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## **Nonattachment and mindfulness: Related but distinct constructs**

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### Abstract

This study examined whether nonattachment, a relatively new construct in the mindfulness literature, showed convergent, discriminant and incremental validity in relation to the well-studied five facets of mindfulness. Mindfulness was defined as a multifaceted construct including observing, describing, acting with awareness, nonjudging and nonreactivity; and measured using a recently validated 20-item Five Facet Mindfulness Questionnaire (FFMQ). Nonattachment was defined as a flexible, balanced way of relating to one's experiences without clinging to or suppressing them, and measured using the 7-item Nonattachment Scale (NAS-7). In a large nationally representative sample of Americans ( $N=7884$ ; 52% female; Age:  $M=47.9$ ,  $SD=16$ ), nonattachment was positively related to all five aspects of mindfulness. Structural equation modeling showed that the 20-item FFMQ and NAS-7 showed good fit; their factor structures were invariant across genders and age groups; and NAS-7 was empirically distinguishable from the five mindfulness facets. Hierarchical regression models provided evidence of the incremental validity of NAS-7. Finally, mediation models showed that nonattachment substantially mediated the links between the mindfulness facets and the outcome variables of satisfaction with life and life effectiveness.

*Keywords:* Five-factor mindfulness questionnaire, nonattachment, life effectiveness, satisfaction with life, psychometrics

Some of the earliest known writings on the constructs of mindfulness and nonattachment date back 25 centuries in Eastern contemplative traditions (Bhikkhu & Bhikkhu, 1995). Mindfulness made its debut in the West with the first known translation of the word by T. W. Rhys Davids in 1881 (Gethin, 2011), and made its way to modern psychology in 1970s with the introduction of Mindfulness Based Stress Reduction program (Kabat-Zinn & Hanh, 2009). Since then, empirical studies on mindfulness have been steadily increasing and a number of self-report instruments have been designed to measure mindfulness (Baer, Smith, & Allen, 2004; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; Brown & Ryan, 2003; Buchheld, Grossman, & Walach, 2001; Cardaciotto, Herbert, Forman, Moitra, & Farrow, 2008; Chadwick et al., 2008; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2004; Hayes & Feldman, 2004; Lau et al., 2006; Sauer et al., 2013). The construct of nonattachment is at least as old as mindfulness in Eastern contemplative traditions, but it is a relative newcomer in the psychological literature, with the first empirical investigation published with the introduction of the Nonattachment Scale or NAS (Sahdra, Shaver, & Brown, 2010).

Nonattachment can be defined as a flexible, balanced way of relating to one's experiences without clinging to or suppressing them (Sahdra, Ciarrochi, Parker, Marshall, & Heaven, 2015; Sahdra & Shaver, 2013; Sahdra et al., 2010). Mindfulness is often defined as paying attention purposely in the present moment while refraining from judgments and impulsive reactions (Kabat-Zinn & Hanh, 2009). This paper examines the relation between nonattachment and mindfulness, particularly to test whether the two constructs are empirically distinguishable.

To this day, there is an ongoing debate about the 'right' way of defining mindfulness while maintaining fidelity of the construct to its historical Buddhist roots and modern assessment standards (Baer, 2011; Bodhi, 2011; Davis, 2014; Dreyfus, 2011; Gethin, 2011;

Greenberg & Mitra, 2015; Grossman, 2011, 2014; Grossman & Van Dam, 2011; Lindahl, 2014; Monteiro, Musten, & Compson, 2015; Purser, 2014; Van Gordon, Shonin, Griffiths, & Singh, 2014; Williams & Kabat-Zinn, 2011). For the purposes of this manuscript, we operationalize mindfulness as a multifaceted construct encompassing five interconnected abilities (Baer et al., 2006): attending to one's internal experiences, thoughts, feelings, or sensations (*observing*), being able to articulate them to some extent (*describing*), responding to the present situation with a degree of awareness (*acting with awareness*), refraining from judging one's internal experiences as 'right' or 'wrong' (*nonjudging*), and withholding habitual reactions to internal experiences (*nonreactivity*).

This operational definition of mindfulness is appealing for methodological and substantive reasons. It is closely tied to a widely used measure of mindfulness, the Five Facet Mindfulness Questionnaire (FFMQ) (Baer et al., 2006). The FFMQ was developed using a factor analysis of the combined item pool of five independently developed mindfulness questionnaires, and therefore is a fairly comprehensive, empirically derived synthesis of the early literature on the assessment of mindfulness. Thus, this measure is a good representation of the different conceptions of mindfulness in the psychological literature. It serves as a suitable benchmark for testing the purported distinctiveness and utility of any other mindfulness-like construct, such as nonattachment.

At least one conceptualization of mindfulness seems to suggest that nonattachment is one of the features of mindfulness: "mindfulness is a state of psychological freedom that occurs when attention remains quiet and limber, without attachment to any particular point of view" (Martin, 1997, p.291). The FFMQ, arguably the most comprehensive measure of mindfulness in the literature, focuses on observing inner experiences without judging them or impulsively reacting to them and acting with awareness, but it has no explicit assessment of attachments/clinging to personal experiences, especially pleasant ones. It is possible that the FFMQ items implicitly measure nonattachment without calling it that. If that is the case, then

any valid and reliable measure of nonattachment will be redundant with at least one of the factors of the FFMQ.

However, from a theoretical perspective, nonattachment and mindfulness seem to be distinct constructs. Based on their review of classical Buddhist texts and consultations with prominent contemporary Buddhist teachers and scholars, Sahdra et al. (2010) described the first-person experience of nonattachment as follows:

Phenomenologically, nonattachment has the subjective quality of not being stuck or fixated on ideas, images, or sensory objects, and not feeling an internal pressure to acquire, hold, avoid, or change. Rather than being aloof, indifferent, uncaring or unengaged (which are common misconceptions about nonattachment in the West), the nonattached individual genuinely cares about, is engaged in and responsive to the present situation without falling into self-aggrandizement or self-degradation (p. 118).

Being “attached” (in the Buddhist sense) to one’s beliefs, sensations, physical objects, other people, even life itself, indicates one’s mistaken view of reality as fixed or permanent. The tendency to reify one’s conceptions (mental representations) can be countered through insight into the constructed and ever-changing (interdependent and impermanent) nature of reality. Such insights often occur in formal meditation training, but can also occur in daily life. For instance, ups and downs in one’s career, damage to or decay of cherished physical possessions, death of a family member, personal injury or illness are myriad life lessons in nonattachment, opportunities to learn to “let go” of one’s clinging to cherished ideas, experiences, possessions and people in one’s lives (Sahdra et al., 2010).

There is a growing support for personal and interpersonal benefits of nonattachment (Allen, 2012; Chang, Hodgins, Lin, & Huang, 2014; Codato, Testoni, Guglielmin, & Armenti; Cosme & Wiens, 2015; Desbordes et al., 2014; Ju & Lee, 2015; Lamis & Dvorak, 2014; Sahdra et al., 2015; Sahdra & Shaver, 2013; Sahdra et al., 2010; Shonin, Gordon, & Griffiths, 2013; Shonin & Van Gordon, 2014; Shonin, Van Gordon, Slade, & Griffiths, 2013; Tang, Hölzel, &

Posner, 2015; Tran et al., 2014; Vago & Silbersweig, 2012). Most relevant to the goals of the present study, mindfulness as measured by the Mindful Attention Awareness Scale (Brown & Ryan, 2003) is positively correlated to NAS-assessed nonattachment but distinguishable from it given a moderate size correlation of around .40 (Sahdra et al., 2010). It remains to be seen how nonattachment will relate to the five factors of mindfulness.

The facets of *nonjudging* and *nonreactivity* involve the ability to let go of (not-attaching-to) one's desire to remain free of negative internal experiences, so we should expect a moderate to high correlation of these variables with nonattachment. The remaining facets of mindfulness – *observing, describing and acting with awareness* – may also be related to nonattachment. Before one can be nonattached to one's unhealthy fixations, one must become aware of them and observe one's attachments without judging oneself harshly and must refrain from reacting impulsively. Thus, mindfulness may be conducive to the cultivation of nonattachment. Mindfulness interventions, often in the form of formal meditations but also through practice in daily life, are believed to enhance nonattachment, and meditators tend to show higher scores on nonattachment than non-meditators (Sahdra et al., 2010). Therefore, we expect the mindfulness facets and nonattachment to be positively correlated.

A vast majority of research on mindfulness has focused on how trait mindfulness or mindfulness interventions lead to reduction of negative mental states like stress, anxiety, depression and rumination (Baer, 2003; Chiesa & Serretti, 2009; Hofmann, Sawyer, Witt, & Oh, 2010; Keng, Smoski, & Robins, 2011; van der Velden et al., 2015). There is a dearth of research on how mindfulness and nonattachment may be linked to life effectiveness of generally healthy individuals in the general population. Mindfulness can allow people to observe and examine their inner states with greater awareness, and less reactivity and self-criticism, which should enable people to act on their important values and goals effectively.

There is no research on the link between nonattachment and effectively pursuing valued goals. Nonattachment can enable people to release from unhelpful fixations, especially

to positive ideas about life (“There should be no problems in my life”), experiences (“I need to feel good all the time”), and comparisons (e.g., “I need to feel better than others”). When people let go of mental fixations about how life “needs to be”, they should be more able to respond to how life actually is. Specifically, we hypothesize that nonattached people will be better at managing time, handling social situations, achieving important goals, flexibly adapting to situations by changing point of view in the face of contradictory evidence, facing challenges with a sense of calm and mental balance, and trusting themselves to fully engage with the task at hand. Since both mindfulness and nonattachment are expected to be positively associated with positive life outcomes, the extent to which nonattachment predicts the outcome variables above and beyond the five facets of mindfulness will provide evidence of the discriminant and incremental validity of nonattachment.

At the minimum, mindfulness, nonattachment and positive life outcomes are expected to be inter-correlated in a cross-sectional study like ours. However, there are theoretical reasons to assume that nonattachment might be one of the outcomes of mindfulness practices. The five facets of mindfulness reflect different behaviours that people “do” (e.g., acting with awareness, describing internal experiences), whereas nonattachment reflects a quality of “letting be” (e.g., letting pleasant and unpleasant experiences come and go without grasping or pushing them away). In Buddhist psychology, attachment (to internal experiences, views about the self, other people and physical possessions) is thought to be a key determinant of *dukkha* or fundamental dissatisfactory nature of the human condition, and mindfulness meditations are thought to liberate people from *dukkha* by helping them release their unhealthy attachments over time (Thera, 1994):

O monks, let alone a year. Should any person practice these four foundations of mindfulness [of the body, sensations, consciousness and mental content]... for seven months, six months, five months, four months, three months, two months, a month, half a month, then one of these two fruits may be expected by him: highest knowledge

[complete cessation of attachments] here and now, or if some remainder of clinging is yet present, the state of non-returning [to sensuous cravings].

This excerpt from a classic ancient Buddhist text on mindfulness, *Satipatthana Sutta*, suggests that mindfulness practices over time lead to nonattachment, which in turn, releases practitioners from *dukkha*, reducing dissatisfaction with life. This causal ordering is consistent with recent theorizing in modern psychological literature that nonattachment is one of the likely mechanisms via which mindfulness produces positive effects (Cosme & Wiens, 2015; Ju & Lee, 2015; Tang et al., 2015; Tran et al., 2014).

Using a large nationally representative sample of American adults, we examined the factor structure of abbreviated forms of the FFMQ and NAS that have previously been validated with community samples: the 20-item Five Facet Mindfulness Questionnaire (Tran, Gluck, & Nader, 2013), an abridged form of the original 39-item FFMQ (Baer et al., 2006); and the 7-item Nonattachment Scale or NAS-7 (Elphinstone, Sahdra, & Ciarrochi, 2015; Sahdra et al., 2015), a short form of the original 30-item Nonattachment Scale (Sahdra et al., 2010). We also conducted tests of measurement invariance of the two measures with respect to age and gender. We then tested the discriminant validity of NAS-7 with respect to each of the five facets of the 20-item FFMQ in structural equation models in which nonattachment items were constrained to load on each of the mindfulness factors (in separate models) to see if nonattachment was redundant with any particular aspect of mindfulness. We also conducted a model to test whether nonattachment might be subsumed, along with the five facets of mindfulness, under a common higher-order factor. We examined the unique contributions of the five mindfulness facets and nonattachment in predicting life effectiveness and satisfaction with life. Based on our theoretical discussion above, we expected nonattachment to be related to the mindfulness facets but empirically distinguishable from them, such that nonattachment would be a distinct factor in structural equation models, and would uniquely predict life outcomes above and beyond the mindfulness facets. Finally, based on our theoretical



discussion above, we conducted mediation models to test the extent to which nonattachment mediated the links between the five mindfulness facets and the outcome variables of satisfaction with life and life effectiveness.

### **Method**

*Participants and design.* A nationally representative American sample ( $N=7884$ ; 52% female; Age:  $M=47.9$ ,  $SD=16$ ) was conducted by a professional survey company. Participants completed an on-line anonymous survey in exchange for points they received from the survey company, which they could redeem for merchandise (directly from the company). All participants provided basic demographic information: Regarding ethnicity background: 7.3% reported African American, 5.6% Hispanic, 8.5% European, 43% European American, 3.4% Asian American, 4.1% Native American, 0.4% Indian subcontinent, 2.6% mixed, multi-racial, and 25% other ethnicities. Participants reported a wide range of educational status: 1.6% had some high school or less, 17.4% had high school diploma or equivalent, 29.6% had some college education, 28.6% had completed a college diploma, 6.8% had some graduate/professional school training, and 16% reported holding a graduate/professional degree. They varied in socioeconomic status as well, with household income ranging from “\$10,000 or less” to “more than \$130,000” (the median category was “\$50,001 to \$60,000”). Regarding the civil status: 19.7% were single, 0.6% reported dating a number of people, 3.9% dating one person, 53.5% were married, 9.6% were divorced, 5.9% were widowed, 5.8% were cohabiting (living with a partner as a couple, but not married), and 1.1% were engaged. For the remaining part of the survey, we utilized a planned missing data design, also known as matrix sampling (Graham, Taylor, Olchowski, & Cumsille, 2006; Schafer, 1997), to keep the burden on participants to a minimum. Each participant received a random sample of 60 items from a large battery of 300 items. Each item consisted of responses from at least 21% of the sample (1655 respondents). This study focused on the following measures:

## Measures

*Mindfulness.* We used the recently validated 20-item Five Facet Mindfulness Questionnaire (Tran et al., 2013), an abridged form of the original 39-item FFMQ (Baer et al., 2006). Tran et al. (2013) have shown the short form to have good psychometric properties in student and community samples. Participants rated their responses to 20 items using a scale from 1 (Never or very rarely true) to 5 (Very often or always true). Example items of the five subscales are as follows: *observing* (e.g., “I pay attention to sensations, such as the wind in my hair or sun on my face”;  $\alpha = .77$ ), *describing* (e.g., “My natural tendency is to put my experiences into words”;  $\alpha = .76$ ), *acting with awareness* (e.g., “When I do things, my mind wanders off and I’m easily distracted” (reverse scored);  $\alpha = .76$ ), *nonjudging* of inner experiences (e.g., “I think some of my emotions are bad or inappropriate and I shouldn’t feel them” (reverse scored);  $\alpha = .79$ ), and *nonreactivity* to inner experiences (e.g., “When I have distressing thoughts or images, I feel calm soon after”;  $\alpha = .77$ ).

*Nonattachment.* The 7-item Nonattachment Scale (NAS-7) is an abridged form of the original 30-item Nonattachment Scale (Sahdra et al., 2010). NAS-7 has recently been validated in independent student and community samples of Australians and Americans (Elphinstone et al., 2015; Sahdra et al., 2015). Participants rated their responses to 7 items using a scale from 1 (Disagree Strongly) to 6 (Agree Strongly). Sample items include: “I can enjoy pleasant experiences without needing them to last forever,” “I do not get ‘hung up’ on wanting an ‘ideal’ or ‘perfect’ life”;  $\alpha = .83$ ).

*Satisfaction with life.* We used a well-established measure (Diener, Emmons, Larsen, & Griffin, 1985), in which participants rated their responses to 5 items using a scale from 1 (Strongly Disagree) to 5 (Strongly Agree). Example items include: “In most ways my life is close to my ideal,” and “I am satisfied with my life.” The measure showed satisfactory internal consistency ( $\alpha = .85$ ).

*Life effectiveness.* The 24-item Life Effectiveness Questionnaire (LEQ) measures people's capacity to adapt and thrive in daily life tasks (Neill, Marsh, & Richards, 2003; Purdie, Neill, & Richards, 2002). Participants rated their responses to 24 items using a scale from 1 (False – Unlike me) to 8 (True – Like me). The measure has 8 subscales: *time management* (e.g., "I manage the way I use my time well";  $\alpha = .83$ ); *social competence* (e.g., "I am successful in social situations";  $\alpha = .85$ ); *achievement motivation* (e.g., "I try to do the best that I possibly can";  $\alpha = .84$ ); *intellectual flexibility* (e.g., "I change my thinking or opinions easily if there is a better idea";  $\alpha = .68$ ); *task leadership* (e.g., "I am a good leader when a task needs to be done";  $\alpha = .80$ ); *emotional control* (e.g., "I can stay calm in stressful situations";  $\alpha = .83$ ); *active initiative* (e.g., "I like to be active 'get into it' person;  $\alpha = .85$ ); and *self-confidence* (e.g., "When I apply myself to something I am confident I will succeed";  $\alpha = .85$ ).

### **Multiple imputation procedure**

The data were missing completely at random or MCAR (Enders, 2010) because the study had missing data by design. Having an MCAR design allowed us to utilize a multiple imputation procedure to produce unbiased estimates (Little & Rubin, 1987). We used the package Amelia II (Honaker, King, & Blackwell, 2011) in the statistical software R (R\_Core\_Team, 2015) to derive 25 imputations. Amelia II implements Expectation-Maximization (EM) algorithm with bootstrapping (Dempster, Laird, & Rubin, 1977; Honaker et al., 2011; King, Honaker, Joseph, & Scheve, 2001). In this procedure, multiple bootstrapped samples of the original incomplete data are used to draw values of the complete data. The EM algorithm draws imputed values from each set of bootstrapped parameters and automatically fills in the missing values with the imputed values. Across the imputed datasets, the observed values remain the same, but the missing values are replaced with draws from EM-based predictive distribution of missing data. We confirmed the robustness of the imputation model by checking that EM convergence was normal and EM chain lengths of all 25 imputed datasets were reasonably short and consistent in length.

## Results

Analyses were conducted using the following R packages: lavaan (Rosseel, 2012), Amelia II (Honaker et al., 2011), semTools (Pornprasertmanit, Miller, Schoemann, & Rosseel, 2013), mitools (Lumley, 2014), and psych (Revelle, 2015).

*Distribution of means in USA.* Using participants' IP addresses, we obtained geographical information using the ip2coordinates application programming interface of Data Science Toolkit (<http://www.datasciencetoolkit.org/developerdocs#ip2coordinates>). Accurate geographical data were available from 6429 participants. Table 1 reports sample sizes in each of the US census regions, along with means and standard deviations of the five subscales of mindfulness and nonattachment. Although comparison of means of our primary variables across US census regions was not an original goal of our study, the results suggest that the means were comparable across the US.

*Zero-order correlations.* Table 2 shows that all the variables of the study were inter-correlated, with a couple of exceptions: the describing and observing subscales of mindfulness were unrelated to each other, and age was unrelated to the time management subscale of life effectiveness.

*Confirmatory Factor Analyses (CFAs).* We conducted a series of CFAs to examine the factor structure of the mindfulness and nonattachment measures. Since chi-squared test is sensitive to sample size, we provide additional goodness-of-fit indices for all CFAs (reported in Tables 3 to 5). In accordance with commonly accepted criteria, the Tucker-Lewis index (TLI) and comparative fit index (CFI)  $\geq .90$ , and root mean square error of approximation (RMSEA)  $< .08$  were considered to provide evidence of adequate model fit. When comparing nested models, the criteria of  $\Delta\text{RMSEA} \leq .015$  (Chen, 2007) and  $\Delta\text{CFI}/\Delta\text{TLI} \leq .01$  (Cheung & Rensvold, 2002) were used as evidence of invariance between models.

A conventional confirmatory factor analysis (CFA<sub>1</sub> in Table 3) of a model with five correlated factors of the 20-item FFMQ showed a just-acceptable fit. However, the fit was

substantially improved in a model (CFA<sub>2</sub>) in which we used an orthogonal latent factor to account for the shared method variance of all the reversed/negative items (Marshall et al., 2015; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). We retained the negative method factor in all subsequent models containing the 20 items of FFMQ.

Table 3 further shows that a single factor model of NAS-7 (CFA<sub>3</sub>) had an excellent fit. (Note that there are no reversed/negative items in NAS-7, so a method factor was irrelevant to a CFA of this measure.) Since nonattachment was positively correlated with the five aspects of mindfulness (as shown in Table 2), we ran additional models to test whether nonattachment is different from mindfulness variables or possibly redundant with one of the mindfulness factors. We first ran a 6-factor model including the five facets of mindfulness and a 6<sup>th</sup> factor of nonattachment (CFA<sub>4</sub> in Table 3), which served as a baseline for comparing subsequent 5-factor models (CFA<sub>5</sub> to CFA<sub>9</sub> in Table 3) in which nonattachment items were combined with each of the mindfulness factor items in separate models. In each case, the 5-factor model showed substantially poor fit compared to the 6-factor model, as evident from  $\Delta RMSEA \leq .09$  and  $\Delta CFI/\Delta TLI \leq .17$ . On their own, none of these 5-factor models fit well using the conventional criteria of  $CFI/TLI \geq .90$  and  $RMSEA < .08$ . These results provide initial factorial validity evidence suggesting that nonattachment, although related to mindfulness, is distinct from the five facets of mindfulness.

Finally, we conducted a higher-order model (CFA<sub>10</sub> in Table 3) with each of the five facets of mindfulness and the sixth factor of nonattachment loaded on an overarching factor. The fit of this model (which assumes that the factors are uncorrelated) was equivalent to the fit of CFA<sub>4</sub>, the model with six correlated factors. The standardized factor loadings of the six factors of the higher-order factor were as follows: Observing: .61; Describing: .57; Awareness: .31; Nonjudging: .43; Nonreactivity: .93; and Nonattachment: .91. These results suggest that nonattachment, along with the five facets of mindfulness, seems to be an element of an overarching factor but nevertheless distinct from the five facets of mindfulness.

*Measurement invariance.* We next tested whether the structure of the mindfulness and nonattachment measures varied with age and gender. Multiple-group SEM tests of invariance were employed to examine the generalizability of the results (across gender and age groups) based on analyses of separate covariance matrices for males and females (for gender invariance tests) and for 10 quantiles of the sample based on age (for age invariance tests). Measurement invariance across groups refers to the degree to which a scale measures the same construct across all the groups. In a configural invariance model (CFA<sub>1</sub> in Tables 4 and 5), the underlying measurement structure is the same but all parameters are free to vary across the groups. Subsequent models add constraints and are compared at each step to see if adding each constraint changes the fit substantially. Weak factorial invariance models (CFA<sub>2</sub> in Tables 4 and 5) hold the factor loadings constant across the groups. Strong factor invariance models (CFA<sub>3</sub> in Tables 4 and 5) constrain both factor loadings and intercepts to be equal across groups. Strict factorial invariance models (CFA<sub>4</sub> in Tables 4 and 5) hold the loadings, intercepts and residuals (unique variances of observed variables) equal across groups. Table 4 shows that the factor structure of the 20-item FFMQ was invariant across gender groups and also across all age groups. Table 5 shows the same to be true of NAS-7. Therefore, gender or age differences in the factor means were interpretable.

*Gender and age differences in factor means.* Based on the CFA<sub>4</sub> of gender invariance test above, females had a factor mean 0.26 standard deviations (*SD*) above the factor mean of males ( $p < .001$ ) for the observing facet of mindfulness. (Males formed the reference category with zero means for all factors.) For the nonjudging factor, the factor mean for females was 0.14 *SD* above the factor mean for males ( $p < .05$ ), but for the nonreactivity factor, females had a factor mean of 0.15 *SD* below the factor mean for males ( $p < .001$ ). For the remaining mindfulness factors of describing (females factor mean = 0.04) and acting with awareness (females factor mean = 0.00), males and females had comparable factor means. Similarly, for nonattachment (females factor mean = 0.02), there was no difference in the factor means of

males and females. The results for factor means of the 10 age groups are reported in Table 6. For all mindfulness factors, except the describing factor, the magnitude of the factor mean estimates increased in successive age groups, suggesting that older participants tended to report higher mindfulness than younger participants. For acting with awareness, nonjudging and nonreactivity, the oldest participants had factor means around 0.35 *SD* greater than the youngest participants ( $p < .001$ ). The age difference for nonattachment was even more dramatic. The oldest age group had the factor mean of 0.70 *SD* above the youngest group ( $p < .001$ ).

*Predicting outcomes.* The results so far show that the five mindfulness factors and the nonattachment factor are distinct in terms of factor structure, but it does not follow that they will be distinct in what they predict. For example, it is possible that the variance that is unique in the nonattachment scale may be of little relevance in predicting life outcomes. To examine the unique relations of the five facets of mindfulness and nonattachment with outcome variables of satisfaction with life and life effectiveness variables, we ran a series of multiple regression models. Since we observed meaningful gender and age differences for mindfulness and nonattachment in previous analyses, we controlled for age and gender in all regression models. Table 7 reports regression coefficients and standard errors from these models. In all cases, the magnitude of the nonattachment coefficients tended to be higher than the magnitude of the mindfulness coefficients. These results show that nonattachment uniquely and substantially predicted each of the outcome variables, providing further evidence of the discriminant validity of nonattachment with respect to the five facets of mindfulness. The pattern of results for the various life effectiveness aspects were similar, so to simplify further analysis, we used a single score of life effectiveness averaging across all items, which showed high internal consistency ( $\alpha = .91$ ).

*Hierarchical regression.* To examine the incremental predictive validity of nonattachment, we conducted hierarchical regression models, in which the five mindfulness

variables were added in the first step, and nonattachment was added in the second step (controlling for age and gender in each case). For satisfaction with life, the  $R^2$  for the first step was .24 and for the second step was .31, thus a change in  $R^2$  of .07. For life effectiveness, the  $R^2$  for the first step was .50 and for the second step was .60, a change in  $R^2$  of .10. Next, we conducted hierarchical regressions in the reverse order, such that nonattachment was added at the first step, and the five mindfulness variables were added at the second step (control for age and gender in each case). For satisfaction with life, the  $R^2$  for the first step was .28 and for the second step was .31, a change in  $R^2$  of .03. For life effectiveness, the  $R^2$  for the first step was .49 and for the second step was .59, a change in  $R^2$  of .10. Taken together, the results of all the regression models so far provide evidence for both the discriminant and incremental validity of nonattachment with respect to the five facets of mindfulness.

*Mediation models.* Based on the theory that nonattachment is a likely mechanism of the positive effects of mindfulness on people's lives, we ran mediation models in which nonattachment mediated the link between each of the mindfulness variables and the two outcome variables of satisfaction with life and life effectiveness. As in previous regression analyses, we also controlled for age and gender.

Figure 1 reports the regression coefficients for the paths in the mediation model with satisfaction with life as an outcome variable. Each of the paths from the mindfulness variables to nonattachment is substantial, and the path from nonattachment to satisfaction with life is also substantial and greater in magnitude than each of the direct paths from the mindfulness variables to the outcome. The coefficients in the parenthesis are from a separate regression model excluding the mediator, which show that only the describing, nonjudging and nonreactivity facets of mindfulness had substantial unique associations with the outcome variable that could be potentially mediated by nonattachment. Nonattachment mediated 68% of the total effect of describing, 32% of the total effect of nonjudging, and 50% of the total effect of nonreactivity.



Figure 2 depicts the results of a mediation model with life effectiveness as the outcome variable. As shown in the coefficients in the parentheses, three mindfulness variables, observing, describing and nonreactivity had substantial unique associations with life effectiveness that could be potentially mediated by nonattachment. For life effectiveness, 35% of the total effect of observing, 30% of describing, and 55% of nonreactivity were mediated by nonattachment. These mediation models lend preliminary support to the theory that nonattachment is a likely mechanism by which mindfulness leads to positive outcomes.

### **Discussion**

Using a large nationally representative sample of Americans, we examined the factor structure of the 20-item Five Facet Mindfulness Questionnaire (Baer et al., 2006; Tran et al., 2013), and the 7-item Nonattachment Scale (Elphinstone et al., 2015; Sahdra et al., 2015). A five-correlated-factors model of the 20-item FFMQ and a single-factor model of NAS-7 showed excellent fit. We then ran models testing the discriminant validity of NAS-7 with respect to the five facets of FFMQ. If nonattachment were redundant with any of the mindfulness factors, a five-factor model in which nonattachment items are included in a mindfulness factor should fit just as well as a six-factor model in which nonattachment items load on their own factor separate from the five facets of mindfulness. None of the five-factor models with nonattachment items combined with mindfulness items fit well, and as expected, these models had very poor fit compared to the six-factor model. Further, the fit of a higher-order model in which the five facets of mindfulness and a sixth factor of nonattachment were loaded on an overarching factor was the same as the fit of the six-correlated factor model. Taken together, these structural equation models provide initial evidence of the factorial validity of nonattachment with respect to mindfulness. They suggest that nonattachment belongs to the same family of constructs as the five mindfulness facets, but it is empirically distinct from the mindfulness factors.

The factor structures for both the measures of mindfulness and nonattachment were

invariant across gender and age, which allowed comparison of factor means across groups. Compared to males, females showed higher factor means for the observing, describing and nonjudging aspects of mindfulness but a lower score for nonreactivity. Males and females showed comparable factor means for the acting with awareness factor of mindfulness and nonattachment. Regarding age, all factors tended to show higher mean levels in successively older age groups. The result of increasing scores of nonattachment in older participants is consistent with previous research on nonattachment using a community sample of Americans (Sahdra et al., 2010). As people age, they experience increasing number of ups and downs in life (e.g., marriage, parenting, change of jobs, loss of loved ones, physical illness), all of which are opportunities to practice mindfulness and nonattachment.

Our results showed that nonattachment and mindfulness were related but distinct constructs. However, it is possible for two variables to load on distinct factors without uniquely predicting relevant outcomes. Nonattachment may be both useful and original, but the part that is useful may not be original (e.g., may overlap with mindfulness), and the part that is original may not be useful (e.g., not predict important outcomes). More specifically, if nonattachment does not predict life outcomes independently of the five mindfulness variables, it may not have practical utility even if the measurement models show that the nonattachment factor is distinct from each of the five mindfulness factors. A series of analyses showed that nonattachment and mindfulness variables uniquely predicted life satisfaction and various facets of life effectiveness, providing evidence of the discriminant validity of NAS-7 measured nonattachment.

Perhaps surprisingly, nonattachment, compared to the five variables of mindfulness, proved to be a stronger predictor of the time management, achievement motivation, and self-confidence aspects of life effectiveness. These results undercut a common misconception that nonattachment implies having little desire to strive for goals. The mindfulness variables were also important in predicting the outcomes independently of nonattachment. But it is not

entirely clear why the mindfulness facet of acting with awareness did not fare well in uniquely predicting life satisfaction and life effectiveness variables, even though acting with awareness shows positive (zero-order) correlations with the outcome variables. Having a large number of correlated predictors in a model makes the model highly conservative in testing the total effect of a predictor.

Although the main goal of our study was to establish the discriminant and incremental validity of the scores of the nonattachment measure, we conducted preliminary mediation models to test the theory that nonattachment is a potential mechanism via which mindfulness enhances positive effects in life. The results were consistent with this theory: nonattachment mediating substantial proportion of the total effects of the mindfulness variables on satisfaction with life and life effectiveness. We hasten to add that the cross-sectional nature of our data cannot provide conclusive evidence for a causal model.

Another theoretical possibility is that the different facets of mindfulness might show synergistic interactions (Eisenlohr-Moul, Walsh, Charnigo, Lynam, & Baer, 2012), leading to increases in nonattachment over time. Future studies with longitudinal and experimental data are needed to better establish causal links and possible moderation effects. Another potential limitation of this study is that we used abbreviated forms of the FFMQ and the NAS, which are the subject of fewer studies than the original long-forms. Further research is needed for cultural validity tests that balance modern psychometric concerns with knowledge of mindfulness and nonattachment in the Buddhist traditions and modern Western mindfulness-based interventions (Baer, 2014). At this stage, the conclusions of this study cannot be generalized to non-Western cultures or clinical samples.

Despite these limitations, NAS-7 measured nonattachment has a potentially important role to play in the mindfulness literature. Nonattachment is related to various aspects of mindfulness but clearly different from them. It may be one of the outcomes of long-term mindfulness practice, and a mechanism via which mindfulness promotes effective pursuit of

valued goals and satisfaction with life. However, nonattachment and mindfulness may have other different determinants, so different interventions may be needed to target them. Interventions harnessing the power of both constructs may be more effective in enhancing positive life outcomes than interventions targeting either one of them alone.

### References

- Allen, J. G. (2012). *Restoring mentalizing in attachment relationships: Treating trauma with plain old therapy*: American Psychiatric Pub.
- Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: science and practice*, *10*(2), 125-143. doi: 10.1093/clipsy.bpg015
- Baer, R. A. (2011). Measuring mindfulness. *Contemporary Buddhism*, *12*(01), 241-261. doi: 10.1080/14639947.2011.564842
- Baer, R. A. (2014). Assessing Mindfulness in Multiple Contexts: a Comment on Christopher, Woodrich, and Tiernan (2014). *Mindfulness*, *6*(3), 687-692. doi: 10.1007/s12671-014-0326-y
- Baer, R. A., Smith, G. T., & Allen, K. B. (2004). Assessment of mindfulness by self-report the Kentucky inventory of mindfulness skills. *Assessment*, *11*(3), 191-206. doi: 10.1177/1073191104268029
- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment*, *13*(1), 27-45. doi: 10.1177/1073191105283504
- Bhikkhu, Ñ., & Bhikkhu, B. (1995). *The middle length discourses of the Buddha: A new translation of the Majjhima Nikāya*: Boston, MA: Wisdom Publications.
- Bodhi, B. (2011). What does mindfulness really mean? A canonical perspective. *Contemporary Buddhism*, *12*(01), 19-39. doi: 10.1080/14639947.2011.564813
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of personality and social psychology*, *84*(4), 822. doi: 10.1037/0022-3514.84.4.822
- Buchheld, N., Grossman, P., & Walach, H. (2001). Measuring mindfulness in insight meditation (Vipassana) and meditation-based psychotherapy: The development of the Freiburg

- Mindfulness Inventory (FMI). *Journal for Meditation and Meditation Research*, 1(1), 11-34.
- Cardaciotto, L., Herbert, J. D., Forman, E. M., Moitra, E., & Farrow, V. (2008). The assessment of present-moment awareness and acceptance the Philadelphia mindfulness scale. *Assessment*, 15(2), 204-223.
- Chadwick, P., Hember, M., Symes, J., Peters, E., Kuipers, E., & Dagnan, D. (2008). Responding mindfully to unpleasant thoughts and images: reliability and validity of the Southampton mindfulness questionnaire (SMQ). *British Journal of Clinical Psychology*, 47(4), 451-455. doi: 10.1348/014466508X314891
- Chang, J.-H., Hodgins, H. S., Lin, Y.-C., & Huang, C.-L. (2014). On the flexibility of the automatic us-them divide. *Human Motivation and Interpersonal Relationships* (pp. 97-119): Springer.
- Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural equation modeling*, 14(3), 464-504. doi: 10.1080/10705510701301834
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural equation modeling*, 9(2), 233-255. doi: 10.1207/S15328007SEM0902\_5
- Chiesa, A., & Serretti, A. (2009). Mindfulness-based stress reduction for stress management in healthy people: a review and meta-analysis. *The journal of alternative and complementary medicine*, 15(5), 593-600. doi: 10.1089/acm.2008.0495
- Codato, M., Testoni, I., Guglielmin, M. S., & Armenti, A. Overcoming female subordination. An educational experiment changes the levels of non-attachment and objectification in a group of female undergraduates. *Interdisciplinary Journal of Family Studies*, 17, 235-249.

- Cosme, D., & Wiens, S. (2015). Self-Reported Trait Mindfulness and Affective Reactivity: A Motivational Approach Using Multiple Psychophysiological Measures. *PloS one*, *10*(3), e0119466. doi: 10.1371/journal.pone.0119466
- Davis, J. H. (2014). Facing Up to the Question of Ethics in Mindfulness-Based Interventions. *Mindfulness*, 1-3. doi: 10.1007/s12671-014-0374-3
- Dempster, A. P., Laird, N. M., & Rubin, D. B. (1977). Maximum likelihood from incomplete data via the EM algorithm. *Journal of the Royal Statistical Society. Series B (Methodological)*, 1-38.
- Desbordes, G., Gard, T., Hoge, E. A., Hölzel, B. K., Kerr, C., Lazar, S. W., . . . Vago, D. R. (2014). Moving beyond mindfulness: defining equanimity as an outcome measure in meditation and contemplative research. *Mindfulness*, 1-17. doi: 10.1007/s12671-013-0269-8
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of personality assessment*, *49*(1), 71-75. doi: 10.1207/s15327752jpa4901\_13
- Dreyfus, G. (2011). Is mindfulness present-centred and non-judgmental? A discussion of the cognitive dimensions of mindfulness. *Contemporary Buddhism*, *12*(01), 41-54. doi: 10.1080/14639947.2011.564815
- Eisenlohr-Moul, T. A., Walsh, E. C., Charnigo, R. J., Lynam, D. R., & Baer, R. A. (2012). The “what” and the “how” of dispositional mindfulness: Using interactions among subscales of the Five-Facet Mindfulness Questionnaire to understand its relation to substance use. *Assessment*, *19*(3), 276-286. doi: 10.1177/1073191112446658
- Elphinstone, B., Sahdra, B. K., & Ciarrochi, J. (2015). Living well by letting go: Reliability and validity of a brief measure of nonattachment. *Unpublished Manuscript*.
- Enders, C. K. (2010). *Applied missing data analysis*. New York: Guilford Press.

- Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J. (2004). Development, factor structure, and initial validation of the Cognitive and Affective Mindfulness Scale. *Unpublished Manuscript*.
- Gethin, R. (2011). On some definitions of mindfulness. *Contemporary Buddhism, 12*(01), 263-279. doi: 10.1080/14639947.2011.564843
- Graham, J. W., Taylor, B. J., Olchowski, A. E., & Cumsille, P. E. (2006). Planned missing data designs in psychological research. *Psychological methods, 11*(4), 323. doi: 10.1037/1082-989X.11.4.323
- Greenberg, M. T., & Mitra, J. L. (2015). From Mindfulness to Right Mindfulness: the Intersection of Awareness and Ethics. *Mindfulness, 6*(1), 74-78. doi: 10.1007/s12671-014-0384-1
- Grossman, P. (2011). Defining mindfulness by how poorly I think I pay attention during everyday awareness and other intractable problems for psychology's (re) invention of mindfulness: comment on Brown et al.(2011). *Psychological assessment, 23*(4), 1034-1040. doi: 10.1037/a0022713
- Grossman, P. (2014). Mindfulness: Awareness Informed by an Embodied Ethic. *Mindfulness, 1*-6. doi: 10.1007/s12671-014-0372-5
- Grossman, P., & Van Dam, N. T. (2011). Mindfulness, by any other name...: trials and tribulations of sati in western psychology and science. *Contemporary Buddhism, 12*(01), 219-239. doi: 10.1080/14639947.2011.564841
- Hayes, A. M., & Feldman, G. (2004). Clarifying the construct of mindfulness in the context of emotion regulation and the process of change in therapy. *Clinical Psychology: science and practice, 11*(3), 255-262. doi: 10.1093/clipsy.bph080
- Hofmann, S. G., Sawyer, A. T., Witt, A. A., & Oh, D. (2010). The effect of mindfulness-based therapy on anxiety and depression: A meta-analytic review. *Journal of consulting and clinical psychology, 78*(2), 169. doi: 10.1037/a0018555



- Honaker, J., King, G., & Blackwell, M. (2011). Amelia II: A program for missing data. *Journal of Statistical Software*, 45(7), 1-47.
- Ju, S. J., & Lee, W. K. (2015). Mindfulness, non-attachment, and emotional well-being in Korean adults. *Advanced Science and Technology Letters*, 87, 68-72. doi: 10.14257/astl.2015.87.15
- Kabat-Zinn, J., & Hanh, T. N. (2009). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*: Delta.
- Keng, S.-L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical psychology review*, 31(6), 1041-1056. doi: 10.1016/j.cpr.2011.04.006
- King, G., Honaker, J., Joseph, A., & Scheve, K. (2001). *Analyzing incomplete political science data: An alternative algorithm for multiple imputation*. Paper presented at the American Political Science Association.
- Lamis, D. A., & Dvorak, R. D. (2014). Mindfulness, nonattachment, and suicide rumination in college students: The mediating role of depressive symptoms. *Mindfulness*, 5(5), 487-496. doi: 10.1007/s12671-013-0203-0
- Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., . . . Devins, G. (2006). The Toronto mindfulness scale: Development and validation. *Journal of Clinical Psychology*, 62(12), 1445-1467. doi: 10.1002/jclp.20326
- Lindahl, J. R. (2014). Why Right Mindfulness Might Not Be Right for Mindfulness. *Mindfulness*, 1-6. doi: 10.1007/s12671-014-0380-5
- Little, R. J., & Rubin, D. B. (1987). *Statistical analysis with missing data*. New York: Wiley.
- Lumley, T. (2014). mitools: Tools for multiple imputation of missing data. (Version 2.3). Retrieved from <http://CRAN.R-project.org/package=mitools>
- Marshall, S. L., Parker, P. D., Ciarrochi, J., Sahdra, B., Jackson, C. J., & Heaven, P. C. (2015). Self-compassion protects against the negative effects of low self-esteem: A longitudinal

study in a large adolescent sample. *Personality and Individual Differences*, 74, 116-121.

doi: 10.1016/j.paid.2014.09.013

Martin, J. R. (1997). Mindfulness: A proposed common factor. *Journal of Psychotherapy integration*, 7(4), 291-312. doi: 10.1023/B:JOP1.0000010885.18025.bc

Monteiro, L. M., Musten, R., & Compson, J. (2015). Traditional and contemporary mindfulness: finding the middle path in the tangle of concerns. *Mindfulness*, 6(1), 1-13. doi: 10.1007/s12671-014-0301-7

Neill, J. T., Marsh, H. W., & Richards, G. E. (2003). The Life Effectiveness Questionnaire: Development and Psychometrics. from <http://www.wilderdom.com/abstracts/NeillMarchRichards2003LEQDevelopmentPsychometrics.htm>

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, 88(5), 879. doi: 10.1037/0021-9010.88.5.879

Pornprasertmanit, S., Miller, P., Schoemann, A., & Rosseel, Y. (2013). semTools: Useful tools for structural equation modeling (Version 0.4-0). Retrieved from <http://CRAN.R-project.org/package=semTools>

Purdie, N., Neill, J. T., & Richards, G. E. (2002). Australian identity and the effect of an outdoor education program. *Australian Journal of Psychology*, 54(1), 32-39. doi: 10.1080/00049530210001706493

Purser, R. E. (2014). Clearing the Muddled Path of Traditional and Contemporary Mindfulness: a Response to Monteiro, Musten, and Compson. *Mindfulness*, 1-23. doi: 10.1007/s12671-014-0373-4

R\_Core\_Team. (2015). R: A language and environment for statistical computing (Version 3.2.0). Vienna, Austria: R Foundation for Statistical Computing. Retrieved from <http://www.R-project.org/>

- Revelle, W. (2015). psych: Procedures for Personality and Psychological Research (Version 1.5.4). Retrieved from <http://CRAN.R-project.org/package=psych>
- Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, 48(2), 1-36.
- Sahdra, B. K., Ciarrochi, J., Parker, P. D., Marshall, S., & Heaven, P. (2015). Empathy and nonattachment independently predict peer nominations of prosocial behavior of adolescents. *Front Psychol*, 6, 263. doi: 10.3389/fpsyg.2015.00263
- Sahdra, B. K., & Shaver, P. R. (2013). Comparing Attachment Theory and Buddhist Psychology. *International Journal for the Psychology of Religion*, 23(4), 282-293. doi: 10.1080/10508619.2013.795821
- Sahdra, B. K., Shaver, P. R., & Brown, K. W. (2010). A scale to measure nonattachment: A Buddhist complement to Western research on attachment and adaptive functioning. *Journal of personality assessment*, 92(2), 116-127. doi: 10.1080/00223890903425960
- Sauer, S., Walach, H., Schmidt, S., Hinterberger, T., Lynch, S., Büssing, A., & Kohls, N. (2013). Assessment of mindfulness: Review on state of the art. *Mindfulness*, 4(1), 3-17. doi: 10.1007/s12671-012-0122-5
- Schafer, J. (1997). *Analysis of incomplete multivariate data*. New York: Chapman Hall.
- Shonin, E., Gordon, W., & Griffiths, M. D. (2013). Buddhist philosophy for the treatment of problem gambling. *Journal of Behavioral Addictions*, 2(2), 63-71. doi: 10.1556/JBA.2.2013.001
- Shonin, E., & Van Gordon, W. (2014). Managers' experiences of meditation awareness training. *Mindfulness*, 1-11. doi: 10.1007/s12671-014-0334-y
- Shonin, E., Van Gordon, W., Slade, K., & Griffiths, M. D. (2013). Mindfulness and other Buddhist-derived interventions in correctional settings: a systematic review. *Aggression and Violent Behavior*, 18(3), 365-372.

- Tang, Y.-Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience*, *16*(4), 213-225. doi: 10.1038/nrn3916
- Thera, N. (1994). *The Foundations of Mindfulness: Satipatthana Sutta*. Retrieved September 10, 2015, from <http://www.accesstoinsight.org/lib/authors/nyanasatta/wheel019.html> - further
- Tran, U. S., Cebolla, A., Gluck, T. M., Soler, J., Garcia-Campayo, J., & von Moy, T. (2014). The serenity of the meditating mind: a cross-cultural psychometric study on a two-factor higher order structure of mindfulness, its effects, and mechanisms related to mental health among experienced meditators. *PloS one*, *9*(10), e110192. doi: 10.1371/journal.pone.0110192
- Tran, U. S., Gluck, T. M., & Nader, I. W. (2013). Investigating the Five Facet Mindfulness Questionnaire (FFMQ): construction of a short form and evidence of a two-factor higher order structure of mindfulness. *J Clin Psychol*, *69*(9), 951-965. doi: 10.1002/jclp.21996
- Vago, D. R., & Silbersweig, D. A. (2012). Self-awareness, self-regulation, and self-transcendence (S-ART): a framework for understanding the neurobiological mechanisms of mindfulness. *Frontiers in human neuroscience*, *6*. doi: 10.3389/fnhum.2012.00296
- van der Velden, A. M., Kuyken, W., Wattar, U., Crane, C., Pallesen, K. J., Dahlgard, J., . . . Piet, J. (2015). A systematic review of mechanisms of change in mindfulness-based cognitive therapy in the treatment of recurrent major depressive disorder. *Clinical psychology review*, *37*, 26-39. doi: 10.1016/j.cpr.2015.02.001
- Van Gordon, W., Shonin, E., Griffiths, M. D., & Singh, N. N. (2014). There is Only One Mindfulness: Why Science and Buddhism Need to Work Together. *Mindfulness*, 1-8. doi: 10.1007/s12671-014-0379-y

Williams, J. M. G., & Kabat-Zinn, J. (2011). Mindfulness: diverse perspectives on its meaning, origins, and multiple applications at the intersection of science and dharma. *Contemporary Buddhism*, 12(01), 1-18. doi: 10.1080/14639947.2011.564811

Table 1

*Means and Standard Deviations of the Five Facets of Mindfulness and Nonattachment in the Five Census Regions of United States*

	Observing		Describing		Awareness		Nonjudging		Nonreactivity		Nonattachment	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Midwest ( <i>n</i> =1700)	3.73	0.63	3.36	0.61	3.49	0.72	3.40	0.75	3.37	0.58	4.60	0.75
Northeast ( <i>n</i> =1304)	3.67	0.66	3.36	0.63	3.48	0.76	3.42	0.80	3.33	0.62	4.57	0.80
Pacific ( <i>n</i> =28)	3.63	0.56	3.29	0.49	3.32	0.66	3.41	0.72	3.44	0.60	4.64	0.74
South ( <i>n</i> =2102)	3.78	0.65	3.41	0.63	3.50	0.77	3.40	0.80	3.43	0.59	4.70	0.76
West ( <i>n</i> =1295)	3.78	0.64	3.40	0.60	3.49	0.75	3.45	0.78	3.41	0.61	4.67	0.76

Table 2

*Inter-Correlations Between Age, Five Mindfulness Variables, Nonattachment, Satisfaction with Life and Life Effectiveness Variables*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	0.07														
3	0.11	0.30													
4	0.26	0.03 <i>ns</i>	0.40												
5	0.28	-0.01	0.37	0.59											
6	0.13	0.40	0.34	0.15	0.14										
7	0.30	0.42	0.39	0.31	0.32	0.64									
8	0.12	0.18	0.27	0.15	0.19	0.45	0.52								
9	0.00 <i>ns</i>	0.26	0.28	0.28	0.09	0.38	0.41	0.42							
10	0.13	0.37	0.54	0.23	0.19	0.49	0.55	0.48	0.42						
11	0.20	0.46	0.32	0.29	0.19	0.39	0.58	0.26	0.42	0.49					
12	0.11	0.48	0.34	0.12	0.09	0.53	0.58	0.37	0.38	0.52	0.55				
13	0.06	0.33	0.42	0.23	0.09	0.48	0.49	0.38	0.46	0.66	0.49	0.50			
14	0.16	0.31	0.35	0.27	0.28	0.62	0.60	0.43	0.41	0.52	0.42	0.49	0.54		
15	0.10	0.41	0.34	0.15	0.05	0.42	0.47	0.39	0.48	0.56	0.57	0.55	0.59	0.47	
16	0.11	0.37	0.42	0.30	0.23	0.50	0.62	0.51	0.52	0.61	0.65	0.56	0.63	0.59	0.65

*Note.* 1 = Age; 2 = Observing; 3 = Describing; 4 = Acting with Awareness; 5 = Nonjudging; 6 = Nonreactivity; 7 = Nonattachment; 8 = Satisfaction with Life; 9 = Time Management; 10 = Social Competence; 11 = Achievement Motivation; 12 = Intellectual Flexibility; 13 = Task Leadership; 14 = Emotional Control; 15 = Active Initiative; 16 = Self Confidence. All correlations were significant ( $p < .01$ ) unless noted as *ns*.

Table 3

*Goodness-of-fit Indices of Confirmatory Factor Analyses of the 20-item Five Facet Mindfulness Questionnaire (FFMQ) and the 7-item*

*Nonattachment Scale (NAS-7)*

Model	$\chi^2$	<i>df</i>	BIC	RMSEA	CFI	TLI	$\Delta$ RMSEA	$\Delta$ CFI	$\Delta$ TLI	
CFA <sub>1</sub> Conventional CFA of FFMQ	371.33	160	470688	.013	.92	.90				
CFA <sub>2</sub> CFA of FFMQ with a negative method factor	19.57	151	434288	.006	.98	.98	.007	.06	.08	CFA <sub>1</sub> vs. CFA <sub>2</sub>
CFA <sub>3</sub> One-factor CFA of NAS-7	15.75	14	177529	.004	.99	.99				
CFA <sub>4</sub> 6-factor CFA of FFMQ + NAS-7	354.11	300	611862	.005	.98	.98				
CFA <sub>5</sub> 5-factor CFA; NAS-7 & Nonreactivity combined	1363.17	547	803474	.014	.81	.80	.009	.17	.18	CFA <sub>4</sub> vs. CFA <sub>5</sub>
CFA <sub>6</sub> 5-factor CFA; NAS-7 & Observing combined	1591.27	547	814161	.016	.76	.74	.011	.22	.24	CFA <sub>4</sub> vs. CFA <sub>6</sub>
CFA <sub>7</sub> 5-factor CFA; NAS-7 & Describing combined	1407.39	547	821898	.014	.81	.79	.009	.17	.19	CFA <sub>4</sub> vs. CFA <sub>7</sub>
CFA <sub>8</sub> 5-factor CFA; NAS-7 & Nonjudging combined	1554.83	547	820754	.015	.77	.75	.010	.21	.23	CFA <sub>4</sub> vs. CFA <sub>8</sub>
CFA <sub>9</sub> 5-factor CFA; NAS-7 & Awareness combined	1735.50	547	822388	.017	.73	.70	.012	.25	.28	CFA <sub>4</sub> vs. CFA <sub>9</sub>
CFA <sub>10</sub> Higher-order CFA of FFMQ + NAS-7	402.83	309	587133	.006	.97	.97	.002	.01	.01	CFA <sub>4</sub> vs. CFA <sub>10</sub>

*Note.* BIC = Bayesian information criterion; RMSEA = root mean square of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index.



Table 4

*Goodness-of-fit Indices of the Factorial Invariance Models of the 20-item Five Facet Mindfulness Questionnaire (FFMQ)*

Model	$\chi^2$	<i>df</i>	BIC	RMSEA	CFI	TLI	$\Delta$ RMSEA	$\Delta$ CFI	$\Delta$ TLI	
<i>Gender Invariance Tests for 20-item FFMQ</i>										
CFA <sub>1</sub> Configural invariance	353.12	302	433834	.007	.99	.99				
CFA <sub>2</sub> Weak factorial invariance ( $\lambda =$ )	383.05	326	433619	.007	.99	.99	.000	.00	.00	CFA <sub>1</sub> vs. CFA <sub>2</sub>
CFA <sub>3</sub> Strong factorial invariance ( $\lambda + \tau =$ )	423.95	340	433493	.008	.98	.98	.001	.01	.01	CFA <sub>2</sub> vs. CFA <sub>3</sub>
CFA <sub>4</sub> Strict factorial invariance ( $\lambda + \tau + \Theta =$ )	445.44	360	433314	.008	.98	.98	.000	.00	.00	CFA <sub>3</sub> vs. CFA <sub>4</sub>
<i>Age Invariance Tests for 20-item FFMQ</i>										
CFA <sub>1</sub> Configural invariance	1821.10	1510	438915	.016	.98	.98				
CFA <sub>2</sub> Weak factorial invariance ( $\lambda =$ )	138.99	1726	436977	.000	.99	.99	.016	.01	.01	CFA <sub>1</sub> vs. CFA <sub>2</sub>
CFA <sub>3</sub> Strong factorial invariance ( $\lambda + \tau =$ )	1535.30	1852	435847	.000	.99	.99	.001	.00	.00	CFA <sub>2</sub> vs. CFA <sub>3</sub>
CFA <sub>4</sub> Strict factorial invariance ( $\lambda + \tau + \Theta =$ )	1629.28	2032	434232	.000	.99	.99	.000	.00	.00	CFA <sub>3</sub> vs. CFA <sub>4</sub>

*Note.*  $\lambda$  = factor loadings;  $\tau$  = observed variables intercepts;  $\Theta$  = unique variances (of observed variables); = equality constraint in a given parameter across groups; BIC = Bayesian information criterion; RMSEA = root mean square of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index.

Table 5

*Goodness-of-fit Indices of the Factorial Invariance Models of the 7-item Nonattachment Scale (NAS-7)*

Model	$\chi^2$	<i>df</i>	BIC	RMSEA	CFI	TLI	$\Delta$ RMSEA	$\Delta$ CFI	$\Delta$ TLI	
<i>Gender Invariance Tests for NAS-7</i>										
CFA <sub>1</sub> Configural invariance	28.81	28	177686	.003	.99	.99				
CFA <sub>2</sub> Weak factorial invariance ( $\lambda =$ )	34.61	34	177633	.002	.99	.99	.001	.00	.00	CFA <sub>1</sub> vs. CFA <sub>2</sub>
CFA <sub>3</sub> Strong factorial invariance ( $\lambda + \tau =$ )	46.84	40	177579	.007	.99	.99	.005	.00	.00	CFA <sub>2</sub> vs. CFA <sub>3</sub>
CFA <sub>4</sub> Strict factorial invariance ( $\lambda + \tau + \Theta =$ )	55.33	47	177516	.007	.99	.99	.000	.00	.00	CFA <sub>3</sub> vs. CFA <sub>4</sub>
<i>Age Invariance Tests for NAS-7</i>										
CFA <sub>1</sub> Configural invariance	96.24	140	177717	.000	.99	.99				
CFA <sub>2</sub> Weak factorial invariance ( $\lambda =$ )	122.35	194	177232	.000	.99	.99	.000	.00	.00	CFA <sub>1</sub> vs. CFA <sub>2</sub>
CFA <sub>3</sub> Strong factorial invariance ( $\lambda + \tau =$ )	17.97	248	176748	.000	.99	.99	.000	.00	.00	CFA <sub>2</sub> vs. CFA <sub>3</sub>
CFA <sub>4</sub> Strict factorial invariance ( $\lambda + \tau + \Theta =$ )	203.90	311	176183	.000	.99	.99	.000	.00	.00	CFA <sub>3</sub> vs. CFA <sub>4</sub>

*Note.*  $\lambda$  = factor loadings;  $\tau$  = observed variables intercepts;  $\Theta$  = unique variances (of observed variables); = equality constraint in a given parameter across groups; BIC = Bayesian information criterion; RMSEA = root mean square of approximation; CFI = comparative fit index; TLI = Tucker-Lewis index.

Table 6

*Factor Means from CFA<sub>4</sub> of the Age Invariance Tests*

Age Groups	[18,26]	(26,33]	(33,38]	(38,43]	(43,49]	(49,54]	(54,59]	(59,65]	(65,73]	(73,99]
<i>N</i>	798	948	686	793	822	873	636	774	820	734
<i>Factor Means from CFA<sub>3</sub> of FFMQ</i>										
Observing	.00	.02	-.03	-.03	.02	.09	.09	.12**	.17***	.14***
Describing	.00	.02	.01	-.01	-.03	-.02	-.04	-.01	.01	-.03
Acting with Awareness	.00	-.02	.03	.12*	.19**	.22***	.23***	.23**	.33***	.34***
Nonjudging	.00	-.01	.02	.08	.12	.18**	.21**	.23**	.36***	.38***
Nonreactivity	.00	.13***	.10*	.09*	.08	.16***	.18***	.24***	.33***	.34***
<i>Factor Means from CFA<sub>3</sub> of NAS-7</i>										
Nonattachment	.00	.07	.13**	.19***	.21***	.35***	.43***	.51***	.67***	.70***

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

Table 7

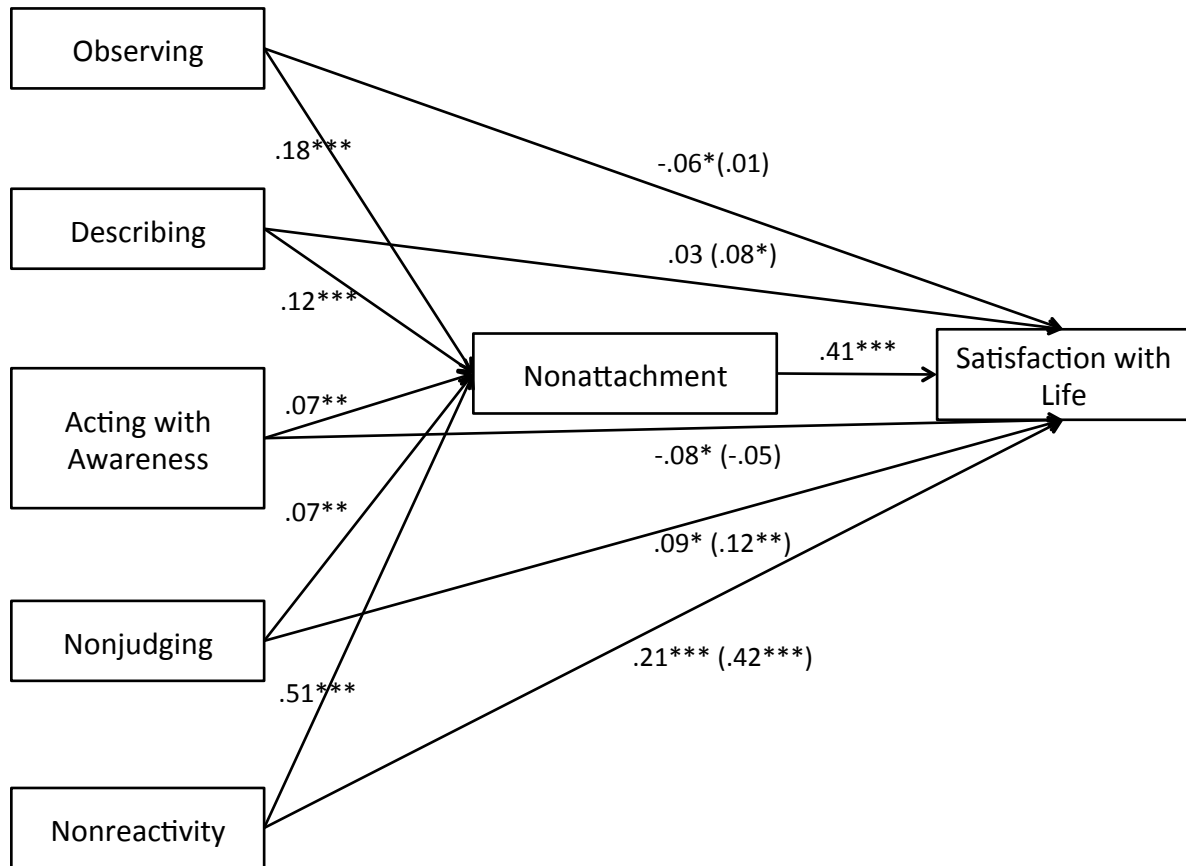
*Estimated Effects (and Standard Errors) from Multiple Regression Models Showing Unique Relations of the Five Mindfulness Variables and Nonattachment with Satisfaction with Life and Life Effectiveness (LE)*

	SWL	LE 1	LE 2	LE 3	LE 4	LE 5	LE 6	LE 7	LE 8
Observing	-.06 (.03)	.03 (.04)	.08** (.03)	.23*** (.04)	.22*** (.04)	.07** (.03)	.07* (.04)	.20*** (.03)	.10*** (.03)
Describing	.03 (.02)	.15*** (.04)	.36*** (.03)	.07** (.03)	.11*** (.03)	.27*** (.04)	.10*** (.03)	.12*** (.04)	.15*** (.02)
Acting with Awareness	-.08* (.04)	.05 (.04)	-.04 (.03)	.10*** (.02)	-.01 (.04)	-.04 (.04)	-.01 (.04)	.02 (.03)	.00 (.03)
Nonjudging	.09* (.04)	-.10*** (.04)	-.05 (.03)	-.07** (.03)	-.09** (.04)	-.09*** (.03)	.10** (.04)	-.10** (.04)	-.04 (.03)
Nonreactivity	.21*** (.03)	.19*** (.04)	.13*** (.04)	-.05 (.04)	.16*** (.05)	.15*** (.04)	.31*** (.04)	.10** (.04)	.11** (.04)
Nonattachment	.41*** (.04)	.26*** (.04)	.31*** (.04)	.47*** (.04)	.36*** (.04)	.30*** (.05)	.32*** (.05)	.30*** (.04)	.47*** (.04)

*Note.* SWL = Satisfaction with Life; LE 1 = Time Management; LE 2 = Social Competence; LE 3 = Achievement Motivation; LE 4 = Intellectual Flexibility; LE 5 = Task Leadership; LE 6 = Emotional Control; LE 7 = Active Initiative; LE 8 = Self Confidence; age and gender covaried in all models.

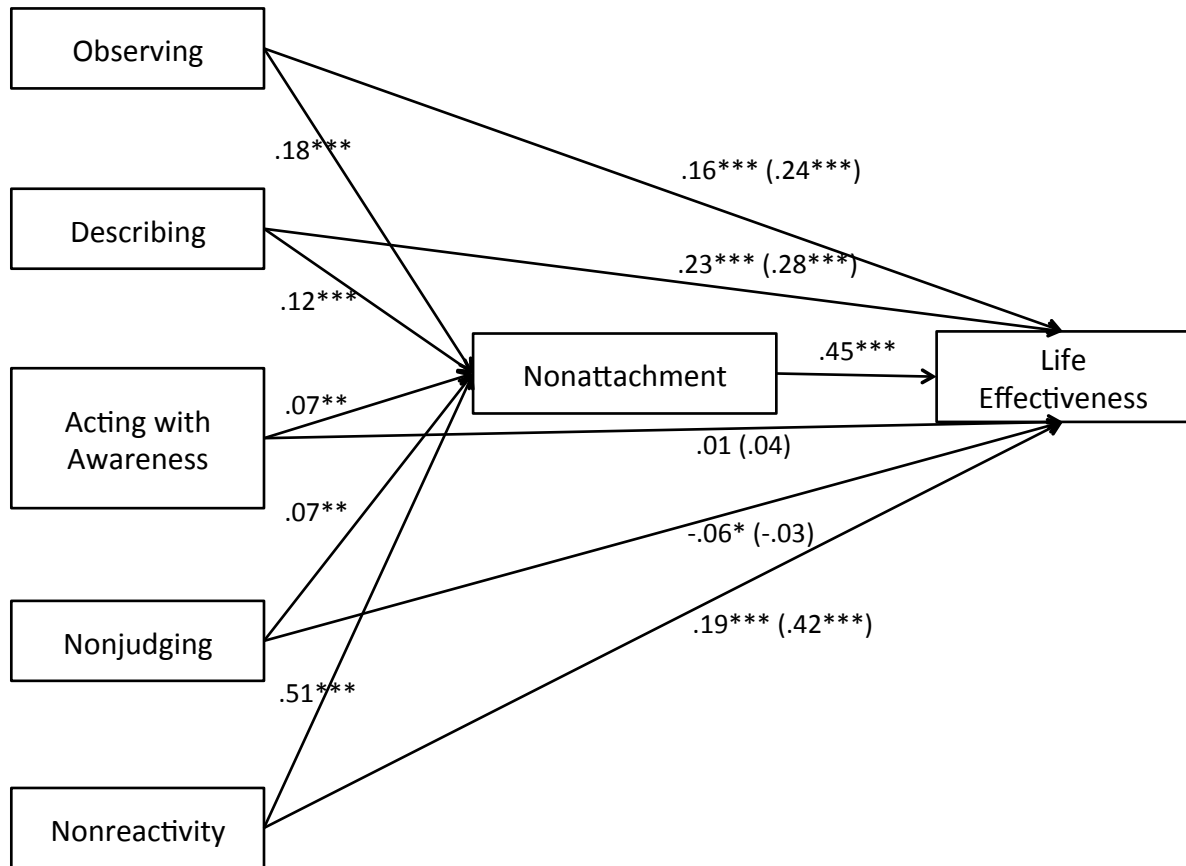
\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

Figure 1



A mediation model with satisfaction with life as the outcome variable. The coefficients in parenthesis are from a separate regression model excluding the mediator. All models controlled for age and gender.  $*p < .05$ ;  $**p < .01$ ;  $***p < .001$ .

Figure 2



A mediation model with life effectiveness as the outcome variable. The coefficients in parenthesis are from a separate regression model excluding the mediator. All models controlled for age and gender.  $*p < .05$ ;  $**p < .01$ ;  $***p < .001$ .