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Brief Report

How regional personality affects individuals' life satisfaction: A case of emotional contagion?

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ABSTRACT

Recent research has shown that life satisfaction is lower in states with a high neuroticism level than in less neurotic states. The present study disentangles the effect of state- and individual-level neuroticism on life satisfaction in a multilevel regression analysis using nationally representative data from 16 German federal states. The results show that controlling for individual-level neuroticism results in a reduction of the effect of state-level neuroticism on individuals' life satisfaction, although it remains statistically and practically significant. Hence, the ecological correlation between state-level neuroticism and state-level life satisfaction reported in prior research is not a mere reflection of individual-level associations. The process of emotional contagion is proposed as the potential mechanism of the state-level neuroticism effect.

1. Introduction

Personality is considered the strongest predictor of subjective well-being (Diener, Suh, Lucas, & Smith, 1999). In particular, individuals with high scores in neuroticism and low scores in extraversion have been consistently shown to report lower life satisfaction and happiness compared with their less neurotic and more extraverted counterparts (Steel, Schmidt, & Shultz, 2008). More recently, it has been suggested that national and regional cultures have distinct personality profiles associated with their residents' well-being (McCrae & Terracciano, 2005). For example, Rentfrow, Mellander, and Florida (2009) established clear patterns of geographic variation in the Big Five personality dimensions across the United States, with the central states being most extraverted, the south and midwest states the most conscientious and the northeast and west coast the most open. Further research demonstrated that these differences are meaningfully related to external variables such as mortality, religiosity, crime rates and subjective well-being (McCann, 2011; Rentfrow, Gosling, & Potter, 2008). Specifically, Rentfrow et al. (2009) have shown that U.S. states with high neuroticism levels were more likely to have lower subjective well-being than less neurotic states. What are the mechanisms through which regional personality characteristics affect individuals' well-being? On the one hand, the ecological correlations reported in these studies might merely reflect the relationships found at the individual level. On the other hand, living in a neurotic region might affect individuals' well-being regardless of individuals' own neuroticism level, for example through emotional contagion (Hatfield, Cacioppo, & Rapson, 1993).

Emotional contagion is a process by which the emotional states of one person are "crossed over" to another person (Hatfield et al., 1993; also see "crossover effect", Westman, 2001). For example, burnout and daily mood were reported to transfer from one member of a team to other members (Bakker & Schaufeli, 2000; Barsade, 2002), and happiness in one person spreads along the person's social networks to the spouse, neighbors, friends and coworkers, up to three degrees of separation (Fowler & Christakis, 2009). These effects are commonly explained by empathy and individuals' propensity to mimic their interaction partners' emotional expressions (Hatfield et al., 1993). Indeed, one's next door neighbor is more likely to affect an individual's happiness than a neighbor living farther away in the same neighborhood, although they share a similar environmental exposure (Fowler & Christakis, 2009). Additionally, burnout spread has been shown to be faster among individuals who are highly susceptible to the emotions of others than among their less empathetic counterparts (Bakker & Schaufeli, 2000).

Research conducted on couples has demonstrated that not only happiness can cross over; one's spouse's personality also affects an individual's relational and personal well-being. For example, having a partner high in neuroticism negatively influences perceived relationship quality and life satisfaction above and beyond one's

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own neuroticism score (Dyrenforth, Kashy, Donnellan, & Lucas, 2010; Malouff, Thorsteinsson, Schutte, Bhullar, & Rooke, 2010). Neurotic individuals show a propensity to experience negative emotions, and they are often distressed and unsatisfied. Consequently, the experience of having a neurotic individual as a life partner might be distressful. In a similar vein, because negative emotions might cross over from one person to another through the process of emotional contagion, a high concentration of neurotic individuals in one's environment may have an adverse effect on one's life satisfaction. This process might represent the mechanism underlying the effect of state-level neuroticism on individuals' well-being. Yet, it can only apply if state-level neuroticism affects one's life satisfaction above and beyond one's own neuroticism score.

In the present paper, using nationally representative data from 16 German federal states, I apply a multilevel analysis technique to disentangle the effects of individual- and state-level personality traits on individuals' well-being. If the effect of state-level personality vanishes when controlling for individual-level personality, the ecological correlations reported in prior research are likely to merely reflect the individual-level relationships. In contrast, if the effect of state-level neuroticism on individuals' life satisfaction exists above and beyond individuals' own neuroticism scores, a more subtle mechanism, for example emotional contagion, is likely to be at work.

2. Method

2.1. Participants

The present analyses are based on data from the German Socio-Economic Panel (GSOEP; Wagner, Frick, & Schupp, 2007). The GSOEP is a nationally representative panel study that has been conducted annually since 1984 by the German Institute for Economic Research (DIW Berlin). Its current database includes approximately 22,000 individuals. The data cover all 16 states, with larger states providing a larger sample (in every state, approximately 2% of the population was randomly selected to take part in the study). In 2005 and 2009, a brief Big Five inventory was administered to the overall GSOEP sample along with the annual questionnaire. The present analyses are based on the data from the 2005 wave (the results of the analysis of the 2009 wave are very similar and are briefly summarized in the results section) and include 22,469 individuals. After a listwise deletion of cases with missing values, the final sample comprised 19,125 individuals (52.1% women, mean age = 48.49, SD = 16.71).

2.2. Measurement

The Big Five personality traits were measured using the BFI-S, which is a brief inventory developed specifically for large-scale surveys (Gerlitz & Schupp, 2005) that measures each dimension with three items on a 7-point scale ranging from "does not apply" to "does apply". The particularly short length of the scales and the fact that they were designed to cover the maximum bandwidth of the underlying dimensions result in a rather modest internal consistency: Cronbach's α: .66 (extraversion), .51 (agreeableness), .62 (conscientiousness), .60 (neuroticism), .63 (openness). However, the correlations between the original scales and the brief versions are high (all $rs > .86$; Donnellan & Lucas, 2008), and the temporal stability indicators approximate those of the long scales (six-month test–retest reliabilities reach $rs > .75$; Lang, Lüdtke, & Asendorpf, 2001). Taken together, the psychometric properties of the BFI-S are considered acceptable, and these brief scales are commonly used in personality and individual differences research, particularly for large national or cross-national samples (e.g., Donnellan & Lucas, 2008).

To derive state-level personality scores, individuals' responses were aggregated at the state level using the overall sample (before listwise deletion). The internal consistency and the temporal stability of the scales at the state level were acceptable (Cronbach's α: .75 (extraversion), .74 (agreeableness), .75 (conscientiousness), .59 (neuroticism), .91 (openness); four-year test–retest reliabilities ranged between $r = .51$ and $r = .87$).

Individuals' life satisfaction was measured using the following question: "How satisfied are you with your life as a whole?" with response options ranging from 0 (*not at all satisfied*) to 10 (*very satisfied*).

At the individual level, I controlled for gender (1 = men, 0 = women), age, marital and employment status as well as education (number of years of education). At the state level, to control for economic and structural differences, I used the global indicator of regional differences in socio-economic living conditions developed by the Cologne Institute for Economic Research (Bundesländer-Ranking, 2005). This index comprises a number of indicators, including regional employment (e.g., regional unemployment rates), wealth (e.g., households' available income), socio-cultural measures (e.g., share of people with a college degree), structural indicators (e.g., crime rates) and economic performance (e.g., companies' return on sales). Each federal state is given a score ranging from 0 (worst living conditions) to 100 (best living conditions). The use of a single indicator reflecting regional differences in economic, labor market and other structural characteristics is particularly appropriate because the small number of higher-level units of analysis (and degrees of freedom) restricts the ability to control for these diverse aspects of regional differences simultaneously.

3. Results

The descriptive statistics (Table 1) suggest that there are substantial regional variations in life satisfaction scores, with the unhappiest state being Thüringen ($M = 6.31$) and the happiest state Schleswig–Holstein ($M = 7.33$). The German states also show differences in average personality traits, with, e.g., Thüringen being the most neurotic ($M = 4.14$) and Schleswig–Holstein the least neurotic state ($M = 3.67$). Similar variations can be observed regarding the other Big Five dimensions (see Table 1).

A simple bivariate correlation analysis showed that state-level life satisfaction is positively associated with state-level differences in socio-economic living conditions ($r = .82$, $p < .001$) and negatively associated with state-level neuroticism ($r = -.79$, $p < .001$; see Fig. 1), thus replicating the results of Rentfrow et al. (2009) for the United States. No other Big Five dimensions were associated with state-level life satisfaction.

To disentangle the effects of personality at the individual and state levels, I conducted a series of multilevel regression analyses with individuals' life satisfaction as the dependent variable and individual- and state-level Big Five scores and individual- and state-level control variables as predictors. The multilevel method disentangles the variance explained at the individual and state levels and is therefore particularly suited to determine whether the effects of states' characteristics are independent from the effects of individuals' characteristics.

Model 1 (Table 2) shows the effects of state-level personality on individuals' life satisfaction. Consistent with the results of the bivariate correlation analyses, only regional levels of neuroticism had a significant effect on individuals' life satisfaction ($b = -2.35$, $p < .01$). Model 2 shows that this effect remained significant, although smaller when controlling for regional differences in socio-economic living conditions ($b = -1.55$, $p < .01$). In Model 3, I