Published in final edited form as:

Psychol Assess. 2018 December ; 30(12): 1625–1639. doi:10.1037/pas0000615.

The Nondual Awareness Dimensional Assessment (NADA): New Tools to Assess Nondual Traits and States of Consciousness Occurring Within and Beyond the Context of Meditation

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Abstract

This manuscript details the development of two measures of nondual awareness, the Nondual Awareness Dimensional Assessment-Trait (NADA-T) and the Nondual Awareness Dimensional Assessment-State (NADA-S). Principal component analysis (N=528) revealed two, interpretable dimensions of the NADA-T: self-transcendence and bliss. Bifactor exploratory structural equation modeling, conducted in three independent samples (N=338, N=221, N=166), indicated that both NADA-T dimensions were components of a second-order nondual awareness construct. Convergent validity was observed between the NADA-T and theoretically aligned constructs, including interdependent self-construals and dispositional mindfulness. Given theoretical and observed relationships between nondual awareness and mindfulness, additional analyses examined the relationship between mindfulness practice and nondual awareness. Results indicated that mindfulness practitioners reported higher NADA-T scores than non-practitioners, and mindfulness practice frequency was positively associated with nondual awareness. To assess the immediate effect of meditation practice on nondual awareness, items retained in the final version of the NADA-T were modified to create the NADA-S. A randomized controlled experiment (N=53) comparing participants receiving a mindfulness induction (i.e., body scan) with those in an attention control group revealed state effects of mindfulness on nondual awareness using two, alternate forms of the NADA-S. Thus, the NADA-T appears to be psychometrically sound, representing a novel, standardized instrument capable of facilitating quantitative investigation of nondual awareness. Furthermore, the NADA-S may be useful for measuring fluctuations in nondual states of awareness evoked during mindfulness meditation practice and other contemplative techniques designed to transform consciousness.

Keywords

Nondaul Awareness; Mediation; Mindfulness; Consciousness

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Ordinary human experience is structured by the duality of subject-object distinctions. However, multiple philosophical and mystical traditions (e.g., Advaita Vedanta, Mahamudra, Dzogchen, Kabbalah, Sufism, Gnosticism, etc.) point to the possibility that this dichotomy may be transcended in special states of nondual awareness. Indeed, nondual awareness might be the *sine qua non* of perennial philosophy (Huxley, 2009), a trans-cultural, experiential foundation underlying the transcendent unity of religions (Bernadette, 2005; James, 1985; Schuon, 1984). Nondual awareness (NDA) can be defined as a state of consciousness that rests in the background of all conscious experiencing – a background field of awareness that is unified, immutable, and empty of mental content, yet retains a quality of cognizant bliss (Josipovic, 2014). This field of awareness is thought to be ever present, yet typically unrecognized, obscured by discursive thought, emotion, and perception (Namgyal & Lhalungpa, 2006). Though NDA is believed to have a meta-cognitive quality, the "awareness of awareness" occurring within nondual states of awareness is purported to be absent of self-referential thought. As such, NDA is characterized by experiences in which the self and world are merged into a unified whole or the boundaries of the self dissolve into an empty vacuity, (Gyamtso, 1994). NDA is also characterized by affectivity. While in some instances, experiencing nonduality may be terrifying (c.f., "the dark night of the soul"), multiple philosophical traditions, including Buddhism, suggest that NDA facilitates fundamental insights into the nature of reality and the emptiness of the self. Such experiential insights are thought to produce profound states of bliss and promote a lasting sense of well-being (Dambrun & Ricard, 2011; Fort, 1988). In contrast, reifying the self as substantive and an independent pole of the subject-object dichotomy is believed to contribute to suffering (Gyamtso, 1994; Rahula, 2007).

Despite the centrality of NDA to contemplative wisdom traditions, NDA has remained a marginalized construct in Western scientific psychology. Historically, psychological investigations have conceptualized NDA as an uncommon, altered state of consciousness induced by extreme experiences resulting from sensory deprivation, spontaneous insight, or psychedelic substances (Tart, 1972). In contrast to this view, innateist schools of Asian philosophy (like the Mahamudra and Dzogchen traditions of Tibetan Buddhism) suggest that NDA is the fundamental nature of consciousness and is therefore both natural and ubiquitous (Dunne, 2011). Though a meditative technology for cultivating states of NDA has been carefully developed over millennia, only in the past several decades have such means become widely accessible to Westerners through the advent of meditation-based mind training programs like Mindfulness-Based Stress Reduction (MBSR: Kabat-Zinn, 1990). The benefits of meditation-based training programs, are well documented and comparable to the benefits derived from other empirically-supported psychological interventions (e.g., Demarzo et al., 2015; Goldberg et al., 2018; Gotink et al., 2015; Goyal et al., 2014; Hilton et al., 2017). Yet, the role of NDA in encouraging positive change remains largely unknown, despite considerable scholarly work suggesting its functional import. The absence of requisite data on this question may be largely due to the absence of a psychometrically validated NDA scale.

Classical narrative self-reports (Bucke, 2010) and nondual philosophical systems (Higgins, 2012) describe NDA as having two primary dimensions: 1) self-transcendence and 2) bliss. The first dimension of NDA is self-transcendence, in which self-perception is altered in

distinct ways. In some instances of NDA, individuals report experiencing the self as being "absorbed" or "melting" into a oneness with all things. In other instances of NDA, individuals report experiencing a form of self-awareness in which sensory representations of self and world are experientially-recognized as mental projections, empty of substance and ontologically void (Kalupahana, 1987). Both forms of self-transcendence are instantiated in Western psychology through William James' seminal work on religious experience (1985) and by Stace (1960) and Tart's (1972) explorations of altered states of consciousness. Yaden et al. (2017) recently situated these two forms of self-transcendence -- which they term "relational" and "annihilational" self-transcendence -- in modern psychological theory, grounding both experiences in affective neuroscience. Yet, an ostensibly "purer" or "higher" form of NDA can also be realized. In this nondual state, subjective and objective qualities of experience are transcended and unified, as alluded to the notion of the unity of "space and awareness" in the Tibetan Buddhist tradition (Namgyal & Lhalungpa, 2006).

Dorjee (2016) recently proposed a model in which the progression from relational self-transcendence, to annihilational self-transcendence, to "pure" awareness is characterized in terms of Gradients of Dereification (Figure 1). This model proposes that five, hierarchically organized, "modes of existential awareness" (p. 7) exist; that individuals differ in their intrinsic abilities to realize given modes of awareness; and that there are methods of encouraging more cultivated modes of awareness. Dorjee (2016) contends that mindfulness meditation is one such method, but empirical examination of this claim is hindered by a lack of measurement tools. Extant self-report measures capture the second mode of awareness, decentering (e.g., Toronto Mindfulness Scale's Decentering Subscale); Yet, no self-report scale currently exists that expressly measures the third and fourth modes of awareness: form and formless absorption (i.e., relational self-transcendence) and experiential emptiness of self (i.e., annihilational self-transcendence). The present study sought to fill this measurement gap, not to test any specific model of self-transcendence, but to develop an NDA scale capable of empirically testing of the emerging models and hypotheses outlining relations between mindfulness training and self-transcendent states (e.g., Dorjee, 2016). Putatively, the practice of mindfulness meditation may evoke transient states of self-transcendence that fluctuate in intensity throughout the meditation session, deepening with elongated practice sessions and greater meditation expertise.

The second dimension of NDA is bliss. NDA is thought to elicit a strong positive emotional tone, typified within Asian and Western contemplative traditions by experiences of extreme joy, bliss, or an all-embracing love. For example, the Dzogchen *Song of the Vajra* characterizes NDA as "incomparable pleasure beyond all limits" (Norbu, 2000). Modern, psychological interpretations of self-transcendent experiences also emphasize the positive affectivity that often accompanies transcendent states (Yaden et al., 2017). Although transcending the duality of subject and object is thought to be capable of producing powerful, positive affective experiences, the dissolution of the self during experiences of NDA has also been described as unsettling and emotionally distressing (Hood, 2001; Yaden et al., 2017). Indeed, dissociative experiences, such as depersonalization and derealization, are pathologized in Western psychology (American Psychiatric Association, 2013). Thus, discrepant emotional experiences appear linked with NDA. Ataria (2015) suggests that self-transcendence and dissociation represent emotionally-valenced poles along a continuum of

altered self-experiences. It may be that personal beliefs about the nature of the self, beliefs potentially impacted by cultural factors or personal interests, influence the appraisal of nondual experiences. Such beliefs may determine the emotional valence of nondual states. Specifically, mindfulness meditation experience may encourage more emotionally positive nondual experiences, given emerging associations between dispositional mindfulness, self-transcendence, and psychological well-being (Halney, Baker & Garland, 2017) as well as evidence that meditative states encourage positive self-transcendent experiences (Dambrun, 2016).

Thus, NDA is central to many contemplative wisdom traditions (e.g., Schuon, 1984) and the NDA construct is of increasing interest to contemplative science (Dambrun, 2016; Dor-Ziderman et al., 2013; Farb et al., 2007; Josipovic, Dinstein, Weber & Heeger, 2012). However, little is currently known about the nature of NDA partly because no measure of NDA currently exists. A psychometrically sound NDA measure is necessary for developing a systematic program of research addressing NDA and exploring NDA as a potential consequence of mindfulness meditation. As such, the primary aim of this study was to develop and evaluate a new instrument designed to measure NDA via two theoretically grounded dimensions of NDA: self-transcendence and bliss. In the construction of this NDA scale we 1) used items from extant scales measuring altered states of consciousness in combination with original NDA items to develop a multidimensional, trait measure of NDA, 2) examined the convergent validity of this multidimensional measure, 3) investigated whether the practice of mindfulness meditation was associated with trait levels of NDA, and 4) used a subset of the NDA items to develop a brief assessment of nondual states, examining the responsiveness of these items to a mindfulness induction in a randomized controlled experiment.

Study 1: CONSTRUCTING A MEASURE OF NDA -- Principal Components Analysis

The aim of Part 1 was to develop an instrument directly measuring NDA. In this pursuit, factor analysis was used to identify the most effective items targeting altered states of consciousness from the available mysticism and meditation scales. Several self-report scales measuring *aspects* of NDA exist. Specifically, six scales were identified with items designed to capture mystical or meditative states of consciousness conceptually aligned with NDA: Mysticism Scale (Hood, 1975), Altered States of Consciousness Rating Form (Studerus, Gamma & Vollenweider, 2010), Mystical Experiences Questionnaire (Barrett, Johnson & Griffiths, 2015), Ego-Dissolution Inventory (Nour, Evans, Nutt & Carhart-Harris, 2016), Dimensions of Meditative Experience Questionnaire (Osis, Bokert & Carlson, 1973), and the Effects of Meditation Scale (Reavley & Pallant, 2009). While, none of these scales were constructed to selectively and uniquely measure NDA, their development provides an important psychometric foundation for this study. For instance, the larger scales (i.e., the Mystical Experiences Questionnaire, Mysticism Scale, Altered States of Consciousness Rating Form, and Dimensions of Meditative Experience Questionnaire) have items addressing both self-transcendence and bliss, but also a number of additional items assessing experiences unrelated to NDA that may dilute the NDA construct and add unnecessary

participant burden. With respect to the Ego-Dissolution Inventory and Effects of Meditation Scale, neither of these scales measures the affective quality of NDA. Therefore, items from these scales were pooled together to ensure that the most effective items would be identified and retained for the development of an optimized NDA measure informed by prior psychometric work. Inspection of the 94 items derived from these six scales revealed the need to augment this item pool with additional NDA items reflecting the extensive exploration of nondual states across a range of Buddhist traditions (e.g., Mahayana, Vajrayana, Tantra, Mahamudra, Dzogchen). The development of six new items rectified this shortcoming. The first two items were crafted to reflect the two forms of self-transcendence proposed within Buddhism to occur during NDA: 1) dissolving: “I have had an experience in which the boundaries of my self dissolved”, and 2) expanding: “I have had an experience in which my mind expanded into space.” The remaining four items were crafted to capture the experience of bliss associated with NDA in some Buddhist traditions (e.g., “I have been surrounded and filled with a blissful warmth or energy”).

Method

Participants: Participants (n=528) came from two sources: 1) university students (n=321), completing this study for course credit, and 2) Mechanical Turk members (n=207), completing this study for 50¢. Combining these two samples diversified participant characteristics at this initial stage of scale development. The mean age was 27 years (SD=11.36; range =18–74) and 70% of participants were female. The majority of respondents were Caucasian (73%), followed by Latino (9%), African American (8%) and Asian (6%).

Procedures: This study was conducted online, with participants completing all surveys in a single testing session. After providing consent and demographic information, participants completed all of the potential NDA items (N=100 items). A single survey instrument presented all included items in random order. A common set of instructions introduced the NDA items: “Looking back over your life, please rate the degree to which you experienced the following phenomena. Answer each question according to your feelings, thoughts, and experiences.” A common, 5-point Likert Type scale was also used, ranging from “Never or Very Rarely” to “Very Often or Always” (e.g., Baer et al., 2006). A large Southeastern university’s IRB approved this study.

Measures: The *Mysticism Scale* (Hood, 1975) is a 32-item instrument measuring mystical experiences that contains three factors: introvertive mysticism, (e.g., “I have never had an experience in which all things seemed to be unified into a single whole”), extrovertive mysticism (e.g., “I have never had an experience in which all things seemed to be unified into a single whole”), and interpretation (e.g., “I have experienced profound joy”) Adequate internal consistency has been reported for the full M scale (.91) and each of the factors (. 82–.85).

The *Mystical Experiences Questionnaire* (Barrett, Johnson & Griffiths, 2015) is a 30-item instrument measuring the occurrence and character of mystical experiences elicited by hallucinogens. The Mystical Experiences Questionnaire is comprised of four factor

analytically derived domains: mystical (e.g., “Experience of the fusion of your personal self into a larger whole”), positive mood (e.g., “Experience of ecstasy”), space/time (e.g., “Being in a realm with no space boundaries”), and ineffability (e.g., “Sense that your experience cannot be described adequately in words”). The authors reported internal consistencies for the four Mystical Experiences Questionnaire subscales ranged from .86 to .97 in a sample of participants taking psilocybin (Barrett, Johnson & Griffiths, 2015).

The *Ego-Dissolution Inventory* (Nour, Evans, Nutt & Carhart-Harris, 2016) is an 8-item instrument measuring the degree to which the boundaries of the self dissolve (e.g., “I experienced a dissolution of my ‘self’ or ego”). The Ego-Dissolution Inventory has a unidimensional structure and yields a single total score. The authors reported internal consistency of .93.

The *Altered States of Consciousness Rating Form* (Studerus, Gamma & Vollenweider, 2010) is a 66-item instrument measuring deviations in normal, waking consciousness. The Altered States of Consciousness Rating Form is comprised of 11 subscales, but only two of those subscales were included in this study: Experience of Unity (e.g., “I have experienced everything seeming to unify into oneness”) and Blissful State (e.g., “I have enjoyed boundless pleasure”). The authors reported adequate internal consistency for the Experience of Unity (.86) and Blissful State (.82) subscales.

The *Dimensions of Meditative Experience Questionnaire* (Osis, Bokert & Carlson, 1973) is a 30-item instrument, developed in collaboration with experienced meditators, measures psychological dimensions of meditative states. The Dimensions of Meditative Experience Questionnaire consists of five primary dimensions, but only the Self-Transcendence dimension was used in this study (e.g., “I have felt an overwhelming sense of closeness with others; all barriers separating us had been dissolved”).

The *Effects of Meditation Scale* (Reavley & Pallant, 2009) is comprised of two complimentary subscales measuring the Effects of Meditation During Meditation and the Effects of Meditation in Everyday Life. Both subscales are multidimensional, but only the 7-item Mystical Experience dimension from the Effects of Meditation During Meditation subscales was used in this study (e.g., “I have had what I describe as a mystical experience”). The authors reported internal consistency for the Mystical Experience dimension fell between .76 and .95.

Results and Discussion—Principal components analysis (PCA) was conducted on all 100 items using principal component factoring followed by oblique rotation of factors (Direct Oblimin) to allow the factors to correlate. The factorability of the NDA items was supported by a highly significant Bartlett’s Test of Sphericity value (.99), exceeding the minimum recommended value of .60 (Tabachnick & Fidell, 2007). Results of the initial PCA yielded seven factors with eigenvalues greater than 1.0, accounting for 63% of the total variance. The number of factors to be retained was guided by theoretical and empirical considerations. Theory suggested that NDA was characterized by two dimensions 1) an altered sense of self and 2) positive affectivity. Empirically, parallel analysis suggested the retention of two, theoretically consistent factors, as only the first two eigenvalues were found

to be greater than random data eigenvalues (Factor 1: eigenvalue=50.57, random data eigenvalue=2.07; Factor 2: eigenvalue=5.21, random data eigenvalue=1.99; Factor 3: eigenvalue=1.89, random data eigenvalue=1.93, etc.). Therefore, a second principal components analysis was performed using the same extraction and rotation methods after constraining the solution to two factors. This two-factor solution accounted for 56% of the total variance.

The scale was shortened by removing items from the two-factor solution if they did not load strongly onto either one of the two factors or were found to load onto both factors. Only items with minimum loadings above .60 on their primary factor and loadings below .20 on their secondary factor were retained (e.g., Baer et al., 2006). Items were removed one at a time and a rotated factor matrix was generated after each removal. During item removal, efforts were made to keep equal numbers of items reflecting relational and annihilational self-transcendence. At the end of this iterative process, 13 items remained. Four relational self-transcendence items and four annihilational self-transcendence items along with one item reflecting the noetic (James, 1985; Hood, 1975) quality of NDA (i.e., “I have experienced the insight that ‘all is One’”) were retained. Four bliss items were also retained. The factor structure of the final scale is depicted in Table 2, with each item linked to its parent questionnaire. The 13-item, two-factor solution accounted for 67% of the total variance. The first factor was interpreted as the *self-transcendence* dimension and the second factor was interpreted as the *bliss* dimension. Composite reliability for the two dimensions was good [self-transcendence (.94) and bliss (.81)] and excellent for the full scale score (.93). The two dimensions were positively correlated ($r=.62$, $p<.001$).

Overall, results from the principal components analysis suggested that the composite, NDA item pool included two identifiable dimensions that were internally consistent and positively correlated. Given this multidimensional structure, this new NDA scale will be termed the Nondual Awareness Dimensional Assessment-Trait (NADA-T).

Examination of the frequency reports for each of the 13 items retained in the NADA revealed NDA is not uncommon (Table 2). Nearly 50% of respondents reported experiencing the self-transcendence items at least sometimes, while approximately 70% of respondents reported experiencing the bliss items at least sometimes.

Study 2: CONFIRMING THE NADA’s STRUCTURE AND EXPLORING CORRELATIONS BETWEEN THE NADA AND OTHER CONSTRUCTS

Part 2a: Exploratory Structural Equation Modeling

The purpose of Part 2a was to further investigate the structure of the NADA-T using bi-factor exploratory structural equation modeling (B-ESEM). Developed as an alternative to confirmatory factor analysis (CFA), B-ESEM is an analytic approach that accounts for the likelihood that items “may be associated with more than one source of true score variance” (Morin et al., 2015). B-ESEM avoids two primary sources of variance unaccounted for by CFA by: 1) allowing all observed variables to load on all latent variables, and 2) partitioning the total covariance from all of the scale items into a global, latent factor, while allowing

specific, latent factors to explain the residual, item covariance. As such, B-ESEM tested whether a global, nondual awareness factor underlies the NADA-T and coexists with the specific self-transcendence and the bliss dimensions.

Method

Participants: Three separate participant samples were used in Part 2. Two samples of American adults were recruited online (N=338, N=221) and a third sample of American adults was gathered from research projects at a large university in the Western United States using the NADA-T as an adjunctive measure (n=166). Participants in the online sample were compensated 50¢ for completing this study and university participants were compensated differentially, according to their study involvement. The mean age for participants in the first online sample was 38 years (SD=12.47; range=18–86) and 63% were female. The majority of participants in the first online sample were Caucasian (68%), African American (10%), Asian (9%) or Latino (7%). The mean age for participants in the second online sample was 38 years (SD=13.29; range=18–86) and 64% were female. The majority of participants in the second online sample were Caucasian (74%), Asian (10%), African American (8%), or Latino (7%). The mean age for participants in the university sample was 46.35 (SD=17.48, range=18–87) and 53% were female. The majority of university participants were Caucasian (89%), Latino (5%), Asian (2%), or Other (2%).

Procedures: All B-ESEM analyses were conducted in MPlus 7.2 (Muthén & Muthén, 1998–2013) following Morin et al.'s (2016) B-ESEM framework. As specified in this framework, maximum likelihood estimation was used, and the global (i.e., NDA) and specific (self-transcendence and bliss dimensions) factors were specified as orthogonal to ensure interpretability and to be consistent with bifactor assumptions (See supplemental materials for an MPlus annotated input file). Approval for these studies was granted by a large Western university's IRB.

Five fit indices were used to evaluate model fit: the comparative fit index (CFI; Bentler, 1990), the Tucker-Lewis Index (TLI; Tucker & Lewis, 1973), the relative chi-square (Cmin/df), the root mean square error of approximation (RMSEA; Steiger, 1990), and the Akaike information criterion (AIC; Akaike, 1987). CFI and TLI values above .90 are regarded as acceptable (e.g., Hu & Bentler, 1999). A relative chi-square value less than 3 is preferred (Schreiber et al., 2006). RMSEA values less than .08 are acceptable (Browne & Cudeck, 1993). AIC is used to compare models, with the model generating the lowest AIC value considered optimal (Schreiber et al., 2006).

Results and Discussion—Goodness-of-fit indices for each of the three B-ESEM models evidenced good fit (Table 3), expect for a single index on one of the models. In the university sample, RMSEA was observed to be slightly above (.089) the suggested range.

B-ESEM results indicated a global NDA dimension is captured by the NADA-T and that both NADA-T dimensions explain significant amounts of item covariance not accounted for by the general NDA factor (Table 4). Only two, significant item cross-loadings emerged. However, some degree of variation in the proportion of variance each item contributed to the global and specific factors was observed across the three samples. For example, the item "I

have experienced the insight that ‘all is One’,” loaded on both the global NDA factor and the specific self-transcendence factor in both online samples, but in the university sample, this item only loaded on the global NDA factor and not the specific self-transcendence factor.

Results from Part 2a provide evidence for the construct validity of the NADA-T, suggesting a global, NDA factor along with two, interpretable dimensions: Self-Transcendence and Bliss. Results further indicate a relatively consistent structure across multiple samples.

Part 2b: RELATIONSHIPS BETWEEN THE NADA AND OTHER CONSTRUCTS

With the structure of the NADA-T identified in Part 2a, Part 2b’s purpose was to establish convergent validity for the NADA-T. Correlational analysis was used to determine relationhips among the NADA-T total score, NADA-T dimensional scores, and constructs theoretically linked with NDA. Two online samples (N=338, N=221) described in Part 2a, were used to perform these analyses. Both samples completed measures of dispositional mindfulness, the big five personality factors, and well-being. In addition, the first sample also completed measures of decentering and interoceptive awareness, while the second sample also completed measures capturing multiple aspects of self-representation, including self salience (i.e., strength of the boundary between the self and world), inclusion of all things in the self, metapersonal self construal (i.e., believing the self to intimately connected with all things), extension of the self into important geographic locations, and extension of the self into valued possessions.

We hypothesized that the NADA-T would be positively correlated with constructs reflecting *beliefs about the self* as broadly distributed and deeply interdependent. As such, the tendency to extend the self into close relationships, physical objects, geographic locations, and ultimately, “all things”, was expected to be positively associated with more frequent NDA. The NADA-T was also expected to be positively correlated with attentional styles characterized by meta-cognitive awareness (i.e., dispositional mindfulness and decentering) and body awareness (i.e., interoceptive awareness). *Dispositional mindfulness* is defined by Kabat-Zinn (1994) as the dispositional tendency to intentionally attend to present moment experience, in a non-judgmental and non-reactive fashion. Theoretical (Gyamtso, 1994) and empirical (Dambrun, 2016, Dor-Ziderman et al., 2013; Farb et al., 2007; Hanley, Baker & Garland, 2017; Josipovic et al., 2012) evidence suggests a positive association between mindfulness and NDA. However, evidence also exists suggesting a significant, negative correlation between dispositional mindfulness and the EOM’s mystical experience dimension (Reavley & Pallant, 2009), which includes some items reflective of NDA. *Decentering* can be understood as the process of recognizing internal phenomena as nothing more than self-generated internal events that lack intrinsic veracity (Davis, Lau & Cairns, 2009). Because decentering involves dis-identification with internal events and NDA suggests dis-identification with the self, a positive correlation between decentering and the NADA-T scales was predicted. *Interoceptive awareness* can be defined as awareness of the physiological state of the body and the evaluative interpretations emerging from such awareness (e.g., Mehling et al., 2012). Because awareness of the body and of adaptively appraising bodily sensations is likely to promote a comfort with the body and tolerance of diverse bodily experiences, the eight interoceptive awareness subscales were predicted to be

positively associated with the NADA-T scales. Positive associations were also expected between the NADA-T and specific *personality factors*. Extraversion and Openness, conceptualized as exploratory tendencies (DeYoung, 2015), were predicted to be positively correlated with the NADA-T scales. With respect to *well-being*, associations between subjective well-being, an indicator of the "good life" characterized by global life satisfaction and more positive affect (Diener et al., 1985), psychological well-being, an indicator of the good life characterized by purposeful living, positive relationships, and autonomy (Ryff & Keyes, 1995), and NDA reports were expected to be positive given the canonical characterization of NDA as blissful.

We also investigated the following hypotheses about the two NADA-T dimensions, self-transcendence and bliss. The nondual experience of self-transcendence was expected to be most closely associated with the broadest self-representations (i.e., the self extended into all things). Similarly, self-transcendence was expected to be closely associated with decentering, given that decentering involves adopting a reflective distance from subjective experiences (including self-relevant cognitions) that might facilitate the process of transcending the delimited self to achieve states of unity and emptiness. Bliss was expected to be most closely associated with the affectively salient constructs, such as the interoceptive elements of emotional awareness, self-regulation, body listening, trusting and the markers of well-being. Thus, Part 2b was undertaken to investigate and evaluate if these predictions were supported by data from the NADA-T scales and other scales designed to assess conceptually related constructs.

Method

Measures: The *Multidimensional Assessment of Interoceptive Awareness* (Mehling et al., 2012) is a 32-item instrument measuring eight elements of interoceptive body awareness and the evaluative processes co-arising with such awareness: Noticing (e.g., "I notice when I am uncomfortable in my body"), Not Distracting (e.g., "I distract myself from sensations of discomfort"), Not Worrying (e.g., "I can notice an unpleasant body sensation without worrying about it"), Attention Regulation (e.g., "I can return awareness to my body if I am distracted"), Emotional Awareness (e.g., I notice how my body changes when I am angry"), Self-Regulation (e.g., "I can use my breath to reduce tension"), Body Listening (e.g., "I listen to my body to inform me about what to do"), and Trusting (e.g., "I am at home in my body").

The Toronto Mindfulness Scale's *Decentering subscale* (Davis, Lau & Cairns, 2009) is a 7-item instrument measuring the ability to remain observant of thoughts and feelings without over-identifying with such internal phenomena.

The *Five Facet Mindfulness Questionnaire* (Baer et al., 2006) is a 39-item measure of dispositional mindfulness, that provides scores for five facets of dispositional mindfulness: Observing (e.g., "When I'm walking, I deliberately notice the sensations of my body moving"), Describing (e.g., "I'm good at finding words to describe my feelings"), Acting with Awareness (e.g., "When I do things, my mind wanders off and I'm easily distracted"), Non-Reacting (e.g., "I watch my feelings without getting lost in them"), and Non-Judging (e.g., "I criticize myself for having irrational or inappropriate emotions").

The *Ten Item Personality Inventory* (Gosling, Rentfrow, & Swann, 2003) is a 10-item measure of the five factor model of personality: Openness, Extraversion, Agreeableness, Conscientiousness, and Emotional Stability.

The *Self-Salience Scale* (Dambrun, 2016) is a single, graphic item measuring the strength of the perceived boundary between the self and the world.

The *Inclusion of Other in the Self* (IOS; Aron, Aron & Smollan, 1992) is a single graphic item measuring the strength of relationship between the self and a designated target. For the purposes of this study, the target was, "all things".

The *Relational-Interdependent Self-Construal Scale* (RISC; Cross, Bacon & Morris, 2000) is an 11-item measure of perceived interdependence with close others.

The *Metaperaonal Self Scale* (MPS; DeCicco & Stroink, 2007) is 10-item measure of the degree to which the self "extends beyond the individual or personal to encompass wider aspects of humankind, life, psyche, or the cosmos" (DeCicco & Stroink, 2007, p.84).

The *Place Identity scale* (Williams & Vaske, 2003) is a 6-item scale measuring the degree to which the self is believed to extend into a particular geographic location. For the purposes of this study, that location was the respondent's "favorite place".

The *Self-Extension Tendency Scale* (Ferraro, Escalas & Bettman, 2010) is an 8-item measure assessing the extent to which the self is extended into personal possessions.

The *Scales of Psychological Well-Being* (Ryff & Keyes, 1995) is an 18-item measure of psychological well-being operationalized as autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance.

The *Satisfaction with Life Scale* (Diener et al., 1985) is a 5-item measure of subjective well-being.

Results and Discussion—Correlations among the NADA-T, the NADA-T dimensions and the primary constructs of interest are reported in Table 5. The observed results are broadly consistent with predictions.

Correlational findings demonstrated that the broadest self-representations (e.g., the metapersonal self-construal) along with decentering, were the constructs most strongly associated with the NADA-T. The interoceptive awareness domains of body listening, self-regulation and attention regulation also evidenced relatively strong associations with the NADA-T. The non-reactivity, observing and describing dispositional mindfulness facets were central to the relationship between the NADA-T and dispositional mindfulness. Emotional stability and openness were the personality factors most closely associated with the NADA-T. Finally, the NADA-T demonstrated positive associations with both forms of well-being, subjective and psychological, although the relationship between the NADA-T and psychological well-being was non-significant in the first online sample.

A similar pattern of associations was observed for both NADA-T dimensions. Self-transcendence was positively associated with each of the self-representation scales, the same three dispositional mindfulness facets, the same six interoceptive awareness domains, decentering, the same two personality factors, and one measure of well-being (subjective well-being). Additionally, significant negative associations emerged between self-transcendence and two dispositional mindfulness facets, acting with awareness and non-judging, in the first sample. The NADA-T's bliss dimensions demonstrated the same pattern of associations observed in the NADA-T total score, with slightly stronger magnitudes of association with the majority of the constructs in comparison with the self-transcendence dimension.

Interpreted holistically, these results suggest that individuals inclined to maintain a non-reactive, reflective distance from their internal experiences while also demonstrating a propensity for interoceptive awareness are more likely to experience nondual states, or vice versa.

Part 2c: Relationships between the NADA and Mindfulness Meditation Practice

The purpose of Part 2c was to examine whether the practice of mindfulness meditation was associated with nondual experiences as measured by the NADA-T. Insight into nonduality is thought to emerge from mindfulness meditation practice (Gyamtso, 1994), thus we predicted that individuals practicing mindfulness would report more frequent nondual experiences. Furthermore, we predicted that more frequent practice of mindfulness meditation would be positively correlated with higher NADA scores.

Method

Participants and Procedures: The two samples of online participants described in Part 2a were used in combination for part 2c. Mindfulness meditation practice was assessed by asking study participants to respond to the following series of questions: 1) "Do you currently have a mindfulness practice (e.g., meditation, yoga)?" (Yes or No), 2) "How long have you practiced?", 3) "How many days per week do you practice?", and 4) "How long do you practice on the days you practice?". Based on participant responses to the first, dichotomous question, this sample was divided into the two subsamples: mindfulness meditation practitioners (n=364), and individuals reporting no mindfulness meditation involvement (n=195). First, a one-way analysis of variance was performed to examine between group differences in NADA-T scores for participants with and without current meditation practice. Then, bivariate correlation analysis was performed to determine whether a relationship existed between NADA-T scores and frequency of mindfulness practice for those participants reporting a current mindfulness practice.

Results and Discussion—Significant between group differences were observed in NADA-T scores for individuals with and without current mindfulness practice (Table 6). Mindfulness meditation practitioners reported significantly higher NADA-T, self-transcendence, and bliss scores than non-practitioners. These results suggest that involvement with mindfulness meditation practice is associated with an increased likelihood of experiencing NDA among participants in this study.

Similarly, NADA-T total scores and both dimensions were found to be positively associated with the length, frequency, and duration of mindfulness meditation practice involvement (Table 7). NADA-T and self-transcendence scores evidenced significant, positive associations with the length of mindfulness meditation practice history, the number of days per week of mindfulness practice, and the duration of the typical mindfulness practice session. Bliss scores were positively associated with the number of days per week practiced and the duration of the typical practice session. Although small in magnitude, these correlations suggest that mindfulness meditation practitioners that practice mindfulness more frequently and engage in longer practice sessions are more likely to report experiencing nondual states.

Study 3: A BRIEF MEASURE OF NONDUAL STATES -- Sensitivity to Mindfulness Meditation Practice

Given the observed relationships between the NADA-T scale and mindfulness meditation practice in Part 2c, a brief measure of nondual *states* of awareness was developed, the Nondual Awareness Dimensional Assessment-State (NADA-S). The NADA-S was developed to capture changes in nondual states occasioned by mindfulness practice and to facilitate neurophenomenological investigation (Varela, 1996) of fluctuations in nondual states occurring during meditative practice. The NADA-S was designed to be brief for assessing moment-to-moment changes in nondual states evoked during specific contemplative practices and during complex sequences of such practices (e.g., a mindful breathing practice, followed by a practice on the nature of self, followed by a nondual practice), examining the progressive deepening of nondual states over an extended meditation practice session (e.g., 60 minutes).

NADA-T items were modified to create the NADA-S. Consistent with the NADA-T, theoretically grounded items were selected for this scale to capture the two dimensions of NDA: self-transcendence and bliss. The two self-transcendence items were designed to capture the two, primary methods of self-transcendence detailed in both Buddhist (e.g., Gyamtso, 1994) and Western (e.g., Yaden et al., 2017) psychological accounts: unifying (i.e., relational self-transcendence) and dissolving (i.e., annihilational self-transcendence). The third item was selected to measure the experience of bliss that often accompanies nondual states (“I felt surrounded and filled with a blissful warmth or energy”).

Method

Participants: 53 participants were recruited from a large university in the Western United States for a study on attention. The mean age of the sample was 27.20 years (SD=6.57) with a range from 18 to 43 years. Women (n=39) made up 71% of the sample and the majority of participants were white (n=45, 82%), Latino (n=4, 7%), Asian (n=2, 4%), or multiracial (n=2, 4%).

Procedures: Study recruitment was performed through in-person class presentations and through university sponsored social media sites. The study was described as an investigation of attention training strategies, and mindfulness was not identified as a research theme so as

to prevent social desirability biases in participant responses. Participants received $15 for their study involvement.

The study procedures took place over two days. On the first day, participants came to individually scheduled pre-testing appointments. Following informed consent, participants completed an unstructured attention task, in which they were asked to sit still, with their eyes open and refrain from talking for 5 minutes. At the end of this task, participants completed the NADA-S. On the second day of the study, participants were randomly assigned (via simple random assignment) into one of two study conditions. The first condition was an active control condition in which participants were instructed to only focus their attention on listening to a selection from *The Natural History of Selborne* (White, 1981). The second condition was the mindfulness condition, in which participants were guided through a standardized, body scan mediation (e.g., Garland, 2013). Both of these study conditions were framed as "attention training strategies" and neither was labeled as "mindfulness" or "meditation." The reading and the body scan were matched for length, both lasting 11 minutes. Participants completed the NADA-S for a second time after either the reading or mindfulness induction.

Measures: Nondual states of awareness were measured with two forms of the NADA-S. Different forms of the NADA-S were administered in two participant subsamples to expand the pool of validated NDA items available. The first form of the NADA-S used the three items modified from the NADA-T to capture nondual states from a traditional Buddhist perspective. Two of the items assessed self-transcendence ("I experienced the boundaries of my self dissolving" and "I experienced my mind expanding into space") and the third measured bliss ("I felt surrounded and filled with a blissful warmth or energy"). A total of 35 participants completed these items, with 16 participants randomized to the mindfulness condition and 19 to the active control condition. The second form of the NADA-S used two different self-transcendence items modified from the NADA-T to target the two forms of self-transcendence proposed by Yalen et al. (2017), relational self-transcendence ("I experienced all things seeming to unify into a single whole") and annihilational self-transcendence ("I experienced all sense of self and identity dissolve away"), but retained the same bliss item as the first form. In a second subsample, a total of 23 participants completed these items, with 13 participants randomized to the mindfulness condition and 10 to the active control condition. Instructions consistent with the Toronto Mindfulness Scale were used to introduce the NADA-S: "Please read each statement and indicate the extent to which you agree with each statement. In other words, how well does the statement describe what you experienced, just now" (Lau et al., 2006, p.1466). The NADA-S was scored on a 10-point Likert scale (1=Not at all, 10=Very Much), and demonstrated adequate composite reliability (Time 1: Form 1=.87, Form 2=.67; Time 2: Form 1=.88, Form 2=.79).

Results and Discussion—Independent samples T-tests revealed no between-group difference in nondual states following the unstructured attention task for either set of items: Item Set 1/Subsample 1: $t(33)=0.65$, $p=.52$; Item Set 2/Subsample 2: $t(21)=0.14$, $p=.89$. Subsequently, repeated measures ANOVA revealed a significant experimental condition (body scan meditation vs. active control) X time (time 1 vs. time 2) interaction on nondual

states regardless of the items used, Item Set 1/Subsample 1: $F(1,33)=4.77$, $p=.036$, $\eta^2=.13$; Item Set 2/Subsample 2: $F(1,21)=6.08$, $p=.022$, $\eta^2=.22$. Participants in the mindfulness condition reported significantly greater increases in nondual states by time 2 (Item Set 1/Subsample 1: 12.56, *SD*=7.38 to 16.62, *SD*=8.17; Item Set 2/Subsample 2: 11.85, SD=4.34 to 18.44, *SD*=3.24), as compared with the active-control participants (Item Set 1/Subsample 1: 14.05, *SD*=6.27 to 12.79, *SD*=6.46; Item Set 2/Subsample 2: 12.10, *SD*=4.53; 13.50, *SD*=6.77). As such, a single, brief mindfulness practice session increased participants' nondual states relative to an attention control condition (Figure 2).

GENERAL DISCUSSION

The purpose of this study was to develop two, psychometrically-sound instruments that assess experiences of nondual awareness (NDA), the Nondual Awareness Dimensional Assessment-Trait (NADA-T) and the Nondual Awareness Dimensional Assessment-State (NADA-S). In this pursuit, we used the most effective items from extant scales measuring aspects of NDA in combination with new, theoretically derived NDA items to develop a multidimensional inventory, the NADA-T, that demonstrated a consistent factor structure across multiple samples. We then examined the NADA-T's convergent validity, and whether mindfulness meditation practice was associated with reports of NDA. Finally, we examined whether a subset of modified, NADA-T items could capture nondual states of awareness occasioned by a single mindfulness training session in order to validate the NADA-S as a measure sensitive to meditation induced changes in NDA.

Study findings suggest several conclusions. First, findings support traditional conceptualizations of NDA as multidimensional. Two distinct dimensions of NDA, self-transcendence and bliss, emerged from principal component analysis and bifactor exploratory structural equation modeling revealed these dimensions were interrelated elements of an overarching NDA construct. The NADA-T total score and both dimensions were consistently associated with a variety of theoretically related constructs in predictable ways, providing evidence of convergent validity. However, the two NADA-T dimensions evidenced distinct patterns of association with the related constructs, suggesting that the self-transcendence and bliss dimensions capture unique, but related aspects of NDA. In addition, mindfulness meditation practice was found to be associated with more frequent occurrences of NDA, providing further evidence of the NADA-T's convergent validity. Finally, a brief mindfulness practice session was found to evoke nondual states, suggesting that the NADA-S may be a valuable tool for assessing NDA fluctuations in response to a variety of contemplative interventions designed to transform states of consciousness. Thus, in summary, the NADA-T and the NADA-S appear to be valid and useful measures of both trait and state levels of NDA, as conceptualized in the present study.

Individuals who report more frequent NDA show a pattern of personal characteristics that distinguishes them from those who experience NDA rarely or not at all. First, these individuals report having a greater capacity to decenter from experience. Decentering may loosen the boundaries of the self by encouraging a meta-cognitive perspective in which one dis-identifies from self-referential cognitions and thereby de-reifies the self as the subject of experience. Similarly, NDA was more frequently endorsed by individuals who reported

being non-reactive by virtue of their ability to observe thoughts from a reflective distance. Second, individuals reporting more frequent experiences of NDA endorse higher levels of interoceptive awareness. Thus, it may be that closely attending to bodily experience encourages NDA in so far as interoceptive awareness may reveal the permeable boundaries between self and world. For instance, focusing on the tactile sensation of contact between one's back and the cushions of a chair may reveal a lack of a sharp phenomenological differentiation between the body and the object. This interpretation is consistent with a recent experimental study that found a body scan meditation, in which attention is shifted throughout the body to develop interoceptive awareness, led to decreased perception of body boundaries (Dambrum, 2016). Third, individuals reporting more frequent NDA endorsed being mindfully observant of ambient perceptions that are not typically salient, like the sensation of wind in one's hair or the sound of clocks ticking. Attention to such external stimuli is posited to recruit allocentric brain regions that counter egocentric, default mode processing, thereby increasing the likelihood of NDA (Austin, 2009). Finally, persons who are more likely to report NDA exhibit greater extraversion and openness; the latter finding accords with an experimental study that found that mystical experiences occasioned by psilocybin were associated with significant increases in openness to experience over time (MacLean et al., 2011). Taken together, individuals reporting more frequent NDA appear to be better able to maintain a reflective distance from mental experience, more attuned to bodily sensation, and more attentive and open to the external world.

Several unexpected findings in this study were also noteworthy and suggest the need for further investigation of nondual experiences in and outside of meditative experience. First, it is noteworthy that in this general population sample, reports of NDA were not infrequent. In our sample, approximately 50% of participants reported experiencing self-transcendence and 70% reported experiencing bliss at least sometimes. Population-based studies of NDA have not been conducted, but large-scale surveys of mystical experiences indicate that altered states of consciousness may be rather common (e.g., Lukoff & Lu, 1988). Also, the differential relationships between the NADA-T and the five facets of dispositional mindfulness need to be clarified. The strength of relationship between the NADA-T and the full Five Facet Mindfulness Questionniare score is impacted by positive correlations between the NADA-T and three dispositional mindfulness facets, non-reacting, observing and describing, as well as negative correlations between the NADA-T and two other mindfulness facets, acting with awareness and non-judging. In short, it may be that certain mindful tendencies, as operationalized by the FFMQ, support NDA while others may not. Tendencies toward metacognitive awareness and non-reactivity appear logically consistent with NDA. That the mindful tendency to act with awareness is negatively associated with NDA may be explained by the apparent absence of agency accompanying the loss of self in nondual states. In other words, maintaining awareness of one's behavior may elicit a form of self-referential monitoring that is inconsistent with NDA. In contrast, why non-judging is negatively correlated with NDA is unclear. It may be the case that non-judging is a form of judgment cultivated in mindfulness meditation, but this judgment itself may even disappear in NDA experience. Examination of these unexpected results should be addressed in future research.

This study had a number of limitations. First, our ability to assess NDA was limited by the item pool derived from existing measures of constructs similar to NDA. Most of these scales were intended to measure mystical experiences that closely resemble NDA, but nonetheless may not be the most direct measure of NDA. Given that NDA is putatively non-discursive, ineffable, and beyond semantic categorization (e.g., Hood, 1975), it is perhaps unsurprising that linguistic attempts to measure NDA would be limited. Similarly, scholars and practitioners disagree with regard to the definition and description of NDA. For instance, considerable hermeneutical debate has focused on whether or not nonduality includes experiences of unity and oneness or is merely *advaita* – that is, "not two" in Sanskrit, – yet the NADA-T and NADA-S include multiple items measuring unification of self with world as well as items in which the self is experienced as a spacious vacuity. More research is needed to clarify this knotty issue further. Relatedly, the NADA-T and NADA-S do not capture Dorjee's (2016) construct of "pristine awareness," ostensibly the "highest" form of NDA. Future iterations of the NADA should strive to incorporate items that attempt to assess this seemingly ineffable construct. Additionally, it is not yet known to what extent NDA, as operationalized by the NADA, is overlapping or distinct from the modes of existential awareness outlined by Dorjee (2016). Future studies are needed to examine the NADA's incremental validity relative to the other modes of existential awareness, such as decentering. Flow is another psychological construct that may share experiential similarities with NDA (Yaden et al., 2017), but is thought to be conceptually distinct. Flow states emerge when effort and challenge are optimally paired and are thus oriented around a specific task or pursuit (Nakamura & Csikszentmihalyi, 2014). In contrast, NDA is a fundamental capacity of awareness that is ever present but inconsistently realized. However, as alterations in self and affective state characterize both constructs, examining NDA and flow in tandem may prove fruitful. Given conceptual links between NDA and constructs such as decentering and flow, extending the NADA's nomological network will be valuable for contextualizing the NADA in relation to previously developed constructs and furthering the NADA's construct validity. Large scale surveys and factor analytic techniques may be particularly well suited for this purpose (e.g., S1 includes a principal components analysis including all NADA-T and decentering items). Furthermore, additional studies are needed to establish the convergent and discriminant validity of the NADA - with a particular focus on the incremental validity of the NADA relative to measures of other constructs integral to contemplative practice (e.g., decentering, flow, attention and emotion regulation, etc.) in predicting clinical outcomes for participants of meditation-based interventions. This study may also have been limited by use of Mechanical Turk for some of the samples under investigation. However, evidence suggests that participants recruited from Mechanical Turk provide data that are valid and useful (Buhrmester, Kwang & Gosling, 2011; Mason & Suri, 2012). Additionally, the high rate of mindfulness practitioners in the Mechanical Turk samples may have influenced results. Although mindfulness meditation practices are increasingly common, including language about a mindfulness scale in the online, survey description may have contributed to sampling bias. Clearly, more research with diverse sample populations would be desirable and necessary in future NDA research.

Contrary to the prevailing view of NDA as an uncommon, aberrant state of consciousness, findings from the present study suggest that NDA is not an infrequent occurrence among

meditation-naïve individuals and occurs with significantly greater frequency among mindfulness meditation practitioners. Hence, NDA may be tractable to meditation-based interventions, though to our knowledge, aside from the present investigation no randomized controlled study of meditation has examined whether participation in mindfulness training or other meditative techniques actually leads to increased occurrence of NDA. The ability to measure nondual experiences with the NADA-T and -S will now allow researchers to systematically assess one of the core mechanisms of mindfulness meditation, an altered sense of self (Tang, Holzel & Posner, 2015; Vago & Silbersweig, 2012), which may provide insight into previous findings supporting the benefits of mindfulness training. Within the mindfulness literature, the NADA-T and -S address important gaps, both theoretically and psychometrically. Specifically, no commonly used mindfulness scale directly assesses the altered states of self that are purported to emerge during mindfulness practice, followed by the more enduring shifts in self-perspective believed to result from mindfulness training. Systematic, scientific exploration of the means by which NDA can be induced most advantageously is a fertile area for future empirical investigation in contemplative science. In that regard, experimental designs are needed to test whether interventions impact NDA. For example, administering both forms of the NADA over the course of mindfulness-based interventions would enable researchers to characterize the effect of mindfulness meditation on NDA, and to test the hypothesis that meditation-induced experiences of NDA mediate the effect of mindfulness training on clinical outcomes (Dunne et al., 2014). It may even be that the NADA-T and -S could provide useful clinical data for more traditional therapeutic approaches that emphasize altering self-schemas, such as cognitive therapy or Jungian psychoanalysis.

Historically, the study of NDA has been theoretically motivated rather than empirically and clinically motivated. The lack of a standardized measure of NDA has likely contributed to this imbalance. To fill this lacuna, the NADA-T and -S were constructed as a means to facilitate quantitative investigation of NDA and provide standardized instruments for such pursuits. Though this measure exhibited excellent psychometric properties in the present study, continued examination of the NADA is needed to ensure the instrument's predictive validity, as well as its generalizability. In summary, findings reported here indicate that the NADA-T and -S are valid measures, and that continued use and refinement of these instruments may provide useful insights into the prevalence, correlates, mechanisms, and consequences of nondual states of awareness and their relations to health and illness. Systematic, quantitative investigation of NDA has much to contribute to the emerging field of contemplative science.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Public Significance Statement

Nondual awareness is an altered state of consciousness that is well documented in religious and meditative traditions. Yet, no standardized method of measuring nondual awareness currently exists. To address this gap, the present study developed and validated two forms of the Nondual Awareness Dimensional Assessment (NADA), with the first form measuring dispositions toward nondual awareness and the second form measuring states of nondual awareness.

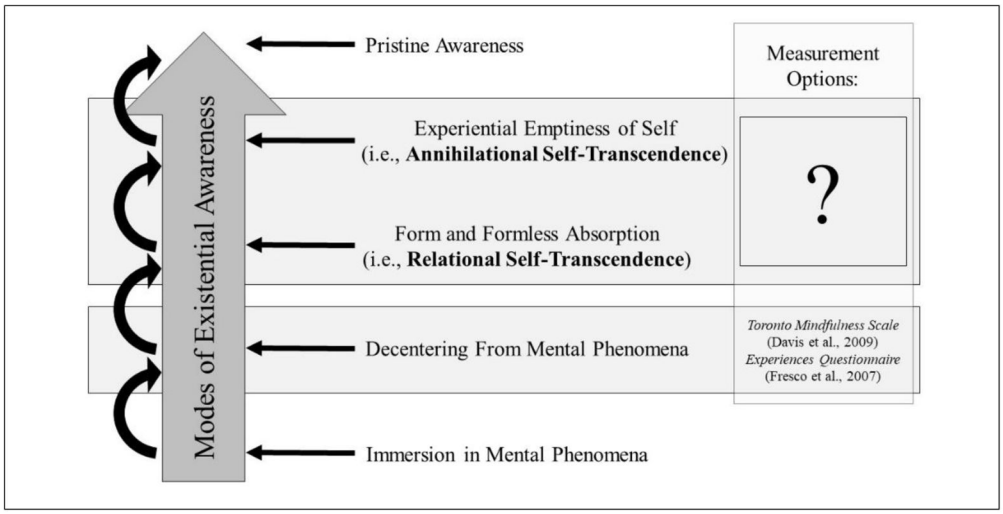

Figure 1.
Gradients of Dereification Model, adopted from Dorjee, 2016

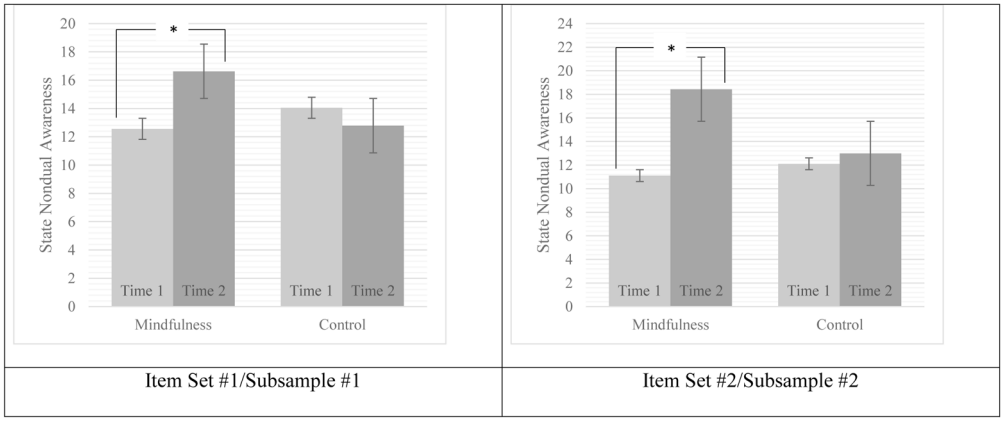

Figure 2.

Increases in state nondual awareness occasioned by mindfulness induction in two sample with two item sets

Table 1

Factor Structure of Nondaul Awareness Dimensional Assessment-Trait (NADA-T)

Scale	Item	Factor	
		1	2
M	I have had an experience in which I felt myself to be absorbed as one with all things	.91	−.03
M	I have had an experience in which all things seemed to be unified into a single whole	.89	−.05
OI	I have had an experience in which the boundaries of my self dissolved	.86	−.03
EDI	I have experienced all notion of self and identity dissolve away	.85	−.13
DME	I have experienced a feeling of oneness in which the boundaries between what is me and what is not me has dissolved	.79	.04
MEQ	I have experienced the insight that “all is One”	.79	.04
OI	I have had an experience in which my mind expanded into space	.76	.12
DME	I have experienced a melting or merging with the others; I became others and they became me	.70	.14
OAV	It has seemed to me that my environment and I were one	.67	.15
OAV	I have experienced an all-embracing love	−.08	.90
EOM	I have felt a sense of awe and wonder	.02	.78
M	I have experienced a perfectly peaceful state	.05	.76
OI	I have been surrounded and filled with a blissful warmth or energy	.15	.71

Note. M= Mysticism Scale; OAV= Altered States of Consciousness Rating Form; MEQ= Mystical Experiences Questionnaire; EDI= Ego-Dissolution Inventory; DME= Dimensions of Meditative Experience Questionnaire; EOM=Effects of Meditation Scale; OI = items originally created by the authors for this study.

Table 2

Prevalence Repots for each of the Final NADA Items

	Never or Very Rarely	Rarely	Sometimes	Often	Very Often or Always	% Reporting experience at least sometimes
I have had an experience in which I felt myself to be absorbed as one with all things	161 (31%)	117 (22%)	148 (28%)	78 (15%)	24 (5%)	48%
I have had an experience in which the boundaries of my self dissolved	154 (29%)	129 (24%)	158 (30%)	66 (13%)	21 (4%)	47%
I have had an experience in which all things seemed to be unified into a single whole	161 (31%)	116 (22%)	155 (29%)	70 (13%)	26 (5%)	47%
I have had an experience in which my mind expanded into space	178 (34%)	121 (23%)	132 (25%)	73 (14%)	24 (5%)	44%
I have experienced all notion of self and identity dissolve away	169 (32%)	126 (24%)	143 (27%)	66 (13%)	24 (5%)	45%
I have experienced the insight that “all is One”	162 (31%)	125 (24%)	133 (25%)	76 (14%)	32 (6%)	45%
I have experienced a feeling of oneness in which the boundaries between what is me and what is not me has dissolved	170 (32%)	118 (22%)	155 (29%)	59 (11%)	26 (5%)	45%
I have experienced a melting or merging with the others; I became others and they became me	193 (37%)	100 (19%)	138 (26%)	66 (13%)	31 (6%)	45%
It has seemed to me that my environment and I were one	130 (25%)	131 (25%)	161 (31%)	84 (16%)	22 (4%)	51%
I have experienced an all-embracing love	72 (14%)	77 (15%)	160 (30%)	136 (26%)	83 (16%)	72%
I have been surrounded and filled with a blissful warmth or energy	78 (15%)	92 (17%)	184 (35%)	122 (23%)	52 (10%)	68%
I have felt a sense of awe and wonder	47 (9%)	75 (14%)	203 (38%)	157 (30%)	46 (9%)	77%
I have experienced a perfectly peaceful state	68 (13%)	108 (21%)	187 (35%)	120 (23%)	45 (9%)	67%

Table 3

Goodness of Fit Statistics and Information Criteria for the NADA-T Models

	χ^2	p	*df*	CFI	TLI	SRMR	RMSEA	AIC	BIC	ABIC
Online Sample #1										
BiFactor ESEM	107.44	<.001	42	.977	.957	.022	.068	11487.274	11724.303	11527.629
Online Sample #2										
BiFactor ESEM	95.07	<.001	42	.972	.948	.024	.076	7528.187	7738.873	7542.392
University Sample										
BiFactor ESEM	97.84	<.001	42	.966	.938	.024	.089	5305.657	5498.600	5302.303

Psychol Assess. Author manuscript; available in PMC 2019 December 01.

Table 4

Standardized Factor Loadings for Bifactor-ESEM Solution of the NADA-T in the three samples

	Nondual Awareness			Self-Transcendence			Bliss			R^2		
	λ (SE)	**λ (SE)**	**λ (SE)**	**λ (SE)**	**λ (SE)**	**λ (SE)**	**λ (SE)**	**λ (SE)**	**λ (SE)**			
Item	**OL 1**	**OL 2**	**Uni**	**OL 1**	**OL 2**	**Uni**	**OL 1**	**OL 2**	**Uni**	**OL 1**	**OL 2**	**Uni**
I have experienced the insight that “all is One”	.73 (.06)	.62 (.11)	.91 (.03)	**.30 (.15)**	**.33[a] (.18)**					.62	.50	.82
I have felt a sense of awe and wonder	.52 (.10)	.61 (.14)	.36 (.08)	−.23 (.05)			**.30 (.13)**	**.24[a] (.27)**	**.66 (.06)**	.41	.45	.57
I have experienced all notion of self and identity dissolve away	.76 (.07)	.50 (.18)	.68 (.09)	**.23[a] (.19)**	**.53 (.18)**	**.40 (.16)**				.63	.56	.63
I have experienced a melting or merging with the others; I became others and they became me	.57 (.13)	.47 (.18)	.78 (.06)	**.59 (.12)**	**.61 (.16)**	**.21 (.19)**				.67	.60	.65
I have experienced a perfectly peaceful state	.58 (.04)	.68 (.11)	.39 (.07)				**.56 (.05)**	**.36[a] (.23)**	**.72 (.06)**	.69	.60	.67
I have experienced a feeling of oneness in which the boundaries between what is me and what is not me has dissolved	.84 (.04)	.71 (.14)	.86 (.07)		**.51 (.19)**	**.29[a] (.18)**				.73	.77	.84
It has seemed to me that my environment and I were one	.71 (.06)	.70 (.10)	.82 (.05)	**.28 (.14)**	**.35 (.18)**	**.20[a] (.17)**				.59	.61	.72
I have experienced an all-embracing love	.61 (.07)	.62 (.14)	.48 (.07)				**.40 (.10)**	**.32[a] (.26)**	**.59 (.06)**	.54	.48	.57
I have had an experience in which my mind expanded into space	.67 (.08)	.57 (.12)	.73 (.06)	**.31 (.16)**	**.62 (.11)**	**.23[a] (.15)**				.55	.71	.58
I have had an experience in which all things seemed to be unified into a single whole	.68 (.11)	.69 (.12)	.73 (.09)	**.55 (.13)**	**.53 (.15)**	**.42 (.16)**				.77	.77	.71
I have been surrounded and filled with a blissful warmth or energy	.60 (.04)	.50 (.15)	.54 (.07)				**.56 (.05)**	**.63 (.08)**	**.67 (.06)**	.68	.67	.74
I have had an experience in which the boundaries of my self dissolved	.73 (.08)	.47 (.08)	.65 (.12)	**.27[a] (.19)**	**.71 (.06)**	**.60 (.14)**		.23 (.07)		.61	.78	.77
I have had an experience in which I felt myself to be absorbed as one with all things	.80 (.05)	.68 (.15)	.79 (.07)		**.53 (.19)**	**.32 (.16)**				.67	.74	.73

[a]Not a statistical effect at α = 0.05. to increase table clarity, cross-loadings below 0.20 are not displayed (cf. Jennrich and Bentler, 2012; Myers et al., 2014; Stenling et al., 2015). Target factor loadings are in bold. OL 1= Online Sample 1, OL 2= Online Sample 2, Uni=University Sample

Table 5

Correlations among NADA-T scores and the Primary Constructs of Interest

		Online Sample #1 (n=338)				Online Sample #2 (n=221)	
		Nondual Awareness	**Self- Transcendence**	**Bliss**	**Nondual Awareness**	**Self- Transcendence**	**Bliss**
Self-Transcendence		**.97*****	-	-	**.97*****	-	-
Bliss		**.81*****	**.65*****	-	**.76*****	**.57*****	-
Self	Self-Salience	-	-	-	*.31****	*.30****	.22**
	Inclusion of Other in the Self	-	-	-	**.56*****	**.56*****	*.38****
	Relational-Interdependent Self	-	-	-	.21**	.13*	*.34****
	Metapersonal Self	-	-	-	**.69*****	**.60*****	**.68*****
	Place Identity	-	-	-	*.36****	.26***	**.50*****
	Possession Identity	-	-	-	*.31****	.29***	.26***
Dispositional Mindfulness		.21***	.13*	*.35****	21***	.12	.37***
DM Facets	Observing	*.41****	*.36****	*.43****	*.40****	*.34****	*.42****
	Describing	.19***	.14*	.27***	.17*	.10	.28***
	Acting with Awareness	−.06	−.12*	.11	−.06	−.12	.13
	Non-judging	−.12*	−.17**	.03	−.06	−.11	.09
	Non-reacting	*.41****	*.36****	*.42****	*.34****	*.30****	*.35****
Decentering		**.59*****	**.59*****	*.46****	-	-	-
Interoceptive Awareness	Noticing	.23***	.19**	.28***	-	-	-
	Not Distracting	−.05	−.06	−.02	-	-	-
	Not Worrying	.03	.01	.07	-	-	-
	Attention Regulation	*.46****	*.42****	*.44****	-	-	-
	Emotional Awareness	*.37****	*.30****	*.45****	-	-	-
	Self Regulation	*.48****	*.43****	*.48****	-	-	-
	Body Listening	*.48****	*.46****	*.41****	-	-	-

		Online Sample #1 (n=338)				Online Sample #2 (n=221)	
		Nondual Awareness	**Self- Transcendence**	**Bliss**	**Nondual Awareness**	**Self- Transcendence**	**Bliss**
	Trusting	*.41***	*.34***	*.48***	-	-	-
Personality	Openness	.20***	.17**	.24***	.21**	.19**	.18**
	Extraversion	.15**	.14*	.14*	.10	.03	.25***
	Agreeableness	.16**	.08	*.30***	.01	−.10	.29***
	Conscientiousness	.12*	.06	.22***	.07	.00	.22**
	Emotional Stability	.20***	.17**	.24***	.22**	.16*	.29***
Subjective Well-Being		.29***	.22***	*.41***	-	-	-
Psychological Well-Being		.09	−.01	*.32***	.19**	.07	*.45***

Note. Using Cohen's correlation conventions (1988), correlation of medium strength (>.30) are italicized and large correlations are bolded (>.50).

* p<.05,

** p<.01,

*** p<.001

Table 6

Between group differences in NADA-T scores for Non-Practitioners and Mindfulness Practitioners

	Non-Practitioners	Mindfulness Practitioners	*df*	*F*	*p*	*η*
NDA	31.76 (11.17)	38.49 (11.61)	1,557	43.78	<.001	.07
Self-Transcendence	19.61(8.67)	24.84 (9.09)	1,557	43.42	<.001	.07
Bliss	12.15 (3.78)	13.64 (3.51)	1,557	21.96	<.001	.04

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Table 7

Correlations among NADA-T scores and Mindfulness Practice Involvement

	NDA	Self-Transcendence	Bliss
Length of Practice History	.10*	.10*	.08
Days per week of Practice	.30***	.30***	.21***
Duration of Typical Practice Session	.18***	.18**	.15**

* p<.05,

** p<.05,

*** p<.001