



Brief Report

Personality correlates of risky health outcomes: Findings from a large Internet study



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ABSTRACT

Numerous studies have documented the effects of personality on health outcomes. However, which traits are most relevant to health, and the precise magnitude of their effects, is inconsistent across studies. The present study used a large sample ($N = 460,172$) to replicate and extend the relations between the Big Five and three health-related outcomes: self-reported health, body mass index, and substance use. Low Conscientiousness predicted all outcomes, indicating that individuals who are less responsible and less self-controlled tend to report poorer health, be more overweight, and engage in more substance use. Individuals who were more emotionally unstable (high Neuroticism) reported poorer health, and individuals prone to seek out social experiences and rewards (high Extraversion) engaged in more frequent substance use.

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1. Introduction

Over the past few decades, a growing body of research has established a link between personality traits and health-related mechanisms, behaviors, and outcomes. Numerous models have been proposed to explain how personality can affect health through processes such as physiological responses, preventative and risky health behaviors, coping mechanisms, and shared genetic risk and resilience factors (Smith, 2006). However, despite widespread agreement that personality plays a critical role in promoting and maintaining health, the field lacks consensus about which particular traits are most strongly linked to health outcomes (Friedman & Kern, 2014). The aim of the present study was to replicate and extend the literature by examining the relation between the Big Five traits and three important health outcomes: (1) general self-reported health, (2) body mass index, and (3) substance use.

Self-reported health is a widely used indicator of current health status and an important predictor of many health outcomes (Idler & Benyamini, 1997). Although the findings vary across studies, all of the Big Five personality traits have been linked to self-reported health, with Conscientiousness generally showing the strongest and most consistent effects (Hampson, Goldberg, Vogt, & Dubanoski, 2006; Takahashi, Edmonds, Jackson, & Roberts, 2013).

Recent longitudinal research has demonstrated that increases in Conscientiousness, Openness, Extraversion, and Agreeableness are associated with improvements in self-reported health over time, whereas increases in Neuroticism are associated with poorer self-reported health over time (Letzring, Edmonds, & Hampson, 2014; Magee, Heaven, & Miller, 2013).

Body mass index (BMI) is a health marker known to be a causal predictor for many obesity-related disease outcomes (National Institutes of Health, 1998). Individuals who are more neurotic and extraverted, and less conscientious, tend to have higher BMI scores, based on both cross-sectional and longitudinal research (Sutin, Ferrucci, Zonderman, & Terracciano, 2011). However, Brummett et al. (2006) found gender differences in these effects; Neuroticism was related to BMI only in females whereas Extraversion was related to BMI only in males.

Substance use is a risky health behavior that has deleterious consequences for health later in life. Individuals who are more neurotic, extraverted, and open, and less conscientious and agreeable, tend to engage in more substance use, based on both cross-sectional and longitudinal research (Turiano, Whiteman, Hampson, Roberts, & Mroczek, 2012). Moreover, substance use and personality trait change are reciprocally related over time (Littlefield, Sher, & Wood, 2009).

The present research used data from a large Internet-based study to address several questions about personality and health: (1) Are there gender, ethnic, and age differences in self-reported health, BMI, and substance use? (2) Which of the Big Five

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personality domains are most strongly related to self-reported health, BMI, and substance use? (3) What are the independent and interactive effects of personality on self-reported health, BMI, and substance use? (4) Does gender, ethnicity, or age moderate any of the personality effects? The extremely large sample size (nearly half a million participants) provided sufficient power to detect very small effects and examine differences in effect sizes across Big Five domains and demographic subgroups.

2. Method

2.1. Participants and procedure

The sample consists of 460,172 adults (63% women) who ranged in age from 18 to 90 years ($M = 34.5$ years, $SD = 13.53$). 86.7% reported being White, 6% Asian, 1.5% Black or African, 4.4% multiracial/other, and 1.4% “rather not say”.

The data were collected between 2009 and 2012 as part of a large Internet-based study of personality sponsored by the British Broadcasting Corporation (BBC). To complete the survey, respondents clicked a link on the BBC’s Lab UK website, which was widely advertised through the BBC webpages and television and radio channels. The survey included questions about demographics, education/work, relationships, personality, health, and childhood experiences. For the present study, we focused on the personality and health measures.

2.2. Measures

2.2.1. Personality

The 44-item Big Five Inventory (BFI) is a well-validated measure of the five basic domains of personality (John, Naumann, & Soto, 2008). The items were rated on a 5-point likert scale ranging from 1 (*disagree strongly*) to 5 (*agree strongly*). In the present sample, the alpha reliabilities were .86 for Extraversion ($M = 3.24$, $SD = .82$), .76 for Agreeableness ($M = 3.73$, $SD = .62$), .83 for Conscientiousness ($M = 3.62$, $SD = .70$), .83 for Neuroticism ($M = 2.97$, $SD = .81$), and .79 for Openness to Experience ($M = 3.70$, $SD = .64$); these reliabilities are comparable to those obtained when the BFI is administered in person.

2.2.2. General Health

We used 11 items from the RAND 36-Item Health Survey, which was adapted from the SF-36 Health Survey (Ware, 2004). Participants reported on their physical and emotional health (e.g., “During the past 4 weeks, have you accomplished less with your work or other daily activities than you would like as a result of your physical health?”), exercise and sleeping habits (e.g., “During the last 30 days, how often did you have trouble sleeping?”), and stress in their daily lives (e.g., “In general, how stressful do you find your daily life?”). The items were standardized because of their varying response formats and averaged to create a measure of General Health ($\alpha = .82$; $M = .00$, $SD = .59$).

2.2.3. Body mass index

Body mass index (BMI) was calculated from each participant’s self-reported height ($M = 5'6"$, $SD = .32$ feet) and weight ($M = 160.4$ lb, $SD = 40.0$ lb). These questions were described as “optional” in the survey, so BMI scores ($M = 24.9$, $SD = 5.7$) are only available for a subset of participants ($N = 225,217$).¹

¹ Participants who responded to the questions about their height and weight did not differ substantially on any of the key study variables from those who did not respond; the standardized difference (Cohen’s d) between respondents and non-respondents was .03 for health, .10 for substance use, and from .01 to .08 for the Big Five dimensions.

2.2.4. Substance use

We used 5 items from the Youth Risk Behavior Survey (Center for Disease Control, 2013). These items ask about cigarette, alcohol, and recreational drug use (e.g., “During the past 30 days, on average how many cigarettes did you smoke per day?”). Items were standardized and averaged to create an overall substance use scale ($\alpha = .71$; $M = .01$, $SD = .71$). One of the five items (“During your life, have you ever used ‘recreational’ drugs?”) was described as “optional”, so it is only available for a subset of participants ($N = 220,117$).²

3. Results

Because of the large sample size, we focus on the magnitude rather than the statistical significance of the effects. The three health outcomes were weakly inter-correlated: BMI was correlated $-.15$ with General Health and $.03$ with substance use; General Health and substance use were correlated $-.04$.

3.1. Demographic effects

On average, men ($M = .07$, $SD = .57$) reported better health than women ($M = -.04$, $SD = .60$). However, men ($M = .16$, $SD = .75$) reported higher levels of substance use than women ($M = -.07$, $SD = .67$). Men ($M = 25.1$, $SD = 4.9$) and women ($M = 24.8$, $SD = 6.0$) did not differ on BMI. With regard to ethnicity, White individuals reported slightly better health ($M = .01$, $SD = .59$), than Black ($M = -.02$, $SD = .59$), Asian ($M = -.07$, $SD = .58$), and multiracial ($M = -.07$, $SD = .60$) individuals. However, White individuals reported more substance use ($M = .05$, $SD = .70$), compared to Black ($M = -.29$, $SD = .66$), Asian ($M = -.43$, $SD = .60$), and multiracial individuals ($M = -.03$, $SD = .72$). Black individuals reported higher BMI ($M = 26.1$, $SD = 7.2$) than White ($M = 25.0$, $SD = 5.6$), multiracial ($M = 24.5$, $SD = 6.1$), and Asian ($M = 23.5$, $SD = 5.3$) individuals. Age was associated with higher BMI scores ($r = .25$) and greater substance use ($r = .09$), but was not related to self-reported health ($r = -.01$).

3.2. Personality correlates of General Health

Table 1 shows zero-order correlations between the Big Five personality traits and General Health. Healthy individuals tended to be low in Neuroticism ($r = -.48$), and high in Extraversion ($r = .23$), Conscientiousness ($r = .21$), and Agreeableness ($r = .16$). The relation between Openness and health was near zero ($r = -.03$).

To examine the independent effects of the Big Five, we conducted multiple regression analyses with all five traits entered simultaneously, along with gender, age, and ethnicity as control variables (see Table 1).³ Neuroticism and Conscientiousness were the most powerful predictors of health, with smaller effects for Extraversion and Openness. The effect of Agreeableness decreased to zero.

To test for moderator effects, we performed a series of multiple regression analyses in which we predicted health from the demo-

² Participants who responded to the recreational drug use question did not differ substantially on any of the key study variables from those who did not respond; the standardized difference (Cohen’s d) between respondents and non-respondents was .02 for BMI, .03 for health, .11 for substance use, and from .02 to .07 for the Big Five dimensions.

³ We also examined the effects of social class, assessed by a standardized composite of occupational status (ranging from “professional” to “farm worker”), education level, and income ($\alpha = .60$). Adding social class as a control variable (along with age, gender, and ethnicity) did not change any of the personality effects reported in Table 1 by more than ± 0.01 , for any of the three health outcomes. In addition, social class did not moderate any of the personality effects (all $\Delta R^2 < 1\%$).

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