

Research Article

Extraversion and Neuroticism in Relation to Well-being – Do Some Social Categories and Personality Traits Modify the Connections between Them?

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Abstract

The theoretical assumptions and research findings have established some connections between extraversion/introversion, and neuroticism on the one hand, and well-being on the other hand. There is scarce scientific literature specifying these connections in different social categories or their possible modification in different levels of such personality traits as psychoticism and social desirability. The goal of the current study was to specify if the relationships between extraversion, neuroticism and well-being varied, according to gender, age, degree of manifestation of psychoticism and social desirability. The sample consisted of 470 Bulgarians from 18 to 55 years old using Bulgarian adaptation of Eysenck Personality Questionnaire and a dichotomized analogous scale measuring subjectively assessed well-being. This study found that higher well-being was related to higher extraversion and lower neuroticism, no matter of gender, age, or the degree of manifestation of other personality traits such as psychoticism and social desirability. Social isolation during COVID-19 pandemic may reflect negatively on well-being, as due to various constraints the extrovert people limit their social contacts and because of increased emotional lability in emergency situations that deserves further being investigated.

Keywords: extraversion; introversion; neuroticism; psychoticism; social desirability; well-being

Table of Contents

Method

Results

Discussion

Limitations and further implications of the study

Conclusion

References

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It is important to specify the relationships between well-being on the one hand and extraversion and neuroticism on the other hand, because well-being has positive effects on social relationships (Diener, 2009; Diener, 2013; Diener & Scollon, 2014; Diener & Seligman, 2004), health (Diener, 2013; Diener & Ryan, 2009; Diener & Scollon, 2014; Diener & Seligman, 2004), and adaptation (Diener & Ryan, 2009). Extraversion and neuroticism are stable personality traits related to well-being (McCrae & Costa, 1999).

Extraversion requires engagement in social interactions, which may lead to well-being (Olesen et al., 2010), if the social interactions are positive and contributing to satisfaction of human needs for belonging, love, and respect. More sociable people experience greater subjective well-being (Diener & Ryan, 2009), as well-being is associated with positive experience of social contacts (Diener, 2009). In 28 countries, extraversion has been found to be associated with increased subjective well-being, positive emotions, and happiness (Fulmer et al., 2010). Extroverts experience higher well-being (Diener & Ryan, 2009; Keyes et al., 2002; Krastev & Yordanova, 2012), life satisfaction (Pavot & Diener, 1993; Pavot & Diener, 2009; Zarbova, 2019) and happiness (Diener & Seligman, 2002; Tair, 2011; Zarbova, 2019) than introverts.

Happiness as an affective component of subjective well-being depends on emotional stability (Tair, 2011). Neuroticism reduces the experience of positive emotions (Bazovska, 2018). Well-being increases with reduction of neuroticism (Diener & Ryan, 2009; Diener & Seligman, 2002; Keyes et al., 2002). People with higher neuroticism consider themselves as more dissatisfied with life (Diener et al., 1985; Neugarten et al., 1961; Pavot & Diener, 1993; Pavot & Diener, 2009; Zarbova, 2019), more unhappy (Diener & Seligman, 2002; Zarbova, 2019), with lower well-being (Zarbova, 2019). Emotional stability is even regarded as

included in emotional well-being that is a part of positive mental health (“NHS Health Scotland”, 2008). Emotional stability may be considered as a component of well-being, of flourishing in life (Bakalova et al., 2015).

The goal of the current study was to specify if the relationships between extraversion, neuroticism and well-being varied, according to gender, age, degree of manifestation of psychoticism and social desirability. Some research findings report that age (Lucas et al., 2004; Mizova et al., 2010; Myers & Diener, 1995; Myers & Diener, 2018; Pavot & Diener, 1993; Pavot & Diener, 2009) and gender do not differentiate subjectively perceived well-being (Diener & Ryan, 2009; McIntosh, 2001; Mizova et al., 2010).

Psychoticism includes proneness to risk taking and sensation seeking, tendency for deviant behavior and aggressiveness, affective insensitivity, impulsivity, interest in sport, creativity, preferences for enjoyment related to crime and horror, suspicious and hostile attitude towards other people, proclivity to domination, initiative, and ambitiousness (Eysenck, 1981/1987). It has been found that psychoticism is related more to social desirability than to extraversion or neuroticism (Tommasi et al., 2018), as well as psychoticism is not associated with psychological well-being (Francis et al., 1999).

Social desirability means positive description of oneself, hyperbolizing own strengths and minimizing own drawbacks (Stoyanova et al., 2013) that may be due to some deficiencies in self-perception (Paspalanova, 1985) and self-convictions or to striving to mislead other people (Paulhus, 2002) to receive their approval (Crowne, 1983; Hebert et al., 1997) and to avoid criticism (Hebert et al., 1997). It has been found that social desirability is not associated with mental, physical, spiritual (Vella-Brodrick & White, 1997), religious (Ellis & Smith, 1991), neither global well-being (Mancini & McKeel, 1986) in different samples.

Based on the above theoretical assumptions and previous research findings, the hypothesis of the study stated that higher well-being would be related to higher extraversion and lower neuroticism, irrespective of any social categories (gender, age) and other personality traits such as psychoticism and social desirability.

Method

A cross-sectional study was conducted in 2019. The sample was selected purposefully to include only adult Bulgarians above 18 years old. All participated voluntarily with informed consent. Data were collected off-line at several universities, hospitals, work offices, sports and fitness clubs.

Participants

More people were approached for participation in the study than those whose results were reported here. About thirty subjects who showed higher social desirability were removed from data analysis. Decision for high social desirability was based on the norms of the scale Social Desirability from Eysenck Personality Questionnaire - the scores above the sum of average and standard deviation for the scale of Social Desirability mean high social desirability (Paspalanov et al., 1984).

The participants in the study whose data were processed statistically were 470 Bulgarians from 18 to 55 years old, which include 243 men (51.70%) and 227 women (48.30%). Their mean age was 27.91 years old, standard deviation was 9.41 years. Their median age was 26 years old. Their age was not normally distributed – Shapiro-Wilk test = .862, $p < .001$. Regarding their social status and occupation, some of them were employees ($n = 281$; 59.79%). The others were secondary school students in their last year of study ($n = 136$; 28.94%), university students ($n = 50$; 10.64%), and unemployed people ($n = 3$; 0.64%). The workers' occupations were medical workers, policemen, social workers, teachers, office administrators, and managers. The students' specialties were English philology, public relationships, law, psychology, social activities, history, geography, etc. The majority of students who participated were in their second year of study. A lot of the secondary school students were attendants of different sports clubs and they practiced sport regularly.

Instrument

Bulgarian adaptation of Eysenck Personality Questionnaire with its scales measuring extraversion/introversion, neuroticism (emotional stability/instability), psychoticism and social desirability was used (Paspalanov et al., 1984). The scale Extraversion/Introversion includes such items as item 5 „Are you a talkative person?” (Paspalanov et al., 1984). An example of the items of the scale Neuroticism is item 11 “Do you often worry about things you should not have done or said?” (Paspalanov et al., 1984). The scale Psychoticism includes such items as item 24 “Do you enjoy hurting people you love?” (Paspalanov et al., 1984). An example of the items of the scale Social Desirability is item 84 “Are you always ready to admit the mistake you made?” (Paspalanov et al., 1984). High scores on the scales indicate extraversion, high neuroticism/emotional instability, high psychoticism, and high social desirability, correspondingly. Cronbach's alphas vary between above .68 and .84 for the scales (Paspalanov, 1984; Paspalanov et al., 1984) or between .706 (for the scale of Psychoticism) and .870 (for the scale of Neuroticism), according to a more recent study (Alexiev & Tsvetkov, 2002).

In the current study, well-being was measured on an analogous scale that represented a straight horizontal line 5 cm in length, whose left part meant low well-being, and its right part meant high well-being. Such a method was applied to measure personality characteristics by Menghin et al. (2003). The participants drew a dot on the analogous scale that corresponded to the degree of their subjectively assessed well-being. The distance was measured in millimeters from the left end of the horizontal line to the dot indicating the subject's answer. A similar procedure was described by Sidorov (2013). In this way, small values mean low well-being and high values mean high well-being. The range of possible values for well-being scores varied from 0 to 5 (in millimeters from the left side of the straight line).

The participants were given the following instructions:

“Please, estimate your well-being by drawing a dot over this horizontal straight line whose left side means low well-being and its right side means high well-being. If you draw your dot near the left side of the horizontal line that means you experience low well-being. If you draw your dot near the right side of the horizontal line that means you experience high well-being. If you draw your dot near the middle of the horizontal line that means your well-being is expressed in a medium degree. Please, draw your dot near this side of the horizontal line that better corresponds to your experienced well-being”.

This single - item scale measuring well-being used in the present study had good face validity assessed by the participants in the study – they agreed that the scale measured subjectively assessed well-being. The scale also had good content validity established by five experts in psychology who decided it as being an appropriate subjective measure of well-being. The criteria adopted by the experts to check content validity were to estimate if this instrument may be used to measure well-being; if it may be used to measure another related phenomenon such as life-satisfaction, for example; if it is comprehensible and unambiguously perceived. Test-retest reliability coefficient after one-week period was .638 among a small sample of 30 participants.

Data analysis

Statistical power (sensitivity, according to Glen, 2015, i.e. probability of rejecting the null hypothesis when it is false) was calculated by means of the software GPower 3.1.9.2 (Faul et al., 2007). Data was processed statistically by means of JASP 0.14 (JASP Team, 2020). Descriptive statistics were computed. Shapiro-Wilk test was applied for checking normality of data distribution. Spearman correlation coefficients and Bayes factors for non-parametric correlations were computed among the studied variables.

Results

Only the answers that were sincere (low or medium social desirability) remained in the data set and were processed statistically. The scores below the average minus standard deviation for the scale of Social Desirability from Eysenck Personality Questionnaire mean low social desirability (Paspalanov et al., 1984). The scores within the range between the subtraction of standard deviation from the average and the sum of average and standard deviation for the scale of Social Desirability mean medium social desirability (Paspalanov et al., 1984).

Only 360 participants answered to all the items measuring psychoticism. For the other variables, data from all 470 participants were obtained.

Well-being scores varied from 0.25 to 4.25. The scores on the variables were not normally distributed (see Table 1), so non-parametric statistics were applied.

Table 1.

Shapiro-Wilk coefficients comparing data distribution with normality distribution

Variable	Shapiro-Wilk value	<i>p</i> -value
Extraversion/Introversion	.964	< .001
Neuroticism	.977	< .001
Well-being	.848	< .001
Psychoticism	.883	< .001
Social desirability	.981	< .001

Descriptive statistics of the studied variables are presented in Table 2.

Table 2.

Descriptive statistics of the scales of Well-being, Extraversion/Introversion, Neuroticism, Psychoticism, and Social desirability

	Well-being	Social desirability	Extraversion/Introversion	Neuroticism	Psychoticism
Valid answers	470	470	470	470	360
Mean	2.741	6.977	13.472	10.451	4.258
Median	3.239	7.000	14.000	10.000	3.000
Standard deviation	0.881	2.919	4.363	5.105	3.677

The mean values and standard deviations presented in Table 2 revealed that the low to medium degree of well-being prevailed. The average scores and the standard deviations on the scales indicated the medium degree of neuroticism, the medium to high degree of extraversion and psychoticism, as well as the low to medium degree of social desirability, according to the norms extracted for Bulgarian population by Paspalanov et al. (1984), but a medium degree of neuroticism, extraversion, and psychoticism, and a low to medium social desirability, according to more recent mean values and standard deviations for Bulgarian population indicated by Dilova (2014).

Statistical power was above .90 for well-being, extraversion, and neuroticism that was high enough for performing correlations among them within this sample size. For Spearman Rho = .20 the required sample size is 194 and for Spearman Rho = .30 the required sample size is 85 to achieve 80% power of the Spearman rank correlation coefficient using a two-tailed test of the alternative hypothesis with significance level .05 (May & Looney, 2020, p.6).

Table 3.

Correlations between well-being on the one hand and extraversion, and neuroticism on the other hand

Correlated variables		<i>N</i>	Spearman's rho	<i>p</i> -value	Lower 95% confidence interval	Upper 95% confidence interval	<i>BF</i> ₁₀
Well-being	Extraversion	470	.294	< .001	0.209	0.374	185800000
	Neuroticism	470	-.379	< .001	-0.454	-0.299	8.411e +17

Note: *N* means number of participants; *BF*₁₀ means Bayes factor in support of alternative hypothesis for significant correlations between the variables; 8.411e +17 means the decimal dot should be 17 signs after 8.

The increasement of subjectively assessed well-being was related to weak increasement of extraversion, and moderate diminishment of neuroticism (see Table 3). The results regarding Bayes factor in Table 3 indicate that the alternative hypotheses for significant correlations between well-being and neuroticism, as well as between well-being and extraversion were billion of times more probable than the null hypotheses about the lack of significant correlations between them that was very strong evidence in support of the alternative hypotheses, according to Rouder et al. (2009).

The correlations between well-being and extraversion (partial correlation Spearman's rho = .248, *p* < .001, *N* = 470), as well as between well-being and neuroticism (partial correlation Spearman's rho = -.391, *p* < .001, *N* = 470) remained statistically significant and with the same direction when controlled for social desirability. The correlations between well-being

and extraversion (partial correlation Spearman's $\rho = .146$, $p = .005$, $N = 360$), as well as between well-being and neuroticism (partial correlation Spearman's $\rho = -.232$, $p < .001$, $N = 360$) remained statistically significant and with the same direction when controlled for psychoticism. The correlations between well-being and extraversion (partial correlation Spearman's $\rho = .229$, $p < .001$, $N = 470$), as well as between well-being and neuroticism (partial correlation Spearman's $\rho = -.380$, $p < .001$, $N = 470$) remained statistically significant and with the same direction when controlled for age.

The correlations between well-being and extraversion (partial correlation Spearman's $\rho = .227$, $p < .001$, $n = 243$), as well as between well-being and neuroticism (partial correlation Spearman's $\rho = -.535$, $p < .001$, $n = 243$) remained statistically significant and with the same direction among the male participants only. The correlations between well-being and extraversion (partial correlation Spearman's $\rho = .230$, $p < .001$, $n = 227$), as well as between well-being and neuroticism (partial correlation Spearman's $\rho = -.159$, $p = .017$, $n = 227$) remained statistically significant and with the same direction among the female participants only.

Discussion

The research findings supported the hypothesis that higher well-being would be related to higher extraversion and lower neuroticism, irrelevant to membership in some social categories (gender, age) or the degree of manifestation of other personality traits such as psychoticism and social desirability. The theoretical assumptions and previous research findings established the connection between extraversion and well-being (Diener & Ryan, 2009; Fulmer et al., 2010; Keyes et al., 2002; McCrae & Costa, 1999), as well as between emotional stability and well-being (Diener & Ryan, 2009; Diener & Seligman, 2002; Keyes et al., 2002; McCrae & Costa, 1999) that was supported in our study. Extroverts experience higher well-being (Diener & Ryan, 2009; Keyes et al., 2002; Krastev & Yordanova, 2012) than introverts that may be related to extroverts' directedness towards other people, because positive relationships are regarded as a dimension of well-being (Ryff & Keyes, 1995) and a pre-requisite for well-being (Mizova et al., 2010). Well-being increases with reduction of neuroticism (Diener & Ryan, 2009; Diener & Seligman, 2002; Keyes et al., 2002; Zarbova, 2019) that may be because emotional stability predisposes towards mental resilience (Bozhilova, 2013) and mental resilience improves many types of well-being (Brown et al., 2020; Burns et al., 2011) and global well-being in this way. These connections between well-

being, extraversion and neuroticism seemed stable as our study revealed that they did not depend on gender, age, levels of social desirability or psychoticism.

Some possible explanations of the existence of connections between well-being and extraversion, as well as between well-being and neuroticism not depending on the level of psychoticism could be that psychoticism is related more to social desirability than to extraversion or neuroticism (Tommasi et al., 2018). Besides, psychological well-being expressed as balanced affect correlates significantly and positively with extraversion, negatively with neuroticism and non-significantly with psychoticism among secondary school students in UK (Francis et al., 1999).

Social desirability does not correlate statistically significantly with mental, physical and spiritual well-being among Australian adults at mean age 39 years old (Vella-Brodrick & White, 1997), neither with religious well-being in a sample of college students in USA (Ellis & Smith, 1991), neither with global well-being among elderly above 65 years old in USA (Mancini & McKeel, 1986). These findings may explain why the levels of social desirability did not change the connection between well-being and extraversion, neither the link between well-being and neuroticism in our sample.

Some possible explanations of the existence of connections between well-being and extraversion, as well as between well-being and neuroticism, that were not modified by age differences may be related to the stability of subjectively perceived well-being during human life (Lucas et al., 2004; Myers & Diener, 1995; Myers & Diener, 2018; Pavot & Diener, 1993; Pavot & Diener, 2009). Age and gender do not differentiate Bulgarians' subjective well-being (Mizova et al., 2010). There are not any significant gender differences in subjective well-being (Diener & Ryan, 2009; McIntosh, 2001). Higher neuroticism among Bulgarian females than in Bulgarian males established in the normative sample when Eysenck Personality Questionnaire was adapted (Paspalanov et al., 1984) did not result in another kind of connection between well-being and neuroticism.

The average scores on well-being scale revealed prevalence of low to medium degree of well-being. Some other studies also found that most Bulgarians had low to medium levels of well-being (Abdallah et al., 2012; Jeffrey et al., 2016) that gave evidence of the construct validity of the scale applied to measure well-being in the present study.

The average scores on extraversion, neuroticism, and psychoticism received in the current study were more similar to these ones of a recent study reporting them (Dilova, 2014) than to

these ones calculated for Bulgarian population long ago by Paspalanov et al. (1984). This finding could be also considered as a proof for validity of the results, besides processing only the answers that were not socially desirable. Higher similarity found in average scores on the same variables in two studies conducted by different authors in more recent years than in one study conducted recently and one study conducted long ago among different sub-samples of Bulgarian population may be interpreted as a proof for the same constructs that have been measured and sincerity of given answers.

Limitations and further implications of the study

Some limitations of the present study concern the size of some sub-samples such as unemployed people, for example. Besides, the research findings may not be extrapolated to anyone below 18 years old or above 55 years old, because it was the age range of the studied Bulgarians. Well-being was studied generally, not any specific types of well-being.

The use of a single item for measuring well-being could be considered as another limitation of the study, but this is a practice in some other studies, too. Overall life satisfaction sometimes is measured by means of a single-item scale (Veenhoven, 2005) with different degrees of answering - from 1 to 10 (Organisation for Economic Co-operation and Development (OECD), 2013), from 0 to 10 (Ryff & Keyes, 1995), or on a 7-point single-item scale (Mizova et al., 2010). Well-being has also been measured on a single-item scale from 0 to 10 (Nichols, 2019). Content analysis found some similarities between the answers to open questions regarding well-being and answers to questionnaires measuring well-being (Westerhof et al., 2001). Most scales measuring subjectively assessed well-being that consist of a single item have good psychometric properties (McIntosh, 2001). The single-item measure of well-being used in this study also had good psychometric properties – good test-retest reliability, face validity, and content validity.

Further studies may focus on specifying if the relationships between extraversion, neuroticism and different types of well-being may be differentiated by the membership in some social categories or by some personality traits. A further study may focus on relationships between emotional stability, perceived control or environmental mastery and well-being.

Conclusion

The results from this study have supported some theoretical assumptions and previous research findings regarding the existence of positive connection between extraversion and

well-being, as well as about the negative connection between emotional lability and well-being. Its scientific contributions consist in clarifying that such relationships between these variables exist independently on gender, age, psychoticism, or social desirability. These findings reveal some important mechanisms for increasing well-being by means of trainings for mastering control over situations and developing emotional stability, and trainings in communicative skills that facilitate maintenance of good social relationships. Developing emotional stability may be manifested by honing the ability to maintaining control in difficult situations. It has been found that the advance in age is accompanied with honing the ability to maintaining control in difficult situations that may be due to accumulated social experience (Mihaylova, 2020), so the ability to maintaining control in difficult situations as manifestation of emotional stability could be modified in some degree during human life (including increasing emotional lability under the conditions of difficult life situations such as the COVID-19 pandemic), but rather in narrow range, because emotional stability is part of the structure of temperament, according to Paspalanov et al. (1984). COVID-19 pandemic may influence negatively on well-being, increasing emotional lability and felt constraint by extraverted people because of social isolation. It has been found that social isolation provokes low well-being (Farewell et al., 2020). Perceived control is also related to increased well-being (Mihaylova, 2020; Ryff & Keyes, 1995), as emotional stability itself does. The connections between well-being and some personal peculiarities seem to interact with the environmental and situational characteristic, especially under the conditions of world pandemic of COVID-19.

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Competing Interests

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