evidence suggests mindfulness training improves self-awareness and self-regulation (Tang et al., 2015), but limited empirical work has addressed the third, hypothesized, mechanism of mindfulness, self-transcendence. In fact, no known empirical study has investigated the process by which self-transcendent experiences emerge in novice practitioners.

Self-transcendence has been defined in many ways and by many disciplines, a full treatment of which is beyond the current study's scope (See Wong, 2016a for review). While acknowledging this rich historical context (e.g., Frankl, 1959; James, 2003; Kaufman, 2020; Maslow, 1971; Schneider, 2009; Stace, 1960), here we adopt a recently synthesized definition of self-transcendence as a transient mental state during which "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'" (Yaden et al., 2017, p. 143). Multiple theorists converge in proposing that self-transcendence often takes one of two forms: 1) relational unity, and 2) annihilational unity (James, 2003; Stace,

1960; Tart, 1972; Yaden et al., 2017). Phenomenologically, during experiences of relational unity, the self is often perceived as "one" with all things, while annihilational unity, is typified by the experience of selflessness, or decreased self-salience. Frequently, expansive positive emotions, such as bliss and awe, accompany self-transcendent experiences (Yaden et al., 2017).

Self-transcendent experiences have been considered rare historically. However, modern survey data suggests that nearly 70% American adults report having experienced self-transcendence (Hanley et al., 2018), and psychometric advances (Dambrun, 2016; Hanley et al., 2018; Hanley & Garland, 2019) have been utilized to reveal that phenomenological features of self-transcendence are commonly reported during mindfulness practice by both novice practitioners (Dambrun, 2016; Dambrun et al., 2019; Garland et al., 2019; Hanley et al., 2018; Hanley & Garland, 2019) and advanced meditators (Ataria et al., 2015; Dor-Ziderman et al., 2013, 2016). Of particular relevance, four recent studies indicated that, relative to active controls, a single mindfulness training session can evoke self-transcendent states in novice practitioners (Dambrun, 2016; Dambrun et al., 2019; Hanley et al., 2018; Hanley & Garland, 2019) and multiple mindfulness training sessions can continue to deepen self-transcendent states over the course of training (Hanley et al., 2020). In addition, a 6-day Ayurvedic retreat incorporating daily meditation, yoga and breathing exercises was shown to increase participants' reports of self-transcendent experiences (Mills et al., 2018), and an eight week mindfulness-based intervention, Mindfulness Oriented Recovery Enhancement (Garland, 2013), increased self-transcendent experiences in opioid-treated chronic pain patients which contributed to a cascade of positive clinical outcomes including decreased pain and opioid misuse (Garland et al., 2019). Complimenting these first person reports of mindfully induced self-transcendent experiences, multiple neuroscientific studies report an inverse relationship between mindful states and activity

in brain regions implicated in self-referential processing (Dor-Ziderman et al., 2013, 2016; Farb et al., 2007; Josipovic, 2014). While it is possible that these findings simply suggest that certain meditative practices reduce self-other mentalizing, they could also be interpreted as evidence of decreased self-salience during meditation. Yet, despite the frequency with which self-transcendence appears to occur in the context of mindfulness practice, very little empirical work has examined how these self-transcendent experiences emerge. Recent theoretical models (Dorjee, 2016; Garland & Fredrickson, 2019) suggest that decentering from internal experience is critical for the realization of self-transcendent states.

Decentering involves adopting a metacognitive perspective so that internal experiences, such as thoughts, emotions, and physical sensations, are witnessed as transient subjective experiences distinct from the experiencer (Bernstein et al., 2015). This reflective distance, similar to Frankl's concept of self-distancing (Frankl, 2014) and distinguishable from indifferent detachment, is thought to loosen the association between internal experiences and the sense of self, rendering internal objects less likely to be identified with the self. In this way, thoughts can be disowned, no longer regarded as "*my* thoughts," but more impersonally as just "thoughts." By decentering from the narrative scripts that reify the self, the self may be experienced in novel ways (Cleary, 1996; Garland & Fredrickson, 2019). For instance, without the habitual subject-object structure ordering narrative self-scripts, the self may be experienced as more interdependent than normally conceived (Berkovich-Ohana & Glickshon, 2017; Millere et al., 2018). In some cases, the sense of self may be experienced as ultimately illusory. In this way, decentering may have the potential to occasion self-transcendent states (Garland & Fredrickson, 2019). However, no study to date has directly tested the hypothesis that mindfulness may induce self-transcendence via decentering. To address this gap, this study explored whether changes in

decentering in response to mindfulness training translated into increases in self-transcendence over the course of five mindfulness training sessions. Our *a priori* hypothesis was that mindfulness training would have a specific, indirect effect on self-transcendence via decentering.

2. Method

2.1 Participants

Participants were 26 healthy, young-adults recruited from a large university in the Western United States. The average participant age was 27.15 years (SD=7.02), and there were 20 (77%) women. Participants were White (83%), Asian (8%), Latino (8%), and multiracial (8%). Participants were randomly assigned to one of two experimental conditions. Between group differences were not observed with respect to age (t_{24}=0.38, p=.70) or race (χ^2=2.20, p=.53), but males outnumbered females in the active listening condition (χ^2=7.80, p=.005). As such, sex was controlled for in all analyses.

2.2 Procedure

Recruitment was conducted through in class presentations and university sanctioned social media outlets. The study was presented as an investigation of attention training strategies, and mindfulness was not mentioned in any recruitment materials to minimize self-selection bias. Computer generated random assignment allocated 13 participants to the mindfulness condition and 13 participants to the active listening control condition. The non-blocked randomization sequence was generated using Excel (Microsoft Office Professional Plus 2016) before the study began by the first author.

The interventions were delivered in individually scheduled sessions on six different days over a three-week span. On the first day, participants completed self-report measures of decentering and self-transcendence after a five-minute resting baseline period during which they

were asked to not move or speak. The assessor was blind to condition at baseline and participants were not informed about their condition allocation until the second study session began. During study sessions two through six, participants completed the decentering and self-transcendence measures immediately after their respective experimental interventions. Follow-up assessments were conducted by the study interventionist due to resource limitations.

Participants in the mindfulness condition received scripted instruction in basic mindful breathing and body scan techniques (Garland, 2013). Participants in the active listening condition were read selections from *The Natural History of Selborne* (White, 1981), a validated attention-control procedure used in experimental studies of mindfulness (Zeidan, Johnson, Diamond, et al., 2010). All study procedures were conducted in the same university-based lab room, with the study facilitator and participant seated at a lab table. The same facilitator read either the mindfulness script or the active listening selections to all participants. The five attention training sessions were presented to participants as attention training workouts. Participants were asked to pay attention as closely as possible while the facilitator read the attention training script (i.e., mindfulness or active listening). Study session time was entirely dedicated to the provision of the experimental intervention, and participants were not provided any didactic information about their respective study condition. The mindfulness and active listening experimental conditions were time matched, lasting 11 minutes per training session. All study procedures were approved by the local university IRB.

2.3 Measures

The Toronto Mindfulness Scale's (TMS; Lau et al., 2006) Decentering subscale includes 7 items designed to assess "awareness of one's experience with some distance and disidentification rather than being carried away by one's thoughts and feelings" (Lau et al., 2006,

p.1452). Statements like "I was aware of my thoughts and feelings without over-identifying with them" are rated on a five-point scale (1= "Not at all", 5="Very much"), with higher scores reflecting greater decentering. The TMS is one of the few self-report scales specifically developed to measure state-like changes in decentering occurring during mindfulness practice (Bergomi et al., 2013; Sauer et al., 2013). It was rigorously developed and validated by a cadre of content experts, demonstrating convergent and discriminant validity as well as sensitivity to mindfulness-based intervention (Lau et al., 2006). Subsequently, the TMS has been successfully used in a wide range of studies, investigating a number of mindfulness-related processes in a wide variety of samples, including young adults (e.g., Bieling et al., 2012; Garland et al., 2013; Hanley et al., 2015; Kiken et al., 2015; Vinci et al., 2014). As such, it was deemed the best method of assessing decentering in the current study. The TMS demonstrated adequate internal consistency in its initial validation study (α=.84; Lau et al., 2006) and in the current study (See Table 1).

Self-transcendence was measured with the Nondual Awareness Dimensional Assessment-State (NADA-S; Hanley, Nakamura & Garland, 2018), a 3-item scale measuring states of consciousness typified by relational unity ("I experienced all things seeming to unify into a single whole"), annihilational unity ("I experienced all sense of self and identity dissolve away"), and bliss ("I felt surrounded and filled with a blissful warmth or energy"). The NADA-S items are rated on a ten-point scale (1= "Not at all", 10="Very much"), with higher scores reflecting greater self-transcendence. As the only self-report tool explicitly designed to assess alterations in self-transcendent states occurring during mindfulness practice, the NADA-S was determined to be the best assessment tool for the current study. Additionally, the NADA-S items are the top performing Nondual Awareness Dimensional Assessment-Trait (NADA-T; Hanley, Nakamura &

Garland, 2018) items as determined by item response theory analyses (manuscript in preparation) and have been shown to function well in young adult (Hanley, Nakamura & Garland, 2018) and clinical (Hudak et al., Under Review) samples. As the top performing NADA-T items, the NADA-S items have been through a rigorous psychometric process involving 1) principal component analysis in a sample of 528 American adults to identify an optimal subset of items capable of assessing self-transcendence experiences 2), bifactor exploratory structural equation modeling in three independent samples (N=338, N=221, N=166) to confirm the NADA-T's structure, 3) convergent/divergent validity testing, and 4) and known group criteria analyses (Hanley, Nakamura & Garland, 2018). The NADA-S evidenced adequate internal reliability in its validation study (α=.79: Hanley, Nakamura & Garland, 2018) as well as in the current study (See Table 1).

Table 1. Means and 95% Confidence Intervals for Decentering and Self-Transcendence by Condition at each Measurement Point

	Baseline		Training Session 1		Training Session 2		Training Session 3		Training Session 4		Training Session 5	
	M	AL	M	AL	M	AL	M	AL	M	AL	M	AL
Decentering	20.08 (17.70 to 22.45)	19.08 (16.40 to 21.75)	23.69 (20.72 to 26.66)	17.31 (14.20 to 20.41)	21.38 (18.89 to 23.88)	19.00 (16.05 to 21.95)	23.69 (21.35 to 26.03)	17.46 (13.58 to 21.34)	21.62 (18.79 to 24.44)	18.38 (14.89 to 21.88)	25.15 (22.81 to 27.50)	19.31 (15.77 to 22.85)
Self-Transcendence	12.62 (10.28 to 14.95)	12.85 (9.52 to 16.17)	19.53 (17.66 to 21.42)	12.69 (9.13 to 16.25)	16.00 (13.51 to 18.49)	13.23 (9.04 to 17.42)	17.38 (14.02 to 20.75)	10.69 (7.19 to 14.20)	15.76 (12.77 to 18.76)	11.15 (7.16 to 15.15)	20.23 (17.57 to 22.90)	11.38 (7.21 to 15.56)
Decentering α	.74		.88		.86		.90		.87		.88	
Self-Transcendence α	.61		.80		.86		.89		.84		.91	

Note. T = Time, M = Mindfulness Condition, AL = Active Listening Condition, α = Cronbach's Alpha
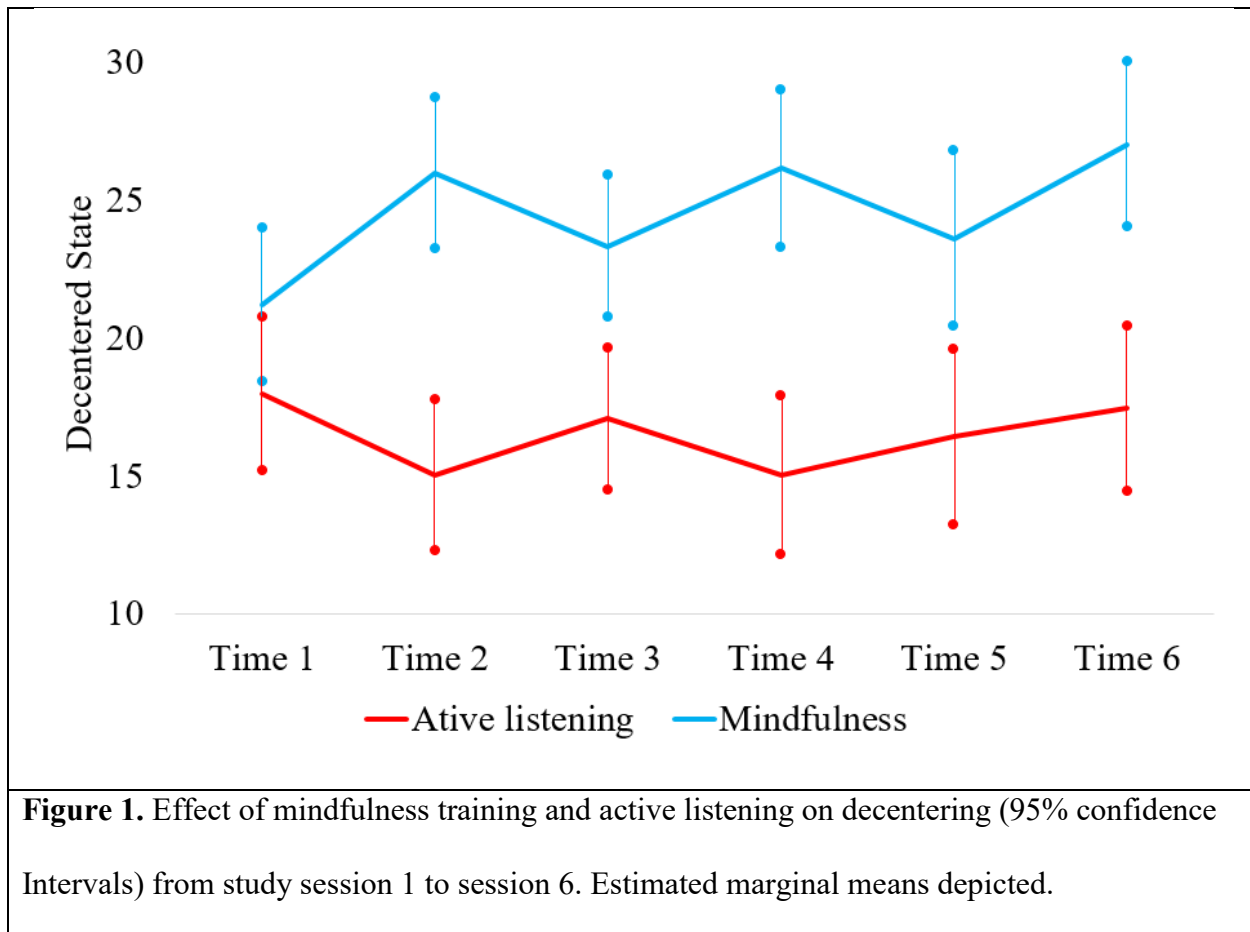
2.4 Analytic Approach

All participants completed all study procedures, resulting in no missing data. Separate repeated measures ANCOVAs were used to examine changes in decentering and self-transcendence over the six study sessions, adjusting for between group differences in sex. Path analysis was then used to investigate whether baseline adjusted decentering at the mid-point of training (decentering at training session three adjusting for decentering at baseline) mediated the relationship between experimental condition and baseline adjusted self-transcendence at the study's end (self-transcendence at training session five adjusting for self-transcendence at baseline). Path analysis was conducted using R's Lavaan package, which employs bootstrapping to test indirect effects (Rosseel, 2012).

Power analysis indicated that a sample of 14 would be required to detect a Condition (mindfulness training vs. active listening) x Time (sessions 1-6) interaction with 80% power at an alpha level of 0.05. For this power calculation we selected an effect size (Cohen's d=0.59) considerably smaller than those we observed in a previous study (Cohen's d=0.78; Cohen's d=1.06) examining the impact of a single mindfulness induction on self-transcendence in a similar population (Hanley, Nakamura, & Garland, 2018). This sample size also provided us adequate power to examine mediation. When a large effect (Cohen's d=0.59) is expected for the β_a and β_b paths, a small sample size (N>22) provides adequate power (.80) for mediation analysis in longitudinal data with at least 2 measurement points and an intraclass correlation coefficient of 0.10 (Pan et al., 2018).

3. Results

3.1 Changes in Decentering

No significant between group difference was observed in decentering at baseline, adjusting for sex: $F_{1,23}=2.44$, $p=.13$. Repeated measures ANCOVA revealed a significant Condition (mindfulness training vs. active listening) x Time (sessions 1-6) interaction for decentering, adjusting for sex: $F_{5,115}=2.72$, $p=.023$, Cohen's $d=0.69$ (Figure 1). Over the course of training, mindfulness training increased decentering ($\bar{x}_{diff}=5.07$) over the course of study relative to active listening ($\bar{x}_{diff}=0.23$).

Figure 1. Effect of mindfulness training and active listening on decentering (95% confidence Intervals) from study session 1 to session 6. Estimated marginal means depicted.

3.2 Changes in Self-Transcendence

No significant between group difference was observed in self-transcendence at baseline, adjusting for sex: $F_{1,23}=0.44$, $p=.51$. Repeated measures ANCOVA revealed a significant Condition (mindfulness training vs. active listening) x Time (sessions 1-6) interaction for self-

transcendence, adjusting for sex: $F_{5,115}=4.41$, $p=.001$, Cohen's $d=0.88$ (Figure 2). Over the course of training, mindfulness training increased self-transcendence ($\bar{x}_{diff}=7.61$) relative to active listening ($\bar{x}_{diff}=-1.47$).
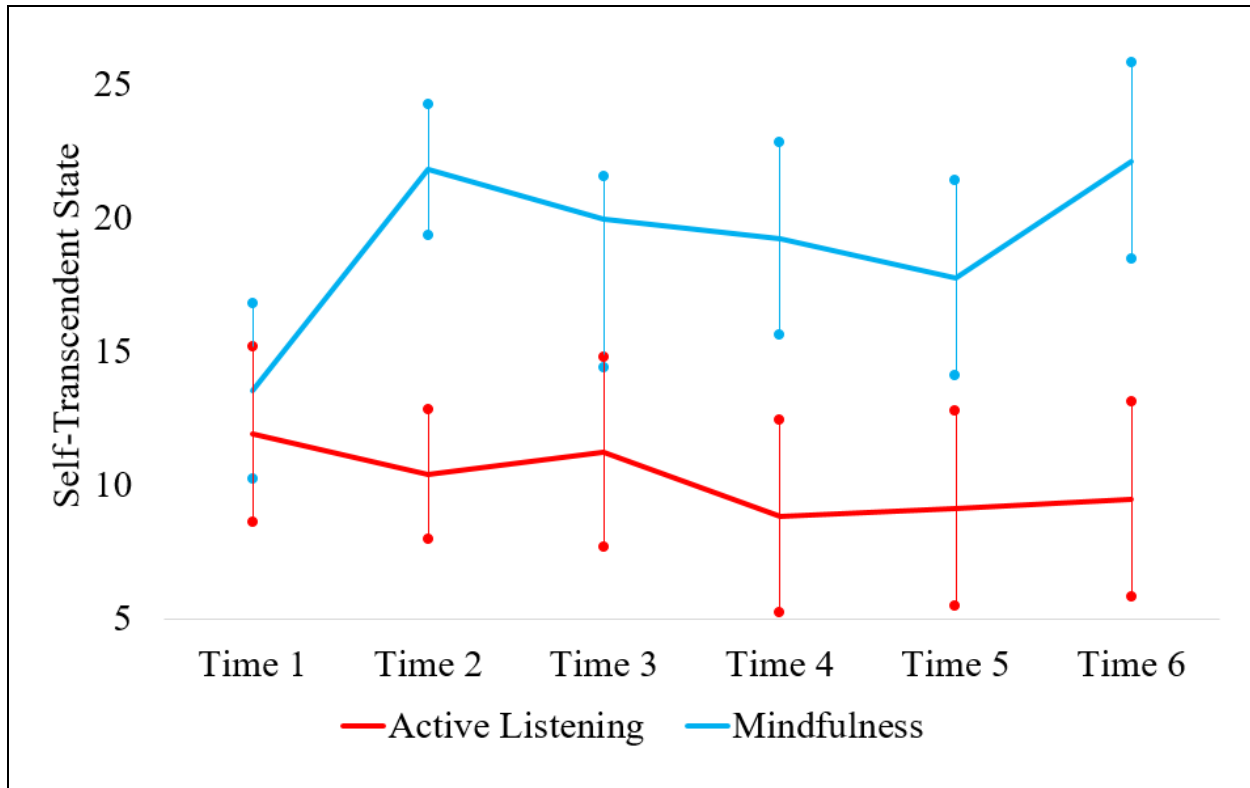

Figure 2. Effect of mindfulness training and active listening on self-transcendent state (95% confidence Intervals) from study session 1 to session 6. Estimated marginal means depicted.

3.3 Relationship between Change in Decentering and Change in Self-Transcendence

Mediation analysis revealed that baseline adjusted decentering during training session three mediated the effect of mindfulness training on baseline adjusted self-transcendence during training session five (Figure 3), adjusting for sex. Mindfulness training demonstrated a significant indirect effect on self-transcendence via decentering ($\beta=.41$, p=.008).
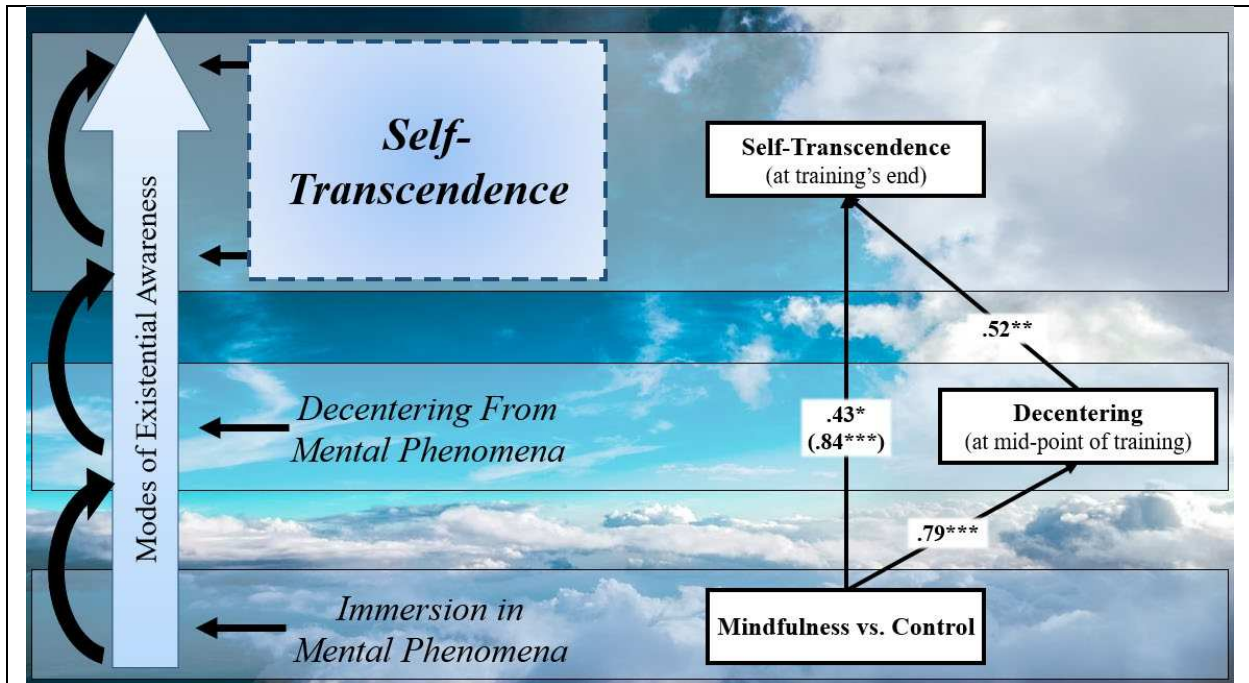
Figure 3. Modes of Existential Awareness Model. Adapted from Dorjee (2016). Mediation model testing the effects of mindfulness training on baseline adjusted decentering at the mid-point of training (i.e., training session three) and baseline adjusted self-transcendent state at training's end (i.e., training session five). Parenthetic value is the direct effect of experimental condition on baseline adjusted self-transcendent state with the mediator removed from the model.

4. Discussion

Historically, self-transcendent states have been the purview of religion and mysticism, existing largely outside the realm of psychological science. However, self-transcendence is increasingly a topic of investigation in Western psychology (Dambrun & Ricard, 2011; Dorjee, 2016; Hanley, Nakamura, & Garland, 2018; Kaufman, 2020; Schneider, 2009; Wong 2016a, 2016b; Yaden et al., 2017); and, recent theoretical efforts have been made to construct models which propose testable hypotheses about a hierarchy of self-transcendent states (e.g., Dorjee,

2016; Garland & Fredrickson, 2019). This study was designed to examine whether decentering meditated the relationship between mindfulness training and self-transcendent states. Results revealed that mindfulness training increased both decentering and self-transcendence over the course of five training sessions relative to an active control condition. Furthermore, path analysis demonstrated that greater decentering by the mid-point of mindfulness training predicted greater self-transcendence by the training's end. This finding indicates that participants that become better able to non-reactively observe their thoughts, feelings and physical sensations while meditating were more likely to experience self-transcendence.

These findings provide preliminary support for the phenomenological hierarchy proposed by Dorjee (2016), which suggests that decentering from mental phenomena can occasion self-transcendent states, such as "form and formless absorptions" (i.e., relational unity; Yaden et al., 2017) and "experiential emptiness of the self" (i.e. annihilational unity; Yaden et al., 2017). See figure 3. Yet, while both Dorjee (2016) and Yaden et al. (2017) propose two distinct types of self-transcendence experience, few validated scales are capable of disentangling self-transcendence in its relational form from self-transcendence in its annihilational form – a psychometric necessity if the relationship between these two forms of self-transcendence are to be individually examined. One notable exception is the NADA-S (Hanley, Nakamura, & Garland, 2018), which contains one relational unity item and one annihilational unity item. Although the NADA-S was used in this study, power concerns precluded analysis at this more granular level. Future studies with larger samples will be needed to empirically examine whether relational unity and annihilational unity are indeed hierarchically organized, whether mindfulness training differentially impacts relational unity and annihilational unity, and whether decentering is differentially related to relational unity and annihilational unity.

These findings also prompt a number of additional questions that need to be pursued in future studies. For example, is progression through Dorjee's proposed modes of awareness (2016) sequential or can modes be skipped. The current study indicates that, on average, decentering evoked self-transcendence, but it also appears that some mindfulness practitioners experienced self-transcendence states without decentering – apparently skipping the intermediary state of decentering. Furthermore, traditional meditation writings indicate that form and formless absorptions are not necessary for access to states involving emptiness of self and practitioners are sometimes explicitly discouraged from cultivating the former states. Another area of future study involves determining which types of meditation differentially encourage certain modes of awareness (e.g., decentering and self-transcendence). And, relatedly, can alternative activities, such as psychedelic substance use or hypnosis, also encourage self-transcendent states or do states experienced in these ways differ from states cultivated through meditations in terms of the locus of volitional control and metacognitive awareness? Furthermore, it has been suggested that self-transcendent experiences have the potential to change how an individual views the world and how they behave in it (Dambrun & Ricard, 2011; Macy, 1991). As such, cognitive and behavioral consequences of self-transcendent experiences need also be investigated. Transcending self-centered views may increase compassion and altruism as others and the surrounding world are experienced in deep communion with the self. In other words, self-transcendent experiences may stimulate a shift in perspective from a "me" oriented mindset (i.e., egocentric) to a "we" mindset (i.e., allocentric). Future studies are needed to examine the theoretically grounded hypothesis that self-transcendence is positively associated with both compassion and altruism.

While this study represents the first empirical test of a long hypothesized relationship between decentering and self-transcendence, limitations and future directions of study should also be noted. Principally, this study was limited by the sample size and the sample characteristics. Although power analysis indicated that the current study was adequately powered, future studies with larger samples are needed to replicate the observed results given persistent concerns that mindfulness studies are underpowered (Van Dam et al., 2018). Relatedly, using an even more rigorous control condition, such as a sham mediation control condition (Zeidan, Johnson, Gordon, et al., 2010), would also be advisable in future studies (Van Dam et al., 2018). With respect to generalizability, the homogenous nature of the sample, consisting primarily of Caucasian, college educated women, is limiting. Replication of this study with more diverse samples is encouraged. We can also make no claim as to the durability of the self-transcendent shifts occasioned by mindfulness in this study since self-transcendence was only assessed immediately after the mindfulness training sessions. It remains unclear from the present study whether these self-transcendent states persist only momentarily or have the potential to catalyze cognitive or emotional changes that extend hours or even days later. Future studies with longer term follow-up assessments are needed, potentially using additional self-transcendence measures in follow-up assessments to capture more durable, dispositional shifts toward self-transcendence such as the NADA-T (Hanley, Nakamura, & Garland, 2018), Awe Experience Scale (Yaden et al., 2019), Nondual Embodiment Thematic Inventory (Mills et al., 2018), or Self-Transcendence Measure-Revised (Wong, 2016b). Finally, while the time ordered modeling approach used in this study indicates there may be a causal relationship between mindful decentering and self-transcendence, future studies are needed to further investigate the nature of this relationship. Of particular value would be to examine whether mindful decentering

occasions self-transcendence over different time scales. For instance, examining whether

decentering leads to self-transcendent experiences during a single mindfulness practice session --

as could be accomplished by multiple administrations of the TMS' Decentering subscale and the

NADA-S during one practice session -- or whether the progression for decentering to self-

transcendence only unfolds across longer periods of time (i.e., multiple mindfulness practices).

  Yet, despite these limitations, this study provides evidence of the phenomenological

depths that brief mindfulness training can achieve, with five practice sessions changing not only

the relationship between a practitioner and their thoughts and feelings, but also the relationship

between a practitioner and their sense of self. As theory has consistently identified self-

transcendence as a core mechanism of mindfulness, this study provides the first empirical

evidence that mindfulness training can, indeed, cultivate self-transcendent experiences through

the process of decentering from internal phenomena.

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