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Identification of the healthy neurotic: Personality traits predict smoking after disease onset

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ABSTRACT

Personality traits are known predictors of health behaviors and health status. However, most of this work focuses exclusively on how personality influences health outcomes rather than how personality influences response to disease. Using a large, national study ($N = 7051$), we investigated whether conscientiousness and neuroticism were associated with smoking behavior after the onset of a disease. After the onset of a major chronic disease, high levels of neuroticism predicted less smoking when paired with high levels of conscientiousness, a combination described as healthy neuroticism. Healthy neuroticism only predicted smoking behavior after the onset of disease, not before, suggesting that the relationship between personality and responses to health problems differs from the relationship between personality and the onset of health problems.

1. Introduction

In the study of health, personality traits have been identified as one of the best psychosocial predictors of both general health status and specific outcomes (Hampson, 2012). Personality traits predict self-rated health (Hampson, Goldberg, Vogt, & Dubanoski, 2007), physician-rated health (Chapman, Lyness, & Duberstein, 2007), biomarkers of health as far as 30 years in the future (Hampson, Edmonds, Goldberg, Dubanoski, & Hillier, 2013), disease onset (Goodwin & Friedman, 2006; Weston, Hill, & Jackson, submitted for publication), and mortality (Jokela et al., 2013; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). However, few studies investigate the role personality plays in the response to disease. The current study examines the association of personality traits with smoking after a diagnosis of a major disease, such as lung disease or a heart condition.

1.1. The relationship of conscientiousness and neuroticism with physical health

The personality traits conscientiousness and neuroticism are among the most frequently and strongly connected to health outcomes and health behaviors (Hampson, 2012). Individuals high in conscientiousness experience better health, as they live longer and are at a lower risk for a variety of illnesses (Chapman, Roberts, & Duberstein, 2011; Kern & Friedman, 2008). This relationship is due to the fact that individuals high in conscientiousness are more likely to engage in positive health behaviors, such as exercise, and less likely to engage in risky health behaviors (Bogg & Roberts, 2004; Hill & Roberts, 2011). Individuals high in neuroticism, on the other hand, are at greater risk for developing illness and have shorter life spans (Hampson, 2012; Roberts et al., 2007). Neuroticism is thought to influence health through both physiological and behavioral pathways. Individuals high in neuroticism experience more anxiety and stress (Bolger & Schilling, 1991), which in turn disrupts immune functioning (Sutin et al., 2010). As a means to cope with this stress, individuals high in neuroticism are also more likely to turn to unhealthy behaviors, such as smoking or drinking (Contrada, Cather, & O'Leary, 1999; Terracciano & Costa, 2004; Turiano, Whiteman, Hampson, Roberts, & Mroczek, 2012).

However, some have argued that high levels of neuroticism can benefit health under certain circumstances (Friedman, 2000). Such arguments of a healthy neuroticism rest on the premise that neuroticism could lead to vigilance and concern about germs, symptoms, and treatments. This potentially positive response to stress and uncertainty is less studied than the typical negative pathway where worry and concern is considered harmful. That is, neuroticism may potentially be both beneficial and/or harmful for health depending on how individuals deal with their anxiety and worries. For example, increased vigilance towards one's health could result in less participation in risky behaviors and attentiveness to physical symptoms, ultimately leading to better health. Rather than turning to negative behavioral outlets to relieve stress (e.g., smoking), individuals instead may choose to confront their stressors head-on and attempt to manage or decrease the source of stress.

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A small number of studies have already provided evidence for the beneficial side of neuroticism by demonstrating that neuroticism may be associated with increased vigilance of somatic symptoms, evidenced by increased reporting of such symptoms (Costa & McCrae, 1987), though this potential pathway is mostly unexplored and undocumented.

An intriguing context where this healthy form of neuroticism may arise is when high levels of neuroticism are paired with high levels of conscientiousness. Individuals high in neuroticism are likely to be concerned about their health (Friedman, 2000), whereas conscientious individuals would do something about these concerns, such as by changing their health behaviors (Bogg, 2008), scheduling visits with their physician, and adhering to their physician's recommendations (Hill & Roberts, 2011). Some evidence suggests that this pairing of neuroticism and conscientiousness is effective for the health process. For example, in a study which examined personality types based on combinations of Big Five traits, those styles which included both high neuroticism and high conscientiousness showed the least frequency of smoking and lower mean consumption of cigarette and were more restrained drinkers (Vollrath & Torgersen, 2002). Additionally, current smokers scored lowest on a combination of high neuroticism and high conscientiousness but scored highest on the combination of high neuroticism and low conscientiousness (Terracciano & Costa, 2004). A final study showed that high neuroticism was protective against increased drinking when paired with high conscientiousness, although this study failed to find the interaction when examining smoking behaviors (Turiano et al., 2012). While these findings are in support of the healthy neurotic, some studies create categories to represent healthy neuroticism while others use continuous variables. This inconsistency of methods may account for inconsistency of results. Ideally, research on personality and health would use continuous variables to examine these interactions. These healthy neurotic individuals should recognize symptoms of health problems sooner and take steps – such as dieting and exercising – to address such symptoms or underlying problems, slowing the progression of disease and having healthier immune systems. In support of this idea, low levels of interleukin-6, an inflammatory biomarker negatively associated with immune functioning, occur in healthy neurotics (Turiano, Mroczek, Moynihan, & Chapman, 2013).

1.2. Personality traits and the response to disease

While numerous studies examine why personality traits may influence health, few studies examine whether personality traits influence reactions to health problems (Chapman et al., 2011; Friedman, 2000). One way to examine this process is to look at how individuals respond to the onset of a major disease. The progression of a chronic illness and the success of its treatment are largely influenced by a patient's coping response, which includes both emotional and behavioral components (Meichenbaum & Turk, 1987; Wiebe & Christensen, 1996). If a patient seeks out a specialist and complies with their recommendations and prescriptions, she is likely to experience fewer physical health problems, fewer negative emotions, and lower economic costs in the long term (Hays et al., 1994; Horwitz & Horwitz, 1993), whereas if the patient fails to change negative health behaviors, such as smoking, then she will naturally experience greater physical, emotional and economic costs. Additionally, different coping responses have different levels of effectiveness; information seeking, for example, leads to better psychological adjustment than fantasizing (Felton & Revenson, 1984), which suggests that individuals who take action to understand and manage their illness will show better emotional health, in addition to better physical health.

Personality traits likely influence responses to health because of their association with behavioral and emotional aspects of the health process. For example, conscientious individuals adhere better to doctors' instructions (Hill & Roberts, 2011), so they are more likely to slow the progression of a major or chronic disease. Personality traits, most notably neuroticism, also likely influence the degree to which a patient effectively copes with the stress and uncertainty that is involved after the onset of a disease (Connor-Smith & Flachsbart, 2007). One review finds support that personality influences the reaction and progression of disease (Wiebe & Christensen, 1996), indicating that high levels of conscientiousness were associated with the most adherence to physician's instructions. Consistent with these findings, in children with Type 1 diabetes, conscientiousness is associated with better regulation of blood sugar levels, known as glycaemic control (Vollrath, Landolt, Gnehm, Laimbacher, & Sennhauser, 2007). However, there is disagreement as to whether low (Christensen et al., 2002), moderate (Wiebe & Christensen, 1996) or high levels of neuroticism (Frasure-Smith, Lesperance, & Talajic, 1995) lead to ideal levels of health behaviors in the post-disease health process.

Despite the numerous studies linking personality traits with mechanisms involved in the health process (e.g., Bogg & Roberts, 2004; Hampson, 2012), the way by which personality influences responses to disease may differ from than the associations between personality and the onset of health. For example, individuals with Type A personality – e.g., ambitious and hostile – typically experience poorer physical functioning, an effect most likely driven by the hostility aspect (Friedman & Rosenman, 1959). However, while Type A personality predicts greater mortality generally, after a heart attack, Type A individuals live longer (Ragland & Brand, 1988), indicating that, in response to disease, personality traits can have a different influence on behavioral choices regarding treatment and recovery. Consequently, this study examines the association between personality and health both before and after a major health event.

1.3. Current study

This study aims to examine how personality influences behavioral responses to chronic disease. Specifically, we examine how the smoking behaviors of older adults are predicted by levels of conscientiousness and neuroticism. We seek to both replicate past findings regarding healthy neuroticism and smoking while extending this research to determine the conditions under which this effect is most likely to be found. To differentiate responses to disease from existing relationships between personality and smoking, we perform three sets of analyses. First, we examine the association between personality traits and smoking behaviors in a broad sample of older adult participants. These first analyses are meant to replicate the general associations found in previous research (e.g., conscientiousness predicts less smoking while neuroticism predicts more; Bogg & Roberts, 2004; Turiano et al., 2012). Second, using a subset of the initial sample, we examine smoking behaviors after the onset of six chronic diseases to examine whether personality traits predict behavioral responses to chronic illness. Third, we examine smoking behaviors before the onset of the diseases to test whether personality trait associations existed before the onset of illness. That is, the third set of analyses tests whether the association between personality and smoking behavior for those who will eventually develop a major illness exists prior to their diagnosis. Together, these analyses test whether personality traits influence a behavioral response after the onset of a major illness.

2. Method

2.1. Participants

Data were taken from the Health and Retirement Study (HRS), a nationwide study of aging adults (Juster & Suzman, 1995; Roberts,