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Relating Mindfulness, Heartfulness, and Psychological Well-Being: the Role of Self-Compassion and Gratitude

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Abstract
The aim of this paper is to shed light on the heartfulness-related aspects of mindfulness, explaining their relationship with optimal human functioning. In particular, we investigated the role of self-compassion and gratitude, two variables linked to mindfulness that we considered as indicators of heartfulness towards the self, and towards others, respectively. We tested the mediation of self-compassion and gratitude in the relationship between mindfulness and the six psychological well-being dimensions of autonomy, self-acceptance, environmental mastery, personal growth, positive relations with others, and purpose in life. Based on the literature, we hypothesized that self-compassion would mediate the association between mindfulness and self-acceptance, autonomy, environmental mastery, and positive relations, and that gratitude would mediate the association between mindfulness and all the above dimensions, except for autonomy. Across two studies, involving both meditators and non-meditators, and two different assessment tools for dispositional mindfulness, our hypotheses were supported, even after controlling for two concurrent variables (social support and resilience). These findings suggest that heartfulness is an important underlying mechanism of mindfulness: it seems to foster higher levels of psychological well-being, or optimal human functioning, through a warm and aware attitude towards the self and others.

Keywords Mindfulness · Self-compassion · Gratitude · Psychological well-being · Mediation · Meditators

Following recent research on the processes underlying the beneficial influence of mindfulness on well-being (e.g., Brown et al. 2015; Shapiro et al. 2006), we investigate the mediators of mindfulness capable of representing its warm, gentle, and caring side. These heart-related facets appear in the description of mindfulness practices and training programs. For instance, Kabat-Zinn (1994) wrote that the "overall tenor of mindfulness practice is gentle, appreciative, and nurturing", and so "another way to think of it would be heartfulness" (p. 7). But, from an empirical point of view, the role of these aspects in the relationship between mindfulness and well-being has yet to receive the attention it deserves. The term heartfulness can be used to describe the warm side of mindfulness, with two variables being capable of portraying

this quality because they combine a caring attitude with aspects of awareness. One variable is self-compassion, in the sense of heartfulness and a caring attitude towards the self; the other is gratitude, which can be conceived as an important aspect of heartfulness towards others (McCullough et al. 2002; Neff 2003; Rosenzweig 2013). These two variables should play an important role in the relation between mindfulness and well-being.

One of the main indicators of individual wellness is psychological well-being, defined as a state of optimal human functioning that goes beyond the experience of happiness, also involving the realization of one's own potential and true self (e.g., Ryff and Keyes 1995). In Ryff's (1989) conceptualization, psychological well-being includes six dimensions. Autonomy involves the perception of living in accord with personal values and beliefs, and the ability to direct one's own behavior and evaluate oneself according to personal standards. Self-acceptance involves positive attitudes and feelings towards oneself, which arise from an accurate perception of one's own actions, motivation, and feelings; it includes the acknowledgment and acceptance of the multiple aspects of the self and of one's past life, including good and bad

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qualities. Environmental mastery refers to the ability to choose and create environmental conditions suitable for one's own psychological conditions, needs, and values; it entails a sense of competence in managing the environment and external activities. Personal growth concerns the propensity to continue to develop one's potential, fulfilling the need to improve oneself and increasing self-knowledge. Positive relations with others involves having cultivated warm and trusting interpersonal relationships, and being able to feel empathy and affection towards closed ones and human beings in general. Purpose in life refers to having a clear understanding of life's purpose, a sense of directedness and goals, which all contribute to the feeling that life is meaningful.

An individual characteristic related to psychological well-being is mindfulness, intended not only as the practice of deliberately attending to present experiences, which lies at the core of Buddhist meditation (e.g., Wallace and Shapiro 2006) and of mindfulness-related training programs (Kabat-Zinn 1990), but also as an individual trait. Dispositional mindfulness is the tendency to think, feel, and act with an open and receptive awareness (Brown and Ryan 2003). It includes both a self-regulation of attention on the present moment, and an open and non-judgmental orientation to experiences, which are accepted without judgments or alterations (Bishop et al. 2004).

These features of mindfulness point to its potential connections with inner development (personal growth), feelings of self-determination (autonomy), understanding of other human beings (positive relations with others), good fit between one's outer and inner worlds (environmental mastery), ability to find meaning (purpose in life), and self-acceptance (e.g., Deci et al. 2015; Wallace and Shapiro 2006). Unsurprisingly, mindfulness has been found positively related to psychological well-being, considered both as a single construct obtained by collapsing the six dimensions (e.g., Baer et al. 2008; Josefsson et al. 2011), and separately in its six dimensions (e.g., Bergin and Pakenham 2016; Bravo et al. 2016).

While not relating mindfulness directly to psychological well-being, Shapiro et al. (2006) postulated that mindfulness takes effect through a reperceiving, a shift in perspective that enables individuals to contemplate their experiences without becoming immersed in them. The authors suggested that four mechanisms deriving from this process influence well-being, i.e., self-regulation, values clarification, cognitive and behavioral flexibility, and exposure (the tendency not to avoid stress and negative emotional states). Some studies have tested this model empirically (Brown et al. 2015; Carmody et al. 2009; Pearson et al. 2015), by equating reperceiving (the first-level mediator) to the construct of decentering (Fresco et al. 2007), and considering the four mechanisms as second-level mediators. Notably, these studies measured values clarification using scales designed to assess purpose in life (e.g., PWB scale by Ryff 1989), cognitive/behavioral flexibility was measured in terms of environmental mastery (Ryff 1989), and

exposure was measured using distress tolerance or psychological flexibility scales. Overall, the results suggested that decentering may be a "cognitive" mediator in the link between mindfulness and two psychological well-being components, i.e., purpose in life and environmental mastery. According to the literature, other partial mediators in the link between mindfulness and well-being are emotional intelligence (Schutte and Malouff 2011), inhibitory capacities directed towards actions and emotions (Sauer et al. 2011), resilience (Bajaj and Pande 2016), self-esteem (Bajaj et al. 2016), hope and optimism (Malinowski and Lim 2015).

Less attention has been paid to the more emotional, "warm", heart-related mechanisms. But, in the practice of mindfulness, awareness and attention to the present moment are not cold, hard, or analytical. Mindfulness involves an "affectionate attention", accompanied by "an attitude of gentleness and compassion" (Kabat-Zinn and Davidson 2012, p. 79). In fact, many Asian languages use the same word for mind and heart, so the terms mindfulness and heartfulness should even be considered as synonymous, or at least closely related concepts (Kabat-Zinn 2009; Santorelli 1999).

Self-compassion is a positive disposition exhibited towards the self in times of trouble and failures (Neff 2003). According to Neff (2003), self-compassion involves three interrelated components: (a) self-kindness, a kind, non-critical attitude of kindness towards the self, embracing one's own limitations; (b) common humanity, the tendency to see personal difficulties as part of a larger human experience; (c) mindfulness, considered in this context as a balanced awareness of painful thoughts and experiences, without over-identifying with them. Notably, the mindfulness component of self-compassion differs from the broad construct of mindfulness (e.g., Neff 2003): while the former refers to the ability to keep mental balance while facing stressful situations, the latter encompasses many other abilities, such as attention, non-judgment, acceptance, and openness. There are several reasons why self-compassion can be conceived as a heart-related, self-oriented consequence of mindfulness. In the practice of mindfulness, for instance, awareness and attention to the present moment are accompanied by a compassionate and kind attitude towards the objects of experience, including the self (e.g. Baer et al. 2012; Kabat-Zinn 2003). Mindfulness is also associated with lesser degrees of over-identification, avoidance strategies, and judgmental attitudes, and these psychological processes are part of a self-compassionate attitude (Allen and Leary 2010). Consistently, the findings of several studies suggest that mindfulness promotes self-compassion, and that self-compassion may be one of the potential mechanisms through which mindfulness is related to well-being. It has been demonstrated that self-compassion partially mediates the relationship between dispositional mindfulness and total scores of psychological well-being (Hollis-Walker and Colosimo 2011) and, together with trait mindfulness, it mediates the

effect of meditation practice on psychological well-being (Baer et al. 2012). Notably, such studies did not consider the dimensions of psychological well-being separately.

Gratitude is a positive feeling related to the perception of having benefited from the actions of another person (Emmons and McCullough 2003). As a disposition, it is defined as "a generalized tendency to recognize and respond with grateful emotion to the roles of other people's benevolence in the positive experiences and outcomes that one obtains" (McCullough et al. 2002, p. 112). There are various reasons why gratitude can be considered as an other-oriented, heart-related consequence of mindfulness. Indeed, gratitude has also been defined as mindful awareness of the benefits in one's life (Emmons and Mishra 2011), and as a sister of mindfulness (Rosenzweig 2013). One of the key aspects of mindfulness practice is the awareness of the interdependence between the self and others (Kabat-Zinn and Davidson 2012), and this awareness is a prerequisite for gratitude (Algoe 2012). Consistently, past research has shown that gratitude is positively related to mindfulness (e.g. Seear and Vella-Brodrick 2013), and can be one of its positive outcomes (e.g. Carlson 2015). Several studies found a positive association between gratitude and well-being (e.g. Emmons and Mishra 2011). For instance, Wood et al. (2009) showed that gratitude was positively associated with four dimensions of psychological well-being, i.e., self-acceptance, personal growth, positive relations with others, and purpose in life, even after controlling for the Big Five personality traits (Wood et al. 2009). No research has been done to date, however, on the mediating role of gratitude in the relationship between mindfulness and psychological well-being.

In two studies, we tested the mediation of self-compassion and gratitude in the associations between mindfulness and psychological well-being dimensions. Based on the features of the variables investigated, we hypothesized specific mediation paths (Fig. 1). As gratitude involves appreciating the positive and meaningful aspects in one's life, acknowledging the importance of other individuals and of one's own social environment, we expected the grateful disposition to mediate the association between mindfulness and personal growth, purpose in life, self-acceptance, positive relations with others, and environmental mastery. As self-compassion entails the acceptance of personal limitations and external conditions, a sense of community with all other humans, and the reliance on one's own beliefs and values, we expected self-compassion to mediate the relationship between mindfulness and self-acceptance, environmental mastery, positive relations with others, and autonomy.

Study 1

The aim of Study 1 was to conduct a first test of our mediation hypotheses, both in a sample of individuals with experience of meditation practices (meditators) and in a sample of non-
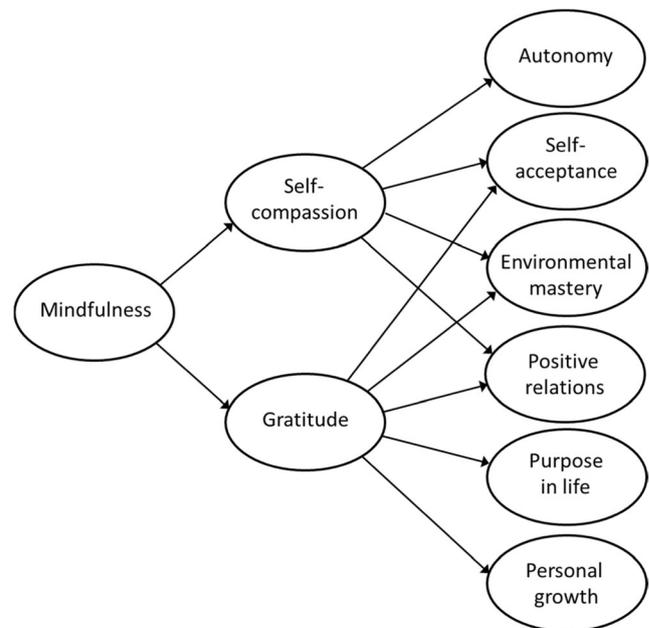

Fig. 1 Hypothesized model: effects of mindfulness on dimensions of psychological well-being through the mediation of self-compassion and gratitude

meditators, relying first on models with observable variables, then on latent variable models, to estimate unbiased paths, as suggested in the literature (e.g. Cole and Preacher 2014).

Method

Participants A convenience sample of 509 Italian respondents was collected from the general population by five research assistants. To enroll meditation practitioners as well, respondents were also recruited at meditation centers in Northern Italy. The two groups (meditators and non-meditators) were then distinguished by the question: "Do you have any previous or current experience of these practices?" with a five-option checklist: yoga, meditation, mindfulness meditation, tai chi, or other practices. The non-meditators group included respondents who either did not report any experience of the above practices, or only had only experience of yoga, tai chi, or other practices not based on meditation. The 103 individuals who ticked "meditation" and "mindfulness meditation" on the checklist were included in the meditators group.

Participants in the meditators group (66% women) were aged from 18 to 74 years (M = 42.60; SD = 12.13). Their occupations were as follows: 7.8% were manual or office workers; 43.7% were retailers, employees, or primary-school teachers; 26.2% were professionals, secondary-school teachers or academics; 10.7% were students; and 7.8% were retired, unemployed or housekeepers (3% did not answer the question). Participants were asked to indicate how long they had been involved in meditation practices. Then we created a variable for the number of months they had been practicing

meditation (see Baer et al. 2008), which ranged from 1 to 180 months ($M = 28.13$; SD = 35.07). This variable was then transformed using a base-10 logarithm function ($M = 2.49$, SD = 1.46; range 0–5.19), and named meditation experience. It was not computed for 13 participants who did not provide details of how long they had practiced meditation.

In the non-meditators group (406 individuals, 56% women), the participants were on average 36.88 years old (SD = 14.15; range 18 to 78). As for their occupations, 13.8% were manual or office workers; 40.3% were retailers, employees, or primary-school teachers; 8.2% were professionals, secondary-school teachers, or academics; 21.7% were students; and 10.6% were retired, unemployed, or housekeepers (5.4% did not say).

Procedure Respondents gave their informed consent to the recruiter and then individually completed a questionnaire in a quiet place. After providing sociodemographic details and answering questions on their experience of meditation practices, they completed the following measures.

Measures Mindfulness was measured with the Mindful Attention Awareness Scale (MAAS; Brown and Ryan 2003; Italian version by Veneziani and Voci 2015b), a self-report instrument developed to capture mindfulness in its core aspects of attention and awareness. The 15 items were rated on a 7-point Likert-type scale, from *almost never* to *almost always*, consistent with the validated Italian version (Veneziani and Voci 2015b). After appropriate recoding, higher scores indicated higher levels of mindfulness. The scale showed a good internal reliability in both meditators ($\alpha = .85$), and non-meditators ($\alpha = .82$).

As a measure of self-compassion, we used the Italian translation (Veneziani et al. 2017) of the 12 items included in the Self-Compassion Scale-Short Form (SCS-SF; Raes et al. 2011). The SCS-SF assesses the different components of self-compassion: self-kindness vs. self-judgment, common humanity vs. isolation, mindfulness vs. over-identification. As suggested by the authors, a single total score was computed. Respondents rated the items on a 5-point scale, from 1 (*almost never*) to 5 (*almost always*). After appropriate recoding, higher scores represented greater self-compassion. The internal consistency of the scale was good in both the meditators ($\alpha = .83$), and the non-meditators ($\alpha = .82$).

To measure gratitude, we used the Italian version (Fuochi et al. in press) of the Gratitude Questionnaire (GQ-6) by McCullough et al. (2002). The scale consists of six items, rated on a 5-point scale, from 1 (*strongly disagree*) to 5 (*strongly agree*). The appropriate items were reverse-coded, so that higher scores always represented a greater degree of dispositional gratitude. The scale was reliable in both meditators ($\alpha = .74$) and non-meditators ($\alpha = .71$).

Psychological well-being was measured by the Italian version (Ruini et al. 2003) of the scale by Ryff (1989) in its revised

54-item version, with nine items for each dimension (Ryff and Keyes 1995). Each statement was rated on a 6-point Likert-type scale, from 1 (*strongly disagree*) to 6 (*strongly agree*). After appropriate recoding, higher scores on each subscale indicated greater well-being in the respective component of psychological well-being. All the dimensions were reliable, in both the meditators (autonomy, $\alpha = .79$; self-acceptance, $\alpha = .85$; environmental mastery, $\alpha = .78$; personal growth, $\alpha = .73$; positive relations with others, $\alpha = .82$; purpose in life, $\alpha = .74$), and the non-meditators (autonomy, $\alpha = .78$; self-acceptance, $\alpha = .84$; environmental mastery, $\alpha = .77$; personal growth, $\alpha = .71$; positive relations with others, $\alpha = .82$; purpose in life, $\alpha = .76$).

Data Analyses In the meditators group, the sample size was too small to allow for analyses using a latent variables technique, so we tested a path model on the manifest variables, in which dispositional mindfulness predicted psychological well-being through the mediation of self-compassion and gratitude. Then we tested another model in which gratitude and self-compassion mediated the relationship between meditation experience and the components of psychological well-being, disregarding the 13 participants who did not report their meditation experience.

In the non-meditators group, data were analyzed using a structural equation model with latent variables (Mplus 7; Muthén and Muthén 2012). For each construct (mindfulness, gratitude, self-compassion, and the six components of psychological well-being), two subsets of items were computed adopting the partial disaggregation approach (Bagozzi and Heatherton 1994). Then, the goodness of fit of the measurement model was tested in a confirmatory factor analysis, using the maximum likelihood method and starting from the covariance matrix. Following the recommendations of Hu and Bentler (1999, p. 27), several indexes were employed: the chi-square test, the ratio of chi-square to degrees of freedom (χ^2/df), the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). A model fits the data adequately when the χ^2 test is not significant or, for large samples, when the χ^2/df ratio is less than 3, when the RMSEA and SRMR are lower than .08, and the CFI is higher than .95 (Hu and Bentler 1999).

To identify mediating processes, a bias-corrected bootstrapping procedure (Preacher and Hayes 2008) was run with 10,000 resamples in Mplus 7 (Muthén and Muthén 2012), for all the models tested. The effects in each model were assessed by calculating the 95% confidence intervals for the unstandardized effects, to test their statistical significance.

Results

Meditators Group As shown in Table 1, a mindful disposition was positively related to both gratitude and self-compassion. In turn, as predicted, gratitude was associated with positive

relations with others, self-acceptance, environmental mastery, personal growth, and purpose in life, while it revealed no significant association with autonomy. In line with our hypotheses, self-compassion was related to autonomy, environmental mastery, positive relations with others, and especially self-acceptance, while it was unrelated to personal growth or purpose in life.

In this first analysis, no direct effect of mindfulness emerged on the psychological well-being dimensions, but dispositional mindfulness had total effects and total indirect effects on all six dimensions of psychological well-being, as shown in Table 2. The analysis of the specific indirect effects supported the expectation that these mediation processes followed different routes. In particular, trait mindfulness had an indirect effect on autonomy exclusively via self-compassion (thus supporting our hypothesis). The MAAS scores were indirectly linked to greater self-acceptance, through gratitude and particularly through self-compassion. Dispositional mindfulness was also indirectly related to environmental mastery, and this indirect effect involved the role of both self-compassion and (albeit weakly) gratitude. The MAAS scores were also indirectly related to higher levels of positive relations with others, and this indirect effect involved the role of both gratitude and self-compassion. Finally, a mindful disposition was indirectly related to purpose in life and personal growth, but only through the effects of gratitude. To rule out the possibility of these results being driven by overlaps between the mindfulness measure and the "mindfulness" dimension of the self-compassion scale, we repeated the mediation analysis after excluding the items assessing the mindfulness component of self-compassion. The pattern of results did not change.

The results obtained when meditation experience was considered as a predictor in the model almost exactly replicated those for dispositional mindfulness. As shown in Table 1, meditation experience predicted gratitude and self-compassion, and their associations with the components of psychological well-being were entirely mediated (see Table 2). Self-compassion was the only mediator in the relationship between meditation experience and autonomy, and (unlike the previous analysis) between meditation experience and environmental mastery. Gratitude was confirmed as the only mediator involved in the prediction of personal growth and purpose in life. As seen before, the effects on self-acceptance and positive relations with others were mediated by both gratitude and self-compassion. As done for dispositional mindfulness, we repeated the mediation analysis after excluding the items measuring the mindfulness component of self-compassion. The only difference was that the effect of self-compassion on positive relations with others was no longer significant.

Overall, our findings were consistent with our predictions. In people with experience of meditation practices, both dispositional mindfulness and meditation experience were related to

higher levels of gratitude and self-compassion, which were associated in turn with specific aspects of psychological well-being. As expected, gratitude mediated the association between mindfulness and positive relations with others, personal growth, self-acceptance, and purpose in life. It seemed to have a mediating role in the association of mindfulness as disposition with environmental mastery too. Again in line with our predictions, self-compassion mediated the effects of mindfulness on self-acceptance, autonomy, environmental mastery, and positive relations with others.

Non-Meditators Group The confirmatory factor analysis indicated a good fit of the model to the data: $\chi^2(99) = 175.97$, $p \cong .00$, $\chi^2/\text{df} = 1.78$, RMSEA = .04 (.033–054; $p = .831$), SRMR = .03, CFI = .98. All the standardized factor loadings were significant at $p < .001$, and ranged from .72 to .98. Then, we tested our hypothesized model. As shown in Table 1, mindfulness (as assessed from MAAS scores) significantly predicted the disposition to be grateful and to be self-compassionate. In line with our hypotheses and with the results in the meditators group, gratitude was strongly related to positive relations with others, while no significant link with autonomy emerged. Gratitude was also associated with higher levels of self-acceptance, environmental mastery, purpose in life, and personal growth. As expected, self-compassion was strongly related to self-acceptance, and was also associated with higher scores in autonomy, environmental mastery, and positive relations with others, while no significant link emerged with personal growth or purpose in life.

Unlike the meditators, the group of non-meditators showed a dispositional mindfulness that was associated directly with four dimensions of well-being (i.e., autonomy, environmental mastery, positive relations with others, and purpose in life. Besides these direct effects, dispositional mindfulness had indirect effects on all the six dimensions of psychological well-being (Table 2). As in the meditators group, their MAAS scores were related to autonomy through the mediation of self-compassion alone, while gratitude was the only mediator in the relationship between MAAS scores and both personal growth and purpose in life. Both gratitude and self-compassion mediated the effects of dispositional mindfulness on environmental mastery, positive relations with others, and self-acceptance, here again reflecting the findings in the meditators group. As before, we repeated the mediation analysis after excluding the items of the mindfulness component of self-compassion. The only change was the appearance of a direct relationship between the MAAS scores and personal growth.

Overall, the pattern of results in the non-meditators group was consistent both with our expectations and with the findings in the meditators group. The main difference between the two groups concerned the presence of several direct effects of dispositional mindfulness on the psychological well-being of

Table 1 Path models with observed variables (Study 1, meditators) and latent variables (Study 1, non-meditators, and Study 2): effects of mindfulness on self-compassion and gratitude; effects of mindfulness, self-compassion, and gratitude on dimensions of psychological well-being

Predictors	Criterion variables							
	Self-compassion	Gratitude	Autonomy	Self-acceptance	Environmental mastery	Personal growth	Positive relations	Purpose in life
Mindfulness								
Study 1: MAAS-M	**.49 [.36, .62]**	**.22 [.09, .36]**	.11 [−.06, .27]	.00 [−.18, .15]	−.05 [−.25, .16]	.08 [−.10, .25]	.07 [−.11, .23]	.13 [−.06, .30]
Study 1: experience-M	**.23 [.13, .32]**	**.18 [.09, .26]**	−.02 [−.14, .10]	.08 [−.03, .19]	.06 [−.06, .19]	.04 [−.07, .13]	.06 [−.03, .16]	.00 [−.09, .09]
Study 1: MAAS-NM	**.55 [.42, .69]**	**.20 [.10, .32]**	**.24 [.08, .40]**	.04 [−.08, .27]	**.16 [.04, .30]**	.12 [−.01, .25]	**.16 [.01, .31]**	**.13 [.10, .38]**
Study 2: MAAS	**.35 [.26, .47]**	**.24 [.14, .36]**	**.12 [.01, .24]**	.05 [−.07, .17]	**.19 [.09, .29]**	**.24 [.01, .27]**	**.16 [.01, .28]**	**.30 [.15, .45]**
Study 2: CAMS-R	**.82 [.62, .99]**	**.72 [.52, .93]**	**.55 [.25, .91]**	**.38 [.08, .73]**	**.72 [.61, 1.03]**	**.40 [.10, .74]**	**.35 [.09, .63]**	**.59 [.18, 1.10]**
Self-compassion								
Study 1: MAAS-M	—	—	**.61 [.33, .89]**	**.68 [.45, .93]**	**.35 [.08, .65]**	.09 [−.09, .29]	**.35 [.11, .62]**	.07 [−.14, .31]
Study 1: experience-M	—	—	**.75 [.46, 1.05]**	**.62 [.29, .88]**	**.35 [.10, .67]**	.14 [−.08, .37]	**.23 [.03, .41]**	.20 [−.21, .43]
Study 1: MAAS-NM	—	—	**.30 [.15, .45]**	**.72 [.59, .86]**	**.51 [.36, .68]**	.03 [.09, .14]	**.26 [.10, .62]**	−.09 [−.05, .22]
Study 2: MAAS	—	—	**.51 [.34, .73]**	**.73 [.57, .92]**	**.40 [.25, .56]**	.03 [−.18, .24]	**.09 [.13, .33]**	−.01 [−.26, .22]
Study 2: CAMS-R	—	—	**.36 [.15, .57]**	**.60 [.37, .82]**	**.20 [.02, .42]**	.06 [−.30, .17]	.04 [−.38, .25]	−.09 [−.45, .24]
Gratitude								
Study 1: MAAS-M	—	—	−.02 [−.28, .24]	**.54 [.29, .77]**	**.40 [.12, .65]**	**.29 [.08, .52]**	**.60 [.35, .81]**	**.39 [.17, .57]**
Study 1: experience-M	—	—	−.07 [−.39, .24]	**.50 [.20, .77]**	.24 [−.10, .55]	**.31 [.06, .57]**	**.65 [.43, .86]**	**.32 [.09, .54]**
Study 1: MAAS-NM	—	—	.10 [−.03, .23]	**.44 [.33, .58]**	**.37 [.14, .51]**	**.31 [.19, .44]**	**.57 [.40, .73]**	**.41 [.26, .56]**
Study 2: MAAS	—	—	−.08 [.05, .74]	**.59 [.45, .74]**	**.33 [.21, 46]**	**.52 [.38, .67]**	**.67 [.54, .82]**	**.42 [.24, .61]**
Study 2: CAMS-R	—	—	.00 [.15, .13]	**.53 [.38, .73]**	**.23 [.09, .37]**	**.47 [.30, .64]**	**.63 [.49, .79]**	**.34 [.14, .57]**

Note. *M*, meditators group; *NM*, non-meditators group. All the effects are unstandardized. Effects in bold are statistically significant, as the 95% confidence intervals do not include 0. In Study 2, the effects are calculated controlling for social support and resilience

Table 2 Total and indirect effects [with 95% confidence intervals] of mindfulness on dimensions of psychological well-being through self-compassion and gratitude: results from path models with observed variables (Study 1, meditators) and latent variables (Study 1, non-meditators, and Study 2)

	Autonomy			Self-acceptance			Environmental mastery			Personal growth			Positive relations			Purpose in life		
	b	CI b	β	b	CI b	β	b	CI b	β	b	CI b	β	b	CI b	β	b	CI b	β
Total effects of mindfulness																		
Study 1: MAAS-M	**.41**	**[.24,.58]**	**.39**	**.45**	**[.26,.65]**	**.38**	**.22**	**[.02,.42]**	**.21**	**.19**	**[.01,.34]**	**.22**	**.37**	**[.17,.57]**	**.36**	**.25**	**[.10,.39]**	**.30**
Study 1: experience-M	**.14**	**[.01,.27]**	**.23**	**.31**	**[.17,.44]**	**.46**	**.19**	**[.06,.31]**	**.31**	**.12**	**[.02,.22]**	**.24**	**.23**	**[.11,.34]**	**.41**	**.10**	**[.01,.20]**	**.21**
Study 1: MAAS-NM	**.42**	**[.28,.57]**	**.36**	**.52**	**[.38,.70]**	**.40**	**.52**	**[.37,.68]**	**.42**	**.20**	**[.08,.31]**	**.20**	**.41**	**[.26,.57]**	**.30**	**.36**	**[.23,.52]**	**.31**
Study 2: MAAS	**.32**	**[.21,.43]**	**.40**	**.45**	**[.32,.60]**	**.44**	**.41**	**[.31,.53]**	**.51**	**.28**	**[.16,.39]**	**.30**	**.36**	**[.24,.49]**	**.37**	**.40**	**[.25,.55]**	**.40**
Study 2: CAMS-R	**.83**	**[.61,1.08]**	**.59**	**1.24**	**[.97,1.50]**	**.69**	**1.04**	**[.82,1.27]**	**.75**	**.68**	**[.45,.94]**	**.42**	**.83**	**[.59,1.08]**	**.50**	**.77**	**[.52,1.05]**	**.45**
Total Indirect effects of mindfulness																		
Study 1: MAAS-M	**.30**	**[.18,.46]**	**.29**	**.45**	**[.29,.65]**	**.38**	**.26**	**[.14,.42]**	**.26**	**.11**	**[.02,.23]**	**.13**	**.31**	**[.16,.47]**	**.30**	**.12**	**[.02,.26]**	**.15**
Study 1: experience-M	**.16**	**[.08,.26]**	**.27**	**.23**	**[.13,.35]**	**.34**	**.12**	**[.06,.21]**	**.21**	**.09**	**[.03,.16]**	**.17**	**.17**	**[.09,.25]**	**.30**	**.10**	**[.05,.18]**	**.22**
Study 1: MAAS-NM	**.18**	**[.10,.29]**	**.16**	**.48**	**[.37,.62]**	**.37**	**.35**	**[.25,.47]**	**.28**	**.08**	**[.01,.15]**	**.08**	**.25**	**[.15,.38]**	**.19**	**.13**	**[.05,.23]**	**.11**
Study 2: MAAS	**.20**	**[.13,.31]**	**.25**	**.40**	**[.28,.54]**	**.39**	**.22**	**[.14,.32]**	**.27**	**.13**	**[.05,.23]**	**.14**	**.20**	**[.10,.30]**	**.21**	**.10**	**[.01,.20]**	**.10**
Study 2: CAMS-R	**.29**	**[.10,.50]**	**.21**	**.86**	**[.63,1.16]**	**.48**	**.32**	**[.11,.56]**	**.23**	**.29**	**[.07,.53]**	**.18**	**.48**	**[.27,.74]**	**.29**	.18	[−.19,.48]	.10
Indirect Effects of mindfulness through:																		
Self-compassion																		
Study 1: MAAS-M	**.30**	**[.17,.48]**	**.29**	**.33**	**[.20,.50]**	**.28**	**.17**	**[.05,.33]**	**.17**	.05	[−.05,.15]	.05	**.18**	**[.05,.34]**	**.17**	.04	[−.07,.16]	.05
Study 1: experience-M	**.17**	**[.09,.28]**	**.29**	**.14**	**[.07,.24]**	**.21**	**.08**	**[.02,.17]**	**.14**	.03	[−.01,.10]	.06	**.05**	**[.01,.11]**	**.09**	.05	[−.00,.11]	.10
Study 1: MAAS-NM	**.16**	**[.08,.26]**	**.14**	**.39**	**[.29,.51]**	**.30**	**.28**	**[.19,.38]**	**.22**	.01	[−.05,.08]	.02	**.14**	**[.06,.24]**	**.10**	.05	[−.03,.13]	.04
Study 2: MAAS	**.18**	**[.11,.29]**	**.23**	**.26**	**[.18,.36]**	**.25**	**.14**	**[.08,.22]**	**.17**	.01	[−.06,.08]	.01	.03	[−.05,.10]	.03	.00	[−.09,.08]	.00
Study 2: CAMS-R	**.29**	**[.14,.49]**	**.21**	**.48**	**[.31,.70]**	**.27**	.16	[−.02,.33]	.12	−.05	[−.26,.13]	−.03	.03	[−.15,.20]	.02	−.07	[−.39,.18]	−.04
Gratitude																		
Study 1: MAAS-M	.00	[−.08,.04]	.00	**.12**	**[.05,.23]**	**.10**	**.09**	**[.03,.18]**	**.09**	**.06**	**[.02,.14]**	**.08**	**.13**	**[.06,.25]**	**.13**	**.09**	**[.03,.17]**	**.11**
Study 1: experience-M	−.01	[−.08,.04]	−.02	**.09**	**[.04,.16]**	**.13**	.04	[−.01,.11]	.08	**.05**	**[.01,.12]**	**.11**	**.12**	**[.06,.19]**	**.21**	**.06**	**[.02,.12]**	**.12**
Study 1: MAAS-NM	.02	[−.00,.06]	.02	**.09**	**[.04,.16]**	**.07**	**.08**	**[.03,.14]**	**.06**	**.06**	**[.03,.11]**	**.06**	**.12**	**[.05,.20]**	**.08**	**.08**	**[.04,.15]**	**.07**
Study 2: MAAS	.02	[−.01,.06]	.03	**.14**	**[.08,.22]**	**.14**	**.08**	**[.04,.14]**	**.10**	**.13**	**[.07,.21]**	**.14**	**.16**	**[.09,.26]**	**.17**	**.10**	**[.05,.18]**	**.10**
Study 2: CAMS-R	.00	[−.12,.10]	.00	**.38**	**[.26,.55]**	**.21**	**.16**	**[.07,.29]**	**.12**	**.33**	**[.21,.51]**	**.20**	**.45**	**[.31,.64]**	**.27**	**.25**	**[.11,.44]**	**.14**

Note. *M*, meditators group; *NM*, non-meditators group. Effects in bold are statistically significant, as the 95% confidence intervals do not include 0. Confidence intervals are computed for the unstandardized effects. In Study 2, the effects are calculated controlling for social support and resilience

the non-meditators, while the mindful disposition was not directly related to any of the dimensions of psychological well-being among the meditators. This discrepancy could be because in people who practice meditation, mindfulness and heartfulness may be conceived as the same thing (Kabat-Zinn 2009; Santorelli 1999), and this could generate overlaps between mindfulness, self-compassion, and gratitude. In fact, among the 103 meditation practitioners, the MAAS correlated $r = .28$ with gratitude and $r = .57$ with self-compassion, while gratitude and self-compassion strongly correlated with one another ($r = .52$); among the 406 non-meditators, these three zero-order correlations were, respectively, $r = .14$, $r = .41$, and $r = .15$ (the three coefficients differed between the two samples with $p = .10$, $p = .03$, and $p < .001$, respectively, one-tailed). It may be that the stronger associations between predictor and mediators in the group of meditators reduced the direct, unmediated effects of mindfulness on well-being seen in the group of non-meditators, suggesting that experience of meditation reinforces the role of these two heartfulness dimensions.

Study 2

The aim of this study was to further test our mediation model by adding another mindfulness measure and controlling for two variables relating to gratitude, self-compassion, and well-being, i.e., resilience and perceived social support. Self-compassion has been shown to mitigate the painful emotional consequences of negative events, facilitating resilience (Leary et al. 2007); and gratitude has been linked to the perception of social support (Froh et al. 2009; Wood et al. 2008). In addition, both social support (e.g., Karademas 2006) and resilience (e.g., Satici 2016) have been identified as predictors of well-being. Resilience has also emerged as a mediator in the relationship between mindfulness and well-being, as measured in terms of life satisfaction and affect (Bajaj and Pande 2016). To remove any effect of overlaps between self-compassion and resilience on the one hand, and between gratitude and social support on the other, we included resilience and social support as control variables in our hypothesized mediation model.

Method

Participants Our convenience sample included 299 Italian respondents (101 men, 198 women) drawn from the general population. Participants ranged from 18 to 72 years of age ($M = 31.15$; SD = 12.10). As for their occupations, 13.7% were manual or office workers; 37.8% were retailers, employees, or primary-school teachers; 8% were professionals, secondary-school teachers, or academics; while 6.2% were housekeepers, unemployed, or retired; 22.1% were students (and 12% did not indicate any occupation).

Procedure Respondents were recruited by two research assistants and completed an online questionnaire covering the measures of interest in this study, other variables not discussed here, and sociodemographic information. For this second study, no information about participants' experience of meditation was collected, so the sample may have included a number of meditators. No meditation centers were involved in participant enrollment, however (unlike the case of Study 1), so the meditators were presumably a small minority of the sample.

Measures We used the MAAS ($\alpha = .85$), the SCS-SF ($\alpha = .83$), the GQ-6 ($\alpha = .79$), and the PWB scale (autonomy, $\alpha = .80$; self-acceptance, $\alpha = .86$; environmental mastery, $\alpha = .76$; personal growth, $\alpha = .72$; positive relations with others, $\alpha = .79$; purpose in life, $\alpha = .77$). We also used the Italian version (Veneziani and Voci 2015a) of the CAMS-R (Feldman et al. 2007), which consists of 12 items measuring the mindfulness aspects of awareness, attention, present focus, and acceptance. Respondents rated items on a 4-point scale (1 = *Rarely/Not at all*, 2 = *Sometimes*, 3 = *Often*, 4 = *Almost always*). After appropriate recoding, higher scores indicated higher levels of mindfulness. The scale was reliable ($\alpha = .77$).

Resilience was measured by the Brief Resilience Scale, composed of six items assessing the ability to bounce back from negative events and stressful situations (Smith et al. 2008). The items were translated into Italian by the authors with the help of a bilingual professional translator, and back-translated by another bilingual translator. Response options ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). The scale's reliability was satisfactory ($\alpha = .86$).

For the assessment of social support, we relied on the Italian validation (Prezza and Principato 2002) of the Multidimensional Scale of Perceived Social Support (Zimet et al. 1988), a 12-item scale assessing perceived social support received from family, friends, and a special person. Respondents rated items on a 5-point agreement scale. Scale reliability was high ($\alpha = .91$).

Data Analyses As for the non-meditators group in the previous study, we created two subsets of items for each construct (Bagozzi and Heatherton 1994), and used a confirmatory factor analysis to compute the model's goodness of fit. Then, we tested our hypothesized model, treating mindfulness as an antecedent of gratitude and self-compassion, which related in turn to each component of psychological well-being. The model was tested after controlling for resilience and social support, which were related to all the other variables. It was tested twice, once using the MAAS to support our previous findings, then using the CAMS-R to ensure that our previous results were not due to particular features of the mindfulness scale employed. A bias-corrected bootstrapping procedure was applied, computing 10,000 bootstrap resamples and using

95% confidence intervals on the indirect effects (Preacher and Hayes 2008).

Results

When the MAAS was used to measure mindfulness, the goodness of fit indexes suggested a correspondence between the model and the data: $\chi^2(154) = 298.94$, $p \cong .00$, $\chi^2/\mathrm{df} = 1.94$, RMSEA = .06 (.046–065; $p = .183$), SRMR = .03, CFI = .97. All the standardized factor loadings were significant at $p < .001$, and ranged from .76 to .95.

As shown in Table 1, and in line with previous findings, gratitude and self-compassion were positively related to the MAAS scores. A grateful disposition was related to higher scores for positive relations with others, self-acceptance, environmental mastery, personal growth, and purpose in life. Self-compassion was related to self-acceptance, autonomy, environmental mastery, and positive relations with others, but not associated with personal growth or purpose in life. As in Study 1 (non-meditators group), the MAAS scores were directly related to autonomy, environmental mastery, personal growth, positive relations with others, and purpose in life, but not to self-acceptance. Besides these direct effects, the MAAS scores were indirectly related to all six dimensions of psychological well-being (Table 2). In particular, mindfulness as measured by the MAAS showed a significant indirect effect on autonomy via self-compassion alone (supporting our previous results), and indirect effects on self-acceptance and environmental mastery mediated by gratitude and self-compassion. Unlike the previous findings, dispositional mindfulness was indirectly related to positive relations with others mainly through the mediation of gratitude. Finally, the MAAS showed indirect effects on purpose in life and personal growth via gratitude alone, supporting our previous findings and predictions. As done in Study 1, we repeated the mediation analysis after excluding the items assessing the mindfulness component of self-compassion. The only change concerned the effect of self-compassion on positive relations with others, which was no longer significant.

The goodness of fit indexes proved the adequacy of the model also when the CAMS-R assessed mindfulness: $\chi^2(154) = 257.59$, $p \cong .00$, $\chi^2/\mathrm{df} = 1.67$, RMSEA = .05 (.037–057; $p = .652$), SRMR = .03, CFI = .98. All the standardized factor loadings were significant at $p < .001$, and ranged from .70 to .95. Tables 1 and 2 show the pattern of results, which largely replicated the findings obtained with the MAAS. The main differences concern the size of the effects, which seem larger in the model run with the CAMS-R scores, and the loss of any mediating effect of self-compassion on environmental mastery.

Apart from the weaker connection between self-compassion and positive relations with others, the results obtained using the CAMS-R largely supported the findings of Study 1. Here again, we repeated the mediation analysis after excluding the items for the mindfulness component of self-compassion, and the results did not change. The hypothesized mediation model thus held when an alternative mindfulness measure was used, and after controlling for resilience and social support.

Discussion

We proposed a mediation model in which heartful aspects of mindfulness, i.e., self-compassion and gratitude, mediated the relationship between mindfulness and the components of psychological well-being, i.e., self-acceptance, autonomy, environmental mastery, personal growth, purpose in life, and positive relations with others. Across two studies, we tested this model by implementing incremental variations. In Study 1, we conducted the analyses separately for individuals with and without experience of meditation practices, considering the meditation experience of the former and the MAAS scores obtained in the two groups (meditators and non-meditators) as exogenous variables of the model. In Study 2, the MAAS and the CAMS scores were both considered, and we controlled for two concurrent variables, resilience and social support. In Study 2 and in the non-meditators of Study 1, we examined the mediation effects using latent variables models.

Despite these methodological variations, our results were coherent across the studies and in line with our hypotheses. The only inconsistency concerned the lack of a direct effect of mindfulness on psychological well-being in the group of meditators involved in Study 1, which supports the idea that for meditators mindfulness and heartfulness as strongly interconnected (e.g., Santorelli 1999), so the effects of mindfulness on the dimensions of psychological well-being in this group were all conveyed by affective and heart-related aspects.

Gratitude and self-compassion are therefore probably two heartfulness-related mechanisms through which mindfulness enhances psychological well-being, or optimal human functioning, regardless of people's experience of meditation. Our findings corroborate the literature showing that mindfulness is associated with greater self-compassion and gratitude (e.g. Baer et al. 2012), and shed light on the heart-related mechanisms mediating the link between mindfulness and the dimensions of psychological well-being. Being grateful was found associated with the ability to cultivate warm interpersonal relationships (i.e. positive relations with others), but also with aspects more closely related to the self, not involving the connection with other individuals. For instance, gratitude mediated the associations of mindfulness with personal growth and self-acceptance. Gratitude may help people high on dispositional mindfulness to accept themselves and acknowledge they have developed over time, perhaps fostering acceptance of positive and negative personal characteristics. Gratitude

also mediated the relationship between mindfulness and purpose in life, as if recognizing the role of external factors in the attainment of personal benefits could help individuals find meaning in past and present experiences. Importantly, all these mediating links are consistent with the literature on the relationships between gratitude and specific dimensions of psychological well-being (Wood et al. 2008).

Turning to self-compassion, the interpretation of its mediating role in the relationship between mindfulness and self-acceptance is straightforward: one of the components of self-compassion is self-kindness, defined as a gentle attitude towards oneself, based on the acceptance of one's own limitations and failings (Neff 2003). As for the mediation of self-compassion in the relationship between mindfulness and positive relations with others, this effect is consistent with the literature showing that self-compassionate people easily extend the kindness and care they feel towards themselves to others, and particularly to their relationship partners, and this improves relationship quality (e.g., Neff and Beretvas 2013). This explains why mindful and self-compassionate individuals tend to have better positive relations with others, and sustains the positive other-oriented outcomes of these two dispositions.

Self-compassion also mediated the relationships between mindfulness and the aspects of psychological well-being labeled as autonomy and environmental mastery, both of which are linked to independence in decision-making and action-taking. These diverse forms of independence might be enhanced by the tendency of self-compassionate people to treat themselves with respect and to fulfill their own needs, avoiding self-criticism (Neff 2003). Lastly, since gratitude mediated the effects of mindfulness on personal growth and purpose in life, but self-compassion did not, it may be that eudaimonic well-being, typically represented by these two dimensions (Bauer et al. 2005), is nurtured more by heartfulness towards others than by heartfulness towards the self.

Comparing our findings with the literature on the mechanisms of mindfulness prompts us to draw several conclusions. First, in the light of the theoretical model proposed by Shapiro et al. (2006), heartfulness may be an alternative mechanism that links mindfulness with well-being, and it could be seen as the affective counterpart of the metamechanism (or first-level mediator) called reperceiving. Second, empirical tests on the Shapiro model (Brown et al. 2015; Carmody et al. 2009; Pearson et al. 2015) have considered as second-level mediators variables that could also be seen as outcomes, i.e., values clarification measured by purpose in life, and behavioral flexibility measured by environmental mastery. These two dimensions of psychological well-being are not individual abilities, but individual outcomes related to positive mental health. Overall, our findings suggest that the Shapiro model might be further developed, both incorporating warmer, heart-

related aspects of mindfulness that go beyond reperceiving and involve gentle attitudes towards the self and others (self-compassion and gratitude), and using psychological well-being as the outcome. Third, our results enrich the evidence of the channels through which mindfulness affects well-being. As well as fostering people's resilience (Bajaj and Pande 2016), positive attitudes to life (Malinowski and Lim 2015), and self-esteem (Bajaj et al. 2016), mindfulness increases their capacity to be kind, understanding, and grateful towards themselves and others. This includes not only a positive self-evaluation, as described in the literature (Bajaj et al. 2016), but also a caring attitude both to the self when facing problems and to the others. Importantly, taking a caring attitude to other individuals ameliorates relations with them.

Limitations

Some limitations of this work need to be acknowledged. First, we only relied on convenience samples, which carry the risk of generalizability issues. Second, as we did not collect detailed information on the type of meditation practiced, or the frequency of the meditation experiences, we can only draw limited inference on the influence of experience of meditation on our respondents. Future research could explore the hypothesized model in regular meditators. Third, the use of a cross-sectional design and only correlational analyses prevented us from drawing conclusions about the causal relations between the variables, especially because cross-sectional mediation analyses often lead to biased estimates compared to longitudinal ones (Maxwell and Cole 2007). Indeed, the lack of a temporal order in the data prevents us from establishing the direction of mediation. Fourth, we used a measure of dispositional mindfulness—the MAAS—that raised serious concerns from both a theoretical and a methodological point of view (e.g., Grossman 2011; Van Dam et al. 2010). In particular, the MAAS only allows the investigation of mechanisms involving a specific aspect of mindfulness, namely, acting with awareness (Coffey and Hartman 2008), while neglecting its acceptance and non-judgment components (Sauer et al. 2013). Moreover, as all items are worded negatively or describe the absence of attentional focus, it may actually measure the perceived propensity to experience lapses of attention (Grossman 2011).

Notwithstanding these limitations, this paper shows the role of heartful aspects of mindfulness—directed both to the self (self-compassion) and to others (gratitude)—in the relationships between a mindful disposition and psychological well-being. Overall, our results point at the importance of considering mindfulness not as an isolated or detached individual feature, but as the core-node in a network of heartful and positive dispositions that foster optimal human functioning.

Author Contributions AV conceptualized the research questions, designed the studies, assisted with data analyses, and drafted parts of the introduction, results, and discussion sections. CAV conducted data analyses, drafted the method sections and parts of the introduction, results, and discussion sections. GF assisted with interpretation of the data and drafted parts of the introduction and discussion sections. All authors contributed to and approved the final version of the manuscript.

Compliance with Ethical Standards

Ethical Standards The manuscript does not contain clinical studies or patient data.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the Ethical Committee for Psychological Research at the University of Padova (protocol number 1948) and with the 1964 Helsinki Declaration and its later amendments, or comparable ethical standards.

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

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