



The Mindfulness Manifold: Exploring How Self-Preoccupation, Self-Compassion, and Self-Transcendence Translate Mindfulness Into Positive Psychological Outcomes

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Abstract

In a correlational study ($n = 670$) using exploratory and confirmatory factor analysis as well as path analysis, evidence for a mindfulness manifold reaching from self-awareness all the way to psychological outcomes was uncovered. Factor analysis of a large number of mindfulness and mindfulness-related scales yielded five interrelated, interpretable factors, subsumed under three aspects of mindfulness derived from a common-denominator model (Vigo & Silbersweig's S-ART model): (a) self-awareness, with the two factors of reflective awareness and controlled sense-of-self in the moment; (b) self-regulation, with the two factors of self-preoccupation and self-compassion; and (c) self-transcendence. In a mediational structural-equation model testing the hypothesis of a flow of influence from self-awareness over self-regulation to self-transcendence, self-awareness was indeed found to influence self-regulation; self-regulation mediated part of the effects of self-awareness on self-transcendence. In turn, self-preoccupation, self-compassion, and self-transcendence, as well as controlled sense-of-self in the moment, alleviated negative emotional states (stress, depression, and anxiety) and had a positive influence on psychological well-being. The results elucidate that self-regulation and self-transcendence are (some of) the mechanisms through which the effects of self-awareness are translated into beneficial psychological outcomes.

Keywords Mindfulness manifold · Positive psychological outcomes · Self-transcendence

It is becoming increasingly clear that mindfulness and meditation have mostly beneficial effects on mind, brain, and life (for recent meta-analyses, see, e.g., Sedlmeier et al. (2012) and Eberth and Sedlmeier (2012); for a book-length treatise, see Verhaeghen (2017); and for a critical review, see Van Dam et al. (2018)). Sedlmeier et al. estimate that the average effect of meditation on psychological outcomes is about $r = 0.28$, or a Cohen's d of 0.58. Moreover, these effects are broadly distributed, with meditation positively impacting variables as diverse as stress, attention, positive and negative emotions, well-being, emotional regulation, empathy, state anxiety, and neuroticism, among others.

A growing body of literature suggests that one main mechanism for the beneficial effects of meditation is increased self-reported mindfulness. Mindfulness can be defined as the ability or propensity to engage in “nonelaborative, nonjudgmental, present-centered awareness in which each thought, feeling, or sensation that arises in the attentional field is acknowledged” (Bishop et al. 2004). Mindfulness as an individual-difference variable is beneficially related to a variety of psychological outcomes (all correlations from meta-analyses in Verhaeghen 2017), such as self-perceived stress (average $r = 0.48$), general well-being (average $r = 0.44$), anxiety (average $r = 0.34$), depressed mood (average $r = 0.33$), negative emotions (average $r = 0.43$), emotion regulation (average $r = 0.22$), rumination (average $r = 0.22$), and self-compassion (average $r = 0.46$); correlations were smaller for positive emotions (average $r = 0.13$) and empathy (average $r = 0.10$). This relationship is at least partially causal, given that changes in mindfulness after meditation training correlate (all correlations from meta-analyses in Verhaeghen 2017) with changes in self-perceived stress (average $r = 0.54$), anxiety

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(average $r = 0.51$), depressed mood (average $r = 0.62$), positive affect (average $r = 0.26$), negative affect (average $r = 0.14$), rumination (average $r = 0.36$), and general well-being (average $r = 0.35$).

Many models have been advanced to explain the translation of mindfulness into positive outcomes (e.g., Baer 2003; Brown et al. 2007; Chiesa et al. 2013; Creswell and Lindsay 2014; Grabovac et al. 2011; Hölzel et al. 2011; Segal et al. 2013; Shapiro et al. 2006; Vago and Silbersweig 2012). They all have different emphases, but the list of proposed reasons why mindfulness meditation works generally contains three categories, as Vago and Silbersweig point out. A first proposed mechanism is a *change in self-awareness*. This involves recognizing automatic habits and automatic patterns of reactivity, as well as an increased awareness of momentary states of body and mind—what is typically meant by mindfulness. A second proposed mechanism is a *change in self-regulation*. This includes better regulation of emotions, heightened self-compassion, increased emotional and cognitive flexibility, increased nonattachment, and acceptance. A final proposed mechanism is *increased self-transcendence*. This implies increased decentering, a stronger awareness of interdependence between self and others, heightened compassion, and an emphasis on ethical practices. Vago and Silbersweig label this common-denominator model the S-ART model, after its three components: self-awareness, self-regulation, and self-transcendence.

The present study aimed to examine the validity of this mediational model, testing whether the effect of mindfulness (“self-awareness”) on psychological outcomes is indeed mediated through self-regulation and self-transcendence.

Three types of outcomes were examined. The first is psychological well-being, a known correlate of mindfulness, as mentioned above. Select subscales of Ryff’s (1989); Ryff and Keyes 1995) Psychological Well-Being (PWB) questionnaire were used to tap this variable. The second outcome concerns psychological symptoms of depression, anxiety, and stress (measured by the Depression Anxiety Stress Scales (DASS); Lovibond and Lovibond 1995). Such symptoms are often the intended target of mindfulness interventions (e.g., Mindfulness-Based Cognitive Therapy (MBCT), explicitly targets depression relapse; Segal et al. 2013); all three, as mentioned above, are related to mindfulness. Finally, creative activities were considered as a potential positive outcome. In a recent paper (Verhaeghen et al. 2017), we found that creative interests are related to ruminative thought styles, which are often negatively related to mindfulness.

The *self-awareness* mechanism is what is usually understood as mindfulness as reflected in the Bishop et al. (2004) definition cited above—an increased awareness of momentary states of body and mind, that is, a meta-awareness of self, a meta-cognitive insight (Teasdale 1999). This component was measured using the Five Factor Mindfulness Scale (FFMQ;

Baer et al. 2008), often considered the gold standard of mindfulness surveys. In this scale, mindfulness is defined as the observing and describing of experience, without judging, as well as acting with awareness and nonreactivity (although the latter concept could be filed under self-regulation, as defined below, as well).

The second proposed mechanism, *self-regulation*, refers to the “ability to effectively manage or alter one’s responses and impulses” (Vago and Silbersweig 2012, p. 2). This component was assessed here with a variety of concepts, casting a rather wide net. Self-regulation has been defined as “exertion of control over the self by the self” by “overriding or inhibiting competing urges, behaviors, or desires,” in order to “maximize the long-term best interests of the individual” (Muraven and Baumeister 2000, p. 247). A first obvious aspect of this mindfulness facet is emotion regulation, that is, the ability to respond to a situation with a range of emotions that is socially acceptable, as well as the ability to delay one’s spontaneous emotional responses as needed (Gross and Thompson 2007). This concept is often theorized as a mediator in mindfulness contexts (e.g., Chiesa et al. 2013; Teper et al. 2013), but rarely investigated as such (see Coffey and Hartman 2008; Coffey et al. 2010, for an exception—they found that self-regulation mediates between mindfulness on the one hand and flourishing and psychological distress on the other). A second possible self-regulation strategy is self-compassion—taking a “warm and accepting stance towards those aspects of oneself and one’s life that are disliked” (Neff et al. 2007, p. 908; for its power as a mediator for the effects of mindfulness on psychological outcomes, see the MacBeth and Gumley 2012, meta-analysis). A third known mediator that can be conceptualized as belonging to the self-regulation category—or, rather, the lack-of-self-regulation category—is rumination, the tendency to focus one’s thoughts somewhat obsessively around the self. Decreases in rumination have been found to mediate effects of mindfulness training on mental health outcomes (for a meta-analysis, see Gu et al. 2015). I also included three concepts borrowed from Buddhist philosophy that can be constructed as aspects of self-regulation, namely, (a) equanimity, that is, examining reality impartially, without bias or discrimination (this concept suffers from a dearth of relevant data; for a proposal to remedy this, see Desbordes et al. 2015); (b) nonattachment, that is, a release from mental fixations (examined previously as a mediator by Coffey and Hartman 2008; Coffey et al. 2010); and (c) sense-of-self, that is, the feeling of a consistent, continued personal identity over time (another variable that has not been investigated in this context), which is often theorized in Buddhism as being deleterious to decrease suffering (e.g., Dahl et al. 2015).

The third proposed mechanism is *self-transcendence*—“the development of a positive relationship between self and other that transcends self-focused needs and increases prosocial characteristics” (Vago and Silbersweig 2012, p. 2).

Vago and Silbersweig mention increased decentering, a stronger awareness of interdependence between self and others, heightened compassion, and an engagement in ethical practices as examples of self-transcendence; Haidt and Morris (2009) reference elevation, admiration, and compassion; Yaden et al. (2017) include experiences of flow, peak, and/or mystical experiences, as well as emotions of love and awe under this moniker. Here again, a wide net was cast by tapping into this component in two ways. One was to include a scale for decentering (which plays a large role in the model developed by Creswell 2017; see also Fresco et al. 2007); the other to include scales for four of the listed emotions: (a) compassion (often assessed as an outcome variable of meditation training, but rarely considered as a mediator), (b) love (rarely investigated at all), (c) joy (*idem*), and (d) awe (*idem*). Additionally, a scale assessing an individual's search for meaning and wisdom was included as well—a reasonable candidate for measuring the more spiritual side of self-transcendence.

The relationships among these variables, both within each S-ART component, among the S-ART components, and between the S-ART components and the assumed outcomes, are undoubtedly complex. Vago and Silbersweig (2012) suggest that self-awareness may precede the two other components; above, I cited a number of studies that show that self-regulation is a significant mediator between mindfulness and psychological outcomes. Grabovac et al. (2011) propose that self-regulation leads to self-transcendence; they posit a specific unfolding of effects within self-regulation, where nonattachment or acceptance would impact rumination. On the basis of the literature, then, it makes sense to posit a flow of effects within S-ART such that self-awareness leads to self-regulation (as posited by Vago & Silbersweig), and both lead to self-transcendence (as claimed by Grabovac et al. 2011). The proposed path of influence is thus in the direction as indicated by the S-ART acronym: from A to R to T.

Given the broad sweep of the S-ART model, a largely exploratory approach seemed warranted. The ultimate goal was to provide a first look at the synergy between these sets of constructs, and, at the very least, provide some evidence whether and, if so, how self-regulation and self-transcendence might mediate the effects of mindfulness on psychological outcomes. In a first step, exploratory factor analysis delineated interpretable constructs within the set of S-ART variables and the set of outcomes; this exploratory analysis was followed by a confirmatory factor analysis on an independent sample. In a next step, linear structural equation modeling was applied to the reduced data set to examine the relationship among and between all constructs. Additional control variables (age, education, religious interest, meditation practice, and the Big Five personality traits) were included in these models to purify the relationships between constructs. That is, some of the relationships among S-ART variables or between S-ART

variables and outcomes might be due to the influence of underlying extraneous factors. For instance, it is likely that rumination and well-being are both related to neuroticism; in order to tap into the true relationship between rumination and well-being, the influence of neuroticism needs to be partialled out. Likewise, some of the bivariate correlations may be due to a covariation of both with age and/or education levels, and that influence likewise needs to be partialled out.

Although this study is by necessity exploratory, a broad guiding hypothesis can be formulated, based on the literature reviewed above, namely, that the S-ART model works as advertised. Specifically, I would expect that the effects of self-awareness on psychological outcomes will be at least partially mediated through self-regulation and self-transcendence, and that the effects of self-regulation on psychological outcomes will be at least partially mediated through self-transcendence. Thus, a structural-equation-based path model with this described directional flow will be tested.

Method

Participants

Data from two independent samples were combined ($n = 670$) for the purposes of the present study. Although it is difficult to determine a priori what the sample size for factor analysis, exploratory or confirmatory, should be, an oft-cited rule of thumb is ten observations per parameter (Kline 2013). The most complicated model tested here (exploratory analysis on the S-ART structural equation model) includes 33 variables; the present sample size thus allows for splitting up the sample in independent samples for an exploratory and a confirmatory analysis, respectively. Sample 1 consisted of 306 Amazon Mechanical Turk workers, aged 18–69 (mean = 33.5, $SD = 1.0$); 42% were women. On average, they had completed 14.8 years of education ($SD = 1.79$). Participants were invited to participate in a study on “mindfulness, acceptance, and psychology,” and offered \$4 in return for their time. Workers needed to be highly qualified in order to participate—more than 5000 HITS approved and a HIT approval rate greater than 98. Sample 2 consisted of 364 students at the Georgia Institute of Technology, participating in a study on mindfulness, acceptance, and psychology in return for course credit. They were aged 18–36 (mean = 20.1, $SD = 1.8$); 42% were women. On average, they had completed 13.9 years of education ($SD = 1.1$). In order to assess potential differences in data quality in the two samples, Cronbach's alphas for all subscales were compared (see the survey section for alpha values for the pooled sample). Sample 1 tended to have higher reliability values (median = 0.86, from 0.56 to 0.97) than sample 2 (median = 0.79, from 0.41 to 0.96), but the correlation between Fisher z -transformed reliability values

between the samples was 0.91 (this transformation was applied to linearize the measurement scale), suggesting that both groups were equally sensitive to differences in the item characteristics that drive reliability.

Procedure

Participants filled out the questionnaires online; they took on average 45 min to complete.

Measures

Here, I group the questionnaires thematically, as hypothesized in the introduction. Reported Cronbach's alpha values indicated are the values obtained in the present, pooled sample.

Control Variables The Mini-IPIP (Donnellan et al. 2006) is a 20-item measurement of the Big Five personality factors: Extraversion (sample item: "I am the life of the party," Cronbach's alpha = 0.87), Agreeableness (sample item: "I sympathize with others' feelings," Cronbach's alpha = 0.82), Conscientiousness (sample item: "I get chores done right away," Cronbach's alpha = 0.75), Openness (which the IPIP labels Intellect/Imagination; sample item: "I have a vivid imagination," Cronbach's alpha = 0.77), and Neuroticism (sample item: "I have frequent mood swings," Cronbach's alpha = 0.73). Participants also indicated current and previous membership of a religious group, level of interest in religion, frequency of attendance at religious services, frequency of prayer and meditation, and duration of a meditation practice, if any. Additionally, participants were asked for their age and educational level.

Self-Awareness The Five Facets Mindfulness Questionnaire (FFMQ; Baer et al. 2008) is a 39-item questionnaire designed to measure five facets of mindfulness: Observing (sample item: "When I am walking, I deliberately notice the sensations of my body moving," Cronbach's alpha = 0.81), Describing (sample item: "I am good at finding words to describe my feelings," Cronbach's alpha = 0.90), Acting with awareness (sample item: the reverse of "When I am doing things, my mind wanders off and I am easily distracted," Cronbach's alpha = 0.90), Nonjudging of inner experience (sample item: the reverse of "I criticize myself for having irrational or inappropriate emotions," Cronbach's alpha = 0.91), and Nonreactivity (sample item: "I perceive my feelings and emotions without having to react to them," Cronbach's alpha = 0.84).

Self-Regulation The Emotion Regulation Questionnaire (ERQ; Gross and John 2003) examines individual differences in the use of two common emotion regulation strategies: Cognitive Reappraisal (six items; sample item: "When I am

faced with a stressful situation, I make myself think about it in a way that helps me stay calm," Cronbach's alpha = 0.91) and Expressive Suppression (four items; sample item: "I control my emotions by not expressing them," Cronbach's alpha = 0.78).

The Self-Compassion Scale, Short Form (SCS; Raes et al. 2011), consists of 12 items, subdivided into 6 subscales of 2 items each: Self-Kindness (sample item: "I try to be understanding and patient towards those aspects of my personality I don't like," Cronbach's alpha = 0.65), Self-Judgment (sample item: "I am disapproving and judgmental about my own flaws and inadequacies," Cronbach's alpha = 0.76), Common Humanity (sample item: "I try to see my failings as part of the human condition," Cronbach's alpha = 0.71), Isolation (sample item: "When I am feeling down, I tend to feel like most other people are probably happier than I am," Cronbach's alpha = 0.65), Mindfulness (sample item: "When something painful happens, I try to take a balanced view of the situation," Cronbach's alpha = 0.69), and Over-Identified (sample item: "When I fail at something important to me, I become consumed by feelings of inadequacy," Cronbach's alpha = 0.73).

The Broad Rumination Scale (BRS; Trani et al., manuscript in preparation) is a 29-item scale aimed at measuring ruminative behavior in a broad sense. Subscales are Optimism (five items; sample item: "My thoughts about myself are more often positive than negative," Cronbach's alpha = 0.86), Compulsivity (five items; sample item: "When I start to worry, it's very hard for me to stop," Cronbach's alpha = 0.85), Social Expressiveness (two items; sample item: the reverse of "I do not like sharing my thoughts and feelings with others," Cronbach's alpha = 0.75), Broodiness (five items; sample item: "When something goes wrong, I tend to think of all the things that have recently gone wrong," Cronbach's alpha = 0.80), Distractibility (five items; sample item: "When I am emotional, it is hard for me to focus on what I am supposed to be doing," Cronbach's alpha = 0.82), Worrying (three items; sample item: "Uncertainty about the future bothers me," Cronbach's alpha = 0.59), and Reflectiveness (four items; sample item: "It is important for me to understand why I feel a certain way," Cronbach's alpha = 0.81).

Three subscales of the Resilience Scale (RS; Lundman et al. 2007) were included: Meaningfulness (seven items, sample item: "My life has meaning," Cronbach's alpha = 0.85), Equanimity (five items, sample item: "I take things one day at a time," Cronbach's alpha = 0.66), and Self-Reliance (six items, sample item: "When I make plans, I follow through with them," Cronbach's alpha = 0.83).

The Nonattachment Scale (NS; Sahdra et al. 2010, Cronbach's alpha = 0.94) consists of 30 items purporting to measure release from mental fixations, sample item: "I can accept the flow of events in my life without hanging onto them or pushing them away."

The Sense-of-Self Scale (SOSS; Flury and Ickes 2007) measures the extent to which participants have a strong sense-of-self, that is, having “a concrete sense of who they are, ... know what their opinions are, ... have strong personal preferences, and ... have a personality that is well defined” (p. 282); it consists of 12 items, Cronbach’s alpha = 0.86, sample item: “I have a clear and definite sense of who I am and what I’m all about.”

Self-Transcendence The Decentering subscale of the Experiences Questionnaire (EQ; Fresco et al. 2007; Cronbach’s alpha = 0.88) consist of 13 items, measuring “the ability to observe one’s thoughts and feelings as temporary, objective events in the mind, as opposed to reflections of the self that are necessarily true” (p. 234), sample item: “I am better able to accept myself as I am.”

Four subscales of the Dispositional Positive Emotion Scales (DPES; Shiota et al. 2006) were included: Joy (six items; sample item: “I am an intensely cheerful person,” Cronbach’s alpha = 0.88), Love (six items; sample item: “I develop strong feelings of closeness to people easily,” Cronbach’s alpha = 0.86), Compassion (five items; sample item: “Taking care of others gives me a warm feeling inside,” Cronbach’s alpha = 0.91), and Awe (six items; sample item: “I see beauty all around me,” Cronbach’s alpha = 0.85).

One subscale of the Aspects of Spirituality Scale (AS; Büssing et al. 2007) was included, namely, the Search for Insight/Wisdom Scale (seven items; sample item: “I strive for insight and truth,” Cronbach’s alpha = 0.88). The wider scale purports to measure “different aspects of vital spirituality, beyond the conceptual boundaries of exclusive definitions of institutional religiosity” (p. 283).

Outcome Variables Four subscales of the Psychological Well-Being Scale (PWB; Ryff and Keyes 1995) were included: Personal Growth (seven items; sample item: “I think it is important to have new experiences that challenge how you think about yourself and the world,” Cronbach’s alpha = 0.81), Positive Relations (seven items; sample item: “Most people see me as loving and affectionate,” Cronbach’s alpha = 0.82), Purpose in Life (seven items; sample item: “I have a sense of direction and purpose in life,” Cronbach’s alpha = 0.80), and Self-Acceptance (seven items; sample item: “When I look at the story of my life, I’m pleased with how things have turned out,” Cronbach’s alpha = 0.90).

Creative interest was measured with the Creative Activities Questionnaire (CAQ; Verhaeghen et al. 2005). This questionnaire lists 20 artistic/creative activities (writing, drawing, singing, painting, acting, etc.). Participants indicate how seriously they pursue each of the creative activities and how many hours per week they spend on these activities. Participants were given the opportunity to add activities should their preferred activity not be among those listed; none of them did.

(Cronbach’s alpha is not a meaningful statistic for a list as disparate as this.)

The DASS (Lovibond and Lovibond 1995) measure, as its name implies, self-reported Depression (sample item: “I could not seem to experience any positive feeling at all,” Cronbach’s alpha = 0.97), Anxiety (sample item: “I was worried about situations in which I might panic and make a fool of myself,” Cronbach’s alpha = 0.93), and Stress (sample item: “I found myself getting upset by quite trivial things,” Cronbach’s alpha = 0.94), with three subscales of 14 items each.

Measures Not Included in the Analyses Additionally, participants filled out the QUEST Scale (Batson and Schoenrade 1991) (data not reported here), and sample 2 also filled out the Moral Foundations Questionnaire (Graham et al. 2009) and the Social and Economic Conservatism Scale (Everett 2013), presented right after the DASS (data not reported here).

Order of Presentation Order of presentation of the scales was FFMQ, NAS, RS, SCS, EQ, SOSS, IPIP, BRS, ERQ, PWB, CAQ, DPES, QUEST, ASP, DASS (MFQ, SECS for the second sample), and demographics.

Data Analyses

Data Reduction

The data set contains a rather large number of variables—49 scales or subscales. Therefore, the first step in the data-analysis was to apply data reduction to the set of measures in order to facilitate both data analysis and interpretation in the structural-equation path-modeling phase. This first step was done in two phases, each using a different subset of the sample (Kline 2013): (a) an exploratory factor analysis, performed on a random selection of two thirds of the sample, and (b) a confirmatory factor analysis, in which the results from the exploratory factor analysis were replicated (and adjusted as necessary) on the remaining one third of the sample. The sample for the exploratory analyses was created using the SPSS Select Cases command, requesting a random draw of approximately 66% of cases; this resulted in a sample of 488 participants. The remainder of the sample, 222 individuals, were used for the confirmatory factor analyses. Three such sets of analyses were performed, one on the set of seven religious/spiritual practice variables (i.e., the answers to the questions: “On a scale of 1–10, how religious would you say you are?”, “Apart from special occasions such as weddings, baptisms, funerals, festivals, and circumcisions, about how often do you attend religious services these days?”, “About how often do you pray outside of religious services?”, “Do you consider yourself as belonging to any particular religion or denomination?”, “About how often do you meditate outside of religious services?”, “If you meditate, how many

hours do you meditate in a typical week?,” and “If you meditate, how long have you been meditating?”), one on the set of nine variables I considered to be outcomes (i.e., the subscales of the Creative Activities Questionnaire, the Psychological Well-Being Scale, and the Depression Anxiety Stress Scales), and one on the set of 33 scales and subscales assumed to reflect S-ART (i.e., the subscales of the Five Facets Mindfulness Questionnaire, the Nonattachment Scale, the Resilience Scale, the Self-Compassion Scale, the Decentering Scale, the Sense-of-Self Scale, the Broad Rumination Scale, the Emotion Regulation Questionnaire, the Dispositional Positive Emotion Scale, and the Search for Insight/Wisdom Scale). All analyses were run with scale or subscale scores as the unit of analysis, *not* the individual items within each scale or subscale. The procedure used here is thus akin to second-order factor analysis (e.g., Rindskopf and Rose 1988), looking for overarching structure in these existing scales, which already emerged out of factor analysis performed at the item level by their original authors during scale construction.

Structural Equation Modeling

Based on the results from the factor analysis (see below), nine constructs were built for use in structural equation path modeling, one construct for each factor that had two or more indicators (thus omitting social expressiveness and creative interests from the ultimate modeling effort). This modeling was done using the full sample, $n = 670$. To build these factors, united-weighted z -composites were calculated; that is, all scores on the relevant subscales were z -transformed, and the z -scores for each subscale within a construct were averaged to yield the final score for that construct.

Structural equation modeling (performed using LISREL) was set up as follows. Variables were organized into three tiers. The first tier consisted of the control variables. These were put in the first tier to control for the effects of personality, religious interest, meditation practice, age, and education as potential underlying third variables in all other relationships. The second tier consisted of the S-ART variables. The third tier contained the two outcome variables.

The baseline model implemented the expected flow of influence from any lower tier to all higher tiers, the assumption being that the control variables influence all others, and S-ART influences the outcomes. Thus, all tier 1 variables connected to all tier 2 variables and to all tier 3 variables, and all tier 2 variables connected to all tier 3 variables. Within the S-ART variables, I assumed a similar hierarchy, as explained in the introduction, flowing from self-awareness (reflective awareness and controlled sense-of-self in the moment) to self-regulation (self-compassion and self-preoccupation) and self-transcendence, and from self-regulation (self-compassion and self-preoccupation) to self-transcendence.

Results

Data Reduction

Factor Analyses on the Religious/Meditation Control Variables

The scree plot for the *exploratory factor analysis* (principal axis factor analysis with oblimin rotation, $n = 428$) is presented in Supplementary Fig. 1A. Eigenvalues and the scree plot suggest a two-factor solution. This solution is presented in Table 1; it explains 65% of the variance. The first factor is easily identifiable as religious interest, the second as meditation practice. (A three-factor solution created a separate factor containing a single variable, “If you meditate, how long have you been meditating?,” and was for that reason considered less desirable than the two-factor solution.) I fitted a two-factor *confirmatory model* ($n = 222$) allowing all variables that loaded more than 0.4 on a single factor to load on that factor, replicating the structure shown in Table 1. Table 2 shows the loadings; all were significant. The model fit the data reasonably well, χ^2 ($df = 13$, $n = 222$) = 56.84, NFI = 0.94, GFI = 0.93, CFI = 0.95, RMSEA = 0.12, standardized RMR = 0.050 (although the χ^2 and RMSEA values leave to be desired). Therefore, this bipartite structure was used for the building of the two constructs to be used in the path analysis.

Factor Analyses on the Outcome Variables

The scree plot for the exploratory factor analysis (principal axis factor analysis with oblimin rotation, $n = 428$) is presented in Supplementary Fig. 1B. Eigenvalues suggest a two-factor solution, the scree plot a possible two-factor solution. The latter solution fell naturally along the lines of the three scales measured, and is therefore retained; it is presented in Table 3, and explains 75% of the variance. The first factor is personal well-being (all subscales of the PWB scale included in the present study), the second creative interest (both subscales of the CAQ), and the third (all three subscales of the DASS scale) can be labeled as negative emotional states. (A four-factor solution created a separate factor containing a single subscale, Personal Growth from the PWB.)

I fitted a three-factor *confirmatory model* ($n = 222$) allowing all variables that loaded more than 0.4 on a single factor to load on that factor, replicating the structure shown in Table 3. Table 4 shows the loadings; all were significant. The model fit the data reasonably well, χ^2 ($df = 24$, $n = 222$) = 90.75, NFI = 0.93, GFI = 0.9, CFI = 0.95, RMSEA = 0.11, standardized RMR = 0.059 (although the χ^2 and RMSEA values leave to be desired). Therefore, this tripartite structure was used for the building of the three constructs to be used in the path analysis.

Factor Analyses on the S-ART Variables The scree plot for the exploratory factor analysis (principal axis factor analysis with oblimin rotation, $n = 428$) is presented in Supplementary

Table 1 The two-factor solution (pattern matrix) for the antecedent religious and spiritual practice variables (principal axis factoring, oblimin rotation) on a subset of the sample

	Factor 1, religious interest	Factor 2, meditation practice
About how often do you pray outside of religious services?	0.90	
Apart from special occasions such as weddings, baptisms, funerals, festivals, and circumcisions, about how often do you attend religious services these days?	0.85	
On a scale of 1–10, how religious would you say you are?	0.84	
Do you consider yourself as belonging to any particular religion or denomination?	0.72	
If you meditate, how many hours do you meditate in a typical week?		0.69
About how often do you meditate outside of religious services?		0.65
If you meditate, how long have you been meditating?		0.44

$N = 448$. For readability purposes, only loadings with an absolute value larger than 0.4 are shown

Fig. 1C. Eigenvalues suggest a five-factor solution, the scree plot a five or six-factor solution. I retained the latter for further analyses; its loadings are represented in Table 5. The factors explained 71% of the variance. I preferred the six-factor solution to the five-factor solution because the latter had a very comprehensive first factor (nine items), which was more cleanly separated into two S-A factors in the six-factor solution. The factor loadings are represented in Table 5.

I interpreted factors 2 and 4 as facets of self-awareness. Factor 2 consists of subscales measuring observing, reflectiveness, and search for wisdom. This factor appears to measure an observing awareness that includes a critical, reflective component; I therefore labeled this factor reflective awareness. Factor 4 consists of acting with awareness, sense-of-self, the opposite of distractibility, nonjudging, and describing. This suggests an open but purposeful awareness that contains an acute sense of the observer; I therefore labeled this scale controlled sense-of-self in the moment.

Three factors seem to be interpretable as falling under self-regulation: factors 1, 3, and 6. Factor 1 included four of the positively voiced self-compassion subscales, as well as scales for decentering, equanimity, nonattachment, and reappraisal.

This suggests an active reappraisal towards equanimity, centering on compassion for the self; I labeled this factor active reappraisal. Factor 3 consisted of the social expressiveness subscale of the Broad Rumination Scale and the inverse of the Suppression subscale of the Emotion Regulation Scale; I dubbed this actor social expressiveness. Factor 6 concerns self-preoccupation; it consisted of three subscales of the Broad Rumination Scale (Worry, Compulsivity, and Broodiness), two negative subscales of the Self-Compassion Scale (Isolation, Overidentified, and Self-Judgment), and the FFMQ Nonreactivity subscale. Factor 5 was interpreted as self-transcendence—it taps into meaningfulness, joy, awe, compassion, love, self-reliance, and optimism.

Next, a six-factor *confirmatory model* ($n = 222$) was fitted, allowing all variables that loaded more than 0.4 on a single factor to load on that factor, replicating the structure shown in Table 5. Additionally, to preserve the purity of the factor estimates, all variables that had cross-loadings larger than 0.4 were eliminated from the confirmatory analysis. Fit of this model was not very good, χ^2 ($df = 237$, $n = 222$) = 1055.97, NFI = 0.89, GFI = 0.79, CFI = 0.91, RMSEA = 0.13, standardized RMR = 0.10. Fit was improved into an acceptable

Table 2 Ultimate two-factor solution for the confirmatory factor analysis of the antecedent variables, performed on the remainder of the sample

	Factor 1, religious interest	Factor 2, meditation practice
About how often do you pray outside of religious services?	0.94	
Apart from special occasions such as weddings, baptisms, funerals, festivals, and circumcisions, about how often do you attend religious services these days?	0.77	
On a scale of 1–10, how religious would you say you are?	0.93	
Do you consider yourself as belonging to any particular religion or denomination?	0.75	
If you meditate, how many hours do you meditate in a typical week?		0.48
About how often do you meditate outside of religious services?		0.72
If you meditate, how long have you been meditating?		0.48

$N = 222$. For readability purposes, only loadings with an absolute value larger than 0.4 are shown

Table 3 Three-factor solution (pattern matrix) for the psychological outcome variables (principal axis factoring, oblimin rotation) performed on a subset of the sample

	Factor 1, psychological well-being	Factor 2, creative interests	Factor 3, negative emotional states
PWB self-acceptance	0.81		
PWB positive relations	0.76		
PWB purpose in life	0.74		
PWB personal growth	0.66		
Creative interests (seriousness)		0.72	
Creative interests (hours)		0.57	
DASS stress			0.93
DASS anxiety			0.91
DASS depression			0.74

N = 448. For readability purposes, only loadings with an absolute value larger than 0.4 are shown
PWB Psychological Well-Being Scale, *DASS* Depression, Anxiety, and Stress Scale

range by removing the ten variables that loaded less than 0.6 on their respective factors (SCS self-judgment, RS equanimity, NAS nonattachment, ERQ reappraisal, FFMQ describing and nonreactivity, BRS optimism and broodiness, and DPES awe and compassion), χ^2 ($df = 137$, $n = 222$) = 384.54, *NFI* = 0.91, *GFI* = 0.93, *CFI* = 0.95, *RMSEA* = 0.091, standardized *RMR* = 0.069. Table 6 shows the resulting loadings; all were significant. Factor 1 is now defined more narrowly by three positive self-compassion variables, as well as decentering; it seemed apt, therefore, to relabel this factor as self-compassion. The variables in Table 6 were used to build the constructs for the subsequent SEM path analysis.

Structural Equation Path Modeling

Supplementary Table 1 presents the intercorrelations of the constructs used as input for the structural equation model: the control variables (the five IPIP personality factors, age, education), the two antecedent variables (religious interest and meditation practice), the five S-ART constructs (reflective awareness, controlled sense-of-self in the moment, self-

preoccupation, self-compassion, and self-transcendence), and the two outcome constructs (negative emotional states and psychological well-being). The three-tiered baseline model described in the “Data Analyses” section did not fit the data very well, with an undesirably large χ^2 value, χ^2 ($df = 4$, $n = 670$) = 166.34, *NFI* = 0.94, *GFI* = 0.97, *CFI* = 0.98, *RMSEA* = 0.25, standardized *RMR* = 0.034.

To improve model fit, all paths that were nonsignificant at $p < 0.05$ were fixed to zero; this removed 44 paths. The resulting model fit the data better, χ^2 ($df = 49$, $n = 670$) = 221.71, *NFI* = 0.97, *GFI* = 0.96, *CFI* = 0.98, *RMSEA* = 0.078, standardized *RMR* = 0.042. In a third step, one newly insignificant path (from Intellect/Imagination to self-compassion) was deleted, and the path with the highest modification index (from religious interest to meditation practice) was freed. Fit improved considerably, χ^2 ($df = 49$, $n = 670$) = 124.29, *NFI* = 0.98, *GFI* = 0.98, *CFI* = 0.99, *RMSEA* = 0.048, standardized *RMR* = 0.023. In a fourth step, a newly nonsignificant path, from age to meditation practice, was deleted, and the path with the highest modification index, from self-preoccupation to self-compassion, was freely estimated; resulting fit was χ^2 ($df = 49$, $n = 670$) = 55.16,

Table 4 Ultimate three-factor solution for the psychological outcome variables after confirmatory factor analysis, performed on the remainder of the sample

	Factor 1, psychological well-being	Factor 2, creative interests	Factor 3, negative emotional states
PWB self-acceptance	0.94		
PWB positive relations	0.62		
PWB purpose in life	0.74		
PWB personal growth	0.64		
Creative interests (seriousness)		0.65	
Creative interests (hours)		0.64	
DASS stress			0.91
DASS anxiety			0.79
DASS depression			0.88

N = 222. For readability purposes, only loadings with an absolute value larger than 0.4 are shown
PWB Psychological Well-Being Scale, *DASS* Depression, Anxiety, and Stress Scale

Table 5 Ultimate, six-factor solution (pattern matrix) for the set of self-awareness, self-regulation, and self-transcendence variables; exploratory factor analysis on a subset of the data (principal axis factoring, oblimin oblique rotation)

	Factor 1, active reappraisal	Factor 2, reflective awareness	Factor 3, social expressiveness	Factor 4, controlled sense-of-self in the moment	Factor 5, self-transcendence	Factor 6, self-preoccupation
SCS self kindness	0.75					
SCS common humanity	0.72					
SCS self judgment	−0.55					
EQ decenter	0.43					
SCS mindfulness	0.43					
FFMQ observing		0.59				
BRS reflectiveness		0.49				
ASP search for wisdom and insight		0.46				
ERQ suppression			0.79			
BRS social expressiveness			−0.66			
FFMQ acting with awareness				0.88		
Sense-of-Self Scale				0.59		
BRS distractibility				−0.54		0.47
FFMQ nonjudging				0.40		
FFMQ describing				0.32		
DPES joy					−0.80	
RS meaningfulness					−0.76	
DPES love					−0.74	
DPES awe					−0.69	
BRS optimism					−0.59	
RS self reliance				0.45	−0.54	
DPES compassion					−0.52	
BRS compulsivity						0.80
BRS worry						0.70
FFMQ nonreactivity						−0.50
SCS isolation						0.44
SCS overidentified						0.42
BRS broodiness						0.40

$N = 448$. For readability purposes, only loadings with an absolute value larger than 0.4 are shown

RS Resilience Scale, EQ Experience Questionnaire, BRS Broad Rumination Scale, FFMQ Five Facets Mindfulness Scale, ASP Aspects of Spirituality Scale, QUEST Quest Scale, ERQ Emotion Regulation Questionnaire, DPES Dispositional Positive Emotions Scale, SCS Self-Compassion Scale (short form)

NFI = 0.99, GFI = 0.99, CFI = 1.00, RMSEA = 0.014, standardized RMR = 0.020. Given that this model fit the data very well, with a nonsignificant χ^2 value, and that the highest modification index was 6.10, the modeling effort was stopped here. The final model (omitting the control variables for legibility) is presented in Fig. 1; the paths originating from the control variables are presented in Table 7.

Discussion

The aim of this study was to explore by what potential mechanism mindfulness as an individual-difference variable might

be associated with positive psychological outcomes (in the present case, the two constructs of psychological well-being and the opposite of the negative emotional states of stress, anxiety, and depression). Vago and Silbersweig's S-ART model was used as a guiding framework. The principal idea in this framework is that there are relationships between all three components—a mindfulness manifold. From my reading of the literature, I expected that self-regulation would mediate between self-awareness and self-transcendence, thus giving rise to a path model where mindfulness as typically defined (which coincides with self-awareness in the S-ART model) might exert its influence on beneficial outcomes through either or both self-regulation and self-transcendence,

Table 6 Ultimate six-factor solution for the set of self-awareness, self-regulation, and self-transcendence variables; confirmatory factor analysis on a subset of the data

	Factor 1, self-compassion	Factor 2, reflective awareness	Factor 3, social expressiveness	Factor 4, controlled sense-of-self in the moment	Factor 5, self-transcendence	Factor 6, self-preoccupation
SCS self kindness	0.79					
SCS common humanity	0.56					
EQ decenter	0.93					
SCS mindfulness	0.68					
FFMQ observing		0.63				
BRS reflectiveness		0.73				
ASP search for wisdom and insight		0.79				
ERQ suppression			0.70			
BRS social expressiveness			-0.97			
FFMQ acting with awareness				0.75		
Sense-of-Self Scale				0.79		
FFMQ nonjudging				0.77		
DPES joy					0.85	
RS meaningfulness					0.79	
DPES love					0.73	
BRS compulsivity						0.79
BRS worry						0.61
SCS isolation						0.82
SCS overidentified						0.89

$N = 222$. Factor 1 has been renamed from its label in Table 3 to reflect its more narrow scope in the present analysis

RS Resilience Scale, EQ Experience Questionnaire, BRS Broad Rumination Scale, FFMQ Five Facets Mindfulness Scale, ASP Aspects of Spirituality Scale, QUEST Quest Scale, ERQ Emotion Regulation Questionnaire, DPES Dispositional Positive Emotions Scale, SCS Self-Compassion Scale (short form)

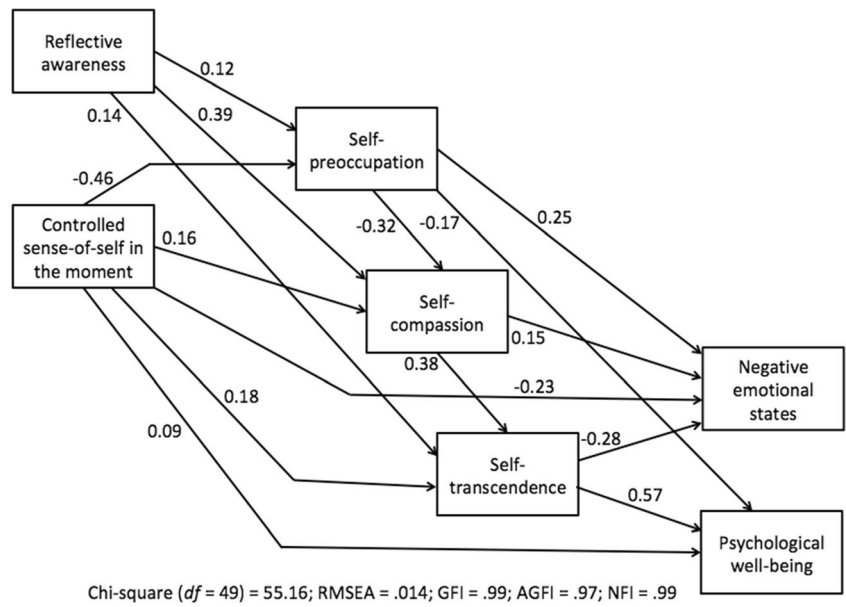
and that self-regulation would exert its influence at least partially through self-transcendence. The data indeed conformed to this model.

Factor analysis of the relevant scales resulted in two constructs that can reasonably be argued to measure mindfulness as typically defined—(a) reflective awareness and (b) controlled sense-of-self in the moment. The latter factor is interesting; in that, it combines mindfulness-in-the-moment with a strong sense-of-self, with the Sense-of-Self Scale loading strongly on this factor (along with scales tapping acting with awareness, nonjudgmentality, and the opposite of distractibility). This is a new finding; the link was uncovered here because of the exploratory nature of the factor analysis, which was thus not constrained to traditional mindfulness measures.

One of the reasons why sense-of-self has not been previously considered in relationship to mindfulness may be that at least some forms of Buddhist meditation—such as *vipassanā* or insight meditation, and *koan* or *shikantaza* practice in Zen—hold the exact opposite view: they are “especially concerned with [deconstructing] the view that the self is enduring and unitary, since a reified sense-of-self is believed to be the

primary cause of suffering and states of discontent” (Dahl et al. 2015, p. 519). Dahl et al. offer an example that demonstrates this point nicely: “[C]onsider the feeling of being overcome by anger. When your sense-of-self is fused with the presence of anger (i.e., the feeling ‘I am angry’), the arising of anger is not seen clearly, but instead forms the lens through which you view experience” (p. 520). In this point of view, a strong sense-of-self would be anathema to salvation. This is not the case here: the Sense-of-Self Scale on its own correlated positively with the psychological well-being factor ($r = 0.61$) and negatively with negative emotional states ($r = -0.58$). It also correlated negatively with self-preoccupation ($r = -0.64$), and positively with self-compassion ($r = 0.58$) and self-transcendence ($r = 0.57$). These correlations are not just significant; they also count as large in Cohen’s (1988) framework for effect sizes. This suggests that a stronger sense-of-self, while in the Buddhist conceptualization negatively related to awakening, appears to have a universally beneficial impact on the psychological variables included in the present study. This finding suggests that, within the context of mindfulness training or mindfulness-based therapy, it might be

Fig. 1 Final path model describing the relationship between religious interest, meditation practice, self-awareness (reflective awareness and controlled sense-of-self in the moment), self-regulation (self-preoccupation and self-compassion), self-transcendence, and psychological outcomes. *N* = 670



worth considering to additionally bolster a strong sense-of-self, rather than emphasizing depersonalization as a strategy to achieve self-transcendence, well-being, and a quelling of mood-related symptoms.

Two of the factors can be construed as tapping self-regulation: (a) (the opposite of) self-preoccupation (which covers the negative, more brooding, and compulsive aspects of rumination, as well as feelings of isolation and over-identifying with failure) and (b) self-compassion (which contained all positively worded subscales of the Self-Compassion Scale, as well as the EQ Decentering subscale).

It may be interesting to note that a separate factor for equanimity did not emerge from the analyses; rather, subscales that tapped into this potential aspect of self-regulation (which would include equanimity, nonattachment, and possibly also

decentering) clustered with four of the self-compassion subscales in the exploratory analysis. Most of the equanimity measures dropped out of the confirmatory analysis. One possible conclusion could be that self-compassion as a construct is ultimately not distinguishable from equanimity, and that the four subscales of the SCS included here are the better assessment of this larger construct.

Likewise, one of the aspects of the self-awareness component proposed in the introduction, namely, emotion regulation, was ultimately not retained in the analysis because the subscales of the Emotion Regulation Questionnaire failed to load above 0.40 on any of the factors. It is not immediately clear why this was the case. One possibility is that the self-regulation survey is formulated at a high level of abstraction, and is thus less likely to load highly on the more specific self-

Table 7 Standardized paths from antecedent variables (age, education, and the Big Five personality factors) to the unit-weighted composites, in the final linear structural equation model

	Age	Education	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Intellect/ imagination	Religious interest	Meditation practice
Religious interest	-0.16	-0.09	0.08	0.15			-0.10		
Meditation practice					-0.10		0.16	0.39	
Reflective awareness				0.27	0.14		0.36		0.19
Controlled sense-of-self in the moment	0.23		0.19		0.26	-0.43	0.11	0.11	
Self-preoccupation			-0.09		0.08	0.43			-0.06
Self-compassion						-0.30			
Self-transcendence	-0.12		0.15	0.18	0.09	-0.11			
Negative emotional states			0.13			0.26			
Psychological well-being	-0.05		0.09	0.09			0.08	0.06	

N = 670. All paths indicated

compassion or self-preoccupation-centered aspects of self-regulation that emerged from the current factor analyses.

Finally, a single factor emerged to fit the self-transcendence component. This factor included the experience of meaningfulness, the experience of joy, and the ethical emotion of love. The exploratory factor analyses further included awe, optimism, self-reliance, and compassion in this factor.

Given that the factor analysis was exploratory, that is, no a priori factor structure was defined; the results of the factor analyses seem encouraging for the validity of the S-ART model. The survey data can be classified quite naturally into these three components, with interpretable subcomponents within the self-awareness and self-regulation components.

Meditational analysis using linear structural equation modeling was applied to the data in order to investigate how the S-ART components interrelate, and how they are associated with desirable psychological outcomes. It is important to note that a relatively minimal structure was imposed on the data. For the baseline model, I assumed a three-tiered structure, where I allowed all variables from lower tiers to influence all variables within the higher-ranked tiers. Tier 1 included age, education, religious interests, meditation practice, and personality, to ensure that the relationships between variables in higher tiers were controlled for these background variables; tier 2 consisted of the S-ART variables (where I additionally assumed a direction of flow from self-awareness to self-regulation to self-transcendence, based on the existing literature); and tier 3 consisted of psychological well-being and negative emotional states. After setting up this initial model, model fitting proceeded in a bottom-up fashion by pruning paths that were nonsignificant, and freeing up paths as indicated by modification indices.

Within the complex of S-ART variables, the expected sequence emerged. The proposed model, where self-awareness variables influenced the self-regulation variables, which in turn impacted self-transcendence, which then in turn positively affected psychological outcomes fit the data excellently. The model also uncovered a nontheorized sequence within the self-regulation variables. Lower levels of self-preoccupation are associated with higher levels of self-compassion, which are in turn connected to higher self-transcendence. There were only a few direct paths outside this sequencing: (a) both reflective awareness and controlled sense-of-self in the moment showed an additional direct and positive path to self-transcendence, (b) controlled sense-of-self in the moment had a direct and negative effect on negative emotional states and a direct and positive effect on psychological well-being, (c) self-preoccupation directly and negatively impacted psychological well-being, and (d) self-compassion had a direct and—counterintuitive—positive effect on negative emotional states. (The latter result is likely a statistical correction for model overfitting, given that the correlation between self-compassion and negative emotional states is negative and

quite large; $r = -0.50$.) The main conclusion is that mindfulness is indeed associated with higher levels of self-regulation and self-transcendence, with self-regulation mediating part of the relationship between mindfulness and self-transcendence. Note that the present study is obviously limited by its cross-sectional nature. While we can probably safely assert that the constructs uncovered here are overlapping—forming a mindfulness manifold—the direction of flow posited here needs to be verified in longitudinal analysis, either of the observational kind or after mindfulness-enhancing intervention. In the absence of longitudinal verification, the complexity of the data can likely be captured in many alternative models.

It is quite intriguing that self-transcendence is so strongly related to the psychological outcomes of lowered negative emotional states, and enhanced psychological well-being. Most of the research in the clinical realm has focused on the role of rumination and worry (i.e., self-preoccupation, in the present data set), and to a smaller extent self-compassion, as the mediators between mindfulness and clinical outcomes. This is warranted, as explained in the introduction, and it is also true in the current data set. Self-preoccupation and self-compassion are important mediators, but the current findings suggest that their influence on psychological outcomes is mediated in large part through increased self-transcendence. These results fit well with Ryff's work (Ryff 2014; Ryff and Singer 2008) on psychological well-being as flourishing (or *eudaimonia*), that is, “to strive, to be proactive, to make meaning and, as articulated by Aristotle over 2000 years ago, to pursue the highest good that is within us” (Ryff and Singer 2008, p. 23). While traditional mindfulness programs such as Mindfulness Based-Stress Reduction and Mindfulness-Based Cognitive Therapy do include some techniques to encourage self-transcendence (e.g., loving-kindness meditation), this is not a main focus of such trainings. The present findings suggest that a more explicit and/or additional focus on generating self-transcendence, as is done, for instance, in Cognitive-Based Compassion Training (e.g., Ozawa-de Silva et al. 2012) or the ReSource Project (e.g., Klimecki et al. 2013), might be even more valuable in generating psychologically beneficial effects for the participants.

Looking deeper into the mindfulness manifold, we can note that the two components of mindfulness identified here have differential effects on different aspects of self-regulation and self-transcendence. Reflective awareness has a direct positive effect on self-preoccupation (i.e., individuals who are more reflective tend towards higher levels of rumination and worry); in contrast, a more controlled sense-of-self in the moment tended to directly lower self-preoccupation, with a particularly large path coefficient. Note that the actual correlation between reflective awareness and self-preoccupation is close to zero ($r = 0.01$), so the direct path should be interpreted cautiously. Reflective awareness also has a stronger effect on self-compassion than controlled sense-of-self in the moment does.

This finding may not be that surprising. More reflective traditions in Buddhism, such as the Tibetan *lojong* tradition that birthed Cognitive-Based Compassion Training, emphasize reflection as a crucial aspect to generate compassion, first for oneself, and then for others.

A final set of findings concerns the role of the control variables. The one meta-analysis on the Big Five personality traits and mindfulness (Giluk 2009) indicates a negative correlation between mindfulness and neuroticism, and positive correlations between mindfulness and the four other personality traits (largest for conscientiousness and agreeableness). The same general pattern was found here (see Table 7). A meta-analysis on the relationship between personality on the one hand and happiness and life satisfaction (akin to psychological well-being) on the other shows a negative relationship between these variables and neuroticism, a zero relationship between these variables and openness, and a positive relationship between these variables and the other three personality traits (Steel et al. 2008); here, a null relationship with neuroticism and a positive relationship with extraversion and agreeableness was obtained, which is not in contradiction with the meta-analytic findings. Finally, a meta-analysis on anxiety and depression (Kotov et al. 2010) shows negative correlations between these states and conscientiousness and extraversion, small negative relationship with openness, a zero relationship with agreeableness, and a positive relationship with neuroticism; in the present data set, only an unexpected positive relationship with extraversion and an expected positive relationship with neuroticism emerged.

One interesting aspect of the present study is that it allows for a direct comparison of the extent to which the psychological outcomes are explained by the Big Five personality traits versus the S-ART variables. Negative emotional states received a large direct influence from neuroticism (0.26), but also a similarly sized direct negative path from controlled sense-of-self in the moment (-0.23), as well as from self-transcendence (-0.28); note that there was also a positive path from self-compassion (0.15). Psychological well-being received direct paths from extraversion (0.09), agreeableness (0.09), and intellect/imagination (0.08), but the paths originating from the S-ART variables were larger in magnitude (-0.17 from self-preoccupation and 0.57 from self-transcendence). It appears, then, that mindfulness, self-regulation, and self-transcendence have stronger effects on the psychological outcomes measured here than personality does. Given the relative lack of plasticity in personality variables, and the inherent trainability of mindfulness (e.g., Eberth and Sedlmeier 2012), this is good news.

Religious interest was directly and positively related to one of the self-awareness variables, controlled sense-of-self in the moment; meditation practice was directly and positively related to reflective awareness and directly and negatively to self-preoccupation. Neither antecedents directly influenced self-

regulation or self-transcendence. This underscores two points. One is a bifurcation in the antecedents of self-awareness, such that the actual practice of meditation was responsible for shaping reflective awareness (as indexed by observing, reflectiveness, and a search for wisdom), whereas spiritual or religious practices—in the present case, prayer, attending services, and self-identifying as religious—were exclusively related to a controlled sense-of-self in the moment (as indexed by acting with awareness, a strong sense-of-self, and a nonjudging attitude). The finding that meditation practice is directly related to reflective awareness, but not (either directly or indirectly) to controlled sense-of-self in the moment mirrors the results of one large-scale previous study, where it was found that meditation practice impacted the Observing subscale of the FFMQ—part of the present reflective awareness construct—but not the Acting with awareness and Nonjudging subscales, which are part of the controlled sense-of-self in the moment construct (Soler et al. 2014; $n = 670$). Note that a much smaller study found the opposite pattern (Falkenström 2010, $n = 76$). One interpretation might be that not all components of mindfulness are amenable to change through meditation practice of the sort our subjects (and those in Soler et al. 2014) engaged in, although both forms of mindfulness play a role in generating positive psychological outcomes. The second point is that the effects of meditation and religious practice on positive psychological outcomes are at least partially mediated by the S-ART complex, and that is thus imperative to more deeply investigate these mediating mechanisms in further research.

Limitations

The main limitation of the present study, as mentioned above, is its cross-sectional design, which precludes strong causal conclusions. A longitudinal or intervention study using the same variables would be necessary to draw causal conclusions. Another limitation is the exploratory character of the analyses. The results make sense, but a replication, perhaps on a different type of sample and/or with an alternative set of measures, would be useful. Third, the questions about meditation practice were brief and vague; in a replication study, it might make sense to collect more detailed information about the types of meditation or meditation tradition(s) participants engage in or have engaged in. Finally, the study is obviously limited by the actual scales and questionnaires used, as well as the ultimately subjective categorizing of the factors within the S-ART framework.

Summarized, the present study uncovered the presence of a mindfulness manifold—many aspects of mindfulness and its related constructs overlap—and the effects of mindfulness on psychological outcomes are mediated by this manifold. Path analysis uncovered that controlled sense-of-self in the moment impacts self-preoccupation; self-preoccupation impacts self-compassion, which in turn increases equanimity, which leads

to higher levels of self-transcendence. Reflective awareness and controlled-sense-of-self in the moment are directly related to self-compassion and self-transcendence. Self-transcendence, finally, decreases negative emotional states, and increases psychological well-being. Future work on mindfulness might benefit from including variables that assess aspects of self-regulation and self-transcendence, given that these are crucial mechanisms in translating the effects of mindfulness into beneficial outcomes. The current data also suggest that different aspects of mindfulness might diverge in subtle but important ways in these translation mechanisms. Finally, the data suggest that a stronger (rather than a deconstructed) sense-of-self might be beneficial, and that it might be a vital part of mindfulness.

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Compliance with Ethical Standards

Conflict of Interest The author declares that he has no conflict of interest.

Research Involving Human Participants All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee at the Georgia Institute of Technology and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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