



Curb your neuroticism – Mindfulness mediates the link between neuroticism and subjective well-being



Mario Wenzel*, Christina von Versen, Sarah Hirschmüller, Thomas Kubiak

Institute of Psychology, Johannes Gutenberg University Mainz, Germany

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ABSTRACT

Recent research has shown that mindfulness moderates the negative emotional reactivity associated with neuroticism. In two studies, we investigated how neuroticism and mindfulness are associated with subjective well-being (SWB), assuming a moderated mediation. In Study 1, 147 participants (74.2% female, $M = 34.3$ years, $SD = 11.9$) completed an online survey. Mindfulness partially mediated but did not moderate the relationship between neuroticism and SWB, indicating that low levels of mindfulness were partially accountable for lower SWB in individuals high in neuroticism. In Study 2, 108 participants (80.6% female, $M = 25.2$ years, $SD = 6.6$) completed daily diaries for 6 days. We found evidence for a moderated mediation in trait as well as daily measures of mindfulness and SWB, in that the lack of mindfulness could explain around one quarter of the negative association between neuroticism and SWB. This mediation was moderated by neuroticism itself in Study 2, in that mindfulness was only a significant mediator for high levels of neuroticism. Our findings demonstrate that negative emotional reactivity associated with neuroticism is partially due to low levels of mindfulness, which offers a promising future research avenue for the role of mindfulness.

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1. Introduction

A plethora of research has shown that neuroticism, characterized by negative affective states such as fear, anxiety, or worry, is negatively linked to subjective well-being (SWB; e.g., Ozer & Benet-Martinez, 2006). Out of the Big Five personality factors, a meta-analysis demonstrated that neuroticism is the strongest predictor of SWB and negative affect (Steel, Schmidt, & Shultz, 2008). Studies trying to reveal the mechanisms by which neuroticism is negatively associated with SWB are diverse and consider biological, psychological, and social factors. For example, Weiss, Bates, and Luciano (2008) demonstrated that neuroticism and SWB share a common genetic basis. Considering social factors, social support, for instance, is both negatively connected to neuroticism (Swickert, 2009; Swickert, Hittner, & Foster, 2010) as well as SWB (Pinquart & Sorensen, 2000), although the evidence for the association with SWB is inconsistent (Bolger & Amarel, 2007). The third group of factors involves cognitive–affective processes such as stress appraisal. For example, neurotic individuals both experience more stressful events (Gunther, Cohen, & Armeli, 1999) and react to

them with more negative emotions (Gross, Sutton, & Ketelaar, 1998; Zautra, Affleck, Tennen, Reich, & Davis, 2005).

1.1. Mindfulness as a mediator

In the present research, we propose mindfulness as another promising cognitive–affective mechanism contributing to the lower SWB in neurotic individuals. Mindfulness refers to a state of present-centered awareness on one's own sensations, thoughts, and feelings without judgment (Brown & Ryan, 2003) or with openness and acceptance (Bishop et al., 2004). It has become an increasingly important topic in research and clinical applications (Khoury et al., 2013). Importantly, it is both associated with SWB (Brown & Ryan, 2003) as well as neuroticism (Baer et al., 2008; Brown & Ryan, 2003), demonstrating an averaged effect size of $r = -.45$ for neuroticism in a recent meta-analysis (Giluk, 2009). One explanation on how mindfulness can explain the negative association of neuroticism and SWB might be that mindfulness influences cognitive–affective processes, which contribute to increased negative affectivity and lower SWB in individuals high in neuroticism. Suls and Martin (2005) focused on five interconnected processes that form a *neurotic cascade*: (1) hyperreactivity, (2) differential exposure, (3) differential appraisal, (4) mood spillover, and (5) the sting of familiar problems. Since each mechanism is seen to reinforce

* Corresponding author at: Department of Psychology, Psychologisches Institut, Johannes Gutenberg-Universität Mainz, Binger-Str. 14-16, D-55122 Mainz, Germany. Tel.: +49 6131 3939132; fax: +49 6131 3939186.

E-mail address: wenzelma@uni-mainz.de (M. Wenzel).

each other, these five processes form a *neurotic cascade*, leading to lower SWB in daily life.

We propose that mindfulness is associated with these processes. For instance, neurotic individuals are more sensitive to negative stimuli signaling punishment (Boksem, Tops, Wester, Mejman, & Lorist, 2006) and to mood induction (Thake & Zelenski, 2013), demonstrating increased affective hyperreactivity. However, recent research found that mindfulness is also linked to reward sensitivity, in that it moderated the association of reward sensitivity on psychological distress (Hamill, Pickett, Amsbaugh, & Aho, 2015). Moreover, neurotic individuals may use differential appraisals. For example, they reported stressful events as more threatening, which they could cope with less personal resources (Gunthert et al., 1999). In turn, Weinstein, Brown, and Ryan (2009) showed that mindful individuals stated more positive stress appraisals and a higher use of approach and a lower use of avoidance coping leading to higher SWB. Furthermore, Suls and Martin (2005) argue that neuroticism leads to mood spillover effects due to its association with rumination (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Since mindfulness training can decrease ruminative thinking (Deyo, Wilson, Ong, & Koopman, 2009), it seems plausible to view mindfulness as a state with the potential to reduce negative emotional outcomes associated with neuroticism. Finally, due to the maladaptive coping strategies and rumination, recurring stressful events lead to a negative self-concept and low self-esteem, which Suls and Martin (2005) term the sting of familiar problems. Mindfulness, demonstrating a positive correlation with self-esteem (Pepping, O'Donovan, & Davis, 2013), might interrupt this familiarity by concentrating on the present moment experiences with a curious, accepting stance. Taken together, we view the neurotic cascade as an intriguing concept, which can be, in our view, summarized into mindfulness or a lack thereof.

1.2. Mindfulness as a moderator

However, studies investigating the role of mindfulness in the neuroticism – SWB link only tested, to the best of our knowledge, for moderation but not for mediation. There is evidence that the relation between neuroticism and SWB is moderated by mindfulness, in that individuals with high levels of neuroticism only reported more depressive mood and anger if levels of mindfulness were low to medium (Barnhofer, Duggan, & Griffith, 2011; Feltman, Robinson, & Ode, 2009). Since these studies did not test other possible mechanisms, such as mindfulness acting as a mediator or moderated mediation, they cannot indicate whether mindfulness might explain the neuroticism – SWB link. If mindfulness were a moderator, neuroticism should differently affect SWB depending on the degree of mindfulness, in that high levels of mindfulness would “counteract” the negative effect of neuroticism on SWB. In contrast, if mindfulness were a mediator, neuroticism should exert its influence on SWB *via* mindfulness. Here, instead of mindfulness “counteracting” effects of neuroticism, differences in mindfulness could account for the negative association of neuroticism and SWB.

Our meditation hypothesis is not necessarily inconsistent with the evidence for moderation, since mediation and moderation might also co-occur (Muller, Judd, & Yzerbyt, 2005). For example, a fourth variable might moderate the mediation effect or moderated mediation might also occur in absence of a fourth variable where the predictor itself could moderate the effect of a mediator on an outcome (Preacher, Rucker, & Hayes, 2007). With regard to the interplay of mindfulness, neuroticism, and SWB, the negative association between neuroticism and SWB might be mediated by mindfulness, which is amplified by high levels of neuroticism. Thus, individuals high in neuroticism indicate lower SWB due to a lack of mindfulness, whereas mindfulness might provide no

explanatory content for differences in SWB in individuals low in neuroticism.

1.3. Aim and hypothesis

The present research examined how mindfulness impacts the effect of neuroticism on SWB covering moderation, mediation, and moderated mediation models. We hypothesized that mindfulness acts as a mediator of the relationship between neuroticism and SWB, that may, in turn, be moderated by neuroticism, in that the indirect effect of neuroticism via mindfulness is larger for increasing levels of neuroticism. In Study 1, we tried to replicate current findings (Barnhofer et al., 2011; Feltman et al., 2009) and expanded the analytical approach by including both moderation and mediation models. In Study 2, we investigated whether the evidence found on the trait level can also be found within individuals in everyday life.

2. Study 1

2.1. Method

2.1.1. Participants

A total of 147 participants (109 females), aged 18–62 years ($M = 34.3$ years, $SD = 11.9$), completed an online survey on Sosci Survey (Leiner, 2014). Three participants were high school students, 53 were undergraduate students (69.8% of psychology), and the rest were employed. We aimed for 170 participants to achieve a power of .80 to detect interactions of the magnitude found in previous research ($R^2_{change} = .03$; Barnhofer et al., 2011; Feltman et al., 2009). The power of the final sample was .74.

2.1.2. Measures

2.1.2.1. Dispositional mindfulness. To assess the trait level of mindfulness, participants completed the German short version (KIMS-Short; Höfling, Ströhle, Michalak, & Heidenreich, 2011) of the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004; Ströhle, Nachtigall, Michalak, & Heidenreich, 2010). The KIMS-Short consists of 20 items (1 = *never or very rarely true* to 5 = *very often or always true*) with four subscales: observing (six items), describing (five items), acting with awareness (four items), and accepting without judgment (five items). We computed the mean score across scales¹ with higher scores indicating higher levels of mindfulness. Cronbach's alpha was $\alpha = .89$.

2.1.2.2. Neuroticism. The participants completed the self-report questionnaire Big Five Inventory (BFI; John, Donahue, & Kentle, 1991) in its German short version BFI-K (Rammstedt & John, 2005). The BFI-K assesses the five personality domains with 21 items on a scale ranging from 1 (*not at all*) to 5 (*extremely*). Neuroticism is covered by four items with a Cronbach's alpha of $\alpha = .77$ in our sample.

2.1.2.3. Subjective well-being. The 5-item WHO-five Well-being Index (WHO-5; WHO, 1998) captures mood, vitality, and general interest as marker of SWB over the last two weeks on a scale ranging from 1 (*at no time*) to 6 (*all of the time*). A higher mean score indicates better SWB. Cronbach's alpha was $\alpha = .84$.

¹ To investigate whether the KIMS-Short mean score represented an appropriate index for general mindfulness, we constructed a measurement model using CFA, where the KIMS-Short subscales loaded on a latent mindfulness factor. This model yielded an acceptable fit, $\chi^2(2) = 4.85$, $p = .088$, CFI = .973, SRMR = .029, RMSEA = .098, $p_{close} = .170$, and, thus, the mean score was used in further analyses to ease interpretation of the results.

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