Supplementary Online Materials for

**Present with You: Does Cultivated Mindfulness Predict**

**Greater Social Connection through Gains in Decentering and**

**Reductions in Negative Emotions?**

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***Part I: Including the Attribution Style Questionnaire Subscale in the Decentering Factor***

We originally included a second measure to our decentering factor, the *Attribution Style Questionnaire - modified* (ASQ; Peterson, Semmel, von Baeyer, Abramson, Metalsky, & Seligman, 1982; See Table 1 for measures of each latent construct and time-point of assessment). However, while testing the measurement model, the ASQ items fit poorly with the TMS items to comprise a decentering latent factor (details outlined below). The ASQ measures attributional style across three dimensions: internality, stability, and globality, using 36 items. In the current study the 12 internality items were used to assess the tendency to make internal vs. external causal attributions. Since decentering is thought to support lower self-focus and ego-involvement, we expected that those higher in decentering would make fewer internal attributions. In our modified ASQ scale, participants read 12 hypothetical scenarios and were asked to imagine that each scenario happened to him/herself (e.g., “You get a raise”; "You have been looking for a job unsuccessfully for some time"). Participants are then asked to report on a scale of 1-7 the extent to which the event was externally (1) or internally (7) caused. We reverse scored this scale such that higher scores mean greater externality in attributions, reflecting lower self-focus and greater decentering. Internal consistency for this measure was low across all items (T1 α = .245), positive scenario items (T1 α =.399), and negative scenario items (T1 α = .309).[[1]](#footnote-1)

*Testing the Measurement Model for the Decentering Latent Factor with the ASQ*

We submitted the items from both the ASQ and TMS scales to 1, 2, 3 and 4 factor EFAs. All four EFAs revealed that the ASQ items were not loading with the TMS items, or with themselves, likely because of the low reliability of the ASQ. Thus, the ASQ items were dropped from the model.

***Part II: Testing the Measurement Model and Factorial Invariance Details***

The measurement model was tested by running factor analyses of all of the proposed indicators for each factor, as outlined below.

1

*Decentering.* A 1-factor CFA of all 7 TMS items indicated that two of its items were not loading with the other five items (loadings of .07 and .22), and thus these two were dropped from the model. A 1-factor CFA for the five remaining TMS items exhibited mediocre fit (RMSEA = .12, 95% CI for RMSEA = .02-.21, CFI = .93, TLI = .87, SRMR = .05) and one item was not contributing to model fit (its standardized factor loading was .36). That item was removed and the 1 factor CFA for the 4 items that loaded together exhibited excellent fit (RMSEA = .03, 95% CI for RMSEA = .00-.21, CFI = .99, TLI = .99, SRMR = .03; Standardized factor loadings ranged from .64 to .78). Thus, each of these four items (#s 2, 4, 6 and 7 of the TMS decentering subscale) served as indicators for the decentering factor.

*Social Connection.* The 1-factor CFA solution for our four social connection measures revealed mediocre to moderate fit to the data (RMSEA = .16, 95% CI for RMSEA = .02-.30, CFI = .94, TLI = .84, SRMR = .06). The standardized factor loading for the Daily Social Behavior measure (.34) indicated that it was not contributing to the assessment of social connection, thus it was removed as an indicator. The resulting model for the social connection factor was comprised of composites of the UCLA Loneliness Scale, the Positivity Resonance Scale and the MOS Social Connection Scale. These composites were computed by averaging across items in the corresponding scales. The fit indices of the CFA for these indicators are unavailable because this model is just identified (Kenny, 2015). However, all three of these scales had acceptable factor loadings (standardized loadings ranged from .43 to .91).

*Positive and Negative Emotions*. The mDES was used to measure positive and negative emotions. To avoid an overparameterized model, we created three parcels as indicators for each construct (i.e., six parcels total) following recommendations by Kishton & Widaman (1994). That is, we ran separate 1-factor EFAs for positive and negative emotion items. Both of these EFAs exhibited parsimonious factor loadings (i.e., .63 -.87 for positive emotions; .54-.84 for negative). Next, three parcels were computed for both positive and negative emotions, based on the size of the EFA factor loading. Specifically, items were rotated through the parcels, such that parcel one was given the highest loading item, then parcel two the second highest, parcel three the third highest, then parcel one the fourth highest, and so on. Rotating through the parcels based on descending factor loadings increases the likelihood that parcels are equally representative of the different aspects of the domain in question (Kishton & Widaman, 1994). Items allocated to each parcel were then averaged to comprise the three indicators for each of the emotion factors. Although the practice of parceling has been widely debated in quantitative psychology (see Little, Cunningham, Shahar, & Widaman, 2002), the current use is justified. Without parceling these items, the models would be overparameterized with ten indicators for each latent construct. The alternative would be to simply average across items, which completely neglects measurement error. Parceling in these models is the best middle ground approach (Little, Cunningham, Shahar, & Widaman, 2002; Kishton & Widaman, 1994).

2

*Testing the Conceptual Model separately at time 1 and time 2.* Next, in building up the model we tested the conceptual model separately for T1 and T2 data. Both of these models fit well (T1: RMSEA = .078, 90% CI RMSEA = .046-0.107, CFI = .951, TLI = .936, SRMR = .066, Chi Square = 93.573, *p* = .003; T2: RMSEA = .039, 90% CI RMSEA = .000-.084, CFI = .987, TLI = .983, SRMR = .064, Chi Square = 65.563, *p* = .260).

***Factorial Invariance***

 With the satisfactory fit of the measurement models, we next tested four levels of factorial invariance, for each construct, across data collection time-points (i.e., 16 tests total). Finding that our measures and constructs are invariant overtime reduces the likelihood of making confounded interpretations of the treatment outcome (Pentz & Chou, 1994; Widaman & Reise, 1997). Longitudinal tests of Configural, Weak, Strong, and Strict invariance were run. Invariance tests were built up from Configural to Strict, with non-significant change in chi-square tests indicating that each higher level of invariance was met. Indeed, all chi-square difference tests were non-significant, indicating that factorial invariance was held in the data at every level. See Table 2 for indices of fit and change in chi-square tests for factorial invariance tests.

***Computing Trait Mindfulness Latent Change Score Variables***

 To capture change in trait mindfulness, we used the identical procedure for computing the emotions latent variables. First we ran an EFA of the 31 items in the FFMQ (*observing* items still excluded) to identify the factor loading for each item. Next, items were grouped into one of three parcels, by descending factor loading (i.e., highest factor loading item in parcel 1, second highest loading in parcel 2, etc.) and items were averaged within each parcel. The three parcels then served as indicators to the new latent constructs of trait mindfulness for each time-point.

***Part III: Hypothesized Model with "Propensity for Social Connection" Latent Variable***

 We also examined a latent construct for the "propensity for social connection" in our a priori hypothesized model. This latent factor in our model was to be indexed with three measures: the *Attitude Implicit Associations Test for Need for Affiliation* (PIAT-NA; Slabbinck, De Houwer, & Van Kenhove, 2012); *Cardiac Vagal Tone*, a psychophysiological marker of capacity for social engagement indexed via Respiratory Sinus Arrhythmia (RSA; Kok et al., 2013); and a semi-scripted *Capitalization Response Interaction,* developed by Algoe and colleagues, from which we measured participants responsive behavior to hearing that our research assistants recently received some good news. To reduce the likelihood that participants would be suspicious of this interaction if we were to repeat a variant of it at pre and post-treatment, this interaction was only conducted at post treatment. Additional information about these measures can be found below.

3

 We anticipated that gains in the propensity for social connection would follow from gains in decentering and reductions in negative emotions. We also expected that gains in the propensity for social connection, would predict gains in reported social connection (see Figure 1). However, this factor failed to meet reasonable criteria for a latent variable while testing the measurement model, thus it was not included in our overall model. Below we detail the measures in this factor as well as our findings while we "built up" the model which led us to discard this latent factor.

*Testing the Measurement Model for the Propensity for Social Connection Factor*

 Since the Capitalization Response Interaction only occurred at the post-training lab, the CFA at Time-1 only included two indicators: scores for the PIAT-NA and RSA. Thus, we identified the CFA model by fixing the variance of the latent factor to one and setting equality constraints in the loadings. Unfortunately, this model led to a non-positive definite matrix. Due to this error, rather than comprise a latent variable, both PIAT-NA and RSA were added separately as manifest variables to the hypothesized model. Results outlining the influence of condition on the Capitalization Response Interaction can be found below. We note that the PIAT-NA and RSA did not correlate at time 1 (r = -.132, *p* = .262) or time 2 (r = -.186, *p* = .145).

*Testing Manifest Variables*

In separate higher-order latent change models (Henk & Castro-Schilo, 2016), PIAT-NA and RSA were entered as manifest variables mediating the influence of decentering and negative emotions on social connection. Since we were not using the latent change model framework to account for changes in these now manifest variables, a change score was computed by subtracting T1 values from T2 values for both variables. In the first latent change model, neither decentering nor negative emotions predicted changes in PIAT-NA (decentering: *b =* -139.411, SE = 112.313, *p* = .215; negative emotions: *b =* -53.737, SE = 43.196, *p* = .213). In the second latent change model, gains in decentering significantly predicted gains in RSA, as denoted by the positive beta weight (*b =* 0.261, SE = 0.122, *p* = .035). Changes in negative emotions, however, did not predict changes in RSA (*b =* -0.044, SE = 0.058, *p* = .450). Neither PIAT-NA (*b <* 0.001, SE < 0.000, *p* = .487) nor RSA (*b =* 0.248, SE = 0.192, *p* = .196) predicted social connection.

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*Additional Information for Propensity for Social Connection Measures*

 *Cardiac vagal tone* is a psychophysiological marker of capacity for social engagement. It is indexed via high-frequency heart rate variability (HF-HRV; Kok et al., 2013), a non-invasive measure based on heart rate during inspiration as compared to heart rate during exhalation. Measures of heart rate and respiration were collected during lab sessions, and recommended procedures were utilized to compute RSA (Grossman, 2007). To collect heart rate (i.e., echocardiogram) disposable snap electrodes were placed on participants in a bipolar configuration on the lateral sides of the torso at the point of the lowermost ribs. To measure participants’ respiration, pneumatic bellows were placed around participants at the point just below the sternum. Continuous recordings of these measures were taken at a sampling rate of 1000Hz. Heart rate and respiration were collected while participants sat alone quietly for 5 minutes.

*Pictorial Attitude Implicit Associations Test for Need for Affiliation* (Slabbinck, De Houwer, & Van Kenhove, 2012). Implicit desire for affiliation was assessed with a variant of the well-known Implicit Associations Test (IAT) paradigm. This version of the IAT measures response latencies in valanced responding to stimuli (photos and words) that are affiliative or not affiliative in nature. Specifically, participants are asked to categorize target photographic stimuli as “together” vs. “alone” while also categorizing non-target words as “attractive” vs. “not attractive”. Categorizations are made as quickly as possible by clicking the D or K key on a keyboard. Target stimuli are seven photos that are affiliative in nature (e.g., friends having a barbeque together) and seven photos that are non-affiliative in nature (e.g., a business man standing alone in a room). Non-target stimuli are words that are positively or negatively valanced. Participants were asked to engage in seven blocks of trials in which they categorize either words or pictures. Categorization words are located in the top left and right corners of the screen, while the stimuli of interest appear in the center of the screen. In the first block (24 trials) participants sorted words (e.g., “nice”, “friendly”, “lovely” vs. “unpleasant”, “nasty”, “unfavorable”) into the “attractive” or “unattractive” categories. In the second block (24 trials) participants categorized affiliative pictures as “alone” or “together”. Block 3 and 4 combine “attractive” and “not attractive” and “alone” and “together” categories. Blocks 5, 6 and 7 are identical to block 2, 3 and 4, respectively, however the position of the categories in each case are reversed. Response time latencies are computed across trials. Slabbinck and colleagues (2010) found higher scores on this IAT for participants who were induced to value affiliation and were socially excluded in an online ball tossing game (Cyberball).

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*Capitalization Response Interaction.* Sharing good news with another is called capitalization. Responding to another's capitalization attempt actively and positively is known to promote trust and prosocial orientation (Reis, Smith, Carmichael, Caprariello, Tsai, Rodrigues, & Maniaci, 2010). The extent to which a listener reacts in an enthusiastic way serves as a signal of responsiveness in the relationship (i.e., expressing understanding, validation, and care). To assess participants’ skill at responding to a capitalization attempt we used a semi-scripted interaction developed by Algoe and colleagues. During the post-intervention lab session, a research assistant offered an opportunity for the participant to capitalize on some good news that she mentioned she just received. Specifically, while removing the psychophysiological sensors at the end of the lab session, the assistant mentioned that she just learned that she can pick up the keys to her new apartment a day earlier than she expected. Just after this interaction, the research assistant, who was blind to experimental condition, left the room to complete a 6-item questionnaire designed to measure the extent to which the assistant perceived the participant’s reaction to be active and constructive. Sample questions include, “How much attention did the participant pay to your good news?” and “How much did the participant celebrate your good news?” Three items assessed how actively participants responded to the news and three how constructively or positively participants responded. Research assistants responded to the questions on a scale from 0 (not at all) to 6 (extremely). This measure exhibited high reliability (T2 α = .93).

***Part IV: Traditional Repeated Measures ANOVAs for Condition and Dependent Measures and Auto-regressive Model***

 Readers may be interested in the results of traditional repeated measures ANOVA analyses, as well as the results of a more traditional auto-regressive modeling technique as an alternative test of our theoretical model. However, it should be noted that the latent change score modeling technique is a more appropriate test of our hypotheses, compared to the auto-regressive model, because it allows us to specify latent changes as predictors and outcomes, which aligns with our theoretical model. An autoregressive model is only able to test the effects of status in a variable on residualized change in another.

*Direct Effects*

The direct effect of condition on the dependent measures was tested with repeated measures ANOVAs, with condition as the between-subject variable. For full results, see Table 3.

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 *Effects of Time.* The whole sample exhibited significant gains from pre-to-post training in trait mindfulness (FFMQ), decentering (TMS), and social connection (UCLA and MOS scales). The sample also exhibited significant trends for greater gains in positivity resonance, implicit desire to affiliate (PIAT-NA), and decreases in negative emotion.

 *Effects of time by condition.* A significant time by condition effect emerged for decentering (TMS). Separate post-hoc paired *t*-tests revealed that both conditions exhibited significantly greater gains in decentering across training (MM: *t*(34) = -5.226, *p* < .001; HP: *t*(34) = -5.226, *p* < .001), however the significant time by condition interaction was driven by the MM condition exhibiting greater gains in decentering than the HP condition (MM mean difference: .531, HP mean difference: .223; See Table 3). Time by condition trends also emerged for trait mindfulness (FFMQ), RSA, and positivity resonance. Post-hoc tests revealed that the trending interaction for trait mindfulness was driven by the mindfulness condition reporting significant gains in trait mindfulness over time, *t*(34) = -3.384, *p* = .002, compared to the HP condition *t*(32) = -1.567, *p* = .127. The trend for the RSA interaction was driven by the health promotion condition exhibiting a reduction in RSA over training, at the level of a trend (HP: *t*(22) = 1.767, *p* = .091; MM: *t*(30) = -1.116, *p* = .273). The trend for the positivity resonance interaction was due to the MM condition exhibiting significant gains in positivity resonance over training (MM: *t*(33) = -2.803, *p* = .009; *t*(32) = -.104, *p* = .918).

*Auto-regressive model.*

 In this auto-regressive model, time-two latent factors are simultaneously predicted by condition and their time-one counterpart latent factors (i.e., controlling for level of the variable at time one; see Figure 2). To capture mechanisms of action based on the theoretical model, we examine whether levels in the latent variables predict levels in other latent variables. Having found support for factorial invariance, indicators were allowed to covary over time-one and time-two, and their intercepts and variances were set to equality. The latent constructs' variances were allowed to covary over time-one and time-two, their variances were set to 1 at time-one and freed at time-two, and their means were set to 0 at time one and freely estimated at time two.

This model fit the data reasonably well (see Table 3 for fit indices). The satisfactory fit of the model allows us to have greater confidence interpreting the parameter estimates and effects reported in the model. See Figure 3 for the standardized parameter estimates. All latent constructs significantly covary with each other in predicted directions, i.e., decentering, social connection, and positive emotions, were positively correlated with each other, and they were all negatively correlated with negative emotions (see Table 4). However, contrary to hypotheses, condition did not significantly predict time two latent variables, above and beyond time one latent variables.[[2]](#footnote-2)

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***Part V: Additional Participant Information***

Prior to completing the daily surveys, 18 participants withdrew from the study, and after completing at least one of the daily surveys but prior to the first lab session, three more participants withdrew. Participation is outlined in the CONSORT Table (Figure 4) below.

 ***Part VI: Estimation of Latent Change Score Variables***

 The hypothesized model was fit such that latent change scores were estimated (per Henk & Castro-Schilo, 2016), initial levels of latent constructs were allowed to correlate with change variables, however latent change variables were not allowed to correlate with the initial levels of other latent constructs. Latent constructs were allowed to correlate with each other at baseline, and the variances of latent constructs at baseline, and the residual variances of the latent change variables were estimated. The variance of time-two latent variables was set to 0. Time-one and time-two unique factor covariances were specified, and their unique factor variances were set to equality (recall strict factorial invariance held for all constructs). The means of the latent variables were set to 0, however both the latent change variables and the indicators' means were estimated.

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Table 1. *Measures of each latent construct and time-point of assessment*

(D) = 4x (Mon, Weds, Fri, & Sun) over 1 week at Pre and Post

(P/P) = at Pre and Post Workshop

Trait Mindfulness:

 FFMQ: Five Factor Mindfulness Scale (P/P)

Decentering:

TMS - Toronto Mindfulness Scale – Decentering subscale (P/P)

ASQ - Attributional Style Questionnaire – Internal/External Attributions(P/P)

Positive and Negative Emotions:

 mDES - Modified Differential Emotions Scale (mDES; 10 positive, 10 negative) – (D)

Social Connection:

 UCLA Loneliness Scale (P/P)

 Pos. Res. - Positivity Resonance Scale (P/P)

 MOS Social Support Survey (P/P)

 Daily Behavioral Questions about Social Connection (D)

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Table 2. *Fit indices for auto-regressive model*

|  |  |
| --- | --- |
| Fit Index | *Auto-regressive Model* |
| χ 2 | 414.057 |
|  Df | 323 |
|  p-value | .001 |
| CFL | 0.943 |
| TLI | 0.938 |
| RMSEA | 0.054 |
|  90% CI RMSEA | 0.037 - 0.069 |
| SRMR | 0.100 |

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Table 3. *Direct effects of mindfulness meditation and health promotion (control) conditions over time and the group × time interactions from two-way ANOVAs for the intent-to-treat sample*

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|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Measure* | *Group (n)* | *Means and SDs at Pre and Post-Training* | *Mean % Change Pre-Post* | *Time Effect* | *Time x Condition Effect* |
|  |  | *M*SD | *M*SD |  | *F**p* | *F**p* |
| FFMQ total | MM (35) | 3.087.564 | 3.315.430 | 7.385% | 12.990.001\*\* | 2.887.094† |
| HP (33) | 3.336.535 | 3.418.486 | 2.458% |  |  |
| Positive Emotions | MM(35) | 1.836.695 | 1.927.672 | 4.956% | 2.3300.132 | 0.0790.780 |
| HP (34) | 1.768.628 | 1.900.736 | 7.466% |  |  |
| Negative Emotions | MM (35) | .682.680 | .528.362 | -22.467% | 2.8110.098† | 0.1090.657 |
| HP (34) | .558.368 | .517.450 | -7.348% |  |  |
| ASQ | MM (35) | 3.591.459 | 3.702.513 | 3.091% | 0.6600.419 | 0.7870.378 |
|  | HP (34) | 3.620.506 | 3.615.618 | -0.138% |  |  |
| TMS | MM (35) | 2.359.657 | 2.890.691 | 22.510% | 30.6140.000\*\*\* | 5.1150.027\* |
|  | HP (34) | 2.492.643 | 2.714.737 | 8.908% |  |  |
| PIAT-NA | MM (32) | 0.308.262 | 0.422.316 | 37.013 | 3.7370.058† | 0.1720.680 |
| HP (26) | 0.317.220 | 0.390.426 | 23.028% |  |  |
| RSA | MM (31) | -1.245.315 | -1.202.294 | -3.454% | 0.1800.673 | 3.9250.053† |
| HP (23) | -1.380.331 | -1.446.307 | 4.783% |  |  |
| UCLA | MM (34) | 2.715.614 | 2.865.619 | 5.525% | 12.2450.001\*\* | 0.1080.743 |
| HP (33) | 2.814.649 | 2.938.590 | 4.407% |  |  |
| PosRes | MM (33) | 58.55425.748 | 68.15622.510 | 16.399% | 3.5450.064† | 2.9700.090† |
| HP (33) | 66.09123.051 | 66.51527.454 | 0.642% |  |  |
| MOS | MM (35) | 3.767.843 | 3.904.821 | 3.636% | 4.7110.034\* | 0.1240.726 |
| HP (34) | 3.822.860 | 3.920.927 | 2.564% |  |  |
| Pro Soc Beh | MM (35) | 2.400.566 | 2.470.532 | 2.916% | 1.1250.293 | 0.0390.844 |
| HP (34) | 2.528.570 | 2.576.60512 | 1.899% |  |  |
| Cap Task Avg1 | MM (34) | *-* | 2.8281.062 | - | - | 1.4170.238 |
| HP (31) | *-* | 2.4891.235 | - | - |  |

*Note: FFMQ = Five Factor Mindfulness Questionnaire, ASQ = Attribution Style Questionnaire; TMS = Toronto Mindfulness Scale; PIAT-NA = Pictorial Attitude Implicit Associations Test for Need for Affiliation; RSA = Respiratory Sinus Arrhythmia; UCLA = UCLA Loneliness Scale; PosRes = Positivity Resonance Scale; MOS = MOS Social Support Scale; Pro SocBeh =Prosocial Behaviors Scale*

1. Capitalization Response Interaction administered at T2 only, one-way ANOVA reported

† *p* < .10, \* *p* < .05, \*\* *p* < .01, \*\*\* *p* < .001

Table 4. *Residualized change correlations among endogenous variables*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Decentering | Negative Emotions | Social Connection | Positive Emotions |
| Decentering | 1 |  |  |  |
| Negative Emotions | *r* = -.397*p* = .076† | 1 |  |  |
| Social Connection | *r* = .587*p* = .008\*\* | *r* = -.506*p* < .001\*\*\* | 1 |  |
| Positive Emotions | *r* = .378*p* = .088† | *r* = -.464*p <*.001\*\*\* | *r* = .511*p* < .001\*\*\* | 1 |
| † *p* <.10, \*\* *p* < .01, \*\*\* *p* < .001 |  |

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Table 5. *Correlations among trait mindfulness facets at baseline*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Observe* | *Describe* | *Non-judging* | *Non-reactivity* | *Acting with Awareness* |
| *Observe* | 1 |   |  |  |  |
| *Describe* | r = .413 *p* < .000\*\*\* | 1 |  |  |  |
| *Non-judging* | r = .184*p* =.073† | r = .254*p* = .012\* | 1 |  |  |
| *Non-reactivity* | r = .388*p* < .000\*\*\* | r = .353*p* < .000\*\*\* | r = .477*p* < .000\*\*\* | 1 |  |
| *Acting with Awareness* | r = .170 *p* = .097† | r = .240*p* = .019\* | r = .480*p* < .000\*\*\* | r = .437*p* < .000\*\*\* | 1 |

† *p* < .10, \* *p* < .05, \*\*\* *p* < .001

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Table 6. *Fit indices for longitudinal factorial invariance models*

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|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Latent Construct*Fit Index | *Configural Invariance* | *Weak Invariance* | *Strong Invariance* | *Strict Invariance* |
| *Decentering* |  |  |  |  |
| χ 2 | 8.439 | 9.482 | 15.033 | 17.623 |
| df | 15 | 18 | 21 | 25 |
| ∆χ2/∆df/p-value |  | 1.043 / 3 / 0.891 | 5.551/ 3 / 0.136 | 2.590/ 4 / 0.629 |
| CFI | 1.000 | 1.000 | 1.000 | 1.000 |
| TLI | 1.061 | 1.000 | 1.040 | 1.041 |
| RMSEA | 0.000 | 0.000 | 0.000 | 0.000 |
| 90% CI RMSEA | 0.000-0.041 | 0.000-0.010 | 0.000-0.055 | 0.000-0.046 |
| SRMR | 0.030 | 0.040 | 0.049 | 0.057 |
| *Negative Emotion* |  |
| χ 2 | 3.720 | 4.373 | 5.137 | 12.378 |
| df | 5 | 7 | 9 | 12 |
| ∆χ2/∆df/p-value |  | 0.653 / 2 /0.721 | 0.764 / 2 /0.683 | 7.242 / 3 / 0.065 |
| CFI | 1.000 | 1.000 | 1.000 | 0.999 |
| TLI | 1.011 | 1.015 | 1.018 | 0.999 |
| RMSEA | 0.000 | 0.000 | 0.000 | 0.018 |
| 90% CI RMSEA | 0.000- 0.123 | 0.0-0.092 | 0.000-0.071 | 0.000-0.108 |
| SRMR | 0.033 | 0.039 | 0.040 | 0.044 |
| *Social Connection* |  |  |  |  |
| χ 2 | 4.703 | 9.501 | 12.253 | 12.290 |
| df | 5 | 7 | 9 | 12 |
| ∆χ2/∆df/p-value |  | 4.798 / 2 / 0.091 | 2.752 / 2 / 0.253 | 0.037 / 3 / 0.998 |
| CFI | 1.000 | 0.993 | 0.990 | 0.999 |
| TLI | 1.003 | 0.984 | 0.984 | 0.999 |
| RMSEA | 0.000 | 0.061 | 0.061 | 0.016 |
| 90% CI RMSEA | 0.000-0.138 | 0.000-0.148 | 0.000-0.139 | 0.000-0.106 |
| SRMR | 0.028 | 0.043 | 0.047 | 0.051 |
| *Positive Emotion* |  |  |  |  |
| χ 2 | 2.122 | 2.673 | 4.571 | 5.097 |
| df | 5 | 7 | 9 | 12 |
| ∆χ2/∆df/p-value |  | 2.122/ 2 / 0.759 | 1.898 / 2 /0.387 | 0.526 / 3 /0.913 |
| CFI | 1.000 | 1.000 | 1.000 | 1.000 |
| TLI | 1.017 | 1.018 | 1.015 | 1.017 |
| RMSEA | 0.000 | 0.000 | 0.000 | 0.000 |
| 90% CI RMSEA | 0.000-0.084 | 0.000-0.048 | 0.000-0.060 | 0.000-0.000 |
| SRMR | 0.014 | 0.016 | 0.015 | 0.017 |

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Table 7*. Correlations, intercepts, and residual variances for both two-wave LCS models*

|  |  |  |
| --- | --- | --- |
| *Model/Paths* | *Estimate* | *SE* |
| Model 1 |  |  |
| Correlations |  |  |
|  ∆ Decentering, Decentering1 | -0.073 | 0.044† |
|  ∆ Negative Emotion, Negative Emotion1 | -0.157 | 0.037\*\*\* |
|  ∆ Social Connection, Social Connection1 | 0.002 | 0.014 |
|  ∆ Positive Emotion, Positive Emotion1 | -0.101 | 0.036\*\* |
|  Intercepts |  |  |
|  ∆ Decentering | 0.341 | 0.091\*\*\* |
|  ∆ Negative Emotion  | 0.122 | 0.130 |
|  ∆ Social Connection  | -0.121 | 0.141 |
|  ∆ Positive Emotion | -0.072 | 0.076 |
|  Residual variances |  |  |
|  ∆ Decentering | 0.089 | 0.061 |
|  ∆ Negative Emotion  | 0.208 | 0.048\*\*\* |
|  ∆ Social Connection  | 0.003 | 0.025 |
|  ∆ Positive Emotion | 0.217 | 0.050\*\*\* |
| Model 2 |  |  |
|  Correlations |  |  |
|  ∆ Trait Mindfulness, Trait Mindfulness1 | -0.046 | 0.015\*\* |
|  ∆ Decentering, Decentering1 | -0.090 | 0.038\* |
|  ∆ Negative Emotion, Negative Emotion1 | -0.157 | 0.036\*\*\* |
|  ∆ Social Connection, Social Connection1 | 0.151 | 0.039\*\*\* |
|  ∆ Positive Emotion, Positive Emotion1 | -0.108 | 0.037\*\* |
|  Means/Intercepts |  |  |
|  ∆ Trait Mindfulness | 0.161 | 0.042\*\*\* |
|  ∆ Decentering | 0.312 | 0.077\*\*\* |
|  ∆ Negative Emotion  | 0.111 | 0.107 |
|  ∆ Social Connection  | -0.112 | 0.088 |
|  ∆ Positive Emotion | -0.057 | 0.074 |
| Residual variances |  |  |
|  ∆ Trait Mindfulness |  0.107 | 0.022\*\*\* |
|  ∆ Decentering | 0.086 | 0.042\* |
|  ∆ Negative Emotion  | 0.200 | 0.045\*\*\* |
|  ∆ Social Connection  | 0.010 | 0.015 |
|  ∆ Positive Emotion | 0.231 | 0.050\*\*\* |

† *p* < .10, \* *p* < .05, \*\* *p* < .01, \*\*\* *p* < .001; *Note.* Subscript 1 denotes time 1.

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Figure 1. *Conceptual model of mindfulness, decentering, emotions, propensity for social connection, and social connection*

Mindfulness Med.

(vs. HP Control)

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Figure 2. *Hypothesized* *auto-regressive model: The influence of condition on time 2 latent variables, controlling for time 1 latent variables*

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Note: Covariances within all time 1 variables are specified as well as covariances within all time 2 variables.

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Figure 3. *Standardized parameter estimates for auto-regressive model: The influence of condition on time 2 latent variables, controlling for time 1 latent variables*

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Note: Covariances within all time 1 variables are specified as well as covariances within all time 2 variables.

Figure 4. *CONSORT flowchart for the Wellness Workshop Study*

Assessed for

eligibility (n = 166 )

Excluded for not meeting inclusion criteria (n = 51)

* Previous meditation training (n = 16)
* Current meditation (n = 17)
* Transportation unavailable (n = 1)
* No daily internet access (n = 1)
* Unable to attend class due to schedule/summer travel (n = 16)

## Enrollment

Eligible for daily surveys at baseline (n = 97)

Internally Randomized (n = 115)

Withdrew prior to completing daily surveys (n = 18)

* Personal reason (n = 2)
* Did not give reason (n = 3)
* Unreachable (n = 13)

Retained at post-test (n = 34)

Retained at post-test (n = 33)

## Post-Test

Mindfulness Meditation (n = 50)

* Attended 0 classes (n = 7)
* Attended 1-3 classes (n = 14)
* Attended 4-6 classes (n = 29)

Health Promotion (n = 44)

* Attended 0 classes (n = 6)
* Attended 1-3 classes (n = 12)
* Attended 4-6 classes (n = 26)

## Treatment

Participants told course name (blind to condition)

Lab 1 - Baseline assessment (n = 94)

Withdrew prior to Lab 1

* Too busy (n = 3)

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Figure 5. *Workshop and assessment schedule*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Course  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 1 |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |   |
| 2 |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |   |   |
| 3 |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |   |
| 4 |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |   |   |
| 5 |   |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |   |   |   |
| 6 |   |   |   |   |   |   |  |   |   |  |  |  |  |  |  |   |   |   |   |   |
| 7 |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |   |
| 8 |   |   |   |   |   |   |   |   |   |   |   |   |  |  |  |  |  |  |   |   |
|  | Mindfulness Meditation |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Health Promotion |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Lab weeks |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Alternate day reporting weeks |  |  |  |  |  |  |  |  |  |  |  |  |  |

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Figure 6. *Standardized parameter estimates for model 1: Latent change*

path significant,  *p* < .05

path trending, *p* < .10

path non-significant, *p* > .10

E: -0.347

SE: 0.146

E: 0.547

SE: 0.120

E: 0.874

SE: 0.301

E: -0.044

SE: 0.104

E: 0.004

SE: 0.116

Mindfulness Med.

 (vs. HP Control)

E: -0.226

SE: 0.194

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1. The alphas for this scale in the original article are reported in regards to the entire scale, not just the items we have selected to use. Therefore, a comparison of alphas across studies is not possible. [↑](#footnote-ref-1)
2. The auto-regressive model was also run with the PIAT-NA and RSA. The model for PIAT-NA did not fit the data well. Condition did not predict time 2 PIAT-NA controlling for time 1 PIAT-NA (*b* = 0.045, SE = 0.090, *p* = .616). The model including RSA did not converge. [↑](#footnote-ref-2)