



Intensity of positive and negative emotions: Explaining the association between personality and depressive symptoms

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ABSTRACT

The aim was to examine to what extent emotional intensity accounted for associations between the Big Five personality dimensions and depressive symptoms. Study 1 tested the model cross-sectionally, using survey data of 266 Dutch social science students. Study 2 experimentally examined how personality dimensions were related to emotional reactivity after exposure to various emotional stimuli. Dutch psychology students ($N = 130$) reported on their personality and viewed an amusing or sad film clip, after which the change in intensity of experienced positive and negative emotions was assessed. Individuals scoring higher on neuroticism generally experienced more intense negative emotions, through which they experienced a higher level of depressive symptoms. Individuals who were more agreeable experienced a lower level of depressive symptoms indirectly through higher general intensity of positive emotions. More agreeable individuals showed stronger increase in negative emotions and stronger decrease in positive emotions, though after exposure to the sad stimulus only. Although replication is needed, our results offer empirical support for a more tailor-made approach in decreasing nonclinical depressive symptoms taking into account both personality characteristics and emotion regulation.

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1. Introduction

There is a need to explain individual differences in nonclinical depressive symptoms as these symptoms are common in society (Lee & Guajardo, 2011). Beck's (2008) influential cognitive model of depression has offered insight into the effects of information processing and cognitive bias on depressive symptoms. This model stresses the importance of individuals' vulnerability to mild stressful events, expressed in daily cognitive-emotional reactions. However, why certain individuals are more reactive to daily events than others has remained unexplained. The five-factor model (FFM) can contribute to such an explanation, as the biological bases of personality dimensions have been considered to underlie vulnerability to stress and depressive symptoms (Costa, Bagby, Herbst, & McCrae, 2005).

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Of the Big Five personality dimensions, particularly neuroticism has been associated with depression-proneness (Bagby, Joffe, Parker, Kalemka, & Harkness, 1995; Goodwin & Gotlib, 2004). Lower extraversion, and in some studies lower agreeableness, higher openness and lower conscientiousness, have also been associated with depressive symptoms (e.g., Chioqueta & Stiles, 2005; Harkness, Bagby, Joffe, & Levitt, 2002). The association between personality and depressive symptoms may be explained by the intensity of emotions individuals experience. Studies have found that high intensity of negative emotions and low intensity of positive emotions were linked with depressive symptoms (Lee & Guajardo, 2011). A consistent positive association has been found between neuroticism and intensity of negative emotions, whereas contradictory results (i.e., negative, statistically non-significant, and positive associations) have been reported for the relation between neuroticism and intensity of positive emotions (Bachorowski & Braaten, 1994; Lee & Guajardo, 2011; McFatter, 1998). Individuals high on extraversion have been found to report high intensity of positive emotions, and negative emotions (Bachorowski & Braaten, 1994; McFatter, 1998). Furthermore, McCrae and Costa (1991) found that openness, agreeableness and conscientiousness were moderately related to high intensity of positive emotions. Finally, Lee and Guajardo (2011) found that not affect intensity but difficulty in identifying feelings mediated between neuroticism and depressive symptoms. In sum, most evidence suggests (i) relations

between neuroticism and intensity of negative emotions, (ii) relations between the other personality dimensions and intensity of positive emotions, whereas (iii) the extent to which emotional intensity accounts for the association between personality dimensions and depressive symptoms has hardly been examined.

To understand emotional experience, also *changes* in emotional intensity in response to an emotional event, in other words emotional reactivity, should be examined. Larsen and Ketelaar (1991), who examined emotional intensity, showed positive associations between extraversion and intensity of positive emotions after positive affect induction and between neuroticism and intensity of negative emotions after negative affect induction. Experimental studies that examined emotional reactivity after emotion induction in depressive individuals have found the opposite effect; i.e., flattened emotional responding ('emotion context insensitivity'; see Rottenberg, 2005). Rottenberg (2005) argues more research is needed examining if individuals high on neuroticism show emotion context insensitivity.

Two studies were conducted to systematically examine the mechanisms through which personality, emotional intensity, and depressive symptoms are associated. First, we examined if intensity of positive and negative emotions accounted for the associations between personality dimensions and depressive symptoms. Second, we investigated how personality dimensions were related to emotional reactivity after exposure to sad or amusing stimuli.

2. Study 1

In Study 1, we first examined direct associations between personality dimensions and depressive symptoms, expecting depressive symptoms to be positively associated with neuroticism and negatively with extraversion. Second, we studied associations between emotional intensity and depressive symptoms, hypothesizing that intensity of negative and positive emotions would be related to higher and lower levels of depressive symptoms, respectively. Third, we examined if high intensity of negative emotions would account for the positive association between neuroticism and depressive symptoms, and high intensity of positive emotions for the negative association between extraversion and depressive symptoms. We also expected negative indirect effects of agreeableness and conscientiousness on depressive symptoms via more intense positive emotions.

2.1. Methods

2.1.1. Participants and procedure

Participants were 266 Dutch social science students (167 women, 99 men). The average age was 21.93 years ($SD = 2.32$). Of the participants, 13.2% lived with their partner, 24.8% with parents, 36.1% with roommates, and 26% lived alone; 56% was involved in a romantic relationship. Participants voluntarily participated during a course. They read a consent form, explaining the goals and procedure, and completed questionnaires.

2.1.2. Measures

The personality dimensions were measured with the Dutch 30-item Big Five questionnaire (Gerris et al., 1998). Six markers (e.g., nervous) for each dimension were answered on a 7-point scale, from *absolutely agree* to *absolutely disagree*. John and Srivastava (1999) have found good reliability and construct validity for their Big Five scores. In our study, Cronbach's alphas were .81 (neuroticism), .88 (extraversion), .78 (openness), .78 (agreeableness), and .92 (conscientiousness). The Emotional Intensity Scale-Reduced (EIS-R; Geuens & de Pelsmacker, 2002) was used to measure emotional intensity. Participants described how they usually feel

in situations (5-point scale, from *little effect on me* to *extremely worried*), e.g., 'someone compliments me' (intensity of positive emotions; 9 items; $\alpha = .72$) and 'I think about awful things that might happen' (intensity of negative emotions; 8 items; $\alpha = .78$). Geuens and de Pelsmacker (2002) have reported adequate internal consistency (alphas across subsamples ranging from .79 to .89), test-retest stability over a 2-week period (e.g., .88 and .83 for positive and negative emotions), and construct validity of their scores. The Beck Depression Inventory II (Dutch BDI-II; 21 items; van der Does, 2002), measured depressive symptoms. Participants answered how they felt last week on a 4-point scale ranging from *not feeling ... to feeling so ... that I cannot endure it*. Van der Does (2002) reported that the scores in his study were reliable and valid. Cronbach's alpha in our study was .75.

2.1.3. Statistical analyses

We tested models with Mplus 5.0 (Muthén & Muthén, 1998–2010), using MLR estimation. Bias-corrected (BC) bootstrapping dealt with potential non-normal sampling distributions of the indirect effects. We initially tested if the multiple mediation model (Fig. 1) differed across gender, by performing a multi-group analysis. Because gender had no effect we collapsed all data. Successively, we verified if there was a total effect of each of the personality dimensions on depressive symptoms estimating the model, excluding the mediators. Then, we estimated the saturated multiple mediation model and decomposed the total effect of each Big Five dimension on depressive symptoms into the direct effect and the two indirect effects through the two mediators in explaining depressive symptoms.

2.2. Results and discussion

2.2.1. Preliminary analyses

We imputed missing data (0.11%) by estimating the observation using regression analysis with the other scale items as predictors. The variable depressive symptoms was not normally distributed, but skewness and kurtosis values were acceptable (below 2 and 5 respectively, Curran, West, & Finch, 1996). Table 1 displays descriptives and correlations. Neuroticism was consistently positively associated with intensity of negative emotions and depressive symptoms. Also, a positive association with intensity of positive emotions was found. Agreeableness, in contrast with extraversion, was positively associated with intensity of positive emotions and negatively associated with depressive symptoms. Openness was negatively, and conscientiousness was positively, associated with intensity of negative emotions.

2.2.2. Explaining associations with emotional intensity

Figure 1 shows the significant direct paths of the final tested model. The personality dimensions explained 9.4% of the variance in depressive symptoms (small-medium effect size; Cohen, 1988). Emotional intensity additionally explained 11.8% (medium-strong effect). Totally, the model explained 21.2% of the depressive symptoms variance. The personality dimensions explained 10.3% of the variance in intensity of positive emotions (medium-strong effect), and 33.7% of the variance in intensity of negative emotions (strong effect).

Table 2's last row depicts the total effects of the personality dimensions on depressive symptoms. Neuroticism and extraversion positively and agreeableness negatively predicted depressive symptoms. Together with the direct (Table 2, first row) and indirect effects (second and third row) the extent to which emotional intensity explains the associations between personality dimensions and depression can be examined.

Emotional intensity completely accounted for the positive association between neuroticism and depressive symptoms, mostly

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