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Psychological and cognitive determinants of mortality: Evidence from a nationally representative sample followed over thirty-five years

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ABSTRACT

Growing evidence suggests that psychological factors, such as conscientiousness and anger, as well as cognitive ability are related to mortality. Less is known about 1) the relative importance of each of these factors in predicting mortality, 2) through what social, economic, and behavioral mechanisms these factors influence mortality, and 3) how these processes unfold over long periods of time in nationally-representative samples. We use 35 years (1972–2007) of data from men (ages 20–40) in the Panel Study of Income Dynamics (PSID), a nationally representative sample in the United States, and discrete time event history analysis (n = 27,373 person-years) to examine the importance of measures of follow-through (a dimension of conscientiousness), anger, and cognitive ability in predicting mortality. We also assess the extent to which income, marriage, and smoking explain the relationship between psychological and cognitive factors with mortality. We find that while follow-through, anger, and cognitive ability are all associated with subsequent mortality when modeled separately, when they are modeled together and baseline demographic characteristics are controlled, only anger remains associated with mortality: being in the top quartile for anger is associated with a 1.57 fold increase in the risk of dying at follow-up compared with those in the bottom quartile. This relationship is robust to the inclusion of income, marriage, and smoking as mediators.

Studies find that conscientiousness (e.g., Roberts et al., 2007), anger (e.g., Kiecolt-Glaser et al., 2002), and cognitive ability (e.g., Deary et al., 2010) are all associated with health and ultimately mortality. Less work, however, has considered these factors together as independent risk factors for mortality, though emerging evidence suggests important connections between personality, emotional regulation, and cognitive function (Wilkowski and Robinson, 2008), which may in turn have implications for health and mortality. Further, much of the work that has examined psychological and cognitive determinants of health and mortality has used non-representative samples (Campbell et al., 2014; Friedman et al., 1995; Terracciano et al., 2008), short observational windows (Hill et al., 2011; Weiss and Costa, 2005), or both, leaving unanswered questions regarding the generalizability of how these psychological and cognitive factors unfold across the life course to impact mortality.

An additional unanswered question is through what social, economic, and behavioral processes psychological and cognitive factors are associated with health and mortality. Prior research has identified psychological and cognitive factors as important determinants for outcomes such as family formation, wages, and risky behaviors (Heckman et al., 2006), and these factors are also all strongly linked to health and mortality (Herd et al., 2007; Lantz et al., 1998; Waite, 1995). Most data sources with measures of both psychological and cognitive factors and health and/or mortality observe individuals from childhood or adolescence through early middle age, precluding an examination of the role of factors such as income, marriage, or smoking behavior at midlife as mechanisms linking psychological and cognitive factors and mortality, which is rare before middle age. While datasets that focus on older age groups benefit from observing the period of the life course where mortality is common, these data may be subject to mortality selection prior to the study. Furthermore, socioeconomic processes unfold most importantly during, roughly, ages 20–55, and these experiences may not be fully

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captured in studies of older adults.

We address these gaps in the literature on psychological and cognitive determinants of mortality by using 35 years of data from the nationally-representative Panel Study of Income Dynamics (PSID) to examine the relationship between follow-through (an important dimension of conscientiousness), anger, and cognitive ability in 1972 and mortality through 2007. Our analytic sample consists of males who are no older than age 40 in 1968. This age range enables us to examine how follow-through, anger, and cognitive ability shape mortality via life course social processes related to income and marital status and smoking. We ask three questions. First, how are follow-through, anger, and cognitive ability related to mortality when modeled separately? Second, how are follow-through, anger, and cognitive ability related to mortality when modeled together? Third, what role do income, marriage, and smoking behavior play in explaining possible links between follow-through, anger, and cognitive ability with mortality? We also account for the connections between socioeconomic status and follow-through, anger, and cognitive ability. Individuals with greater follow-through and cognitive ability, and lower anger, may be more likely to continue in school, which in turn may facilitate further gains in psychological and cognitive skills (Mirowsky and Ross, 2007). And higher levels of financial resources may in fact enhance follow-through (Pearlin et al., 2007). By accounting for the relationships between socioeconomic status and psychological and cognitive factors, we reduce bias in our estimates of these factors.

1. Conscientiousness, health, and mortality

A large literature has examined the relationship between personality characteristics and health. Many of these studies focus on dimensions of the Big Five (Costa and McCrae, 1992), which includes openness, conscientiousness, extraversion, agreeableness, and neuroticism. Among the most consistent findings from these studies is the positive association between conscientiousness and health (Goodwin and Friedman, 2006; Reiss et al., 2014). Conscientiousness contains several facets, including orderliness, industriousness, persistence, self-control, and responsibility (Roberts et al., 2014). Individuals who report higher levels of conscientiousness are less likely to report a variety of physical and mental health conditions (Goodwin and Friedman, 2006), disease progression (O'Cleirigh et al., 2007), and are more likely to live longer lives (Friedman et al., 1995; Hill et al., 2011). Among the dimensions of conscientiousness, a meta-analysis has found that those related to achievement, such as persistence—which is quite similar to follow-through, and those related to order including organization and discipline were most-strongly related to longevity (Kern and Friedman, 2008).

Why is conscientiousness associated with health and mortality? Broadly speaking, facets of conscientiousness, such as organization, hard work, tenacity, impulse control, dependability, and conformity with norms and rules facilitate successful navigation of many dimensions of life (Bogg and Roberts, 2004), such as continued engagement with social roles related to employment and family and reduced involvement in deviant behaviors. More specifically, conscientiousness is associated with a variety of social and behavioral factors—health behaviors, socioeconomic status, and marriage—that are themselves associated with better health (Herd et al., 2007; Lantz et al., 1998; Waite, 1995).

Much of the work that has examined conscientiousness and health has focused on health behaviors. Individuals with higher levels of conscientiousness are less likely to engage in a variety of unhealthy behaviors, including tobacco use, substance abuse, risky driving and sexual practices, violent behavior, and physical inactivity (for a summary, see Bogg and Roberts, 2004). Prior work has also identified the importance of psychological factors such as conscientiousness for labor market outcomes, including employment and wages (e.g., Farkas, 2003). Research has also found that social responsibility—a component of conscientiousness—is negatively associated with divorce in early midlife (Roberts and Bogg, 2004) and positively associated with positive marital interaction (Robins et al., 2000). To date, however, the relative importance of various social factors—especially income and marital status—as mechanisms linking conscientiousness and health has not been extensively tested using nationally representative data with a long observational window.

2. Anger, health, and mortality

Several studies have demonstrated a link between anger and health. Anger is an emotional state that ranges from mild irritation to fury or rage and has been associated with health and all-cause mortality (Suinn, 2001; Wilkowski and Robinson, 2008). A major focus of research on the anger–health connection has been coronary heart disease, where the weight of the evidence indicates important harmful impacts of anger (Chida and Steptoe, 2009; Smith et al., 2004). For example, anger is associated with atherosclerosis (Harris et al., 2003), endothelial dysfunction (Gottdiener et al., 2003), and heart attack (Nawrot et al., 2011).

Anger has also been linked to a number of health behaviors associated with health and mortality. Elevated anger or hostility is associated with tobacco use and excess alcohol consumption (Bunde and Suls, 2006), high body mass index (Bunde and Suls, 2006), poor eating habits and reduced aerobic physical activity (Anton and Miller, 2005), disrupted sleep following interpersonal conflict (Brissette and Cohen, 2002), and aggressive driving behavior (Deffenbacher et al., 2003). Less work, however, has examined the extent to which anger may impact health via economic outcomes and social relationships. Indirect evidence which links anger to workplace aggression (Douglas and Martinko, 2001) suggests that angry individuals may have difficulty with labor force attachment and promotion, potentially resulting in reduced wages and unemployment. In addition, anger compromises social relationships, including marriage (Wilkowski and Robinson, 2008). Anger is negatively associated with current and future marital adjustment (Baron et al., 2007) as well as prospective marital separation and divorce (Miller et al., 1995). As such, anger, like conscientiousness, may affect individuals' ability to fulfill economic and social roles. While these studies are intriguing, they are based on convenience or not nationally-representative samples and thus may not be generalizable to the whole population.

3. Cognitive ability, health, and mortality

Cognitive ability, or intelligence, is also associated with health and mortality (Deary et al., 2010). Cognitive ability reflects “at a minimum, verbal, reading, and writing abilities, as well as those in mathematics, science, music, and art” and is often measured using aptitude tests (Farkas, 2003: 543). Those with higher cognitive ability are less likely to suffer from a variety of mental illnesses, dementia, accidental injury, physical illnesses—including cardiovascular disease and cancer—experience lower all-cause, disease-specific mortality, and death from homicide (for a review, see Deary et al., 2010).

As with conscientiousness and anger, cognitive ability may be associated with mortality through its association with facilitating or impeding individuals' successful navigation of the social world. For example, individuals with higher cognitive ability may be better able to process information about their health, leading to healthier behaviors (Cutler and Llearas-Muney, 2010). Indeed, cognitive