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The Mindful Personality II: Exploring the Metatraits from a Cybernetic Perspective

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Abstract Relationships between dispositional mindfulness and the personality metatraits, stability and plasticity, remain unexplored despite continued efforts to more accurately characterize associations between dispositional mindfulness and personality. The metatraits are theorized to constitute basic requirements for biological survival and their expression is believed to be a strong determinant of well-being. As such, this study used path analysis to explore associations between dispositional mindfulness, the metatraits, and psychological well-being in a sample of 403 American adults. Results indicate that dispositional mindfulness is principally associated with stability, or the capacity to sustain currently operative schemas and goals. Results further suggest a positive relationship between dispositional mindfulness and plasticity, or the tendency to flexibly adapt to changing circumstances. A more granular investigation of these associations demonstrated that the facets of dispositional mindfulness are differentially related with the metatraits. Ultimately, the metatraits were found to fully mediate the relationship between dispositional mindfulness and psychological well-being.

Keywords Mindfulness · Personality · Personality metatraits · Stability · Plasticity · Well-being

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Introduction

Associations between dispositional mindfulness and the Big Five personality factors continue to be clarified by empirical and theoretical advances (e.g., Hanley and Garland 2017; Rau and Williams 2016). However, few investigations of dispositional mindfulness and the Big Five have organized personality in an integrative fashion or have attempted to examine personality from a mechanistic framework. Typically, the Big Five personality factors are examined in isolation and discussed as functionally distinct traits. In contrast, the Cybernetic Big Five Theory (DeYoung 2015) challenges the traditional conceptualization of the Big Five as separate and distinct traits. The Cybernetic Big Five Theory organizes the Big Five into two higher-order personality metatraits, stability, and plasticity that serve as latent factors onto which the Big Five selectively load in factor analyses (DeYoung 2006; Digman 1997). Beyond being merely statistical entities, these two metatraits are theorized to constitute basic requirements for biological survival (DeYoung 2015; Grossberg 1987; Macy 1991), and their expression is thought to be directly linked to well-being (Hirsh et al. 2012).

The Cybernetic Big Five Theory asserts that personality can be understood as a cybernetic system that evolved to aid human survival (DeYoung 2015). Cybernetic systems are defined by two core components. First, the system must have a goal (e.g., survival) to guide its efforts (DeYoung 2015; Macy 1991). Second, the system must have the ability to receive and process environmental feedback (e.g., via the senses and the mind), thereby informing goal-relevant progress (DeYoung 2015; Macy 1991). The Cybernetic Big Five Theory proposes that the Big Five personality factors and the two hierarchically situated metatraits operate as adaptive parameters in the human cybernetic system. Each of the Big Five personality factors evidence distinct,

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but interactive, roles in furthering goal-related behavior (see DeYoung 2015 for a complete analysis of these roles). More broadly, the metatraits capture interpersonal variance in individual efforts to maintain established goals while simultaneously adjusting to environmental change.

The *stability* metatrait can be understood as the mechanism by which cybernetic systems maintain goal directedness when encountering disruptive impulses. Stability is comprised of emotional stability (i.e., low neuroticism), motivational stability (i.e., conscientiousness), and social stability (i.e., agreeableness). The *plasticity* metatrait can be understood as the mechanism by which cybernetic systems approach and explore the unknown, either cognitively (i.e., openness) or behaviorally (i.e., extraversion). The balance between stability and plasticity is arguably the core tension in cybernetic systems (Grossberg 1987), as "they not only must be capable of maintaining stable functioning, they must also be sufficiently plastic to adapt to changing and unpredictable environments" (p.47). It is important to emphasize that although stability is characterized by security and certainty regarding knowledge of the self and the world, learning occurs when novel information is extracted from the unknown (Peterson 1999). As such, the metatraits are oriented around the intersection of the known and unknown. The capacity to continuously navigate this intersection, maintaining and appropriately modifying a set of value-based goals in the face of anomalous, unexpected events, appears fundamental for learning, growth, and well-being.

Mindfulness may operate at the intersection of stability and plasticity. In fact, "flux-balance" (Von Bertalanffy 1968), or the capacity to find stability in instability, may be supported by mindfulness. Mindfulness can be understood as a quality of consciousness characterized by the metacognitive capacity to maintain focus on a particular attentional object with equanimity (Baer et al. 2006; Desbordes et al. 2015; Dreyfus 2011; Kabat-Zinn 1994). Conversely, being mindless is characterized by distractibility and impulsivity. The cognitive state of mindfulness can be intentionally fostered by a number of practices (e.g., Carmody and Baer 2008), but it can also exist as a naturally-occurring, uncultivated quality (Brown and Ryan 2003).

As cybernetic operations are guided by both proximal and distal goals, a mindful disposition may impact the motivational draw of goal-relevant, desired states. In short, desire could be understood to motivate cybernetic systems (Peterson 1999). In the pursuit of desired states, discerning between proximal goals that serve either hedonic or eudemonic ends is likely to have substantive consequences for well-being. Mindfulness is believed to support the maintenance of personally valued, distal goals by facilitating non-reactivity to proximal, appetitive desires (Garland et al. 2015). Indeed, traditional Buddhist thought contends that desire is the root of all suffering (Gyamtso 1994; Rāhula 1974), and mindfulness is a skillful means of relinquishing attachment to desire. Thus, mindfulness may skew the cybernetic cycle itself towards the conservation of distal, eudemonic goals. In this capacity, mindfulness may serve a stabilizing role by supporting distal goal stability, which may in turn encourage the subjective experience of stability.

Two mechanisms of mindfulness, attentional control and emotion regulation (Hölzel et al. 2011; Tang et al. 2015; Vago and Silbersweig 2012), may provide some insight into the stabilizing function of dispositional mindfulness. First, greater attentional control allows for sustained focus on a particular target, as well as the capacity to voluntarily redirect wandering or distracted attention back to a previously selected target. Growing evidence suggests that dispositional mindfulness is associated with both attentional capacities (e.g., Baer et al. 2006; Herndon 2008; Moore and Malinowski 2009; Schmertz et al. 2009). As such, more mindful individuals may be better able to stabilize their attention, a capacity central to maintaining the motivational stability characterizing conscientiousness. Second, greater emotion regulation would likely reduce the impact of affective disruptions on goal stability, as emotion is a primary motivator of behavior (e.g., Craig 2002; Easterbrook 1959). Dispositional mindfulness is also associated with reduced physiological reactivity (e.g., Brown et al. 2012, 2013; Fogarty et al. 2015), suggesting that more mindful individuals are generally less reactive and more equanimous (e.g., Desbordes et al. 2015, Hill and Updegraff 2012). Furthermore, more mindful individuals also appear to experience quicker emotional recovery following a stressor (e.g., Bullis et al. 2014). Thus, more mindful individuals may be better able to stabilize their emotions, a capacity central to maintaining the emotional stability characterizing low neuroticism.

The same two mechanisms of mindfulness, attentional control and emotional regulation, may also provide some insight into the role dispositional mindfulness may play in supporting plasticity. Emotion is believed to influence both behavior (e.g., Craig 2002) and attention (e.g. Dolan 2002). Negative emotion is associated with behavioral inhibition and is thought to constrict attentional resources while positive emotion is associated with behavioral approach and an expanded attentional field (Garland et al. 2010). Mechanistically, mindful emotion regulation capacities may limit the scope of attentional and behavioral constriction related to negative emotion. As a consequence of more mindful emotion regulation, attentional and behavioral ranges may remain broader. Indeed, evidence suggests that more mindful individuals are more cognitively flexible (Hodgins and Adair 2010; Moore and Malinowski 2009) and better able to change the way they are thinking about life situations (e.g., Hanley and Garland 2014) More globally, mindful individuals report greater positive affect (Goyal et al. 2014; Sedlmeier et al. 2012), likely

predisposing them to broader attentional fields and more expansive behavioral repertoires. Such attentional and behavioral breadth may allow more mindful individuals to be more flexible in their goal pursuit.

Despite these theoretical links between dispositional mindfulness and the metatraits, no empirical investigations of these constructs have been conducted. However, recent meta-analytic work suggests that dispositional mindfulness may be more accurately positioned as a metatrait correlate than in relation to any of the Big Five personality factors independently (Hanley and Garland 2017). Given these results, a strong theoretical association has been proposed between dispositional mindfulness and stability, as well as a more moderate association between dispositional mindfulness and plasticity (see Hanley and Garland 2017). Empirical work is needed to unpack these relationships and situate them in relation to well-being.

Psychological well-being is a multidimensional conceptualization of well-being, in which the good life is often characterized by six components of positive psychological functioning: self-acceptance, personal growth, purpose in life, positive relations with others, environmental mastery, and autonomy (Ryff and Keyes 1995, Ryff 1989). The metatraits (e.g., Hirsh et al. 2012; Şimşek and Koydemir 2013) and dispositional mindfulness (e.g., Brown and Ryan 2003; Hanley et al. 2015) are intimately linked with well-being. An expanding body of theoretical work supports the centrality of the metatraits in sustaining positive psychological functioning (Hirsh et al. 2012; Peterson 1999; DeYoung 2015), and emerging empirical work supports this relationship (Şimşek 2014; Şimşek and Koydemir 2013). Comparatively, the association between dispositional mindfulness and psychological well-being is well substantiated, with a variety of results converging to suggest a robust relationship between the two constructs (e.g., Brown and Ryan 2003; Hanley et al. 2015). Yet, despite these theoretical and empirical links, no study to date has connected all four constructs by directly examining associations between psychological well-being, the metatraits, and dispositional mindfulness.

The primary purpose of this study was to investigate the relationship between dispositional mindfulness and the metatraits, stability and plasticity, linking all three constructs to psychological well-being. Path analysis was used to investigate these relationships. It was hypothesized that dispositional mindfulness would be positively associated with both metatraits and stability and plasticity. However, dispositional mindfulness was expected to be more strongly associated with the stability metatrait given findings from a recent meta-analysis which indicated that dispositional mindfulness was most closely associated with the three personality factors constituting stability (Hanley and Garland 2017). It was further hypothesized that the metatraits would mediate the relationship between dispositional mindfulness and psychological well-being.

Method

Participants

Participants (n = 403) were recruited from Amazon's crowdsourcing website, Mechanical Turk. Respondents were awarded 25¢ for their participation. Female participants (61%) outnumbered male participants, with a mean age of 36.99 ± 12.62. Ethnically, participants identified as Caucasian (75%), African America (8%), Asian (8%), Latino (5%), multiracial (2%), or American Indian (2%).

Procedures

The three measures used in this study were part of a larger investigation of the relationships between dispositional mindfulness and self-configurations that was completed online in a single testing administration and took respondents an average of 24 min to complete.

Measures

Dispositional Mindfulness

The Five Facet Mindfulness Questionnaire (FFMQ) (Baer et al. 2006) is a well-validated 39-item measure using a 5-point Likert scale (1 = "Never or very rarely true", 5 = "Very often or always true") to assess core characteristics of dispositional mindfulness (α = 0.91). The FFM is composed of five scales: observing (α = 0.83), describing (α = 0.86), acting with awareness (α = 0.90), non-reacting (α = 0.84), and non-judging (α = 0.91).

Big Five Personality Traits

The Ten-Item Personality Inventory (Gosling et al. 2003) is a well-validated ten-item measure using a 7-point Likert (1 = "Disagree Strongly", 7 = "Agree Strongly") scale to assess the five factor model of personality: emotional stability (α = 0.70), conscientiousness (α = 0.68), agreeableness (α = 0.48), openness (α = 0.45), and extraversion (α = 0.63). The latent, stability metatrait variable was a factor analytically derived from the agreeableness, conscientiousness, and emotional stability total scores. The latent, plasticity metatrait variable was a factor analytically derived from the openness and extraversion total scores.

Psychological Well-Being

The Scales of Psychological Well-Being (Ryff and Keyes 1995) is a well-validated 18-item measure using a 5-point Likert (1 = "Disagree Strongly", 7 = "Agree Strongly") scale to assess well-being across six domains (α = 0.86): autonomy,

environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance.

Data Analyses

First, a preliminary bivariate correlational analysis was performed to explore the relationships between dispositional mindfulness, the five facets of dispositional mindfulness, and the five personality factors. A correlation matrix is reported in Table 1 along with descriptive statistics for each variable.

Second, path-modeling procedures were conducted in AMOS 24 to (a) identify the basic relationships between dispositional mindfulness, the metatraits, and psychological well-being (and, more specifically, to test whether the metatraits mediated the relationships between dispositional mindfulness and psychological well-being) and (b) outline the relationships between dispositional mindfulness, the metatraits, and psychological well-being in greater detail by modeling the five facets of mindfulness in relation to the metatraits and psychological well-being.

Results

Bivariate correlational analysis (Table 1) indicated that dispositional mindfulness was most strongly associated with the three personality factors constituting the stability metatrait, emotional stability (0.48), conscientiousness or motivational stability (0.49), and agreeableness or social stability (0.42). Dispositional mindfulness also evidenced positive relationships of similar magnitudes with the two personality factors constituting the plasticity metatrait, extraversion (0.16), and openness (0.19).

This pattern of associations appears to be the result of differential relationships between the facets of dispositional mindfulness and the personality factors. The *self-regulation* mindfulness facets, non-judging, acting with awareness, and non-reacting appeared to be most closely associated with the stability personality factors, neuroticism, conscientiousness, and agreeableness. Comparatively, the *self-awareness* mindfulness facets, observing and describing, evidenced slightly stronger associations with the plasticity personality factors, extraversion and openness.

Mindful Metatrait Model

The mindful metatrait model evidenced excellent fit: $x^2/df = 2.32$, CFI = 0.98, GFI = 0.92, RMSEA = 0.06, and SRMR = 0.04 (Fig. 1). Dispositional mindfulness was found to be positively associated with both metatraits, but evidenced a significantly stronger relationship with stability as revealed by a Fisher's *r*-to-transformation ($z = 9.66, p < .001$). Dispositional mindfulness also demonstrated a significant indirect effect on psychological

Table 1 Bivariate correlations between dispositional mindfulnes, the Big Five personality factors, and psychological well-being

	1	1a	1b	1c	1d	1e	2	3	4	5	6	M (SD)
1. Dispositional Mindfulness	–											129.89 (20.24)
1a. Observing	0.48***	–										28.19 (5.53)
1b. Describing	0.77***	0.41***	–									27.30 (6.28)
1c. Acting with awareness	0.77***	0.11*	0.46***	–								27.04 (7.00)
1d. Non-reacting	0.52***	0.38***	0.26***	0.18***	–							21.54 (5.01)
1e. Non-judging	0.65***	− 0.14**	0.36***	0.56***	0.08	–						25.81 (7.32)
2. Emotional stability	0.48***	0.03	0.22***	0.42***	0.44***	0.39***	–					9.22 (3.15)
3. Conscientiousness	0.49***	0.11*	0.30***	0.50***	0.25***	0.37***	0.44***	–				10.60 (2.78)
4. Agreeableness	0.42***	0.18***	0.25***	0.41***	0.17**	0.31***	0.45***	0.29***	–			10.46 (2.57)
5. Openness	0.19***	0.17***	0.10*	0.14**	0.12*	0.10*	0.17***	0.10*	0.24***	–		10.01 (2.57)
6. Extraversion	0.16**	0.08	0.17**	0.07	0.13*	0.07	0.15**	0.04	0.05	0.22***	–	7.09 (3.18)
7. Psychological well-being	0.66***	0.25***	0.44***	0.57***	0.35***	0.49***	0.49***	0.51***	0.42***	0.25***	0.23***	86.85 (16.61)

*$p<.05$, **$p<.01$, ***$p<.001$

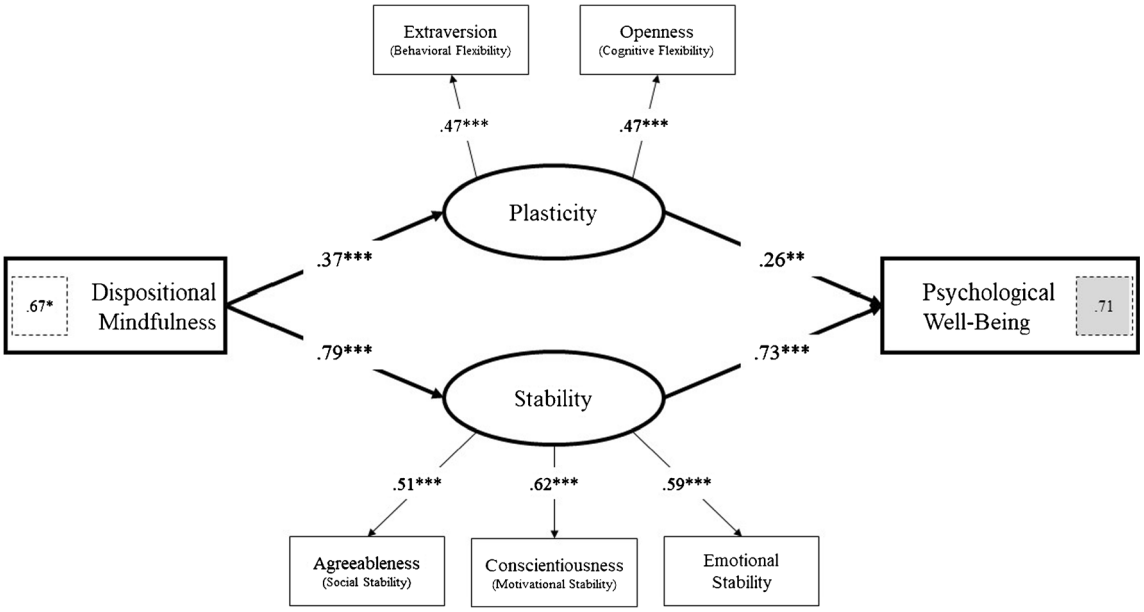

Fig. 1 Mindful metatrait model. Standardized regression coefficients for the relationships between dispositional mindfulness, the metatraits, and psychological well-being. Standardized indirect effect of dispositional mindfulness is provided in the white, dashed box. Amount of variance explained in psychological well-being is provided in the gray, dashed box

well-being via the metatraits (0.67*). Both metatraits were found to be positively associated with psychological well-being; however, stability evidenced a significantly stronger relationship with psychological well-being as revealed by a Fisher's *r*-to-transformation ($z = 9.37$, $p < .001$).

Mindful Facets Metatrait Model

The full mindful facet metatrait model evidenced good fit ($x^2/df = 3.93$, CFI = 0.94, GFI = 0.96, RMSEA = 0.085, and SRMR = 0.044) across several indices, and fit was improved by removing non-significant paths: $x^2/df = 3.43$, CFI = 0.94, GFI = 0.96, RMSEA = 0.078, and SRMR = 0.05. All associations between the mindfulness facets and the metatraits were positive; and generally, the associations between the mindfulness facets and stability were stronger than the associations between the mindfulness facets and plasticity. As observed in the preliminary correlation analysis, the mindfulness facets appeared to relate differentially with the metatraits. Two of the self-regulation mindfulness facets, acting with awareness and non-reacting, were most closely associated with stability, while the self-awareness mindfulness facets, observing and describing, were most closely associated with plasticity. The non-judging mindfulness facet evidenced similar magnitudes of association with both stability and plasticity (Fig. 2).

Discussion

This study investigated the relationships between dispositional mindfulness, the personality metatraits—stability and plasticity—and psychological well-being. Path analysis was used to examine associations between dispositional mindfulness, the metatraits, and psychological well-being at increasing levels of granularity, using the aggregated dispositional mindfulness score in the first model and then modeling the five facets of dispositional mindfulness (observing, describing, acting with awareness, non-reacting, and non-judging) in the second.

Mindfulness and Stability

Results indicated that dispositional mindfulness was principally associated with stability, or the capacity to sustain goal-directed efforts, despite distraction or anomalous interference. Stability appears to manifest as the capacity to inhibit disruptive impulses, regardless of whether stimuli are appetitive or aversive. DeYoung (2015) contends that, upon encounters with unexpected events, more stable individuals are less likely to allow immediate goals, such as hedonistic gain, to supplant ongoing, long-term goals, such as the pursuit of a meaningful career. Comparatively, individuals with low stability scores tend to exhibit features of impulsivity, leaving them more susceptible to emotional distress and disrupted goal-related pursuits in the face of experiential aberrations. Instability increases uncertainty, thereby increasing the incidence of highly disorganized internal states believed to prompt emotional distress (Hirsh et al. 2012). As such, stability has significant emotional consequences. This characterization of stability is strikingly similar to descriptions of mindfulness typified by non-reactivity and equanimity (Baer et al. 2006; Desbordes et al. 2015; Dreyfus

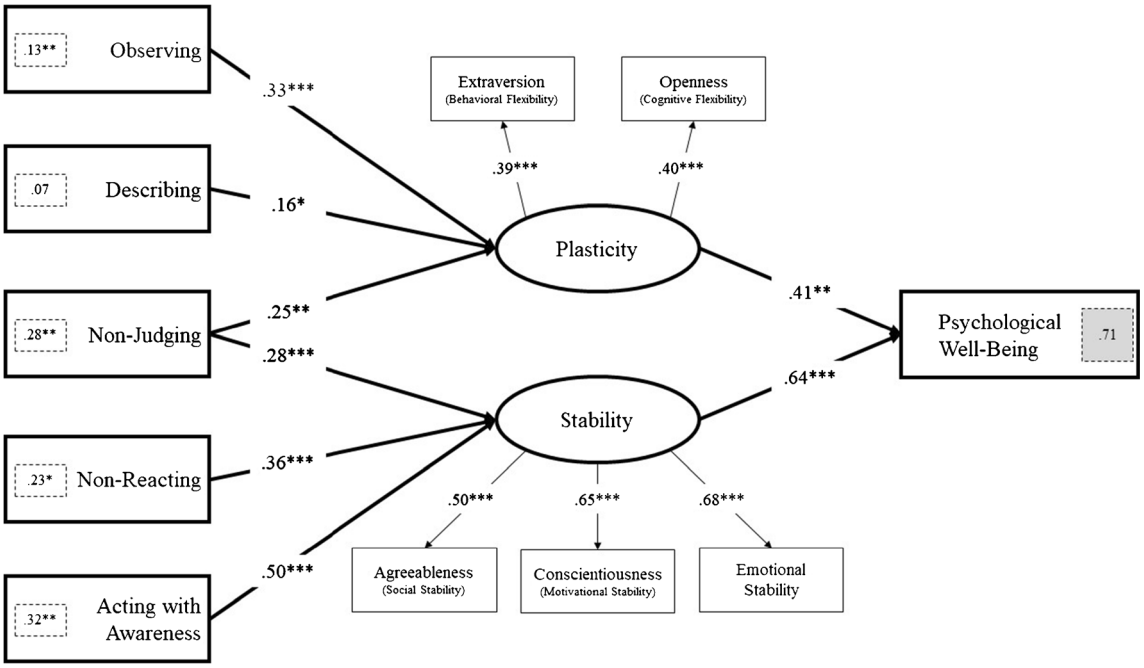

Fig. 2 Mindful facets metatrait model. Standardized regression coefficients for the relationships between the dispositional mindfulness facets, the metatraits, and psychological well-being. Standardized indirect effect of each dispositional mindfulness facet is provided in the white, dashed box. Amount of variance explained in psychological well-being is provided in the gray, dashed box

2011). In fact, dispositional mindfulness may reflect an orientation to experience that is marked by stability—potentially a product of enhanced attention control and emotion regulation. Examination at the dispositional mindfulness facet level provides preliminary support for this assertion. The mindful self-regulatory skills (acting with awareness, non-reacting, and non-judging) were most closely associated with stability, suggesting that individuals who are more attentive to their own automatic reactions and better able to regulate negative emotions and judgments may have more stable personalities.

Applying these findings to daily life, it may be that small, mindfully performed serial behaviors (e.g., household chores) have a cumulative effect on global estimations of personal stability that result in a trait-like tendency towards stability. While the correlational results from this study are insufficient for causal claims, experimental studies are needed to test this possibility. As dispositional mindfulness suggests a general orientation towards the present moment, it may be that engaging with everyday tasks with mindful attention fundamentally alters the experience of those tasks (Hanley et al. 2015). For example, acting with awareness and intention during everyday activities (e.g., eating, walking, or household chores) may first lead to short-term reductions in distractibility. Regularly approaching everyday activities with awareness and intention may further strengthen and develop the qualities of sustained attention and behavioral perseverance that underlie stability. In turn, this practice in stability may be generalized across time and circumstance as well as recruited in the service of more complex, self-relevant pursuits. Given these hypothesized links, examining the relationship between informal mindfulness practices, such as mindful eating or mindful walking, may be particularly relevant in better understanding the development of a more stable personality.

Mindfulness and Plasticity

Results further suggested a positive relationship between dispositional mindfulness and plasticity. Although this relationship has not been explicitly articulated in the literature, it is logically supported by previous findings linking mindfulness with greater cognitive flexibility—a pairing that is extensively outlined in the Mindfulness-to-Meaning Theory (Garland et al. 2015). Mindfulness has long been theoretically linked with greater de-automaticity (Deikman 1966; Vago and Silbersweig 2012), or less habitual, rigid behavioral patterns. Empirical work provides evidence in support of this claim, suggesting that mindfulness training reduces automatic responding (Wenk-Sormaz 2005) and decreases attentional bias (Garland et al. 2013, 2017), thereby expanding perceptual and cognitive fields that may then yield a broader range of behavioral options (Garland et al. 2015). Attentional control appears to be a critical feature of these broadening processes; without attending to feedback from goal-directed actions, no behavioral change can be initiated. Given that mindfulness is fundamentally a quality of attention, it appears theoretically consistent that the mindful meta-awareness skills—observing

and describing (e.g., Hadash et al. 2016)—were most closely linked with the plasticity metatrait in this study. Presumably, individuals with greater meta-awareness would be more likely to recognize errors in an operative strategy or alternative opportunities. As such, mindfulness may strengthen and expand the feedback pathways between the individual and environment, while also allowing more selective responding to such communication.

The Metatraits and Well-Being

The pronounced difference in the relationships between the metatraits and psychological well-being is noteworthy. Stability evidenced a strong relationship with psychological well-being, but plasticity evidenced only a minimal relationship with psychological well-being. From an Aristotelian perspective, psychological well-being reflects an enduring, global estimation of meaningful living that de-emphasizes hedonic pleasure as a critical marker of the good life (Ryan and Deci 2001; Ryff 1989). It may be that psychological well-being reflects a more proactive and intentional approach to well-being, wherein present-moment actions and behaviors are situated in relation to a persisting commitment to personal growth and development. This pursuit of psychological well-being may eschew momentarily rewarding possibilities for future satisfactions, an approach to well-being requiring emotional and behavioral stability.

While this study offers novel empirical evidence linking dispositional mindfulness, the personality metatraits and well-being, limitations should also be noted. First, the sample was recruited from a crowdsourcing website; and, although evidence suggests Mechanical Turk users provide good quality data (Buhrmester et al. 2011; Mason and Suri 2012), replication in alternative samples is needed. Second, the cross-sectional nature of the data precludes causal testing and it may be that alternatively specified path models may also fit the data well. Longitudinal studies are needed to explore causal relationships between mindfulness training, personality development, and well-being. Despite these limitations, evidence from this study suggests that dispositional mindfulness has a robust relationship with the metatraits, and the metatraits fully mediate the relationship between dispositional mindfulness and psychological well-being. As such, more mindful individuals appear to represent their personalities in ways that have substantive implications for well-being. Most notably, more mindfulness is linked with more stability, which is linked with greater well-being.

Author Contributions AWH designed and executed the study, performed the data analyses, and wrote the first draft of the manuscript. AKB collaborated in the writing and editing of the final manuscript. ELG collaborated with the data analysis plan and writing of the manuscript.

Compliance with Ethical Standards

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

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Ethics Statement This research was approved by Florida State University's Institutional Review Board.

Informed Consent Statement To ensure informed consent, all participants actively selected that they consented to take part in the study before being able to proceed to the survey questions.

References

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27–45.

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84*(4), 822–848.

Brown, K. W., Weinstein, N., & Creswell, J. D. (2012). Trait mindfulness modulates neuroendocrine and affective responses to social evaluative threat. *Psychoneuroendocrinology, 37*(12), 2037–2041.

Brown, K. W., Goodman, R. J., & Inzlicht, M. (2013). Dispositional mindfulness and the attenuation of neural responses to emotional stimuli. *Social Cognitive and Affective Neuroscience, 8*(1), 93–99.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on psychological science, 6*(1), 3–5.

Bullis, J. R., Bøe, H. J., Asnaani, A., & Hofmann, S. G. (2014). The benefits of being mindful: Trait mindfulness predicts less stress reactivity to suppression. *Journal of Behavior Therapy and Experimental Psychiatry, 45*(1), 57–66.

Carmody, J., & Baer, R. A. (2008). 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, 31*(1), 23–33.

Craig, A. D. (2002). How do you feel? Interoception: the sense of the physiological condition of the body. *Nature Reviews Neuroscience, 3*(8), 655–666.

Deikman, A. J. (1966). De-automatization and the mystic experience. *Psychiatry, 29*(4), 324–338.

Desbordes, G., Gard, T., Hoge, E. A., Hölzel, B. K., Kerr, C., Lazar, S. W., et al. (2015). Moving beyond mindfulness: defining equanimity as an outcome measure in meditation and contemplative research. *Mindfulness, 6*(2), 356–372.

DeYoung, C. G. (2006). Higher-order factors of the Big Five in a multi-informant sample. *Journal of Personality and Social Psychology, 91*(6), 1138–1151.

DeYoung, C. G. (2015). Cybernetic big five theory. *Journal of Research in Personality, 56*, 33–58.

Digman, J. M. (1997). Higher-order factors of the Big Five. *Journal of Personality and Social Psychology, 73*(6), 1246.

Dolan, R. J. (2002). Emotion, cognition, and behavior. *Science, 298*(5596), 1191–1194.

Dreyfus, G. (2011). Is mindfulness present-centred and non-judgmental? A discussion of the cognitive dimensions of mindfulness. *Contemporary Buddhism, 12*(01), 41–54.

Easterbrook, J. A. (1959). The effect of emotion on cue utilization and the organization of behavior. *Psychological Review, 66*(3), 183–201.

Fogarty, F. A., Lu, L. M., Sollers, J. J., Krivoschekov, S. G., Booth, R. J., & Consedine, N. S. (2015). Why it pays to be mindful: trait mindfulness predicts physiological recovery from emotional stress and greater differentiation among negative emotions. *Mindfulness, 6*(2), 175–185.

Garland, E. L., Baker, A. K., & Howard, M. O. (2017). Mindfulness-Oriented Recovery Enhancement Reduces Opioid Attentional Bias Among Prescription Opioid-Treated Chronic Pain Patients. *Journal of the Society for Social Work and Research, 8*(4), 000–000.

Garland, E. L., Fredrickson, B., Kring, A. M., Johnson, D. P., Meyer, P. S., & Penn, D. L. (2010). Upward spirals of positive emotions counter downward spirals of negativity: Insights from the broaden-and-build theory and affective neuroscience on the treatment of emotion dysfunctions and deficits in psychopathology. *Clinical Psychology Review, 30*(7), 849–864.

Garland, E. L., Froeliger, B. E., Passik, S. D., & Howard, M. O. (2013). Attentional bias for prescription opioid cues among opioid dependent chronic pain patients. *Journal of Behavioral Medicine, 36*(6), 611–620.

Garland, E. L., Farb, N. A., Goldin, P. R., & Fredrickson, B. L. (2015). Mindfulness broadens awareness and builds eudaimonic meaning: a process model of mindful positive emotion regulation. *Psychological Inquiry, 26*(4), 293–314.

Gosling, S. D., Rentfrow, P. J., & Swann, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality, 37*(6), 504–528.

Goyal, M., Singh, S., Sibinga, E. M. S., Gould, N. F., Rowland-Seymour, A., Sharma, R., et al. (2014). Meditation programs for psychological stress and well-being: a systematic review and meta-analysis. *JAMA Internal Medicine, 174*(3), 357–368.

Grossberg, S. (1987). Competitive learning: from interactive activation to adaptive resonance. *Cognitive Science, 11*(1), 23–63.

Gyamtso, K. (1994). *Progressive stages of meditation on emptiness*. Oxford: Longchen Foundation.

Hadash, Y., Plonsker, R., Vago, D. R., & Bernstein, A. (2016). Experiential self-referential and selfless processing in mindfulness and mental health: Conceptual model and implicit measurement methodology. *Psychological assessment, 28*(7), 856–869.

Hanley, A. W., & Garland, E. L. (2014). Dispositional mindfulness co-varies with self-reported positive reappraisal. *Personality and Individual Differences, 66*, 146–152.

Hanley, A. W. & Garland, E. L. (2017). The mindful personality: a meta-analysis from a cybernetic perspective. *Mindfulness*.

Hanley, A. W., Warner, A. R., Dehili, V. M., Canto, A. I., & Garland, E. L. (2015). Washing dishes to wash the dishes: brief instruction in an informal mindfulness practice. *Mindfulness, 6*(5), 1095–1103.

Herndon, F. (2008). Testing mindfulness with perceptual and cognitive factors: external vs. internal encoding, and the cognitive failures questionnaire. *Personality and Individual Differences, 44*(1), 32–41.

Hill, C. L., & Updegraff, J. A. (2012). Mindfulness and its relationship to emotional regulation. *Emotion, 12*(1), 81–90.

Hirsh, J. B., Mar, R. A., & Peterson, J. B. (2012). Psychological entropy: a framework for understanding uncertainty-related anxiety. *Psychological Review, 119*(2), 304.

Hodgins, H. S., & Adair, K. C. (2010). Attentional processes and meditation. *Consciousness and cognition, 19*(4), 872–878.

Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindfulness meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science, 6*(6), 537–559.

Kabat-Zinn, J. (1994). *Wherever you go, there you are: mindfulness meditation in everyday life*. New York: Hyperion.

Macy, J. (1991). *Mutual causality in Buddhism and general systems theory: the dharma of natural systems*. Albany: SUNY Press.

Mason, W., & Suri, S. (2012). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior research methods, 44*(1), 1–23.

Moore, A., & Malinowski, P. (2009). Meditation, mindfulness and cognitive flexibility. *Consciousness and Cognition, 18*(1), 176–186.

Peterson, J. B. (1999). *Maps of meaning: the architecture of belief*. New York: Routledge.

Rāhula, W. (1974). *What the Buddha taught*. New York: Grove Press.

Rau, H. K., & Williams, P. G. (2016). Dispositional mindfulness: a critical review of construct validation research. *Personality and Individual Differences, 93*, 32–43.

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: a review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52*(1), 141–166.

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology, 57*(6), 1069–1081.

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology, 69*(4), 719–727.

Schmertz, S. K., Anderson, P. L., & Robins, D. L. (2009). The relation between self-report mindfulness and performance on tasks of sustained attention. *Journal of Psychopathology and Behavioral Assessment, 31*(1), 60–66.

Sedlmeier, P., Eberth, J., Schwarz, M., Zimmermann, D., Haarig, F., Jaeger, S., & Kunze, S. (2012). The psychological effects of meditation: a meta-analysis. *Psychological Bulletin, 138*(6), 1139.

Şimşek, Ö. F. (2014). Higher order structure of personality and mental health: does general affectivity matter? *Journal of Personality Assessment, 96*(2), 226–236.

Şimşek, Ö. F., & Koydemir, S. (2013). Linking metatraits of the big five to well-being and ill-being: do basic psychological needs matter? *Social Indicators Research, 112*(1), 221–238.

Tang, Y.-Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience, 16*(4), 213–225.

Vago, D. R., & Silbersweig, D. (2012). Self-awareness, self-regulation, and self-transcendence (S-ART): a framework for understanding the neurobiological mechanisms of mindfulness. *Frontiers in Human Neuroscience, 6*, 296.

Von Bertalanffy, L. (1968). *General system theory: foundations, development, applications*. New York: George Braziller.

Wenk-Sormaz, H. (2005). Meditation can reduce habitual responding. *Alternative therapies in health and medicine, 11*(2), 42–58.