



# HHS Public Access

Author manuscript

*Mindfulness (N Y)*. Author manuscript; available in PMC 2018 December 01.

Published in final edited form as:

*Mindfulness (N Y)*. 2017 December ; 8(6): 1456–1470. doi:10.1007/s12671-017-0736-8.

## The mindful personality: A meta-analysis from a cybernetic perspective

Adam W. Hanley, PhD and

University of Utah

Eric L. Garland, PhD

University of Utah

### Abstract

Dispositional mindfulness (DM), or the tendency to attend to present moment experience, may have important implications for the structure of human personality. However, relationships between DM and the Big Five Model of Personality (BF) have not been definitively established. Therefore, the purpose of this meta-analysis was to extend previous investigations of the relationship between DM and the BF, utilizing a larger sample of studies, attending to relational inconsistencies potentially associated with alternative methods of operationalizing DM, conducting the first meta-analysis of the DM subdomains in relation to the BF, and situating the results in a cybernetic model. Results indicate that neuroticism evidenced the strongest, negative relationship with DM and conscientiousness evidenced the strongest, positive relationship with DM, suggesting the mindful personality may be characterized principally by emotional stability and conscientious self-regulation - potentially reflective of an inclination towards the personality metatrait stability. Measurement differences were also observed, with the mindful personality arrived at through the FFMQ differing to some extent from the mindful personality emerging from the MAAS. Broadly, the mindful personality associated with the FFMQ appears to reflect greater personality complexity, with the FFMQ evidencing associations with all five personality factors while the MAAS appears primarily linked with only three personality factors (Neuroticism, Conscientiousness and Agreeableness). Examination of the relationships between the BF and DM at the facet level also suggest unique patterns of association between the DM facets and each of the personality factors.

### Introduction

Although not counted among the canonical personality domains, dispositional mindfulness may be an important aspect of human personality. Mindfulness is robustly associated with well-being (e.g., Brown & Ryan, 2003; Eberth & Sedlmeier, 2012). Similarly, specific personality configurations are also linked to well-being and more positive life outcomes

---

Corresponding Author Note Adam W. Hanley, PhD, College of Social Work, University of Utah, Salt Lake City, UT. Correspondence regarding this manuscript should be addressed to Adam Hanley, College of Social Work, University of Utah, 395 South 1500 East #111, Salt Lake City, UT 84112. Phone: 801-213-4191 adam.hanley@utah.edu.

Declaration of Conflicting Interests Adam Hanley and Eric Garland declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

(Ozer, 2006; Roberts, 2007). Therefore, clarifying associations between dispositional mindfulness (DM) and the Big Five Model of Personality (BF) may have valuable implications for well-being. Yet, relations between dispositional mindfulness (DM) and the Five Factor Model of Personality (FFM) have not been definitively established. Previous investigations of these relationships have yielded inconsistent results (Giluk, 2009; Rau & Williams, 2016). Notably different estimates of the strength of association between DM and several of the BF personality factors have been reported (e.g., Extraversion: Baer et al., 2006 vs. Tucker et al., 2014; Openness to Experience: Gootzeit et al., 2014 vs. Hollis-Walker et al., 2011). Furthermore, the only extant meta-analysis of DM and the FFM identified a relatively wide range of reported relationships between DM and the BF, urging continued investigation of these relationships (Giluk, 2009).

While a number of factors could potentially contribute to this variability, varying approaches to measuring DM are believed to underlie these equivocal findings (Giluk, 2009; Rau & Williams, 2016). Specifically, it may be that unidimensional (i.e., Mindful Attention and Awareness Scale; Brow & Ryan, 2003) and multidimensional (i.e., Five Facet Mindfulness Questionnaire; Baer et al., 2006) DM scales are differentially related to the BF. Indeed, a preliminary review of how the BF relate to uni- and multidimensional scales suggests systematic differences. Specifically, greater variability in the associations between DM and extraversion, openness as well as agreeableness has been reported in studies measuring DM with the MAAS (Baer et al., 2006; Kong, 2015; Ortner, 2007; Waters, 2007) in comparison with studies using the FFMQ (Hollis-Walker, 2011; Karakashian, 2011; McGarvey, 2010; Schurtz, 2011). Thus, inconsistent findings may originate from measurement selection decisions.

Furthermore, theoretical advancements in personality psychology may offer a compelling, integrative framework for interpreting associations between DM and the BF. The Cybernetic Big Five Theory (CB5T; DeYoung, 2015) is based on the premise that humans are cybernetic systems. Cybernetic systems are goal-directed, complex systems whose behavior is driven by feedback processes (Bateson, 1972; Macy, 1991). Cybernetics emerged in response to the inadequacy of traditional, linear approaches to modeling biological behavior (Macy, 1991; von Bertalanffy, 1968). In contrast, cybernetic models assume behavior is emergent, dynamic, and iterative (Macy, 1991; Wiener, 1948). The CB5T contends that the BF represent behavioral parameters of mechanisms that evolved to guide human behavior, with each personality factor reflecting cybernetic mechanisms that facilitate pursuit of both evolved and individually defined goals. Situating the relationships between DM and the BF in a cybernetic framework may offer greater explanatory utility, exploring personality in a holistic manner. Furthermore, a cybernetic approach is likely to offer more applied interpretations of the relationship between DM and the BF, providing insight into the dispositional behavioral tendencies of mindful individuals.

Broadly, this meta-analysis has two primary purposes: 1) to clarify the nature of the relationship between DM and the BF, and 2) to expand theoretical interpretations of this relationship. First, with respect to clarification, previous meta-analytic work examining the relationships between DM and the BF will be updated, utilizing a larger sample of studies. More significantly, two novel approaches to the meta-analysis of the link between DM and

the BF will be pursued to examine, a) the relationships between DM and the BF across alternative methods of operationalizing DM, and, b) the relationships between the subdomains of DM and the BF. Second, with respect to interpretation, a more refined understanding of the relationship between DM and the BF is the natural result of the more granular analytic approaches targeting the subdomains of DM. Additionally, the relationships between DM and the BF will be interpreted in a novel, cybernetic framework, as proposed by the CB5T. Relationships between DM and each of the BF personality factors, as cybernetic parameters, will be considered.

## Mindfulness

Mindfulness is a construct of considerable interest in the psychological literature. This interest is likely driven by evidence linking mindfulness with a wide range of psychological (Brown & Ryan, 2003; Carmody & Baer, 2008, Eberth & Sedlmeier, 2012), physical (Chiesa & Serreti, 2009; Grossman, Niemann, Schmidt, & Walach, 2004; Paul-Labrador et al., 2006) and relational (Barnes et al., 2007; Carson, Carson, Gil & Baucom, 2004; Coatsworth, Duncan, Greenberg & Nix, 2010; Jones et al., 2011) benefits. Consequently, considerable effort has been devoted to creating conceptual and operational definitions of mindfulness. Unfortunately, conceptual and operational consensus has not been entirely achieved, leaving broader conclusions about mindfulness tentative without the assurance of consistent terminology or measurement equivalency (e.g., Bergomi, Tschacher & Zupper, 2013). Adding to this complexity, mindfulness has simultaneously been conceptualized as a state, disposition, practice and intervention (Vago & Silbersweig, 2012). Operationally, at least ten measures of mindfulness have been developed. Eight of these measures are designed to assess dispositional mindfulness (Mindful Attention and Awareness Scale, Brown & Ryan, 2003; Kentucky Inventory of Mindfulness, Baer, Smith & Allen, 2004; Freiburg Mindfulness Inventory, Walach et al., 2006; Five Facet Mindfulness Questionnaire, Baer et al., 2006; Cognitive and Affective Mindfulness Scale – Revised, Feldman et al., 2007; Philadelphia Mindfulness Scale, Cardaciotto et al., 2008; Southampton Mindfulness Questionnaire, Chadwick et al., 2008; Toronto Mindfulness Scale Trait Version, Davis et al., 2009). The remaining two measures are designed to assess the cognitive state of mindfulness (Toronto Mindfulness Scale, Lau et al., 2006), and the process of implementing mindfulness in the context of interventions (Applied Mindfulness Process Scale, Li, Black, & Garland, 2016). This breadth of research demands clear delineation of how researchers operationalize the construct of DM to ensure clarity of communication and a base level of generalizability for results.

Dispositional mindfulness (DM) will be the primary focus of this meta-analysis. Operationally, only studies employing the most frequently used unidimensional measure of DM (Mindful Attention and Awareness Scale; Brown & Ryan, 2003) and multidimensional measure of DM (Five Facet Mindfulness Questionnaire; Baer et al., 2006) will be included. Notable similarities are apparent in the conceptual definitions informing both the MAAS and FFMQ, despite structural differences in the measures. Brown and Ryan (2003) state that mindfulness is “being attentive to and aware of what is taking place in the present” (p.822). Baer et al. (2006) slightly extend Brown and Ryan's definition by stating that mindfulness is “bringing one's attention to experiences occurring in the present moment, in a

nonjudgmental or accepting way” (p.27). The propensity to express these psychological qualities of attentiveness, awareness, and acceptance in daily life can be conceptualized as dispositional mindfulness.

Both the MAAS and FFMQ were designed to be multidimensional. The MAAS initially contained two factors, presence and acceptance, but only the presence factor was retained in the final scale. The FFMQ's multidimensional structure was arrived at by factor analyzing the five dispositional mindfulness scales available at the time: Mindful Attention and Awareness Scale (Brown & Ryan, 2003), Freiburg Mindfulness Inventory (Buchheld, Grossman, & Walach, 2001), Kentucky Inventory of Mindfulness (Baer, Smith, & Allen, 2004), Cognitive Affective Mindfulness Scale (Feldman, Hayes, Kumar, & Greeson, 2004; S. C. Hayes & Feldman, 2004), and the Mindfulness Questionnaire (Chadwick, Hember, Mead, Lilley, & Dagnan, 2005). This analysis yielded five facets of mindfulness: observing, describing, acting with awareness, nonreacting and non-judging. The observing facet refers to attending to experiences both internally and externally (e.g., “I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing”), but concerns about differential item functioning have led to recent critiques of this facet (Gu et al., 2016; Siegling, Furnham & Petrides, 2016; Siegling & Petrides, 2016; Van Dam, Earleywine & Danoff-Burg, 2009). Systematic differences in the observing facet have been found in meditating and non-meditating samples (Van Dam, Earleywine & Danoff-Burg, 2009), and emerging evidence suggests that the observing facet may not be valid measure of DM for individuals without a meditation history (Siegling, Furnham & Petrides, 2016; Siegling & Petrides, 2016). The describing facet reflects the use of words to label internal experiences (e.g., “I'm good at finding words to describe my feelings”). The acting with awareness facet denotes being present moment oriented during activities (e.g., “I am easily distracted” – reversed scored). The non-judging of inner experiences facet suggests being nonevaluative toward cognitive or emotional events (e.g., “I perceive my feelings and emotions without having to react to them”). The non-reactivity to inner experience facet indicates a metacognitive disengagement from aversive thoughts or feelings, allowing them to come and go without attempting to control them (e.g., “When I have distressing thoughts or images, I ‘step back,’ and I am aware of the thought or image without getting taken over by it”).

The nomological net surrounding DM is ripe for continued expansion and clarification. Such expansion is valuable for advancing theory and improving clinical practice. Insofar as evidence suggests that DM is salutary (e.g., Chiesa & Serreti, 2009; Eberth & Sedlmeier, 2012), pursuing a better understanding of DM and its psychological correlates may provide conceptual insights with potential therapeutic applications. The investigation of DM in relation to the Big Five personality factors may be one such valuable pursuit.

### **Personality as a Cybernetic System and Dispositional Mindfulness**

The delineation of personality domains has been shown to provide behavioral insights and lend predictive power in a variety of domains (e.g., Eysenck, 1998). Indeed, personality factors, such as those identified by the Big Five Model of Personality (BF), evidence strong predictive utility with respect to general well-being, relationship satisfaction, occupational attainment, and mortality (Ozer, 2006; Roberts, 2007). The BF is one of the most

empirically validated configurations of personality, consisting of extraversion, agreeableness, conscientiousness, openness to experience, and neuroticism (John, Naumann & Soto, 2008). Traditionally, these five personality factors have been conceptualized as distinct constructs. However, a recently proposed theory of personality, the Cybernetic Big Five Theory (CB5T; DeYoung, 2015), suggests that cybernetics provides a conceptual framework capable of integrating the BF. More specifically, the CB5T suggests that the BF function as behavioral parameters in the human cybernetic system.

Cybernetic systems are characterized by three primary qualities: 1) goal-directed behavior, 2) the sensory capacity to receive environmental feedback, and 3) the ability to adaptively respond to environmental feedback. The field of cybernetics arose from biological and technological investigations (von Bertalanffy, 1968; Wiener, 1948), but has also been usefully applied to the analysis of human behavior. DeYoung (2015) outlines basic cybernetic operations using a schematic cycle of five stages: 1) goal activation, 2) action selection, 3) action, 4) outcome interpretation, and 5) goal comparison. In the following sections, each of the personality factors will be linked to this model of cybernetic operations. However, it is important to emphasize that these stages rarely, if ever, operate linearly. Relations between these five stages of cybernetic operation are more appropriately characterized as simultaneous and dynamic. Thus, this stage model should be interpreted as a useful heuristic, designed to highlight the different functions that the human mind must accomplish, and not as an immutable structure. Furthermore, it should be expected that multiple personality factors will be relevant at each stage of the cybernetic cycle. However, for reasons of parsimony, the BF personality factors will be coupled with only their most prominent stages of the cybernetic cycle. For a more extensive exploration of the more complex relationships between the BF and the cybernetic stages see DeYoung (2015).

Previous research has examined associations between DM and five factors of personality (see Rau & Williams, 2016), although not from a cybernetic perspective. The following sections will provide brief descriptions of each of the BF factors of personality. Then, each personality factor's cybernetic role will be presented along with a brief discussion of how DM may influence that role.

**Extraversion**—Extraverted individuals are commonly characterized as “warm, outgoing and socially engaged” (Rau & Williams, 2016, p.36). From a cybernetic perspective, extraversion is conceived as the personality factor most closely linked with the cybernetic cycle's first stage: goal activation (DeYoung, 2015). Goals “govern information processing and behavior” (DeYoung, 2015, p.41) by signaling the possibility of a reward. A reward, from the cybernetic perspective, is any indication of goal relevant progress. Thus, extraversion appears to reflect the degree to which a reward may be sufficiently motivating.

Investigations of the relationship between extraversion and DM have yielded mixed results (Baer et al., 2006; Hollis-Walker, 2011; Karakashian, 2011; Ortner, 2007). However, positive relationships between extraversion and DM appear most common, and have been interpreted to result from both constructs evidencing positive associations with well-being and positive affect (Giluk, 2009; Rau & Williams, 2016). Well-being and positive affect are intimately linked with reward sensitivity. Functionally, well-being and positive affect are achieved by

responding to cues signaling the potential availability of a reward (e.g., Chiew & Braver, 2011). Extraverts are likely to be more sensitive to and motivated by such cues (DeYoung, 2015).

**Openness to Experience**—Individuals open to experience tend to be “attentive to and curious about their inner (i.e., emotions, thoughts) and outer (i.e., activities, foods, social values) experiences” (Rau & Williams, 2016, p.37). From a cybernetic perspective, openness is conceived as the personality factor most closely associated to the elements of the cybernetic cycle situated on either side of action: action selection and outcome interpretation (DeYoung, 2015). During the second stage of the cybernetic cycle, action selection, the most appropriate action is selected to further goal relevant progress. During the fourth stage, outcome interpretation, environmental feedback is processed to inform interpretation of the selected action’s impact on the current state of the world.

Applied to the cybernetic cycle, openness to experience plays a central role at two stages of the cycle. However, it appears to operate similarly at both points. Both the action selection and outcome interpretation stages are characterized by an examination (elaboration and synthesis) of behavioral or interpretative options, yielding greater behavioral and cognitive flexibility. Mindfulness has long been implicated in deautomatization – i.e., reinvesting conscious attention in behaviors which have become habitual (Deikman, 1966). Thus, DM may foster heightened involvement with decision making rather than reflexive engagement in overlearned, automatized routines. Indeed, DM has been linked with greater behavioral () and cognitive () flexibility. Greater breadth at the point of action selection would provide a wider range of behavioral options for goal attainment and flexible selection of alternative strategies should the initial action prove ineffective. Similarly, Greater breadth at the point of outcome interpretation would provide more interpretive possibilities. By increasing access to novel information, such cognitive breadth is likely to allow for more nuanced contextual appraisals, allowing for adaptive reconstrual of events to emerge from the multiple interpretive possibilities nested in any single event. Indeed, accumulating empirical evidence suggests that mindfulness may facilitate reappraisal by virtue of increasing openness to novel perceptual input and perspective taking (for a review, see Garland et al., 2015).

**Conscientiousness**—Conscientious individuals are likely to be “self-disciplined and deliberate ... described as dependable, responsible, rule-abiding, and achievement-oriented” (Rau & Williams, 2016, p.39). From a cybernetic perspective, conscientiousness is conceived as the personality factor most closely linked with the third stage of the cybernetic cycle: action (DeYoung, 2015). Thus, conscientiousness is proposed to function cybernetically as the protector of long-term, eudaimonic goals, along with the behavioral strategies supporting those goals. Simultaneously, conscientiousness is thought to limit the disruptive ability of short-term, appetitive goals.

Investigations of the relationship between conscientiousness and DM have yielded generally consistent results. Associations between the two constructs are typically positive and moderately strong (Giluk, 2009; Rau & Williams, 2016). Such consistency may be the result of conceptual similarities between the DM and conscientiousness. Specifically, metacognitive awareness and self-regulatory capacities characterize both constructs. Giluk



(2009) emphasizes that deliberate, intentional responding is the hallmark of both DM and conscientiousness as opposed to impulsive reactivity that may be expected for individuals low in conscientiousness or DM. Kabat-Zinn (1990) asserts that DM can be understood as the opposite of “autopilot”. Mindful behavior is marked by intention and awareness. As such, mindfulness appears closely linked with conscientiousness when characterized cybernetically as motivational stability.

**Neuroticism**—Neurotic individuals are inclined “to experience negative affect such as anxiety, hostility, depressed mood, and emotional sensitivity” (Rau & Williams, 2016, p.35). From a cybernetic perspective, neuroticism is conceived as the personality factor most closely linked with the cybernetic cycle's final stage: goal comparison (DeYoung, 2015). Goal comparison involves comparing the current state with the desired state to identify any discrepancies between desired and observed outcomes. Discrepancies signal errors that can range from trivial to profound. A more trivial discrepancy may simply signal that an inadequate behavioral strategy was previously selected. A more profound discrepancy may signal a fundamentally inadequate schemas of the self or the world (DeYoung, 2015). Mismatches between expected and observed outcomes are likely to trigger negative emotions and defensive responses (DeYoung, 2015). Broadly, neuroticism, within a cybernetic framework, indicates the degree to which discrepant goal comparisons elicit negative emotions and defensive responses.

Investigations of the relationship between neuroticism and DM have yielded generally consistent results. Neuroticism is the BF personality factor most strongly related with DM, most often investigated in conjunction with DM, and the only BF personality factor unequivocally negative in its association with DM (Giluk, 2009; Rau & Williams, 2016). The conceptual inverse of neuroticism can be understood as emotional stability (Giluk, 2009). Thus, a defining feature of neuroticism is reactivity (Suls & Martin, 2005; Rau & Williams, 2016); and, the reactivity characteristic of neuroticism may be attributed to self-regulatory deficits, both emotional and behavioral. Indeed, neurotic individuals tend to be highly attuned and sensitive to aversive stimuli, responding to threats with avoidance (e.g., Lommen, Engelhard & van den Hout, 2010). In contrast, self-regulation is a central feature of mindfulness, and emotion regulation is a core mechanism supporting self-regulation (Tang, Holzel & Posner, 2015). Both these mindful regulatory capacities are exhibited behaviorally as nonreactivity – a key facet of DM. Nonreactivity may allow more mindful individuals to better navigate the inevitability of discrepant goal comparisons and accompanying experiences of negative emotionality (e.g., Hill & Updegraff, 2012), suspending habitual scripts triggered by negative emotions and allowing for more adaptive, intentional behavioral responses (e.g., Vago & Silbersweig, 2012).

**Agreeableness**—Agreeable individuals can be described as “level-headed, considerate, and trusting in [their] approach to social relationships ... generally good-natured, cooperative, caring and concerned for others” (Rau & Williams, 2016, p.38). Agreeableness is also unique among the BF personality traits with respect to its cybernetic function. Agreeableness is not singularly linked with any specific stage of the cybernetic cycle. Instead, agreeableness is believed to impact all stages of the cybernetic cycle as individual

goals are enacted in a social context (DeYoung, 2015). Thus, cooperation is often necessary for the pursuit of personal goals. Personal goals must be balanced in relation to the goals of others, all of which are situated within larger social structures. DeYoung (2015) concludes that “the human cybernetic system is pervasively shaped by our sociality” (p.46)

Investigations of the relationship between agreeableness and DM have yielded generally consistent results. Associations between the two constructs are typically positive and moderately strong (Giluk, 2009; Rau & Williams, 2016). The qualities traditionally descriptive of agreeableness, introduced above, are resonant with prosocial qualities often associated with DM, such as empathy (Block-Lerner et al., 2007; Birnie, Speca & Carlson, 2010) and compassion (Neff, 2008; Neff & Germer, 2013). Such interpersonal tendencies may allow more mindful individuals to be more present and responsive in their social interactions.

## Summary

Continued investigation is needed to clarify relationships between DM and the BF. Both empirical and theoretical advancements may be instrumental in this pursuit. A number of new studies have been conducted since Giluk's (2009) original meta-analysis of DM and the BF. This larger body research allows for novel analytic inquiries. Thus, the present meta-analysis has three analytic aims: 1) update previous meta-analytic work exploring the relationships between DM and the BF by using a more uniform inclusion criteria with respect to the measurement of DM; 2) explore differences in the relationships between the BF and DM as measured by unidimensional and multidimensional measures of DM; 3) examine relationships between the BF and the five facets of mindfulness as delineated by the FFMQ. In addition, a new theoretical framework of personality has been proposed, capable of organizing the BF personality factors into an integrative, cybernetic cycle. Thus, this study has an additional theoretical aim: to ground the relationships between DM and the BF observed in the present meta-analysis in a five stage cybernetic cycle as detailed by the Cybernetic Big Five Theory (see Figure 1).

## Method

The analytic methods and inclusion criteria for this meta-analysis were identified in advance in accordance with the PRISMA Statement (Moher et al., 2009).

## Data Selection

A computerized database search was performed, using PsycINFO, PubMed, Web of Science, Academic Search Complete, and ProQuest Dissertations. Studies referencing dispositional mindfulness and the five facet model of personality were identified using the following search terms: mindfulness, dispositional mindfulness, personality, five facet, big five, extraversion, agreeableness, conscientiousness, openness to experience, neuroticism, and emotional stability. This search yielded 932 potential studies, including peer-reviewed journal articles as well as unpublished manuscripts and dissertations. Date of publication was not limited and studies from each database's first available date until March 11, 2016 were included. Abstracts from these studies were reviewed for relevance or duplication, and



186 studies with relevant or ambiguous abstracts were retained. Both ancestry and dependency searches were performed using Google Scholar, but these searches revealed no new studies. Studies from a previous meta-analysis (Giluk, 2009) and a recent review article (Rau & Williams, 2016) examining the relationship between dispositional mindfulness and the FFM were also carefully reviewed. Several studies addressed in the meta-analysis and review article were excluded from the current study to increase the precision of this analysis's measurement of mindfulness.

Ultimately, 45 original studies met the following inclusion criteria:

- The study described an empirical investigation
- The study evaluated the relationship between dispositional mindfulness and at least one of the five factors of personality
- Dispositional mindfulness was measured by either the Mindful Attention Awareness Scale (MAAS) or the Five Facet Mindfulness Questionnaire (FFMQ)
- The sample consisted of nonclinical, native English speaking adults
- The publication provided enough data to compute effect sizes

One of the selected studies reported relationships between DM and the FFM using both measure of DM in a single sample. Several other studies reported multiple samples within the same manuscript. These samples were scored separately, resulting in a final set of 46 independent samples from 38 manuscripts. Sample characteristics and measurement method for the final set of included studies is provided in Table 1.

### Efforts to Obtain Additional Data

For those studies deemed eligible but not including requisite information, (e.g., correlations between DM and the five personality factors), study authors were contacted by email. Study author's contact information was obtained from either the study manuscript, the authors' academic institution website, or from a Google search. The first authors of 13 manuscripts were contacted, with 9 (69%) providing usable data and 4 (31%) proving unable to be reached.

### Effect Size Calculation

The effect size Pearson  $r$  was used in this analysis. Effect sizes were calculated using a random effects model as the included studies were comprised of heterogeneous samples and multiple measures of DM and the FFM were used. As Pearson's  $r$  is not normally distributed,  $r$  values were transformed into Fisher's  $Z$  scores for the meta-analytic calculations and then converted back to  $r$  scores for reporting purposes (Quintana, 2015).

### Analysis Plan

Three sets of analysis were performed to address the relationships between DM and the FFM for 1) all identified studies of DM and the BF, 2) only those studies measuring DM with the MAAS, and 3) only those studies measuring DM with the FFMQ. Each set of analysis entailed five separate analyses, one for each personality factor. Five more sets of

analysis with 5 analyses in each set were performed examining the relationships between the five DM facets (observing, describing, acting with awareness, non-reacting, and non-judging) and the FFM.

## Results

Meta-analytic results from the full analysis, MAAS analysis, and FFMQ analysis are reported in Table 2. Meta-analytic results for the exploration of each mindfulness facet are reported in Table 3. Both tables also include tests of heterogeneity ( $I^2$ ,  $Tau^2$ ,  $Q$ ) and publication bias (Rank Correlation Test, Egger Test).

### Full Analysis

In the full analysis, DM evidenced the strongest relationship with neuroticism (-.47), followed by conscientiousness (.34) and agreeableness (.26). Extraversion (.17) and openness (.15) were found to be the least associated with DM when examining results from both measures of DM in tandem.

### MAAS vs. FFMQ

Differing patterns of association emerged across the five personality factors when compared across the two primary DM scales. The MAAS demonstrated relationships with the personality factors similar to the full analysis, with neuroticism (-.45), conscientiousness (.35), and agreeableness (.27) demonstrating the strongest relationships with this unidimensional measure of DM. In comparison with the MAAS, the FFMQ evidenced a stronger negative relationship with neuroticism (-.55) as well as stronger positive relationships with extraversion (.29) and openness to experience (.25). Similar magnitudes of association with conscientiousness (MAAS = .35; FFMQ = .33) and agreeableness (MAAS = .27; FFMQ = .22) were observed in both the MAAS and FFMQ analyses.

### Mindfulness Facet Analysis

The mindfulness facets were differentially related to the personality factors. Both extraversion and agreeableness demonstrated similar patterns of association across all five DM facets, demonstrating significant, positive associations with each facet while being most strongly associated with the describing facet (extraversion = .30, agreeableness = .20). The remaining four mindfulness facets demonstrated relatively similar associations for both extraversion (.10 to .16) and agreeableness (.13 to .18). Neuroticism and conscientiousness were significantly associated with four of the five mindfulness facets, with neither demonstrating a relationship with the mindfulness facet observing. Neuroticism demonstrated the strongest levels of association across three mindfulness facets: acting with awareness (-.40), non-reacting (-.42), and nonjudging (-.55). Conscientiousness was primarily related to the acting with awareness mindfulness facet (.50), demonstrating relatively equivalent associations with the remaining three mindfulness facets (.18 to .24). Openness to experience was the personality factors least associated with the mindfulness facets, evidencing significant relationships with only three mindfulness facets. The observing mindfulness facet demonstrated the strongest association with openness to experience (.40).

## Discussion

This meta-analysis of the relationships between DM and the BF found DM to be associated with each of the five personality factors in distinct ways. These relationships were examined at three levels of granularity: 1) the *full analyses* including the two most common measure of DM, 2) the *scale specific analyses* in which the most common unidimensional (MAAS) and multidimensional (FFMQ) measures of DM were explored individually in relation to the BF, and 3) the *facet level analyses* in which the relationships between the FFMQ's five facets of mindfulness are examined in relation with the BF. Results from the full analyses replicate an earlier meta-analysis (Giluk, 2009) and are resonant with a more recent systematic review of mindfulness and personality (Rau & William's, 2016). The scale specific analyses and the mindfulness facet analyses reflect novel contributions towards the effort to more fully characterize the relationship between the BF and DM. Additionally, interpreting the relationships between DM and the BF within a cybernetic framework represent novel, theoretical contributions from this study.

### Full Analysis

Examining both mindfulness measures conjointly revealed associations between the BF and DM consistent with Giluk's (2009) results. Neuroticism demonstrated the strongest, negative relationship with DM, while conscientiousness demonstrated the strongest, positive relationship. Agreeableness evidenced a moderately strong association with DM. Openness to experience and extraversion were only minimally associated with DM. Taken together, the mindful personality emerging from all included studies is characterized principally by emotional stability and conscientious self-regulation, with a tendency towards prosociality.

From a cybernetic perspective, mindfulness appears particularly relevant for the later stages of the cybernetic cycle, action (the third stage) and goal comparison (the fifth stage). Results suggest that more mindful individuals are more likely to maintain motivational stability in the pursuit of meaningful goals. Results further suggest that more mindful individuals are less likely to react defensively in response to uncertainty, threat and punishment – a proclivity that is likely to support the pursuit of long-term goals. The observed correlations between DM, extraversion, and openness to experience suggest that mindfulness is only modestly related to the earlier cybernetic stages of goal activation and action selection as well as the fourth stage of outcome interpretation. Possibly, mindful individuals may be more likely to be sensitive to rewards suggestive of eudaimonic ends. Furthermore, more mindful individuals are likely to have access to a broader range of behavioral options in pursuing their goals and a broader cognitive range in interpreting the outcome of their actions. Finally, more mindful individuals are more likely to be prosocial in their goal relevant pursuits, evidencing a willingness to coordinate their goals with others.

Examined holistically, these patterns of association suggest that DM may be better understood as correlate of personality metatraits. Factor analytic research on the BF has yielded two higher order metatraits: stability and plasticity (DeYoung, 2015). These metatraits are believed to capture fundamental attributes required for cybernetic systems to navigate the natural world and adapt to an ever changing environment. The CB5T therefore identifies these two metatraits as the broadest categorization of personality (DeYoung,

2015). The metatrait of stability, or the tendency to protect goals and beliefs from disruptive impulses, subsumes the factors of neuroticism (low), conscientiousness, and agreeableness (DeYoung, 2015). Viewed as elements of stability, these three personality factors can be alternatively conceptualized as emotional stability, motivational stability, and social stability, respectively. The metatrait of plasticity, or the tendency to explore and create new goals and beliefs, subsumes the factors of extraversion and openness. Viewed as elements of plasticity, these two personality factors can be alternatively conceptualized as reflecting tendencies toward behavioral exploration and cognitive exploration, respectively.

DM's associations with emotional stability, conscientiousness, and agreeableness may suggest that DM is closely related to the stability metatrait. Stability reflects the ability to maintain goal-relevant pursuit despite distracting impulses (DeYoung, 2015), a capacity very similar to the equanimous, non-reactive stance characterizing DM. However, mindfulness does not appear to be exclusively associated with stability. Associations were also observed between DM and the two personality factors constituting the plasticity metatrait, extraversion (i.e., behavioral exploration) and openness (i.e., cognitive exploration). These associations suggest that mindful individuals are unlikely to rigidly avoid anomalous or novel experiences, remaining open to both cognitive and behavioral exploration. Nevertheless, DM is much more closely associated with stability than plasticity, comparatively. The metatraits are conceived as the broadest dimension of personality as well as the principle means of survival for cybernetic systems endeavoring to maintain homeostasis in an unpredictable world (DeYoung, 2014). These results coupled with theoretical claims appear to suggest that mindfulness may be positioned at the intersection of stability and plasticity. Indeed, mindfulness has long been touted as a skillful means of maintaining equanimity in the face of suffering inherent in life (Rahula, 1959). While this study suggests a potential link between DM and the personality metatraits, future studies are encouraged to empirically test this proposed relationship through latent variable modeling approaches.

### Scale Specific Analyses

Moving beyond replication of previous findings, this meta-analysis sought to address previous concerns about the impact of measurement decisions on the relationships between DM and the BF (Giluk, 2009; Rau & Williams, 2016). Measurement concerns were expressly highlighted in Giluk's (2009) previous meta-analysis. Findings from this study indicate notable differences in the associations between the two most common measures of DM, the MAAS and the FFMQ, and the BF. Associations between the MAAS and the BF largely reflect the patterns of association observed in the full meta-analysis. However, slightly weaker associations between the MAAS and both extraversion as well as openness to experience emerged when the MAAS was examined in isolation. The mindful personality delineated by the MAAS, therefore, is quite consistent with the mindful personality described above: emotionally stable, self-regulating and sociable. Cybernetically, emotional, motivational and social stability appear to support the maintenance of goal relevant actions while limiting negative emotionality and defensive responses to uncertainty or adversity.

The FFMQ, in contrast, demonstrated noticeably stronger relationships with neuroticism, extraversion and openness. With respect to conscientiousness and agreeableness, similar magnitudes of association were observed regardless of whether mindfulness was measured with the FFMQ or MAAS. Thus, the mindful personality arrived at through the FFMQ differs considerably from the mindful personality emerging from the MAAS and from the full analysis combining both scales. The mindful personality delineated by the FFMQ suggests an individual with considerable emotional stability along with pronounced tendencies towards self-regulation, and prosociality. This constellation of personality features is very similar to the highly stable personality linked to the MAAS. However, in addition to stability, the personality delineated by the FFMQ also suggests an individual with more pronounced tendencies towards extraversion and openness. Thus, plasticity is considerably more present in the FFMQ's mindful personality, displaying greater tendencies toward behavioral and cognitive exploration. Open, active engagement with life is consistent with classic psychological operationalizations of mindfulness that acknowledge the role of curiosity and receptivity to experience in mindful attention and awareness (Lau et al., 2006; Bishop et al., 2004). In that regard, the practice of mindfulness has been linked with increased openness to experience and extraversion (van den Hurk et al., 2011).

Broadly, the mindful personality associated with the FFMQ appears to reflect greater personality complexity. The FFMQ evidenced associations with all 5 personality factors, capturing associations with both personality metatraits along with association with all five stages of the cybernetic cycle. Comparatively, the MAAS appears primarily linked with only three personality factors, reflecting only the stability metatrait and being primarily situated in the latter half of the cybernetic cycle. Discussion of the FFMQ's facet level meta-analyses may provide some insight into differences in personality emerging between the two measures.

### **Mindfulness Facet Analyses**

Unique patterns of association between the DM facets and each of the personality factors were revealed by examining these interrelationships. Conscientiousness and extraversion each were associated with a single mindfulness facet. In contrast, neuroticism and openness to experience were associated with two distinct clusters of mindfulness facets. Finally, agreeableness evidenced relatively equivalent magnitudes of association across all five DM facets.

*Conscientiousness*, the BF personality factor most closely related with the action stage of the cybernetic cycle, was primarily associated with the DM facet acting with awareness. Thus, individuals more likely to act intentionally are also more likely to be self-disciplined and responsible. Both constructs reflect the capacity to sustain attention on a particular task as well as a metacognitive capacity to reorient attention back to task when distracted.

*Extraversion* was primarily associated with the describing DM facet. Thus, individuals more capable of discriminating between internal states are also more likely to be responsive to the possibility of rewards. This conclusion is resonant with predictions from the CB5T. The mindful ability to identify cognitive and emotional states may allow more mindful individuals to respond to internal and external cues suggestive of rewarding possibilities.

*Neuroticism* appears uniquely associated with the three DM facets denoting mindful self-regulation: acting with awareness, non-reacting, and non-judging. The larger pattern of association between the DM facets and neuroticism suggest that individuals reporting greater facility with self-regulation, measured behaviorally and cognitively, demonstrate greater emotional stability. *Openness to experience* was most strongly associated with the self-awareness DM facets, observing and describing. Thus, the tendency to observe internal and external experiences while also differentiating between internal states is suggestive of greater openness and curiosity about experience. Greater self-awareness may contribute to a more fluid knowledge of behavioral options in stage two of the cybernetic cycle, action selection. Furthermore, greater self-awareness would likely increase the range of interpretative options available in stage four of the cybernetic cycle, outcome interpretation. More generally, attention to internal and external events may allow more mindfully observant and descriptive individuals to more quickly identify discrepancies between their expectations and outcomes to facilitate goal pursuit. *Agreeableness*, in contrast, evidenced relatively equivalent magnitudes of association across all five DM facets. It appears that the mindfulness facets may work in concert, engaging both mindful self-awareness along with mindful self-regulation, to support social stability.

**Limitations**—While these results appear to be broadly consonant with previous findings and relatively consistent with theoretical expectations, limitations of this meta-analysis should be noted and considered when interpreting the results. First, considerable variability in the measurement of the BF was observed in this meta-analysis, with some scales consisting of only 10 items (e.g., Philip et al., 2010; Plaut et al., 2012), some scales using only adjectives (Kong et al., 2015), and others consisting of over 50+ items (Niemic et al., 2010; Earley et al., 2011). While each personality measure included in this meta-analysis was psychometrically sound and established within the personality literature, it is likely that different personality measures relate differently to DM. Future studies may be able to attend to specific personality measures along with specific DM measures. Second, sample characteristics should be taken into consideration when thinking about the generalizability of these results. Only native English speakers were included in this meta-analysis to limit psychometric considerations potentially arising from translation. Hence, these results may not generalize cross-culturally. Also limiting generalizability, the majority of respondents in the included studies were WEIRD (Henrich, Heine & Norenzayan, 2010), disproportionately young adult female. Third, a lack of information on participants' involvement with mindfulness practice may be another limitation as noticeable differences in the relationship between DM and the BF have been reported between individuals practicing mindfulness and those that do not (Van Dam, Earleywine & Danoff-Burg, 2009); and, evidence suggests that involvement with a mindfulness practice can impact personality presentation (e.g., van den Hurk, et al., 2011). Attending to practice involvement in future studies addressing DM and personality would likely account for a potential confounding variable. Fourth, a lack of heterogeneity in a few of the facet level analyses suggest that interpretation of results at the facet level should be done with caution and that continued exploration at this level of analysis is warranted. Finally, these results may be systematically biased as associations between DM and the BF were only derived from studies using the same method of measurement, self-report. As social desirability is differentially linked with the BF



(Bäckström & Björklund, 2013), and presumably with DM as well, sources of variance other than the focal constructs could be accounting for (differences in) the observed associations. Future studies employing alternative measurement strategies are needed to corroborate these results.

**Summary**—Exploring relationships between DM and the BF emerging from specific measures of DM suggest that measurement decisions may be contributing to inconsistent results. Exploration at the facet level, providing further specificity, suggests that underlying differences in the associations between the BF differ between the two most common measure of DM. Scale specific analyses and facet level analyses suggest systematic differences in the relation between DM and the BF, likely contributing to discrepant results reported in the mindfulness literature. Differentiation of associative patterns at the facet level provide some insight into the cognitive and behavioral tendencies nested in the mindful disposition that manifest as particular personality characteristics. However, given the cross-sectional nature of this meta-analysis, posting a causal or directional claim is hazardous. Nevertheless, directional claims have been supported by experimental studies, with some researchers suggesting that personality factors may predispose certain individuals to either embrace or reject mindfulness practices (e.g., Tucker et al., 2014), while other researchers have provided evidence that mindfulness meditation can adjust personality reports (e.g., Crescentini & Capruso, 2015).

Given evidence of the malleability of both DM (e.g., Carmody & Baer, 2008) and personality (e.g., MacLean et al., 2011 Roberts, Walton & Viechtbauer, 2006), continued exploration of the relationship between DM and personality would likely be beneficial. Pragmatically, individuals identified as possessing personality traits inconsistent with DM could be targeted with early mindfulness-based interventions as a selective prevention strategy. Alternatively, individuals evidencing personality qualities attuned with the more mindful personality traits may be excellent candidates for mindfulness-based interventions or for engagement in long-term contemplative practice. Ultimately, continued exploration of associations between DM and personality at the facet level may afford a “personalized medicine” approach to mindfulness training, by providing a means of tailoring mindfulness techniques to specific personality profiles as a means of boosting clinical outcomes. For instance, targeting the development of greater behavioral and cognitive regulation skills may be particularly helpful in reducing neuroticism and thereby decrease the risk of developing future affective disorders. Or, learning mindfulness skills promoting the tendency to be descriptive of experience may allow individuals to be more outgoing or extraverted, with consequent prosocial benefits. These causal hypotheses could be tested empirically with studies utilizing mindfulness based interventions.

## Acknowledgments

Eric Garland was supported in the preparation of this manuscript by Grant R34DA037005 from NIDA.

## References

References marked with an asterisk indicate studies included in the meta-analysis.

- Bäckström M, Björklund F. Social desirability in personality inventories: Symptoms, diagnosis and prescribed cure. *Scandinavian Journal of Psychology*. 2013; 54(2):152–159. [PubMed: 23252410]
- \*. Baer RA, Smith GT, Hopkins J, Krietemeyer J, Toney L. Using self-report assessment methods to explore facets of mindfulness. *Assessment*. 2006; 13(1):27–45. [PubMed: 16443717]
- Baer RA, Lykins EL, Peters JR. Mindfulness and self-compassion as predictors of psychological well-being in long-term meditators and matched nonmeditators. *The Journal of Positive Psychology*. 2012; 7(3):230–238.
- Barnes S, Brown KW, Krusemark E, Campbell WK, Rogge RD. The role of mindfulness in romantic relationship satisfaction and responses to relationship stress. *Journal of Marital and Family Therapy*. 2007; 33(4):482–500. [PubMed: 17935531]
- \*. Barnhofer T, Duggan DS, Griffith JW. Dispositional mindfulness moderates the relation between neuroticism and depressive symptoms. *Personality and Individual Differences*. 2011; 51(8):958–962. [PubMed: 22180693]
- Bateson, G. *Steps to an ecology of mind: Collected essays in anthropology, psychiatry, evolution, and epistemology*. University of Chicago Press; 1972.
- Bergomi C, Tschacher W, Kupper Z. The assessment of mindfulness with self-report measures: Existing scales and open issues. *Mindfulness*. 2013; 4(3):191–202.
- Birnie K, Speca M, Carlson LE. Exploring self-compassion and empathy in the context of mindfulness-based stress reduction (MBSR). *Stress and Health*. 2010; 26(5):359–371.
- Block-Lerner J, Adair C, Plumb JC, Rhatigan DL, Orsillo SM. The case for mindfulness based approaches in the cultivation of empathy: Does nonjudgmental, present-moment awareness increase capacity for perspective taking and empathic concern? *Journal of Marital and Family Therapy*. 2007; 33(4):501–516. [PubMed: 17935532]
- Bodhi B. What does mindfulness really mean? A canonical perspective. *Contemporary Buddhism*. 2011; 12(01):19–39.
- \*. Brown KW, Ryan RM. The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*. 2003; 84(4):822–848. [PubMed: 12703651]
- \*. Brown KW, Goodman RJ, Inzlicht M. Dispositional mindfulness and the attenuation of neural responses to emotional stimuli. *Social Cognitive and Affective Neuroscience*. 2012; 8:93–99. [PubMed: 22253259]
- Buchheld N, Grossman P, Walach H. Measuring mindfulness in insight meditation (Vipassana) and meditation-based psychotherapy: The development of the Freiburg Mindfulness Inventory (FMI). *Journal for Meditation and Meditation Research*. 2001; 1(1):11–34.
- Carmody J, Baer RA. Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine*. 2008; 31(1):23–33. [PubMed: 17899351]
- Carson JW, Carson KM, Gil KM, Baucom DH. Mindfulness-based relationship enhancement. *Behavior Therapy*. 2004; 35(3):471–494.
- Chadwick P, Hember M, Mead S, Lilley B, Dagnan D. Responding mindfully to unpleasant thoughts and images: Reliability and validity of the Mindfulness Questionnaire. Unpublished manuscript. 2005
- \*. Chavers DJ. Relationships between spirituality, religiosity, mindfulness, personality, and resilience (Doctoral Dissertation). University of South Alabama. 2013
- Chiesa A, Serretti A. Mindfulness-based interventions for chronic pain: A systematic review of the evidence. *The Journal of Alternative and Complementary Medicine*. 2011; 17(1):83–93. [PubMed: 21265650]
- Chiew KS, Braver TS. Positive affect versus reward: emotional and motivational influences on cognitive control. *Cognitive and Affective Control*. 2011; 30:1–10.
- Coatsworth JD, Duncan LG, Greenberg MT, Nix RL. Changing parent's mindfulness, child management skills and relationship quality with their youth: Results from a randomized pilot intervention trial. *Journal of Child and Family Studies*. 2010; 19(2):203–217. [PubMed: 24013587]

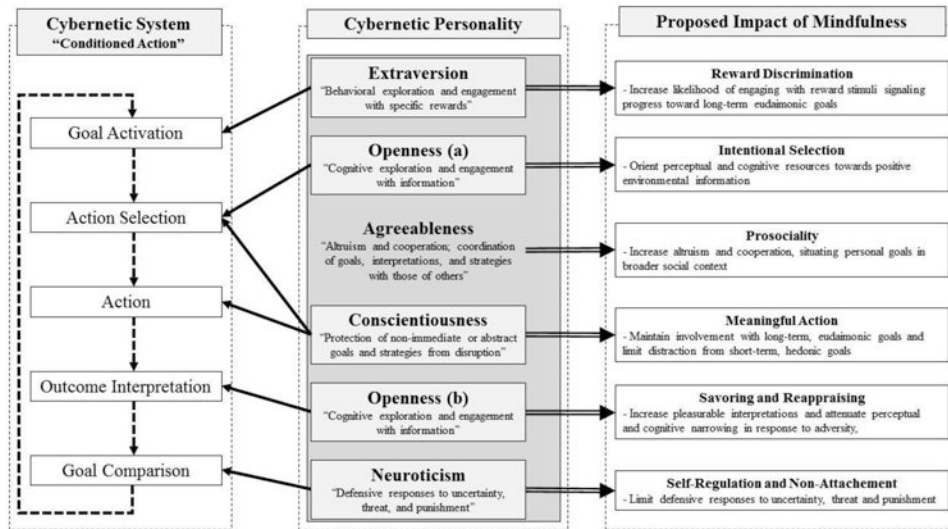
- Crescentini C, Capurso V. Mindfulness meditation and explicit and implicit indicators of personality and self-concept changes. *Frontiers in Psychology*. 2015; 6:44. [PubMed: 25688222]
- Deikman AJ. De-automatization and the Mystic Experience. *Psychiatry. Journal for the Study of Interpersonal Processes*. 1966; 29(4):324–338.
- DeYoung CG. Cybernetic big five theory. *Journal of Research in Personality*. 2015; 56:33–58.
- Dreyfus G. Is mindfulness present-centred and non-judgmental? A discussion of the cognitive dimensions of mindfulness. *Contemporary Buddhism*. 2011; 12(01):41–54.
- \*. Earley, MD. An internet-based study of associations between personality, spirituality, and trait mindfulness (Doctoral dissertation). University of Maryland; Baltimore County: 2011.
- Eberth J, Sedlmeier P. The effects of mindfulness meditation: A meta-analysis. *Mindfulness*. 2012; 3(3):174–189.
- \*. Eisenlohr-Moul TA, Walsh EC, Charnigo RJ, Lynam DR, Baer RA. 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*. 2012; 19(3):276–86. [PubMed: 22589412]
- Eysenck, HJ. *Dimensions of Personality*. Vol. 5. New Brunswick, New Jersey: Transaction Publishers; 1998.
- Feldman GC, Hayes AM, Kumar SM, Greeson JM, Laurenceau JP. Development, factor structure, and initial validation of the Cognitive and Affective Mindfulness Scale. Unpublished manuscript. 2004
- \*. Feltman R, Robinson MD, Ode S. Mindfulness as a moderator of neuroticism–outcome relations: A self-regulation perspective. *Journal of Research in Personality*. 2009; 43(6):953–961.
- \*. Fetterman AK, Robinson MD, Ode S, Gordon KH. Neuroticism as a risk factor for behavioral dysregulation: A mindfulness-mediation perspective. *Journal of Social and Clinical Psychology*. 2010; 29(3):301–321.
- Fletcher L, Hayes SC. Relational frame theory, acceptance and commitment therapy, and a functional analytic definition of mindfulness. *Journal of Rational-Emotive and Cognitive-Behavior Therapy*. 2005; 23(4):315–336.
- Garland EL, Farb NA, R Goldin P, Fredrickson BL. Mindfulness broadens awareness and builds eudaimonic meaning: a process model of mindful positive emotion regulation. *Psychological Inquiry*. 2015; 26(4):293–314. [PubMed: 27087765]
- Garland EL, Hanley A, Farb NA, Froeliger B. State mindfulness during meditation predicts enhanced cognitive reappraisal. *Mindfulness*. 2015; 6(2):234–242. [PubMed: 26085851]
- Giluk TL. Mindfulness, big five personality, and affect: A meta-analysis. *Personality and Individual Differences*. 2009; 47(8):805–811.
- \*. Gootzeit, JH. ACT process measures: specificity and incremental value (Doctoral Thesis). University of Iowa; Iowa City: 2014.
- Grossman P, Niemann L, Schmidt S, Walach H. Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research*. 2004; 57(1):35–43. [PubMed: 15256293]
- Gu J, Strauss C, Crane C, Barnhofer T, Karl A, Cavanagh K, Kuyken W. Examining the factor structure of the 39-item and 15-item versions of the Five Facet Mindfulness Questionnaire before and after mindfulness-based cognitive therapy for people with recurrent depression. *Psychological Assessment*. 2016; 28(7):791–802. [PubMed: 27078186]
- \*. Hanley AW. The mindful personality: Associations between dispositional mindfulness and the Five Factor Model of personality. *Personality and Individual Differences*. 2016; 91:154–158.
- Hanley AW, Garland EL. Dispositional mindfulness co-varies with self-reported positive reappraisal. *Personality and Individual Differences*. 2014; 66:146–152. [PubMed: 24904191]
- Hanley A, Garland E, Canto A, Warner A, Hanley R, Dehili V, Proctor A. Dispositional mindfulness and bias in self-theories. *Mindfulness*. 2015; 6(2):202–207.
- Hanley A, Warner A, Garland EL. Associations between mindfulness, psychological well-being, and subjective well-being with respect to contemplative practice. *Journal of Happiness Studies*. 2015; 16(6):1423–1436.

- Hayes AM, Feldman G. Clarifying the construct of mindfulness in the context of emotion regulation and the process of change in therapy. *Clinical Psychology: Science and Practice*. 2004; 11(3):255–262.
- Hayes, SC., Follette, VM., Linehan, M. *Mindfulness and acceptance: Expanding the cognitive-behavioral tradition*. New York: Guilford Press; 2004.
- Henrich J, Heine SJ, Norenzayan A. The weirdest people in the world? *Behavioral and Brain Sciences*. 2010; 33(2-3):61–83. [PubMed: 20550733]
- Hill CL, Updegraff JA. Mindfulness and its relationship to emotional regulation. *Emotion*. 2012; 12(1): 81–90. [PubMed: 22148996]
- \* Hollis-Walker L, Colosimo K. Mindfulness, self-compassion, and happiness in non-meditators: A theoretical and empirical examination. *Personality and Individual Differences*. 2011; 50(2):222–227.
- John, OP., Naumann, LP., Soto, CJ. Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues. In: John, OP., Robins, RW., Pervin, LA., editors. *Handbook of personality: Theory and Research*. New York: Guilford Press; 2008. p. 114-158.
- Jones KC, Welton SR, Oliver TC, Thorburn JW. Mindfulness, spousal attachment, and marital satisfaction: A mediated model. *The Family Journal*. 2011; 19(4):357–361.
- Kabat-Zinn, J. *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness: Fifteenth anniversary edition*. New York: Bantam Dell; 2005.
- \* Karakashian, M. The University of Memphis. 2011. *The predictive utility of mindfulness, experiential avoidance and values-based action for well-being in college students (Doctoral Dissertation)*.
- \* Klockner, K., Hicks, R. Individual Mindfulness, Cognitive Failures and Personality (the Big Five) in a Workplace Sample. First International Conference on Mindfulness; Rome, Italy. 2013, May, 8-12; 2013.
- \* Kong DT. The role of mindfulness and neuroticism in predicting acculturative anxiety forecasting error. *Mindfulness*. 2015; 6(6):1387–1400.
- \* Kostanski, M. Paper presented at the annual conference of the Australian Association for Research in Education. Fremantle; 2007. *The role of mindfulness in reducing stress for pre-service students*.
- \* Latzman RD, Masuda A. Examining mindfulness and psychological inflexibility within the framework of Big Five personality. *Personality and Individual Differences*. 2013; 55(2):129–134.
- Lommen MJ, Engelhard IM, van den Hout MA. Neuroticism and avoidance of ambiguous stimuli: Better safe than sorry? *Personality and Individual Differences*. 2010; 49(8):1001–1006.
- MacLean KA, Johnson MW, Griffiths RR. Mystical experiences occasioned by the hallucinogen psilocybin lead to increases in the personality domain of openness. *Journal of Psychopharmacology*. 2011; 25(11):1453–1461. [PubMed: 21956378]
- Macy, J. *Mutual causality in Buddhism and general systems theory: The dharma of natural systems*. Albany, NY: SUNY Press; 1991.
- \* McGarvey, MK. *Mindfulness practices and emotional development in adult life: a developmental framework for research and teaching (Doctoral Dissertation)*. Harvard University; 2010.
- Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Annals of Internal Medicine*. 2009; 151(4):264–269. [PubMed: 19622511]
- Neff, KD. Self-compassion: Moving beyond the pitfalls of a separate self-concept. In: Bauer, KD., Waymants, HA., editors. *Transcending self-interest: Psychological explorations of the quiet ego*. Washington, DC: APA Books; 2008. p. 95-106.
- Neff KD, Germer CK. A pilot study and randomized controlled trial of the mindful self compassion program. *Journal of Clinical Psychology*. 2013; 69(1):28–44. [PubMed: 23070875]
- \* Niemiec CP, Brown KW, Kashdan TB, Cozzolino PJ, Breen WE, Levesque-Bristol C, Ryan RM. Being present in the face of existential threat: The role of trait mindfulness in reducing defensive responses to mortality salience. *Journal of Personality and Social Psychology*. 2010; 99(3):442–452.

- \*. O'Loughlin RE, Zuckerman M. Mindfulness as a moderator of the relationship between dehydroepiandrosterone and reported physical symptoms. *Personality and Individual Differences*. 2008; 44(5):1193–1202.
- \*. Ortner CN, Kilner SJ, Zelazo PD. Mindfulness meditation and reduced emotional interference on a cognitive task. *Motivation and Emotion*. 2007; 31(4):271–283.
- Ozer DJ, Benet-Martinez V. Personality and the prediction of consequential outcomes. *Annual Reviews Psychology*. 2006; 57:401–421.
- Paul-Labrador M, Polk D, Dwyer JH, Velasquez I, Nidich S, Rainforth M, et al. Merz CNB. Effects of a randomized controlled trial of transcendental meditation on components of the metabolic syndrome in subjects with coronary heart disease. *Archives of internal Medicine*. 2006; 166(11): 1218–1224. [PubMed: 16772250]
- \*. Philip, AC. More Than Meditation: The Role of Dispositional Mindfulness in Alcohol and Marijuana-Related Problems (Doctoral Dissertation). Auburn University; 2010.
- \*. Plaut VC, Bartlett RP III. Blind consent? A social psychological investigation of non-readership of click-through agreements. *Law and Human Behavior*. 2012; 36:293(4)
- Quintana DS. From pre-registration to publication: a non-technical primer for conducting a meta-analysis to synthesize correlational data. *Frontiers in Psychology*. 2015; 6:1–9. [PubMed: 25688217]
- R hula, W. What the Buddha Taught. New York: Grove Press; 1974.
- Rau HK, Williams PG. Dispositional mindfulness: a critical review of construct validation research. *Personality and Individual Differences*. 2016; 93:32–43.
- Roberts BW, Kuncel NR, Shiner R, Caspi A, Goldberg LR. The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives on Psychological Science*. 2007; 2(4):313–345. [PubMed: 26151971]
- Roberts BW, Walton KE, Viechtbauer W. Patterns of mean-level change in personality traits across the life course: a meta-analysis of longitudinal studies. *Psychological Bulletin*. 2006; 132(1):1–25. [PubMed: 16435954]
- \*. Rush, CL. Mindfulness Mediates Neuroticism as a Predictor of Self-Control and Impulsivity: Potential Implications for Behavioral Regulation (Master's Thesis). American University; 2013.
- \*. Schnitker, SA., Emmons, RA. Patience as a virtue: Religious and psychological perspectives. In: Piedmont, RL., editor. *Research in the Social Scientific Study of Religion*. Vol. 18. Brill: Academic Publishers; 2007. p. 177-208.
- \*. Schurtz, DR. Mindfulness as a possible means of coping with envy (Doctoral Dissertation). University of Kentucky; 2011.
- \*. Siegling AB, Petrides KV. Measures of trait mindfulness: Convergent validity, shared dimensionality, and linkages to the five-factor model. *Frontiers in Psychology*. 2013; 5:1164–1164.
- Siegling AB, Furnham A, Petrides KV. Facet Benchmarking: Advanced application of a new instrument refinement method. *Personality and Individual Differences*. in press.
- Siegling AB, Petrides KV. Zeroing in on mindfulness facets: Similarities, validity, and dimensionality across three independent measures. *PLOSOne*. 2016; 11(4):e0153073.
- Suls J, Martin R. The daily life of the garden variety neurotic: Reactivity, stressor exposure, mood spillover, and maladaptive coping. *Journal of Personality*. 2005; 73(6):1485–1510. [PubMed: 16274443]
- Tang YY, Hölzel BK, Posner MI. The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience*. 2015; 16(4):213–225. [PubMed: 25783612]
- \*. Taren AA, Creswell JD, Gianaros PJ. Dispositional mindfulness co-varies with smaller amygdala and caudate volumes in community adults. *PLoS One*. 2013; 8(5):e64574. [PubMed: 23717632]
- \*. Thompson BL, Waltz JA. Mindfulness, self-esteem, and unconditional self-acceptance. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*. 2008; 26(2):119–126.
- \*. Tucker RP, O'Keefe VM, Cole AB, Rhoades-Kerswill S, Hollingsworth DW, Helle AC, et al. Wingate LR. Mindfulness tempers the impact of personality on suicidal ideation. *Personality and Individual Differences*. 2014; 68:229–233.

- Vago DR, Silbersweig DA. Self-awareness, self-regulation, and selftranscendence (S-ART): a framework for understanding the neurobiological mechanisms of mindfulness. *Frontiers in Human Neuroscience*. 2012; 6:1–30. [PubMed: 22279433]
- van Dam NT, Earleywine M, Danoff-Burg S. Differential item function across meditators and non-meditators on the Five Facet Mindfulness Questionnaire. *Personality and Individual Differences*. 2009; 47(5):516–521.
- van den Hurk PA, Wiggins T, Giommi F, Barendregt HP, Speckens AE, van Schie HT. On the relationship between the practice of mindfulness meditation and personality—an exploratory analysis of the mediating role of mindfulness skills. *Mindfulness*. 2011; 2(3):194–200. [PubMed: 21909341]
- Von Bertalanffy, L. *General System Theory*. New York, NY: Braziller; 1968.
- \*. Walsh JJ, Balint MG, SJ DRS, Fredericksen LK, Madsen S. Predicting individual differences in mindfulness: The role of trait anxiety, attachment anxiety and attentional control. *Personality and Individual Differences*. 2009; 46(2):94–99.
- \*. Waters CG. *Personality and dissociation: Evidence from a slide-viewing physiology paradigm (Doctoral Dissertation)*. North Dakota State University. 2006
- \*. Way BM, Creswell JD, Eisenberger NI, Lieberman MD. Dispositional mindfulness and depressive symptomatology: correlations with limbic and self-referential neural activity during rest. *Emotion*. 2010; 10(12):1012–1013.
- \*. Westbrook, M. Eastern Kentucky University. 2013. *The Impact of Personality, Mindfulness, And Symptoms on Response to Brief Meditation (Master's Thesis)*.
- Wiener, N. *Cybernetics: Control and communication in the animal and the machine*. New York: Wiley; 1948.
- \*. Williams, JC. *Development of a multifaceted acceptance scale: Construction and initial validation (Master's Thesis)* Binghamton University. State University of New York; 2007.
- \*. Wupperman P, Neumann CS, Axelrod SR. Do deficits in mindfulness underlie borderline personality features and core difficulties? *Journal of Personality Disorders*. 2008; 22(5):466–482. [PubMed: 18834295]
- \*. Yang, T. *Why and When Does a Mindfulness Intervention Promote Job Performance? The Interpersonal Mechanisms and Individual, Job, and Social Contingencies (Doctoral dissertation)*. University of Minnesota; 2015.
- \*. Zabelina DL, Robinson MD, Ostafin BD, Council JR. Manipulating mindfulness benefits creative elaboration at high levels of neuroticism. *Empirical Studies of the Arts*. 2011; 29(2):243–255.





**Figure 1.** Proposed Relationships between the Cybernetic System, Cybernetic Personality and Mindfulness. Quotations from DeYoung, 2015.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 1

Overview of Included Studies

#	Author	Year	Sample	N	Age	Female	Personality Measure	Extra	Agree	Consc	Open	Neuro
Mindful Attention and Awareness Scale												
1	Baer	2006	Undergraduate Psychology Students	613	21	70%	NEO-FFI	-.08	-	-	.23	-.41
2	Brown	2012	Introductory Psychology Students	34	22	61%	NEO-FFI	-	-	-	-	-.44
3	Brown_1	2003	University Students	313	20	66%	NEO-PI	-	-	-	.18	-.56
3	Brown_2	2003	University Students	187	20	62%	NEO-FFI	-	-	-	.12	-.33
3	Brown_3	2003	University Students	145	20	64%	NEO-FFI	-	-	-	.19	-.56
4	Chavers (T)	2013	Adults over 22	208	46	80%	NEO-FFI	.24	.40	.30	.09	-.53
5	Earley (T)	2011	Adults	291	-	70%	NEO-FFI	.12	.30	.27	.09	-.52
6	Feltman_1	2009	Undergraduate Students	195	-	59%	GB-B	-	-	-	-	-.49
6	Feltman_2	2009	Undergraduate Students	94	-	52%	GB-B	-	-	-	-	-.48
7	Fetterman_1	2010	Undergraduate students	91	-	56%	GB-B	-	-	-	-	-.49
7	Fetterman_2	2010	Undergraduate students	67	-	-	GB-B	-	-	-	-	-.67
7	Fetterman_3	2010	Undergraduate students	68	-	59%	GB-B	-	-	-	-	-.53
8	Gootzeit (T)	2014	College Students and Mechanical Turk users	830	19	71%	PIP (20)	.06	.08	.33	.01	-.27
9	Klockner	2013	Workers	92	-	35%	PIP (50)	0.11	-0.10	0.02	0.15	-0.44
10	Kong	2015	Undergraduate Students	86	20	80%	Mini Markers	0.21	0.37	0.46	0.31	-0.36
11	Kostanski	2007	Pre-service Tertiary Students	267	-	-	NEO-FFI	.15	.27	.40	-	-0.58
12	Latzman	2013	Undergraduate College Students	429	21	80%	BFI	0.19	0.41	0.5	0.09	-0.44
13	Niemiec_1	2010	Undergraduate Students	64	-	78%	NEO-FFI	-	-	-	-	-0.34
13	Niemiec_2	2010	Undergraduate Students	216	-	73%	NEO-FFI	0.18	0.34	0.31	-0.02	-0.32
14	O’loughlin	2008	Undergraduate Students	265	-	74%	BFI	-	-	-	-	-0.28
15	Ortner_1	2007	Meditation Practitioners	28	36	54%	BFI	0.36	0.54	0.23	-0.14	-.43
15	Ortner_2	2007	University Students	82	23	76%	BFI	0.19	0.21	0.46	0.06	-0.28
16	Philip (T)	2010	Undergraduate Students	427	20	71%	BFI (10)	0.10	0.29	0.41	0.07	-0.35
17	Plaut	2012	Undergraduate Students	181	19	41%	TIP1	0.00	0.09	0.27	0.13	-0.28
18	Rush (D)	2013	American Adults	287	30	71%	GB-B	-	-	-	-	-0.42
19	Schmitker	2007	Undergraduate Psychology Students	324	21	78%	BFI	0.00	0.43	0.29	0.03	-0.36
20a	Siegling	2014	British University Students	358	22	76%	BFI	0.14	0.31	0.31	0.02	-0.35

#	Author	Year	Sample	N	Age	Female	Personality Measure	Extra	Agree	Consc	Open	Neuro
21	Taren	2013	American Adults	152	41	50%	NEO	0.25	-	0.31	-	-0.39
22	Thompson	2007	Introductory Psychology Students	167	19	71%	IPIP (50)	-0.05	0.29	0.28	0.04	-0.41
23	Walsh	2009	Psychology Students and Staff	127	-	79%	NEO-PI	-	-	-	-	-0.33
24	Waters (D)	2007	Undergraduate Students	60	-	55%	BFI	-0.01	-0.09	-	-	-0.41
25	Way	2010	Undergraduate Students	27	-	60%	IPIP (10)	-	-	-	-	-0.24
26	Williams	2007	Undergraduate Students	261	19	58%	NEO-FFI	0.13	0.28	-	-	-0.34
27	Wupperman	2008	Introductory Psychology Students	342	-	73%	EPQ	-	-	-	-	-0.54
28	Yang (D)	2015	Health Care Professionals	72	34	93%	IPIP (20)	0.11	0.23	0.25	0.19	-0.24
Five Facet Mindfulness Questionnaire												
29	Barnhofer	2011	Community Sample	144	43	60%	EPQ	-	-	-	-	-0.6
30	Eisenlohr-Moul	2012	Introductory Psychology Students	296	19	55%	FFF	0.25	0.09	0.25	0.06	-0.44
31	Hanley	2015	University Students	485	21	78%	BFI	0.22	0.31	0.38	0.31	-0.44
32	Hollis-Walker	2011	University Students and Demographically Community Members	123	21	78%	NEO-PI	0.42	0.36	0.46	0.35	-0.66
33	Karakashian (D)	2011	University Students	174	23	76%	BFI (10)	0.19	0.28	0.28	0.05	-0.51
34	McGarvey (D)	2010	Leaders who practice mindfulness	118	50	47%	NEO-PI	0.28	0.3	0.27	0.38	-0.67
35	Schurtz (D)	2011	University Students	141	20	66%	FFF	0.28	.01	0.15	0.05	-0.52
20b	Siegling	2014	British University Students	358	22	76%	BFI	0.34	0.27	0.37	0.31	-0.47
36	Tucker	2014	University Students	315	19	65%	FFF	0.36	0.24	0.29	0.23	-0.42
37	Westbrook (T)	2013	Undergraduate University Students	114	21	64%	IPIP (50)	0.20	0.04	0.33	0.32	-0.4
38	Zabelina	2011	Undergraduate University Students	81	21	48%	GB-B	-	-	-	-	-0.39

**Note.** Extra = Extraversion. Agree = Agreeableness. Consc = Conscientiousness. Open = Openness. Neuro = Neuroticism. GB-B = Goldberg Broad-Bandwidth. BFI = Big Five Inventory. IPIP = International Personality Item Pool. EPQ = Eysenck Personality Questionnaire. FFF= Five Factor Form. TIPI = Ten Item Personality Inventory (D) = Dissertation. (T) = Thesis.

Siegling used both the MAAS and FFMQ to measure mindfulness.

**Table 2**  
**Results for Full Meta-Analyses, MAAS Meta-Analyses, and FFMQ Meta-Analyses**

Trait	K	N	r	SE	95% CI	I <sup>2</sup>	Tau <sup>2</sup>	Q	Rank	Egger	
Full Analysis											
Extraversion	28		.17	.024	.12	.22	74%	.012	118.92 ( $p<.001$ )	.062 ( $p=.64$ )	1.034 ( $p=.30$ )
Agreeableness	26		.26	.028	.20	.31	78%	.015	117.89 ( $p<.001$ )	-.154 ( $p=.26$ )	-.648 ( $p=.52$ )
Conscientiousness	25		.34	.020	.30	.38	55%	.005	55.12 ( $p<.001$ )	-.110 ( $p=.43$ )	-1.356 ( $p=.18$ )
Openness	27		.15	.022	.10	.19	71%	.010	98.52 ( $p<.001$ )	.114 ( $p=.40$ )	.291 ( $p=.77$ )
Neuroticism	45		-.47	.021	-.52	-.43	72%	.013	159.26 ( $p<.001$ )	-.052 ( $p=.61$ )	-.380 ( $p=.70$ )
MAAS Analysis											
Extraversion	20		.11	.024	.06	.15	59%	.006	48.34 ( $p<.001$ )	.116 ( $p=.50$ )	1.439 ( $p=.15$ )
Agreeableness	18		.27	.037	.20	.35	81%	.018	90.99 ( $p<.001$ )	-.177 ( $p=.33$ )	-.463 ( $p=.64$ )
Conscientiousness	17		.35	.027	.29	.40	61%	.007	40.39 ( $p<.001$ )	-.132 ( $p=.49$ )	-1.157 ( $p=.25$ )
Openness	19		.10	.021	.06	.14	47%	.003	35.41 ( $p=.008$ )	.216 ( $p=.21$ )	.389 ( $p=.70$ )
Neuroticism	35		-.45	.023	-.49	-.40	69%	.011	114.22 ( $p<.001$ )	-.032 ( $p=.80$ )	-.147 ( $p=.88$ )
FFMQ Analysis											
Extraversion	9		.29	.028	.24	.35	33%	.002	11.74 ( $p=.16$ )	.111 ( $p=.76$ )	.081 ( $p=.94$ )
Agreeableness	9		.22	.042	.14	.30	70%	.010	25.05 ( $p=.002$ )	-.278 ( $p=.36$ )	-.612 ( $p=.54$ )
Conscientiousness	9		.33	.030	.27	.39	41%	.003	13.92 ( $p=.08$ )	-.111 ( $p=.76$ )	-.585 ( $p=.56$ )
Openness	9		.23	.047	.14	.33	76%	.014	31.84 ( $p<.001$ )	-.056 ( $p=.92$ )	.275 ( $p=.78$ )
Neuroticism	11		-.55	.039	-.63	-.48	70%	.011	28.77 ( $p=.001$ )	-.345 ( $p=.16$ )	-1.44 ( $p=.15$ )

Table 3

Results for FFMQ Facet Meta-Analyses

Trait	K	r	SE	95% CI	I <sup>2</sup>	Tau <sup>2</sup>	Q	Rank	Egger
Observing									
Extraversion	9	.13	.043	.05 .22	73%	.009	18.71 (p=.005)	.429 (p=.24)	1.403 (p=.16)
Agreeableness	9	.13	.040	.05 .21	69%	.007	20.50 (p=.002)	-.048 (p=1.00)	-.010 (p=.99)
Conscientiousness	9	.10	.054	-.01 .21	83%	.016	30.19 (p<.001)	.335 (p=.38)	1.589 (p=.11)
Openness	9	.40	.050	.30 .50	85%	.016	40.52 (p<.001)	.286 (p=.40)	1.725 (p=.08)
Neuroticism	11	.02	.059	-.09 .14	89%	.024	41.35 (p<.001)	-.357 (p=.28)	-1.294 (p=.20)
Describing									
Extraversion	9	.30	.039	.22 .37	66%	.006	16.91 (p=.01)	.429 (p=.24)	2.12 (p=.03)
Agreeableness	9	.20	.045	.11 .29	76%	.010	23.03 (p<.001)	-.333 (p=.38)	-1.28 (p=.20)
Conscientiousness	9	.24	.030	.19 .30	44%	.003	11.31 (p=.08)	-.048 (p=1.00)	.937 (p=.35)
Openness	9	.27	.042	.19 .35	78%	.010	26.47 (p<.001)	.286 (p=.40)	1.167 (p=.24)
Neuroticism	11	-.24	.024	-.29 -.20	36%	.002	11.25 (p=.13)	-.143 (p=.72)	-.905 (p=.37)
Acting with Awareness									
Extraversion	9	.10	.044	.02 .19	75%	.010	23.99 (p<.001)	.238 (p=.56)	.679 (p=.50)
Agreeableness	9	.18	.067	.05 .31	89%	.027	55.68 (p<.001)	.238 (p=.56)	.411 (p=.68)
Conscientiousness	9	.50	.073	.35 .64	91%	.033	55.18 (p<.001)	.048 (p=1.00)	.873 (p=.38)
Openness	9	.01	.023	-.05 .06	50%	.003	12.96 (p<.001)	.071 (p=.90)	.115 (p=.91)
Neuroticism	11	-.40	.037	-.47 -.33	71%	.007	24.45 (p=.001)	-.071 (p=.90)	-.887 (p=.38)
No-Reacting									
Extraversion	9	.10	.021	.06 .14	0%	0	3.11 (p=.79)	.048 (p=1.00)	.940 (p=.35)
Agreeableness	9	.16	.051	.06 .26	81%	.014	28.89 (p<.001)	.238 (p=.56)	1.334 (p=.18)
Conscientiousness	9	.20	.055	.09 .31	84%	.017	32.62 (p<.001)	.714 (p=.03)	1.789 (p=.07)
Openness	9	.16	.018	.12 .20	.01%	<.001	9.41 (p=.22)	.000 (p=1.00)	.376 (p=.71)
Neuroticism	11	-.42	.077	-.57 -.27	94%	.043	67.83 (p<.001)	-.143 (p=.72)	-.820 (p=.41)
Non-Judging									
Extraversion	9	.16	.028	.11 .21	35%	.002	8.30 (p=.22)	.048 (p=1.00)	.480 (p=.63)

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Trait	K	r	SE	95% CI	I <sup>2</sup>	Tau <sup>2</sup>	Q	Rank	Egger
Agreeableness	9	.15	.057	.04 .27	85%	.018	37.81 (p<.001)	.143 (p=.77)	.321 (p=.75)
Conscientiousness	9	.18	.052	.08 .28	82%	.015	26.83 (p<.001)	-.143 (p=.77)	-.430 (p=.67)
Openness	9	.04	.046	-.06 .13	82%	.013	29.70 (p<.001)	.286 (p=.40)	1.789 (p=.07)
Neuroticism	11	-.55	.034	-.62 -.49	66%	.006	19.95 (p=.006)	-.357 (p=.28)	-1.790 (p=.07)