



Personality traits and psychological well-being as moderators of the relationship between stressors and negative affect: A daily diary study

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Abstract

Individuals high in neuroticism tend to experience greater negative affect when confronted with stressors. In the present study, four other personality traits (i.e., openness, conscientiousness, agreeableness, and extraversion) were included to examine their unique contribution to affective reactivity to stress. In addition, three domains of psychological well-being (positive relations with others, environmental mastery, and autonomy) were included to examine whether they mediate the associations between the traits and affective reactivity. Data from a daily diary study were used, collected over 8 days ($N=782$). The results of Bayesian multilevel modeling showed that, of the Big Five traits, only neuroticism moderated the relationship between stressful events and experienced negative affect. In other words, among the traits, neuroticism was the only robust predictor of affective reactivity. However, when the three well-being variables were added, neuroticism was no longer a significant predictor. Environmental mastery weakened the association between stressors and negative affect, whereas autonomy reinforced this association. The results of a Bayesian multilevel moderation analysis confirmed that mastery and autonomy fully mediated the relationship between neuroticism and stressor-induced negative affect. An important implication of the study is that the negative influence of neuroticism on affective reactivity can be reduced by developing mastery and competence skills.

Keywords Affective reactivity · Stressors · Negative affect · Big Five · Psychological well-being · Autonomy · Bayesian

Personality traits are individual differences in the tendency to exhibit relatively predictable patterns of behavior, thought, and emotion (McCrae & Costa, 2003). Having a personality trait “means that one is predisposed to act in a certain way in a given situation. Furthermore, the response tendency is generalized, meaning that it underlies a characteristic mode of behavior one that endures across time and cuts across situations that are not all the same” (p. 234). After decades of research and extended discussions about the optimal number of traits and their appropriate labels, the discipline has now settled on a comprehensive taxonomy of personality traits: the “Big Five” personality dimensions (John, 2021). The five

personality traits are extraversion, agreeableness, openness, conscientiousness, and neuroticism. Personality traits partially determine behavior and influence important life outcomes (Roberts et al., 2007). For example, they provide a context for affective experiences, resilience, coping processes, and stress appraisal and management (e.g., Bibbey et al., 2013; De Berardis et al., 2018; Orsolini et al., 2020).

The present study focused on stress reactivity, i.e., the extent to which individuals experience negative affect when confronted with daily stressors (Brose et al., 2021). Neuroticism has received much attention in this literature (Bolger, 1990; Gunthert et al., 1999). The hallmarks of neuroticism include over-reactivity and hypervigilance to potential negative events, leading to a tendency to interpret stressful and ordinary events as more threatening (Zhang, 2020). Therefore, individuals high in neuroticism experience higher levels of negative affect in response to daily stressors. In a daily diary study, Mroczek and Almeida (2004) found support for this prediction by showing that neuroticism increased

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the positive association between the frequency and severity of stressful events and negative affect. However, other personality traits may also play an important role in stress management, and their role has not been fully explored in previous research. The results of a recent meta-analysis (Oshio et al., 2018) showed that all Big Five dimensions are moderately associated with resilience. Neuroticism is related to lower resilience and extraversion, openness, agreeableness, and conscientiousness are related to higher resilience. Similarly, the meta-analysis by Connor-Smith and Flachsbart (2007) showed that the five personality traits predict specific coping strategies, which has potential implications for stress management. The meta-analysis by Anglim et al. (2020) also showed that personality traits other than openness had nontrivial associations with negative affect. In a daily diary study, Leger et al. (2016) found that extraversion, openness, and conscientiousness contributed to stressor-induced negative affect over and above neuroticism. Higher levels of these traits mitigated the associations between stressors and negative affect. Therefore, all personality traits may act as moderators of the relationship between stressors and affect. The present study attempted to investigate this possibility by including all Big Five personality traits.

Little is known about the mechanisms by which personality traits influence the association between stressors and negative affect. Another purpose of the present study was to examine whether elements of psychological well-being mediate these associations. On the one hand, Big Five traits are strongly associated with psychological well-being (Anglim et al., 2020; Joshanloo, 2019). On the other hand, various aspects of psychological functioning are associated with emotion regulation processes and outcomes (e.g., Church et al., 2012; Nyklíček et al., 2011). Thus, personality traits may influence affective outcomes at least in part through their associations with aspects of optimal psychological functioning. In the present study, the three well-being variables of positive relations with others (relatedness), environmental mastery (competence), and autonomy were included along with Big Five traits as moderators of stress-related negative affect. These three variables are highlighted in Ryff's model of psychological well-being as fundamental aspects of optimal well-being (Ryff, 1989). They are also considered basic psychological needs in self-determination theory (Ryan & Deci, 2008), where it is posited that their satisfaction is critical for optimal psychological functioning. Well-being variables and personality traits are correlated, yet distinct constructs (e.g., Anglim et al., 2020). In much of previous research, personality traits have been considered as predictors of well-being. In summary, it was hypothesized that psychological well-being would mediate the relationship between personality traits and stress

reactivity. For example, neuroticism would be associated with decreased psychological well-being, which would per se increase stress reactivity. This hypothesis is in line with previous research predicting and finding that the satisfaction of psychological needs (i.e., the presence of psychological well-being) is among the mediators of the relationship between personality traits and various outcomes (e.g., Demirbaş-Çelik & Keklik, 2018; Şimşek & Koydemir, 2013).

Study Design

This study was a daily diary study conducted for eight consecutive days. Stressful events and negative affect were measured each day. It was expected that experiencing stressful events would be simultaneously associated with an increase in negative affect. The main aim of this study was to investigate whether the daily associations between stressful events and experienced negative affect were moderated by personality traits and psychological well-being, after controlling for age and gender. This study used a diary design rather than retrospective reports. Diary research is a type of intensive repeated measures design in which data are collected repeatedly for each participant each day. While cross-sectional studies and most experimental studies often examine psychological variables at the between-person level, diary research allows for the examination of within-person effects and thus can enrich our knowledge of variations in variables over time and their relationships at the within-person level (Boynton & O'Hara, 2019). The advantage of this design is that the data are collected in a natural setting rather than under controlled laboratory conditions, which increases ecological validity. In addition, repeated data collection provides more accurate descriptions of daily experiences, feelings, and thoughts compared to one-time assessments because recall errors are reduced (Nezlek, 2012).

Analytic Strategy

Multi-level modeling (MLM) was used to distinguish two levels of analysis: the person level (i.e., between-person or inter-individual level) and the diary level (i.e., the within-person or intra-individual level). The variables measured every day are diary-level variables that capture within-person fluctuations. Person-level variables (e.g., personality traits and indicators of psychological functioning) are measured only once and tap into between-person differences (Nezlek, 2012). These variables can predict individual differences in diary-level outcomes or

moderate the associations between diary-level variables. MLM is the most appropriate strategy for analyzing diary data. Firstly, MLM accounts for the hierarchical structure of the data and handles the dependency of the error terms in repeated measures designs. Secondly, MLM allows using variables at their appropriate levels (Heck & Thomas, 2020). Variables measured multiple times are entered at the diary level, and time-invariant variables (such as gender) are entered at the person level. Thirdly, in traditional methods for analyzing longitudinal data (e.g., repeated measure ANOVA), only participants with complete data can be used, whereas MLM uses available data from incomplete observations, and thus is very effective in minimizing the effects of attrition (Finch et al., 2019).

Methods

Participants

Data were obtained from the Midlife in the United States (MIDUS) Refresher project, collected between 2011 and 2014, and the Midlife in the United States (MIDUS Refresher): Daily Diary Project, conducted between 2012 and 2014 (Ryff & Almeida, 2018; Ryff et al., 2016). The daily diary participants were a random subsample of the Refresher cohort who participated in the main MIDUS Refresher project. The sample consisted of 782 individuals ($M_{\text{age}} = 47.907$, $SD_{\text{age}} = 12.670$, 55.6% females) who responded to eight daily surveys, proving 5,849 daily reports altogether. Of the participants, 627 completed all eight daily surveys and 155 participants provided one to seven answers. No participant was excluded from the analysis. Negative affect and stressor variables were obtained from the daily diary study, whereas the personality and well-being variables were obtained from the main Refresher project.

Measures

Negative Affect Fourteen items (i.e., restless or fidgety, nervous, worthless, so sad nothing cheer you up, everything was an effort, hopeless, lonely, afraid, jittery, irritable, ashamed, upset, angry, and frustrated) were used to measure daily negative affect (Cronbach's $\alpha = 0.89$). The respondents reported how much of the time during "today" they felt any of the affective states on a 5-point item ranging from 0 (*none of the time*) to 4 (*all of the time*). Considering that the variable had a very high kurtosis value (15.06), it was log-transformed, which reduced its kurtosis to 4.244.

Stressors The respondents were asked if they experienced seven types of stressors since yesterday: an argument or disagreement, anything that they could have argued about but they decided to let pass, anything at home that most people would consider stressful, anything at work or school that most people would consider stressful, discrimination, anything that happened to a close friend or relative, and anything else. The variable that shows the number of daily stressors (ranging between 0 and 5) was highly skewed, with 0–1 event reported on 89.3% of the days. Therefore, a binary variable (0 = no event, 1 = 1 or more events) was used to show if any stressful event was experienced or not on each day. More descriptive information on the reported stressors across stressors and days is provided in supplementary tables S1–S9.

The Big Five The MIDI Personality Scale (Lachman & Weaver, 1997) has 26 items and measures the Big Five personality traits. Respondents indicated how well the items describe them, on a scale from 1 (*a lot*) to 4 (*not at all*). The items were reverse-coded such that higher scores indicated higher levels of the traits. Cronbach's alphas are reported in Table 1.

Psychological Well-Being The positive relations, environmental mastery, and autonomy subscales of Ryff's (1989)

Table 1 Descriptive statistics, alphas, and intercorrelations

	Min	Max	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	α	1	2	3	4	5	6	7
1. Agreeableness	1.400	4.000	3.359	.536	-.663	-.204	.790	1						
2. Extraversion	1.200	4.000	3.062	.596	-.440	-.278	.754	.546	1					
3. Neuroticism	1.000	4.000	2.136	.688	.499	-.133	.724	-.154	-.218	1				
4. Conscientiousness	1.400	4.000	3.353	.497	-.682	.160	.685	.320	.287	-.225	1			
5. Openness	1.143	4.000	2.920	.533	-.204	-.077	.765	.356	.449	-.244	.286	1		
6. Environmental mastery	12.000	49.000	36.585	8.079	-.485	-.275	.804	.263	.423	-.566	.433	.266	1	
7. Positive relations with others	12.000	49.000	39.172	7.494	-.700	-.088	.789	.503	.521	-.371	.336	.247	.665	1
8. Autonomy	9.000	49.000	36.329	7.223	-.459	.119	.717	.110	.301	-.364	.326	.368	.496	.342

All correlation coefficients are significant at $p < .001$. α = cronbach's alpha

psychological well-being scale were used. Each variable has seven items, which are scored on a 7-point scale ranging from *strongly disagree* (1) to *strongly agree* (7). Cronbach's alphas are reported in Table 1.

Statistical Analysis

Multi-level modeling was conducted using *Mplus* 8.4. Bayesian estimation was used with 50,000 draws, two Markov Chain Monte Carlo chains with the GIBBS (PX1) algorithm, and *Mplus*' default priors (Muthén et al., 2017). To reduce autocorrelation between MCMC draws, every 10th iteration was used. No cases were excluded for missing data. Median was used as the measure of central tendency. The intercept and slope had random components (i.e., they were allowed to vary across the individuals) covarying at the between-person level. At the within-person level, daily stress was the predictor of negative affect, and at the between-person level, gender, age, personality traits, and well-being variables were the predictors of the random slope and intercept. Continuous between-person variables (age, personality variables, and psychological well-being) were grand-mean centered. The convergence of the models and the quality of the posterior distributions were evaluated using the potential scale reduction factor (PSRF; Gelman & Rubin, 1992) as well as Bayesian posterior parameter trace plots and autocorrelation plots. The PSRF of all models was 1.000, suggesting convergence (Kaplan & Depaoli, 2012). In addition, the Bayesian plots provided evidence of acceptable posterior distributions.

Results

Preliminary Analyses

Descriptive statistics, Cronbach's alphas, and intercorrelations between person-level variables are presented in Table 1. All scales had acceptable reliabilities. The magnitudes of the intercorrelations do not indicate a serious problem with multicollinearity (e.g., Tabachnick & Fidell, 2015). The intraclass correlation was 0.530, indicating that 53% of the variance in negative affect was at the between-person level and 47% was at the within-person (diary) level.

Model 1: Big Five as Moderators

In the first model, the Big Five were included to see if they could moderate the relationship between stressors and negative affect. The fixed effects are shown in Table 2. Daily stress positively predicted daily negative affect at the diary level, explaining 18.2% of the variance. The association between the two variables was allowed to vary randomly at the person level, and the time-invariant predictors (the Big

Five, age, and gender) were specified as predictors of this random slope. As can be seen in Table 2, only neuroticism significantly predicted between-person level variation in the slope. The moderation effect is shown in Fig. 1. At higher levels of neuroticism, the relationship between stressful events and negative affect is stronger. Person-level variables also predicted individual differences in the random intercept of negative affect: extraversion (-), neuroticism (+), conscientiousness (-), openness (+), and age (-). Gender had no significant effect. The person-level variables together predicted 24.7% of the variance in the random intercept and 16.7% of the variance in the random slope.

Model 2: Neuroticism And Well-Being as Moderators

In a second model, neuroticism was included along with the three well-being variables to examine whether neuroticism remains a significant moderator and to test whether psychological well-being can significantly moderate the association between stressors and negative affect beyond neuroticism, age, and gender. The fixed effects are presented in Table 2. As can be seen, neuroticism was not a significant moderator after controlling for well-being. Environmental mastery and autonomy were significant predictors of the random slope. Moderation effects are depicted in Figs. 2 and 3. At higher levels of environmental mastery, the relationship between stressful events and negative affect is weaker. At higher levels of autonomy, this relationship is stronger. Two variables were significant predictors of the intercept: mastery was associated with lower mean levels of negative affect, whereas neuroticism was associated with higher mean levels of negative affect. The person-level variables together explained 24.1% of the variance of the random intercept and 19.6% of the variance of the random slope.

Model 3: Mediated Moderation

Holding psychological well-being constant, the effect of neuroticism was no longer significant. Thus, it appears that psychological well-being fully mediate the associations between neuroticism and the random slope. This was explicitly tested in a multilevel mediated moderation model in which neuroticism was specified not only to predict the random slope but also to predict the three well-being variables. The fixed effects are shown in Table 2. Neuroticism was negatively associated with the three well-being variables. Three indirect effects via the three well-being variables were estimated. The indirect effect via mastery was significant (estimate = 0.031, 95% credibility interval = 0.017, 0.045), as was the indirect effect via autonomy (estimate = -0.008, 95% credibility interval = -0.015, -0.002). The indirect effect through relationships was not significant (estimate = -0.002, 95%

Table 2 Fixed effects

Outcome	Predictor	Unstandardized	Posterior <i>SD</i>	95% <i>credible interval</i>			Standardized
				Low	Up	Sig	
Model 1							
Negative Intercept	Stress	0.128	0.008	0.112	0.143	*	0.377
Intercept	Agreeableness	0.019	0.012	-0.004	0.041		0.077
Intercept	Extraversion	-0.031	0.010	-0.052	-0.011	*	-0.146
Intercept	Neuroticism	0.075	0.008	0.061	0.090	*	0.403
Intercept	Conscientiousness	-0.042	0.011	-0.063	-0.021	*	-0.161
Intercept	Openness	0.042	0.011	0.021	0.063	*	0.174
Intercept	Age	-0.001	0.000	-0.002	0.000	*	-0.080
Intercept	Female	0.012	0.010	-0.009	0.032		0.046
Slope	Agreeableness	0.022	0.012	-0.002	0.047		0.151
Slope	Extraversion	-0.020	0.011	-0.042	0.001		-0.154
Slope	Neuroticism	0.035	0.008	0.019	0.051	*	0.305
Slope	Conscientiousness	-0.004	0.011	-0.027	0.018		-0.026
Slope	Openness	0.020	0.012	-0.003	0.043		0.135
Slope	Age	-0.001	0.000	-0.002	0.000		-0.128
Slope	Female	-0.001	0.011	-0.023	0.021		-0.009
Model 2							
Negative Intercept	Stress	0.126	0.008	0.109	0.142	*	0.373
Intercept	Neuroticism	0.047	0.009	0.029	0.065	*	0.241
Intercept	Mastery	-0.004	0.001	-0.006	-0.002	*	-0.244
Intercept	Relations	-0.002	0.001	-0.003	0.000		-0.083
Intercept	Autonomy	0.001	0.001	-0.001	0.002		0.031
Intercept	Age	-0.001	0.000	-0.001	0.000		-0.058
Intercept	Female	0.012	0.011	-0.009	0.032		0.043
Slope	Neuroticism	0.013	0.010	-0.007	0.032		0.097
Slope	Mastery	-0.005	0.001	-0.007	-0.003	*	-0.421
Slope	Relations	0.000	0.001	-0.001	0.002		0.041
Slope	Autonomy	0.002	0.001	0.000	0.004	*	0.172
Slope	Age	-0.001	0.000	-0.001	0.000		-0.086
Slope	Female	0.003	0.011	-0.019	0.025		0.019
Model 3							
Negative Intercept	Stress	0.126	0.008	0.110	0.143	*	0.373
Intercept	Neuroticism	0.048	0.009	0.030	0.066	*	0.178
Intercept	Mastery	-0.004	0.001	-0.006	-0.002	*	-0.231
Intercept	Relations	-0.002	0.001	-0.003	0.000		-0.085
Intercept	Autonomy	0.001	0.001	-0.001	0.002		0.032
Intercept	Age	-0.001	0.000	-0.001	0.000		-0.062
Intercept	Female	0.011	0.011	-0.009	0.032		0.043
Slope	Neuroticism	0.013	0.010	-0.007	0.032		0.069
Slope	Mastery	-0.005	0.001	-0.007	-0.003	*	-0.392
Slope	Relations	0.000	0.001	-0.001	0.002		0.036
Slope	Autonomy	0.002	0.001	0.001	0.004	*	0.175
Slope	Age	-0.001	0.000	-0.001	0.000		-0.085
Slope	Female	0.003	0.011	-0.019	0.025		0.015
Mastery	Neuroticism	-6.515	0.351	-7.204	-5.824	*	-0.429
Relations	Neuroticism	-3.875	0.366	-4.596	-3.153	*	-0.261
Autonomy	Neuroticism	-3.769	0.355	-4.461	-3.073	*	-0.262

Fig. 1 Neuroticism as the moderator of the association between stressful events and negative affect. The y axis presents the effect of stressful events on negative affect

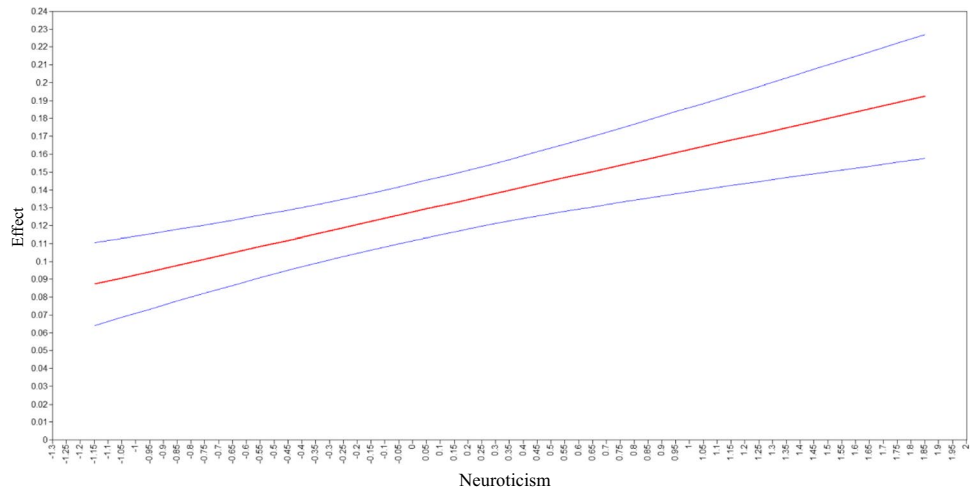


Fig. 2 Environmental mastery as the moderator of the association between stressful events and negative affect. The y axis presents the effect of stressful events on negative affect

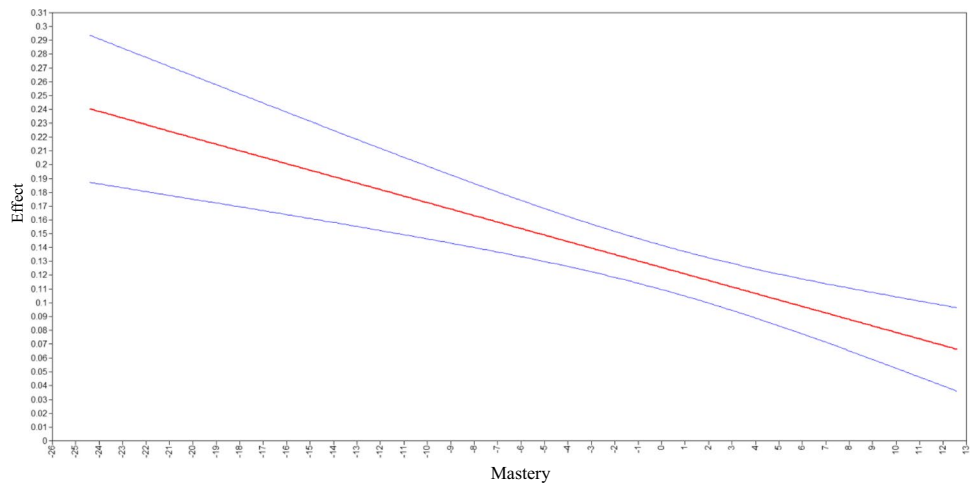
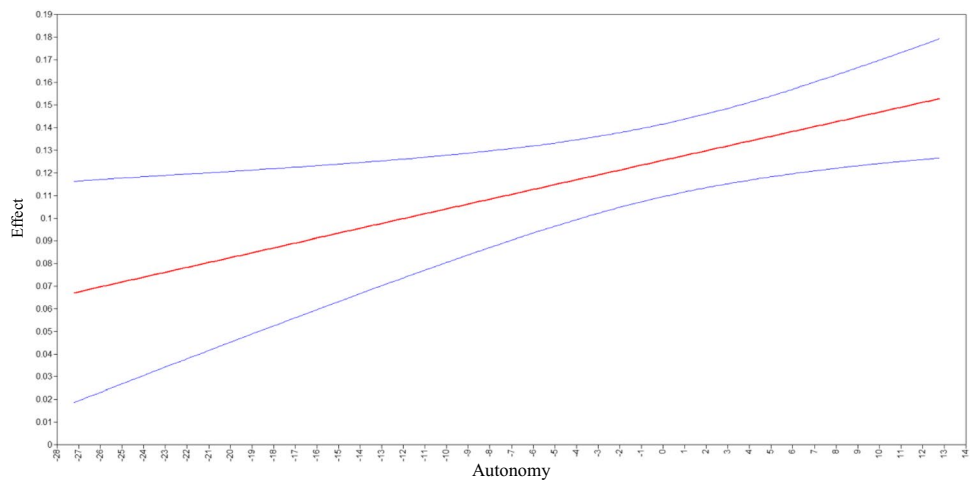


Fig. 3 Autonomy as the moderator of the association between stressful events and negative affect. The y axis presents the effect of stressful events on negative affect



credibility interval = -0.009, 0.006). The direct effect of neuroticism on the random slope was also not significant (estimate = 0.013, 95% credibility interval = -0.007, 0.032), indicating full mediation via mastery and autonomy.

Post Hoc Models: Models with Only Autonomy and Relations

A separate model was tested using only autonomy as a between-person level variable. Results showed that autonomy was a negative predictor of the random intercept (estimate = -0.004, 95% credibility interval = -0.006, -0.003) and slope (estimate = -0.001, 95% credibility interval = -0.002, 0.001). In another model, only positive relations was investigated. Results showed that positive relations was a negative predictor of the random intercept (estimate = -0.006, 95% credibility interval = -0.007, -0.004) and slope (estimate = -0.002, 95% credibility interval = -0.004, -0.001). These results suggest that the nonsignificant effect of relations and the negative effect of autonomy on stress reactivity and mean negative affect observed in Models 2 and 3 are because neuroticism, environmental mastery, and demographic variables were held constant in these models.

Post Hoc Models: Models Accounting for Missing Data

While 627 participants completed all eight daily questionnaires, 155 individuals completed the questionnaire on one to seven days. It could be that individuals with higher levels of neuroticism, stress, and negative affect or lower levels of psychological well-being completed the questionnaire on fewer days. Additional analyses were conducted to investigate this possibility. As Tables S10-S12 in the supplementary material show, there were some significant differences between individuals with complete and incomplete data. The differences were not large, but three of the Cohen's *ds* (for environmental mastery, number of stressors, and negative affect) were above 0.20, which is nontrivial. A binary variable was created to distinguish between individuals with complete data and those with at least one missing day. This variable was added to the study's three models as a predictor of the intercept, slope, and mediators. The results showed that in none of the post hoc models, the binary variable was a significant predictor of the slope, intercept, or mediators. The estimates for the other parameters were also highly comparable to those of the main models (results can be obtained from the author). Consequently, accounting for the missing data did not affect the conclusions drawn in the study.

Discussion

The Big Five as Moderators

The results showed that age, gender, and four of the personality traits had no effect on the relationship between stressors and experienced negative affect, but neuroticism did. Stressors had a greater negative impact on affective experience in individuals with higher neuroticism than in individuals with lower neuroticism. Neuroticism encompasses a set of tendencies that increase the negative influence of daily stressors. These include stress proneness and the tendency to display negative reactions such as anxiety, fear, and anger in stressful situations, as well as impulsivity, sadness, and shame when thinking about negative life events (McCrae & Costa, 2003). Extraversion, another affective personality trait that plays a key role in emotion processing, was not a significant predictor of stress reactivity. The latter finding may suggest that extraversion is more important in processing positive emotional stimuli than stressors (Bartussek et al., 1996).

Extraversion, neuroticism, conscientiousness, and age predicted mean scores for negative affect in the expected directions. For example, consistent with the present results, age has been found to be associated with lower negative affect (Mroczek & Kolarz, 1998). The contributions of extraversion (-), neuroticism (+), and conscientiousness (-) to overall negative affect were also consistent with previous research (Anglim et al., 2020; Carver & Connor-Smith, 2009). However, other findings contradicted the findings of previous research. For example, agreeableness has been found to be negatively related to negative affect (Anglim et al., 2020; Carver & Connor-Smith, 2009), whereas, in the present study, agreeableness showed no significant relationship with the random intercept. Openness has a complicated relationship with affective well-being and coping variables. Meta-analyses show that openness has moderately positive associations with resilience (Oshio et al., 2018) and weak positive associations with a range of constructive coping strategies (Connor-Smith & Flachsbart, 2007). However, in a recent meta-analysis, researchers found that openness was not associated with negative affect (Anglim et al., 2020). In the present study, individuals with higher levels of openness were found to have higher levels of negative affect on average. It is noteworthy that previous research was predominantly based on cross-sectional designs with no partitioning of variance, whereas the present study used MLM to partition variance into between- and within-person components and used intensive longitudinal data. Therefore, differences in analysis and design strategies may also account for the different results for agreeableness and openness in this study.

Psychological Well-Being as Moderator and Mediator

When positive relationships, environmental mastery, and autonomy were included in the model, neuroticism was no longer a significant predictor of stress reactivity. Positive relationships was negatively related to neuroticism. Positive relationships did not predict the slope or intercept over and above the other covariates. This variable also did not mediate the relationship between neuroticism and slope. Of course, this does not mean that quality personal relationships are irrelevant in the context of coping with stress. Rather, these results suggest that positive relations contribute little to stress management when controlling for neuroticism, mastery, autonomy, and demographic variables. As the post hoc results indicated, without controlling for covariates, positive relationships actually predicted lower overall levels of negative affect and lower stressor-induced negative affect.

Neuroticism was negatively related to environmental mastery. Previous research has also shown that neuroticism is associated with lower levels of self-efficacy, mastery, and competence (e.g., Piechurska-Kuciel, 2021; Williamson & Johnston, 2017, see Anglim et al., 2020 for meta-analytic results). Mastery was associated with lower stressor-induced negative affect. Thus, one mechanism for the effect of neuroticism on stress reactivity appears to be the negative association of neuroticism with mastery/competence. What about autonomy? The results of this study are consistent with meta-analytic findings that neuroticism and autonomy are negatively correlated (Anglim et al., 2020). Previous research also suggests that autonomy is negatively correlated with the frequency of negative affect (Joshano, 2016). Thus, autonomy was expected to reduce affective reactivity to stressors. However, in the present study, autonomy was found to strengthen the relationship between stressors and negative affect, which can be considered an unexpected result. In explaining this unexpected result, it should be noted that the effect of autonomy on the random slope in this analysis is adjusted for the effects of other covariates. As the post hoc model results showed, autonomy was associated with more negative affect elicited by the stressor when not controlling for other variables. Therefore, autonomy acts as an enhancer of stress-induced negative affect only when the shared variance of autonomy and the other covariates (i.e., neuroticism, mastery, relatedness, and demographic variables) is partialled out. It is also worth noting that the current study is a daily diary study that captures individuals' daily experiences. Therefore, these results may differ from cross-sectional studies, which typically capture individuals' recalled moods and experiences over a longer periods of time (e.g., one month).

In sum, environmental mastery and autonomy fully mediate the relationship between neuroticism and stress-induced

negative affect. Thus, there are multiple pathways from neuroticism to stressor-induced negative affect. Neuroticism may enhance stressor-induced negative affect through its association with diminished mastery. On the other hand, neuroticism may decrease negative affect through its association with decreased autonomy. Because the association between neuroticism and mastery is stronger than between neuroticism and autonomy, and mastery is a stronger predictor of affective reactivity than autonomy, the indirect route via mastery is the stronger one. Thus, the overall contribution of neuroticism on stress reactivity resulting from these different mechanisms is most likely negative rather than positive.

Implications for Developing Interventions

Among the Big Five traits, neuroticism deserves more attention when it comes to stress management and negative affect regulation. Thus, individuals with high levels of neuroticism may be at higher risk for suboptimal stress management than individuals with lower levels of neuroticism. The negative influences of neuroticism on daily affective experience are due in part to its tendency to amplify the negative hedonistic effects of stressors in daily life, a finding that can be used in developing effective interventions for people with high levels of neuroticism. The study also sheds light on the mechanisms of neuroticism's effects. Specifically, neuroticism may impair stress management processes by reducing feelings of mastery and competence. Therefore, to reduce the potentially negative effects of neuroticism on coping processes, interventions could focus on improving competence and mastery skills in individuals with high neuroticism. Many studies have demonstrated an association between mastery beliefs (i.e., perceived ability to exert control over stress coping outcomes) and reduced stress and anxiety (e.g., Felsten, 1991; Gallagher et al., 2010).

Another conclusion from the present study is that some variants of autonomy may be detrimental to stress management and therefore should not be overemphasized in stress management interventions. For example, if the emphasis on autonomy is detrimental to the quality of personal relationships or feelings of mastery, it may also be detrimental to stress regulation. Remarkably, a recent study in four countries showed that of 14 indicators of well-being, autonomy was the least correlated with the other aspects (Joshano, 2021). Other studies also suggest that autonomy may have opposing relationships with social well-being (Joshano & Weijers, 2019). Thus, it seems that in the context of stress management, a one-sided emphasis on autonomy would not be constructive. Rather, autonomy should be balanced against other psychological skills, keeping in mind that a sense of mastery over stressors is a more important target for intervention. Needless to say, further diary studies and

long-term longitudinal or experimental research are needed to develop more effective evidence-based interventions.

Limitations and Future Directions

The measures of personality and psychological functioning used in this study are rather brief. Although these measures have acceptable psychometric properties (e.g., Joshanloo, 2018; Kállay & Rus, 2014), they do not provide a comprehensive assessment of the facets of personality and psychological functioning. A more detailed assessment of the different aspects of each of the variables included in this study would be required in future research. For example, research has found different relationships between the different facets of each personality trait and negative affect (e.g., Quevedo & Abella, 2011). Similarly, in this study, psychological well-being was measured using Ryff's (1989) scales. Other psychological models conceptualize and measure these variables somewhat differently. For example, in self-determination theory (Ryan & Deci, 2008), the concept of autonomy refers primarily to the internal determination of one's actions. Ryff's concept of autonomy emphasizes an additional element, namely the courage to express one's thoughts and resist social influences. Therefore, future studies need to replicate these findings using alternative scales drawn from different theoretical backgrounds. Measuring autonomy using scales developed in the self-determination theory literature could lead to different results regarding the influence of autonomy on stress reactivity.

Another limitation of this study is that it draws mediation inferences based on cross-sectional data at the interpersonal level. The temporal order of the between-person variables could not be empirically determined in this study. Rather, it was hypothesized based on theoretical considerations and previous research. Although no conclusions were drawn about the temporal order between neuroticism and mastery in the present study, previous longitudinal research suggests that personality is a prospective predictor of competence (e.g., Shiner & Masten, 2012). It should be noted that only one wave of data is currently available as part of the MIDUS Refresher Project. Thus, it remains for future studies to examine the mediation hypotheses of the present study with data collected over time to account for longitudinal stability and change in these variables. Finally, only three indicators of psychological well-being were included in the present study. The MIDUS Refresher Project includes other indicators of optimal functioning (such as self-acceptance and self-esteem). However, these indicators are highly correlated with each other (Joshanloo, 2021), and including many intercorrelated variables in the analysis could cause problems with multicollinearity and lead to spurious results. Future research needs to examine subsets of these indicators

to provide a more comprehensive assessment of the role of psychological well-being in coping with stress.

Concluding Remarks

Among the Big Five traits, neuroticism is the most relevant to stress reactivity. Environmental mastery and autonomy fully mediate the influence of neuroticism on stress reactivity. Mastery is the main mediator with the straightforward role of contributing to optimal stress management. The role of autonomy is somewhat more complicated. Without controlling for covariates, autonomy was predictive of lower mean levels of negative affect and lower stressor-induced negative affect. This is consistent with the generally accepted positive role of autonomy in many aspects of optimal functioning (Deci & Ryan, 2008). However, an important finding of the study is that when the shared variance of autonomy with other psychological skills is controlled, what remains may be redundant or even detrimental to various aspects of affect regulation. This calls for greater awareness that the interactions between psychological skills are as important as the exploration of their individual roles. Consequently, the common use of composite scores of psychological skills (e.g., Campbell et al., 2018; Neufeld et al., 2020) may obscure the unique contributions of each individual skill. Overall, the unexpected findings related to autonomy and its negative impact on stress management deserve more attention in future studies of affect regulation and stress management.

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s12144-022-02842-4>.

Data Availability The data that support the findings of this study are available from The National Archive of Computerized Data on Aging (NACDA): <https://doi.org/10.3886/ICPSR36532.v3> and <https://doi.org/10.3886/ICPSR37083.v2>

Declarations

Ethics Approval This study presents a secondary analysis of a de-identified and publicly available data set. More information on the data and study procedures can be found at <https://www.midus.wisc.edu>.

Consent to Participate All participants provided written informed consent.

Conflict of Interest The author declares that he has no conflict of interest.

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