

Neuroticism

Weiting Ng, School of Arts and Social Sciences, SIM University, Singapore

© 2015 Elsevier Ltd. All rights reserved.

This article is a revision of the previous edition article by D. Watson, volume 15, pp. 10609–10612, © 2001, Elsevier Ltd.

Abstract

The personality dimension of neuroticism, as defined by the trait perspective, refers to relatively enduring tendencies to think and react in anxious and maladaptive ways, and feel more negative emotions. Research has suggested that this personality dimension is universal, having been replicated across cultures and having a strong biological basis. Neuroticism is a robust and strong correlate of various constructs (e.g., emotional disorders, cognitive processes, emotion regulation, and coping) and is also an important predictor of diverse life outcomes (e.g., well-being, mental and physical health, social relationships). Although it demonstrates rank-order stability, extensive evidence indicates that there is mean-level decrease in neuroticism over the life span.

Definition of Neuroticism: A Trait Perspective

Traits refer to generalized and personalized tendencies – that is, consistent and stable modes of an individual's adjustment to his or her environment. In contrast to the nomothetic approach, which studies trait units that apply to all people, the idiographic approach emphasizes that every individual is unique and different, and general principles cannot be broadly applied to all people to understand and predict their behaviors. Although the concept of traits originated from Allport, the main emphasis of the modern-day trait approach has now diverged. The trait approach is now geared toward a descriptive and comparison orientation rather than being grounded in explanatory purposes. Though lacking in accuracy, as the trait approach does not provide a comprehensive theory of personality, theories based on this approach provide diverse perspectives, ranging from viewing traits as descriptive concepts to viewing them as biologically based causal concepts. The merits of this approach are that it is a convenient method for assessing personality characteristics and comparing people, and it provides a heuristic way of making predictions and judgments.

The most popular and commonly used trait theories are based on Costa and McCrae's five-factor model (FFM) and the Big Five (Costa and McCrae, 1992; John and Srivastava, 1999). Factor-analytic studies originating from Goldberg's lexical tradition and factor analyses of personality questionnaires consistently converged to yield five factors (Costa and McCrae, 1992; Goldberg, 1990), and the lexical and questionnaire traditions were merged to produce a five-factor structure. The Big Five dimensions are extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. Extraversion assesses the quantity and intensity of interpersonal interaction, and one's activity level, need for stimulation, and capacity for joy. Agreeableness refers to a prosocial and communal orientation toward others and assesses the quality of one's interpersonal orientation along a continuum from compassion to antagonism. Conscientiousness describes the extent that an individual possesses socially prescribed impulse control such as delaying gratification, following norms and rules, organization, and persistence. Openness to experience describes the breadth, depth, originality, and complexity of an

individual's mental and experiential life. It assesses an individual's proactive seeking and appreciation of experience and exploration of the unfamiliar. Finally, neuroticism assesses an individual's adjustment versus emotional instability. This personality dimension identifies individuals prone to psychological distress, unrealistic ideas, excessive cravings or urges, and maladaptive coping responses. Individuals who are low on neuroticism are calm, secure, and emotionally stable, whereas those high on neuroticism tend to be emotionally unstable and show characteristics of being anxious, depressed, moody, and irritable. Based on the NEO Personality Inventory – Revised (NEO-PI-R), the FFM further differentiates the broad domain of neuroticism into the facets of anxiety, angry hostility, depression, self-consciousness, vulnerability, and impulsiveness (Costa and McCrae, 1992).

The five-factor theory (FFT) posits that these five basic dimensions correspond to basic psychological tendencies in every individual and are biologically based. These personality dimensions interact reciprocally with external influences (e.g., cultural norms, life events) to influence characteristic adaptations (e.g., an individual's thoughts, feelings, and behaviors) (McCrae and Costa, 2008). The FFT assumes that these basic tendencies are uniform across cultures and are universal; this universality might be attributed to the species-wide biological bases of traits or might represent a psychological consequence of the shared human experiences of living in societies where similar life tasks might be promoted by most modern cultures (McCrae and Costa, 1997).

Universality of Neuroticism

Across the myriad of personality theories, various researchers have conceptualized neuroticism distinctively, assigning different labels to it (e.g., neuroticism, negative emotionality, negative affectivity, emotional instability). Yet, despite the disparate labels and definitions, the common underlying characteristics across the various personality models signal that they are referring to a fundamentally similar personality construct. For instance, although Eysenck's three-factor personality theory comprises only three basic dimensions – psychoticism, extraversion–introversion, and neuroticism – neuroticism as conceptualized in his theory is similar to that

in the FFM. It also subsumes lower-level traits such as worrying, anxious, depressed, moody, and emotional instability. Eysenck's three-factor theory emphasizes the biological determinants for the three superfactors, and he hypothesized that the biological basis for neuroticism stems from the autonomic nervous system; those higher in neuroticism have lower threshold activation in the autonomic nervous system (Eysenck, 1990). Equivalence can also be drawn between Tellegen's three- (or four-) factor model and the Big Five model. Assessed by the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1985), Tellegen's model comprises positive emotionality, negative emotionality, and constraint (and absorption). Commonalities exist between the negative emotionality factor and neuroticism – individuals high in negative emotionality have a low threshold for the experience of negative emotions and tend to be involved in antagonistic relationships. Factor analyses indicated that the Big Five constructs can be subsumed under Tellegen's four dimensions because negative emotionality encompasses neuroticism and (the inverse of) agreeableness. Therefore, despite its varying labels, the conceptualization and inclusion of the neuroticism construct across different personality theories suggests that it is a universal personality dimension.

The replication of the neuroticism construct across cultures reinforces the notion that it is a universal personality dimension (McCrae and Costa, 2008). The FFM personality structure (including neuroticism) has been consistently replicated across cultures. For example, the same FFM based on American adults was replicated with German, Israeli, Korean, and Chinese adults (McCrae and Costa, 1997). Lexical studies also found cross-language agreement on the five factors – studies of German traits (using German adjectives) replicated the English-language five factors and clearly recovered the FFM, and Chinese trait terms also yielded five dimensions that overlap considerably with the Big Five dimensions. In sum, various cross-cultural studies, including a large-scale observer rating study across 50 different cultures, provide clear evidence for the universality of the FFM across different instruments and measurement methods (McCrae and Costa, 1997, 2008; McCrae and Terracciano, 2005).

Another line of evidence that supports the universality of neuroticism is its biological basis. Twin studies comparing monozygotic (MZ) and dizygotic (DZ) twins provide some evidence that neuroticism has a biological basis and is partly heritable. MZ twins correlated much higher (0.46) than DZ twins (0.2) on neuroticism. However, results from adoption studies undermine these findings that highlight the importance of genetic influence on neuroticism. Correlations between biological parents and their adopted-away offspring were almost zero, suggesting that the high correlations between MZ twins might have been partly caused by their more similar environments (Plomin and Caspi, 1999). To circumvent this problem and control for environmental effects, researchers compared reared-apart and reared-together MZ twins. Though various studies diverge on their estimates of the heritability of neuroticism (some found lower correlations for reared-apart MZ twins (0.25) than reared-together MZ twins (0.41), whereas others found similar correlations for reared-apart and reared-together MZ twins), the overall evidence indicates that neuroticism is partly

biologically determined and heritable to some extent (Pedersen et al., 1988; Plomin and Caspi, 1999). In recapitulation, the replication of neuroticism across cultures and personality models and its biological basis substantiate the conclusion that it is a universal personality trait.

Links between Neuroticism and Other Constructs

Emotional Disorders

Before the *Diagnostic and Statistical Manual of Mental disorders* (DSM-III), early DSM-based categories of mood disorders included the clinical label of neurosis, which comprised individuals showing anxiety and depressive disorders. The personality trait neuroticism, however, is independent of the construct of neurosis. Subsequent editions of the DSM stopped employing the diagnosis of neurosis and instead classified patients into specific anxiety or mood disorders. Yet, the growing evidence highlighting the strong associations between neuroticism and various mental disorders suggests that neuroticism may represent a broad, underlying syndrome common across the disorders (Barlow et al., 2013).

In their review, Barlow et al. (2013) summarized theoretical and empirical evidence underscoring the role of neuroticism in the development and course of emotional disorders. First, there are high rates of comorbidity among anxiety and mood disorders. Second, treatments for a specific disorder often improve comorbid anxiety/mood disorders that are not targeted, demonstrating broad treatment responsiveness that may possibly be due to common features among different disorders. Finally, neuroscience evidence suggests that emotional disorders may share a common biological syndrome related to hyperexcitability of limbic structures (e.g., amygdala overactivation, limited cortical inhibition of amygdala responses). Likewise, individuals high in neuroticism exhibit similar amygdala overactivation. These three areas support the conception that there are commonalities among anxiety and mood disorders, which may arise from a broader, temperamental syndrome (i.e., neuroticism). These commonalities can be traced to the underlying structure of emotional disorders that are defined by the two core dimensions of neuroticism and extraversion (Barlow, 2002). The higher-order dimension of neuroticism explained most of the covariance among various anxiety and mood disorders (e.g., depression, social anxiety disorder, panic disorder) (Barlow et al., 2013).

The triple-vulnerability theory formulated by Barlow and colleagues serves as a framework to explain the origins of neuroticism and emotional disorders. The two generalized vulnerabilities in the theory – (1) a biological vulnerability that is heritable and (2) a psychological vulnerability that stems from adverse early experiences and predisposes one to a sense of unpredictability and uncontrollability – are hypothesized to be risk factors for the development and expression of neuroticism. When subjected to stressful environmental contexts, people with these two vulnerabilities develop a generalized, anxious syndrome. The last element of the theory – a specific psychological vulnerability (which is mainly learned) – accounts for why a particular form of emotional disorder is manifested. Given that trait neuroticism underlies the roots of anxiety and mood

disorders, Barlow and colleagues proposed that psychological interventions and treatments directed at addressing this temperamental vulnerability may yield greater success than traditional treatments targeting the symptoms of specific disorders.

Emotion

As reflected by its conceptualization and definition, neuroticism should be closely related to emotions. Indeed, numerous correlational, experimental, and longitudinal studies have converged on the conclusion that neuroticism is positively linked to negative emotions (e.g., Diener and Lucas, 1999; Tellegen, 1985; Watson and Clark, 1984). This robust relation has also been found across various cultures, where neuroticism predicted unpleasant affect over a period of 10 years. The temperament perspective posits that the biological basis of neuroticism leads to predilections to experience negative affect. Emerging research has begun to pinpoint some of these neurobiological bases; for example, high levels of neuroticism are linked to excessive sensitivity of the amygdala and low serotonin levels. This temperament perspective is also supported by heritability studies, demonstrating that genetics account for about 31% of the variance in neuroticism (Pedersen et al., 1988).

Temperamental differences in emotions can result from differences in reactivity or baseline affect (or both). According to the reactivity model, individuals high in neuroticism react more strongly to negative stimuli – this differential reactivity to emotional stimuli accounts for neuroticism differences in emotional experiences (Gross et al., 1998). In support of the reactivity model, experimental studies found that neuroticism was associated with higher negative emotions in unpleasant situations. Recent functional imaging studies also confirm that neuroticism is associated with brain reactivity to negative emotional stimuli (Canli et al., 2001). Ecologically valid studies examining naturalistic affective responses have also replicated the experimental findings. Diary studies, for example, documented that participants higher in neuroticism were more reactive to stress and showed a stronger association between daily stress and daily negative affect (e.g., Mroczek and Almeida, 2004). Another model, the affect-level model, posits that differences in neuroticism lead to differences in tonic levels of negative affect; hence, those high in neuroticism feel more negative regardless of the circumstances or stimuli (Diener and Lucas, 1999; Gross et al., 1998). In support of both models, studies by Gross et al. (1998) found that neuroticism correlated positively with baseline negative affect and with increases in negative emotions in response to unpleasant stimuli.

Cognitive Processing

According to the cognitive perspective, individual differences in cognitive processes or cognitive processing of emotional information can also account for neuroticism differences in emotional experiences (Rusting, 1998). Cognitive processes refer to ways of encoding and categorizing information, expectancies about outcomes and self-efficacy, self-regulatory

processes, or coping styles. Personality theories like the FFT and the cognitive-affective processing system (CAPS) that incorporate additional elements (e.g., dynamic processes) and do not focus solely on traits may shed some light on how neuroticism differences in cognitive processing arise. The FFT postulates that the five factors (i.e., basic tendencies) interact with external influences through dynamic processes (such as cognitive styles) to shape characteristic adaptations. In turn, some dynamic processes can be differentially affected by personality traits (McCrae and Costa, 2008). CAPS theory conceives personality as a system characterized by interrelated cognitive and affective units that interact dynamically. Individual differences in behavioral and affective responses to the external environment are due to individual differences not only in the accessibility of particular cognitive-affective units but also in the distinctive organization and chronic activation levels of these units. Dynamic reciprocal transactions occur not only between this personality system and the external environment but also within the system, among the social-cognitive and affective variables (Mischel and Shoda, 1995).

Extant evidence does support the view of a more comprehensive system, where personality traits interact reciprocally with other processes (e.g., cognitive styles, affect). Other than affect (as discussed in the earlier section), neuroticism also influences cognitive processing. Studies have shown that individuals higher in neuroticism demonstrate a cognitive processing bias toward negative stimuli. For instance, high-neuroticism individuals recalled more negative words, exhibited a negative attentional bias, and responded faster to targets located with negative words. Not only do they process and recall negative stimuli faster and better on various cognitive tasks, they also interpret ambiguous stimuli negatively (Rusting and Larsen, 1998). Individuals high in neuroticism also tended to appraise the environment negatively (Watson and Clark, 1984). The superior processing of trait-congruent emotional information may be one possible explanation for why high-neuroticism individuals experience stronger negative emotions.

Emotion Regulation and Coping

The close associations between neuroticism and emotional experience also extend to emotion regulation. Neuroticism predicts efforts to control emotions, and correlational findings have revealed neuroticism differences in positive and negative emotion regulation (e.g., Gross, 1999). Tendencies to diminish or eliminate one's negative emotions or turn them in a more positive direction correlated inversely with neuroticism. This means that those higher in neuroticism are less likely to improve their negative mood or cope with negative outcomes and their emotional impact. They are also less likely to savor positive affect. Usage of the emotion regulation strategy, reappraisal, which leads to lower negative emotions and more positive emotions, is also correlated negatively with neuroticism (Gross and John, 2003). The link with emotion regulation extends beyond a concurrent association, as neuroticism also predicts future emotion regulation. Prior neuroticism predicted lower use of strategies to repair negative emotions at a later age (Kokkonen and Pulkkinen, 2001). Hence, the evidence

consistently documents that neuroticism is associated with use of maladaptive emotion regulation strategies.

Coping processes, which are considered as a type of cognitive process that people undergo when dealing with stressful or difficult events, have also been increasingly linked to neuroticism. Neuroticism relates to negative dispositional coping styles and cognitive appraisals and is consistently found to be associated with the use of ineffective coping mechanisms. High-neuroticism individuals also tended to use less adaptive coping strategies to cope with the daily stressors than low-neuroticism individuals. The links between neuroticism and coping were further confirmed in a meta-analysis, which found that neuroticism predicted specific problematic coping strategies like withdrawal, wishful thinking, and negative emotion-focused coping (Connor-Smith and Flachsbart, 2007).

Neuroticism not only exerts direct effects on constructs, such as emotion, emotion regulation, and cognitive processes, but also plays an important moderating role. For instance, not only does neuroticism affect people's emotional reactivity to stressors and their choice of coping strategies, it also moderates the efficacy of those coping strategies (Bolger and Zuckerman, 1995). There is also evidence that neuroticism moderates the effectiveness of cognitive strategies on emotion regulation. Reappraising an unpleasant real-life event or a hypothetical situation decreased negative emotions among low-neuroticism, but not among high-neuroticism, individuals (Ng and Diener, 2009). Conversely, negatively reappraising a positive event to dampen it decreased positive emotions among high-neuroticism, but not low-neuroticism, individuals. Hence, cognitive strategies have differential effects on positive and negative emotions for people varying in neuroticism. High-neuroticism individuals are less proficient at negative mood repair, but yet are more susceptible to the detrimental effects of maladaptive strategies.

Life Outcomes

In summary, the links between neuroticism and the various constructs highlight that neuroticism would predict outcomes in important life domains. A review of the extensive literature on the relationship between personality and subjective well-being confirmed that neuroticism is linked to lower well-being (Steel et al., 2008). People higher in neuroticism are lower in happiness and life satisfaction and experience greater negative affect. Neuroticism is also inversely related to the overall quality of life. Furthermore, neuroticism is closely associated with and predictive of mental and physical health. Extensive evidence indicates that it strongly correlates with mood, anxiety, somatoform, eating disorders, and schizophrenia, and correlates moderately with personality disorders. It is also associated with physical health problems such as cardiovascular disease and even predicts longevity in the general population (Lahey, 2009). However, a recent longitudinal study suggests that high neuroticism, when accompanied by high conscientiousness, can still be associated with some health benefits. Specifically, people who were high in both neuroticism and conscientiousness had lower levels of interleukin-6; that is, they had lower

health risk for chronic diseases such as heart disease (Turiano et al., 2013).

In the work domain, negative emotionality (or neuroticism) predicted future work outcomes: Those higher in negative emotionality at age of 18 years subsequently had lower levels of occupational attainment, less job satisfaction, and less financial security at age of 26 years (Roberts et al., 2003). In the social domain, neuroticism is a consistent personality predictor of relationship outcomes (e.g., relationship dissatisfaction, conflict, abuse) and relationship quality (Caspi et al., 2005). It is also inversely related to marital satisfaction (Lahey, 2009). Therefore, work from different areas converges to underscore the pivotal role of neuroticism in life and how it serves as a robust and important correlate and predictor of key outcomes. Overall, the evidence underlines that higher neuroticism is related to more adverse outcomes – being less happy, less healthy, and less successful, although it may be associated with some health benefits when combined with other personality traits (e.g., conscientiousness).

Change in Neuroticism across the Life Span

Longitudinal studies on personality have shown that personality traits (such as neuroticism) are not fixed and can change over time. Despite its strong genetic basis and the belief that genes do not change, neuroticism is not entirely determined by genes and can also be influenced by environmental factors and the interactions between genes and environment. For instance, if one's environment does not fit with one's existing genetic predisposition, one can try to change the environment (manipulative process) or try to change one's personality traits to achieve a more congruent person–environment fit. Hence, as environments change and interact with genes via bidirectional and dynamic processes, these experiences can affect neuroticism change. Although people change as they age, there is still overall consistency in personality. A meta-analysis of longitudinal studies demonstrated high rank-order consistency (i.e., the relative ordering of individuals within a group over time) for the Big Five personality traits, as all five traits were fairly stable (with consistency estimates ranging from 0.5 to 0.55), with neuroticism showing a stability coefficient estimate of 0.50 (Roberts and DelVecchio, 2000).

Indeed, personality continuity is exhibited from childhood to adulthood. Childhood temperamental qualities are closely linked to adult personality traits. Findings indicated that children who exhibited the undercontrolled temperament type at age of 3 years showed high levels of negative emotionality (or neuroticism) at ages of 18 and 26 years (Caspi et al., 2003). Longitudinal and cross-sectional studies of personality trait change confirm that personality traits continue to change in adulthood, and even into old age (Roberts and Mroczek, 2008). Cross-sectional findings that middle-aged individuals are lower in neuroticism than young adults are corroborated by longitudinal studies that showed that there is increased emotional stability with age (Roberts et al., 2006). This mean-level change in neuroticism (i.e., the increases/decreases over time in a sample/population of individuals) occurs throughout the life span, starting from adolescence,

with larger decreases in young adulthood (age of 20–40 years), though people continue to decrease in neuroticism in middle and old age (Roberts et al., 2006).

This decline in neuroticism has been replicated across cultures, suggesting that its developmental trend is universal. Indeed, there is strong evidence of universal personality maturation, where neuroticism showed age-related decreases across 62 nations (Bleidorn et al., 2013). Consistent with the FFT perspective that personality traits are biologically determined, there should be no cultural differences in personality developmental trends. Yet, there is also evidence of significant cultural differences in age effects on personality traits across the 62 cultures; specifically, cultures with earlier job-role transitions showed more pronounced age-related decreases in neuroticism. Hence, these findings also support the social investment theory, which proposes that cultural norms regarding the timing of life transitions (e.g., family-role and job-role transitions) influence personality maturation (Bleidorn et al., 2013). That is, investment in social roles contributes to personality development.

Why do personality traits change over time? Although personality is partly determined by genes, personality change can occur via mechanisms such as life and work experiences, changes in cultures and social environments, and changes in expectancies and goals. Work and life experiences are a major factor for why people change as they age. Roberts et al. (2003) found that work experiences were related to changes in personality traits. For example, occupational attainment, work satisfaction, and financial security were related to decreases in negative emotionality (as assessed by the MPQ). Similarly, increases in work satisfaction and relationship satisfaction were associated with decreases in neuroticism (Scollon and Diener, 2006). In recapitulation, personality traits do change due to life experiences and through interactions with one's environment and culture.

Conclusion

It is evident that neuroticism is not merely a descriptive personality trait for comparing people. Neuroticism is also a strong predictor of emotion, mental and physical health, work outcomes, and social relationships. Its close links to adverse outcomes in important life domains highlight that it is germane to understand the mechanisms underlying these links. Development of models that would explain the causal relations between neuroticism and these life outcomes, as well as examine potential interventions or treatments, would be important. Such interventions could help to improve or even prevent the undesirable outcomes associated with high levels of neuroticism. For example, in the area of mental disorders, treatments that target temperamental vulnerabilities could be developed, as they would address commonalities underlying various disorders and would be more effective than treatments targeting symptoms. Additionally, future treatment approaches could examine ways of reducing high levels of neuroticism. This is pertinent, given that there is potential for change in neuroticism although it exhibits fairly large rank-order stability, as substantial evidence has noted mean-level decreases in neuroticism across the life span.

See also: Anxiety and Anxiety Disorders; Emotional Regulation; Personality, Trait Models of; Personality: Historical and Conceptual Perspectives.

Bibliography

- Barlow, D.H., Sauer-Zavala, S., Carl, J.R., Bullis, J.R., Ellard, K.K., 2013. The nature, diagnosis, and treatment of neuroticism: back to the future. *Clinical Psychological Science* 1, 1–22.
- Barlow, D.H., 2002. *Anxiety and its Disorders: The Nature and Treatment of Anxiety and Panic*, second ed. Guilford Press, New York, NY.
- Bleidorn, W., Klimstra, T.A., Dennisen, J.J.A., Rentfrow, P.J., Potter, J., Gosling, S.D., 2013. Personality maturation around the world: a cross-cultural examination of social-investment theory. *Psychological Science* 24, 2530–2540.
- Bolger, A., Zuckerman, A., 1995. A framework for studying personality in the stress process. *Journal of Personality and Social Psychology* 69, 890–902.
- Canli, T., Zhao, Z., Desmond, J.E., Kang, E., Gross, J., Gabrieli, J., 2001. An fMRI study of personality influences on brain reactivity to emotional stimuli. *Behavioral Neuroscience* 115, 33–42.
- Caspi, A., Harrington, H., Milne, B., Amell, J.W., Theodore, R.E., Moffitt, T.E., 2003. Children's behavioral styles at age 3 are linked to their adult personality traits at age 26. *Journal of Personality* 71, 495–513.
- Caspi, A., Roberts, B.W., Shiner, R.L., 2005. Personality development: stability and change. *Annual Review of Psychology* 56, 453–484.
- Connor-Smith, J.K., Flachsbart, C., 2007. Relations between personality and coping: a meta-analysis. *Journal of Personality and Social Psychology* 93, 1080–1107.
- Costa, P.T., McCrae, R.R., 1992. *NEO PI-R Professional Manual*. Psychological Assessment Resources, Odessa, FL.
- Diener, E., Lucas, R.E., 1999. Personality and subjective well-being. In: Kahneman, D., Diener, E., Schwarz, N. (Eds.), *Well-being: The Foundations of Hedonic Psychology*. Russell Sage Foundation, New York, pp. 213–229.
- Eysenck, H.J., 1990. Biological dimensions of personality. In: Pervin, L.A. (Ed.), *Handbook of Personality: Theory and Research*. Guilford Press, New York, pp. 244–276.
- Goldberg, L.R., 1990. An alternative "description of personality": the Big-Five factor structure. *Journal of Personality and Social Psychology* 59, 1216–1229.
- Gross, J.J., 1999. Emotion and emotion regulation. In: Pervin, L.A., John, O.P. (Eds.), *Handbook of Personality: Theory and Research*. Guilford Press, New York, pp. 525–552.
- Gross, J.J., John, O.P., 2003. Individual differences in two emotion regulation processes: implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology* 85, 348–362.
- Gross, J.J., Sutton, S.K., Ketelaar, T., 1998. Relations between affect and personality: support for the affect-level and affective-reactivity views. *Personality and Social Psychology Bulletin* 24, 279–288.
- John, O.P., Srivastava, S., 1999. The big five trait taxonomy: history, measurement, and theoretical perspectives. In: Pervin, L.A., John, O.P. (Eds.), *Handbook of Personality: Theory and Research*. Guilford Press, New York, pp. 102–138.
- Kokkonen, M., Pulkkinen, L., 2001. Extraversion and neuroticism as antecedents of emotion regulation and dysregulation in adulthood. *European Journal of Personality* 15, 407–424.
- Lahey, B.B., 2009. Public health significance of neuroticism. *American Psychologist* 64, 241–256.
- McCrae, R.R., Costa, P.T., 1997. Personality trait structure as a human universal. *American Psychologist* 52, 509–516.
- McCrae, R.R., Costa, P.T., 2008. The five-factor theory of personality. In: John, O.P., Robins, R.W., Pervin, L.A. (Eds.), *Handbook of Personality: Theory and Research*. Guilford Press, New York, pp. 159–181.
- McCrae, R.R., Terracciano, A., 2005. 79 Members of the Personality Profiles of Cultures Project, 2005. Personality profiles of cultures: aggregate personality traits. *Journal of Personality and Social Psychology* 89, 407–425.
- Mischel, W., Shoda, Y., 1995. A cognitive-affective system theory of personality: reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review* 102, 246–268.
- Mroczek, D.K., Almeida, D.M., 2004. The effect of daily stress, personality, and age on daily negative affect. *Journal of Personality* 72, 355–378.
- Ng, W., Diener, E., 2009. Feeling bad? The "power" of positive thinking may not apply to everyone. *Journal of Research in Personality* 43, 455–463.

- Pedersen, N.L., Plomin, R., McClearn, G.E., Friberg, L., 1988. Neuroticism, extraversion, and related traits in adult twins reared apart and reared together. *Journal of Personality and Social Psychology* 55, 950–957.
- Plomin, R., Caspi, A., 1999. Behavioral genetics and personality. In: Pervin, L.A., John, O.P. (Eds.), *Handbook of Personality: Theory and Research*. Guilford Press, New York, pp. 251–276.
- Roberts, B.W., Caspi, A., Moffitt, T., 2003. Work experiences and personality development in young adulthood. *Journal of Personality and Social Psychology* 84, 582–593.
- Roberts, B.W., DelVecchio, W.F., 2000. The rank-order consistency of personality from childhood to old age: a quantitative review of longitudinal studies. *Psychological Bulletin* 126, 3–25.
- Roberts, B.W., Mroczek, D., 2008. Personality trait change in adulthood. *Current Directions in Psychological Science* 17, 31–35.
- Roberts, B.W., Walton, K., Viechtbauer, W., 2006. Patterns of mean-level change in personality traits across the life course: a meta-analysis of longitudinal studies. *Psychological Bulletin* 132, 1–25.
- Rusting, C.L., 1998. Personality, mood, and cognitive processing of emotional information: three conceptual frameworks. *Psychological Bulletin* 124, 165–196.
- Rusting, C.L., Larsen, R.L., 1998. Personality and cognitive processing of affective information. *Personality and Social Psychology Bulletin* 24, 200–213.
- Scollon, C.N., Diener, E., 2006. Love, work, and changes in extraversion and neuroticism over time. *Journal of Personality and Social Psychology* 91, 1152–1165.
- Steel, P., Schmidt, J., Schultz, J., 2008. Refining the relationship between personality and subjective well-being. *Psychological Bulletin* 134, 138–161.
- Tellegen, A., 1985. Structures of mood and personality and their relevance to assessing anxiety, with an emphasis on self-report. In: Tuma, A.H., Maser, J.D. (Eds.), *Anxiety and the Anxiety Disorders*. Erlbaum, Hillsdale, NJ, pp. 681–706.
- Turiano, N.A., Mroczek, D.K., Moynihan, J., Chapman, B.P., 2013. Big 5 personality traits and interleukin-6: evidence for “healthy neuroticism” in a US population sample. *Brain, Behavior, Immunity* 28, 83–89.
- Watson, D., Clark, L.A., 1984. Negative affectivity: the disposition to experience aversive emotional states. *Psychological Bulletin* 96, 465–490.