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Compensatory Conscientiousness and Health in Older Couples

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Abstract

The present study tested the effect of conscientiousness and neuroticism on health and physical limitations in a representative sample of older couples (N = 2,203) drawn from the Health and Retirement Study. As in past research, conscientiousness predicted better health and physical functioning, whereas neuroticism predicted worse health and physical functioning. Unique to this study was the finding that conscientiousness demonstrated a compensatory effect, such that husbands' conscientiousness predicted wives' health outcomes above and beyond wives' own personality. The same pattern held true for wives' conscientiousness as a predictor of husbands' health outcomes. Furthermore, conscientiousness and neuroticism acted synergistically, such that people who scored high for both traits were healthier than others. Finally, we found that the combination of high conscientiousness and high neuroticism was also compensatory, such that the wives of men with this combination of personality traits reported better health than other women.

Conscientiousness refers to individual differences in the propensity to follow socially prescribed norms for impulse control, to be task and goal directed, to be planful, to delay gratification, and to follow norms and rules (John & Srivastava, 1999). A study by Friedman et al. (1993) showed that conscientiousness predicts longevity. Specifically, participants in this study tended to live longer if, as 8-year-olds, they had been rated as more conscientious by parents and teachers. These effects held after controlling for gender and parental divorce, two known influences on longevity. The positive effect of conscientiousness on longevity has now been replicated across several studies and more heterogeneous samples (Kern & Friedman, 2008; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007).

Consistent with the finding that conscientiousness predicts longevity, research has shown that conscientiousness predicts most of the major preventive and risky behaviors associated with both physical health and mortality (Bogg & Roberts, 2004). Conscientiousness also predicts physical health itself. For example, low levels of conscientiousness are associated with diabetes, high blood pressure, skin problems, strokes, ulcers, and tuberculosis (Goodwin & Friedman, 2006). Similarly, of the Big Five personality traits, conscientiousness was shown to be the best predictor of illness burden (i.e., physician-quantified morbidity) even when controlling for education, substance abuse, hypertension, and cholesterol (Chapman, Lyness, & Duberstein, 2007). In addition, childhood ratings of conscientiousness predict midlife health ratings even when controlling for social environmental factors such as education and health-related behaviors (e.g., exercise, diet, and smoking; Hampson, Goldberg, Vogt, & Dubanoski, 2007). Conscientiousness has even been shown to predict slowed disease progression in HIV patients (O'Cleirigh, Ironson, Weiss, & Costa, 2007).

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The majority of research linking conscientiousness to health outcomes has been predicated on the reasonable assumption that it is the person's own personality that will affect his or her health outcomes. This assumption overlooks the possibility that the personalities of people in an individual's close social network may also affect his or her health outcomes. More specifically, spouses or caretakers who are more conscientious may be more reliable caregivers and therefore enhance the health of their partners. We refer to this as the *compensatory conscientiousness* effect.

The idea of compensatory conscientiousness was inspired by couples research showing that spouses' personality contributed to their partners' important life outcomes. For example, a prospective longitudinal study found that women who were more individualistic were subsequently more successful in their work, and that women who were married to more individualistic husbands were even more successful (Helson & Roberts, 1992). The contribution of husbands' personality to wives' work outcomes was independent of the women's own personality traits. Similarly, research on the effect of couples' personality traits on marital outcomes has shown that one's partner's personality has an effect on one's own outcomes, such as marital satisfaction (Robins, Caspi, & Moffitt, 2000). In this work, self-reported negative emotionality, a component of neuroticism, predicted lower self-reported relationship satisfaction. Moreover, partners' negative emotionality predicted spouses' reports of relationship satisfaction above and beyond the effect of spouses' own levels of negative emotionality.

Two health-related studies have shown similar patterns. In the first study (van Aken, Junger, Verhoeven, van Aken, & Dekovic, 2007), lower maternal conscientiousness predicted greater numbers of minor injuries in toddlers in an analysis controlling for background factors and ratings of the toddlers' temperament. This study is not an ideal demonstration of compensatory conscientiousness, however, as the temperament ratings came from the parents, who also completed the self-report personality measures. A more compelling example comes from a study of the effects of child and parent personality on glycemic control (i.e., control of blood sugar levels) in a sample of diabetic children ages 6 to 16 (Vollrath, Landolt, Gnehm, Laimbacher, & Sennhauser, 2007). The children were followed for 2 years, and the researchers found that those who rated themselves as more conscientious had better glycemic control, as measured by blood analysis. In addition, in an analysis controlling for the children's personality, children of mothers who were more conscientious had better glycemic control, a finding consistent with the idea of compensatory conscientiousness.

Clearly, the couples and health research supports the possibility that it is good for one's health to have a conscientious person in one's social-support network, but to our knowledge the idea of compensatory conscientiousness has never been tested directly in the health domain. To test the interplay of partners' personality in influencing health outcomes, we examined the association of personality and health ratings among more than 2,000 couples taking part in the Health and Retirement Study (HRS), a nationally representative study of the population over age 50. The structure of the data, being partly based on couples, allowed us to examine multiple pathways by which conscientiousness might influence health. The first possibility is that the individual's own personality is predictive of his or her outcomes. The second possibility, which captures the idea of compensatory conscientiousness, is that a partner's personality adds to the prediction of a person's outcomes. The third possibility is that a husband's and wife's personality traits act synergistically (i.e., in a multiplicative way) on health outcomes, such that the personality of an individual's partner is influential only when that individual has a certain level of conscientiousness. This possibility would entail multiplicative associations among personality traits within individuals and potentially between individuals.

Additionally, other personality traits may interact with conscientiousness and affect health processes. Neuroticism has been shown to be a strong predictor of mortality and disease (Jerram & Coleman, 1999; Roberts et al., 2007). Specifically, neuroticism is associated with increases in worry and anxiety that may have detrimental effects on the immune system (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002). Moreover, neuroticism and increases in neuroticism are known to predict mortality in old age (Mroczek & Spiro, 2007). However, some evidence suggests that neuroticism could also have beneficial effects. For example, being anxious about one's health may lead to activities that promote good health and safeguard against poor health (Lee, Wadsworth, & Hotopf, 2006). Because neuroticism could be beneficial if it led people to be more attuned to and responsible for their health, we hypothesized that being both high in conscientiousness and high in neuroticism could enhance one's health. The open question was whether the health of one's spouse also benefits.

In the present study, we tested these hypothesized pathways using data from the HRS. First, we tested for a direct effect of conscientiousness on health. Next, we investigated the idea of compensatory conscientiousness by testing whether the conscientiousness of a participant's partner predicted the participant's self-reported health above and beyond the participant's own conscientiousness. In order to account for the interdependencies within couples and to determine the unique effects of each partner, we used the actor-partner interaction model (APIM; Campbell & Kashy, 2002; Kenny, Kashy, & Cook, 2006). The APIM examines the influence of each participant's personality on his or her own health (actor effect), as well as the effect of the personality of the actor's spouse on the actor's health (partner effect). We then tested for a synergistic effect between partner and actor conscientiousness. We also tested both actor and partner effects of neuroticism on health. To test whether being both high in conscientiousness and high in neuroticism leads to better health, we tested the interaction between actor neuroticism and actor conscientiousness. We also tested for an interactive effect of partner neuroticism and partner conscientiousness on the actor's health.

METHOD

Sample and Procedure

The HRS is a nationally representative longitudinal study of Americans ages 50 and above. We report data collected in the eighth wave of assessment (2006). The HRS sample consists of households and respondents selected by a multistage probability design. Within each household, the spouse or domestic partner of the sampled respondent is interviewed regardless of his or her age.

In 2006, approximately 50% of the longitudinal HRS sample was visited for an enhanced face-to-face interview. Respondents and their partners also received a self-report psychosocial questionnaire that they were asked to complete and mail to the University of Michigan. The response rate was 90% (N = 7,881). For the present study, we selected data from heterosexual households in which both husband and wife completed measures of conscientiousness and neuroticism (N = 2,203 couples). The average age of these participants was 66.5 years (range = 30-97). Ethnicity was 85% Caucasian or other, 8% African American, and 7% Hispanic; on average, participants reported 12.78 years of education.

Measures

Personality was assessed with an adjective measure developed for the Midlife Development Inventory (Lachman & Bertrand, 2001). For this measure, Lachman and Bertrand selected adjectives that the literature most consistently identified as trait markers for the Big Five.

The items in the Conscientiousness scale were *organized, responsible, hardworking, careless* (reverse-scored), and *thorough*. The adjectives in the Neuroticism scale consisted of *moody, nervous, calm* (reverse-scored), and *worrying*. Participants used a 4-point rating scale to indicate how well each of these adjectives described themselves (1 = *not*, 4 = *a lot*). Both scales were reliable, with alphas above .70.

Health was measured using two different methods. Subjective health was assessed with a single item: "Would you say your health is excellent, very good, good, fair, or poor?" Responses were coded on a 5-point scale (1 = *poor*, 5 = *excellent*). In addition, health was measured by the physical functioning of the participants. Physical functioning is a multidimensional concept encompassing mobility, large-muscle functioning, fine motor skills, gross motor skills, and the ability to perform activities of daily living (ADLs) and instrumental activities of daily living (IADLs). In the HRS, physical functioning is assessed by items adapted from scales developed by Rosow and Breslau (1966); Nagi (1976); Katz, Ford, Moskowitz, Jackson, and Jaffe (1963); and Lawton and Brody (1969). Participants are asked whether or not a health problem causes them to have any difficulty with a series of activities: The items range from running or jogging a mile, walking one block, and climbing one flight of stairs, to picking up a dime, shopping for groceries, dressing, and bathing. For the present analyses, we used a count of reported limitations ($M = 3.97$, $SD = 3.95$; range = 0-23). The resulting measure of physical functioning was significantly correlated with self-rated health ($r = -.58$, $p < .05$).

Analyses

To examine the influence of personality on health, we used hierarchical linear modeling in SAS Proc Mixed software to conduct multilevel models so that we could evaluate variance in health due to individual variance in personality and due to membership in a couple. The multilevel framework takes account of the intrinsic interdependencies within couples associated with shared lifestyles and assortative-mating variance. The APIM was used to examine the influence of each participant's personality on his or her own health (actor effect), as well as the effect of the personality of the actor's spouse on the actor's health (partner effect; Campbell & Kashy, 2002; Kenny et al., 2006). We conducted these analyses while controlling for socioeconomic status (years of education) and age in order to rule out some possible third-variable interpretations. All predictors were centered on their grand means for use in interaction terms.

Because we had distinguishable dyads, differences between husbands and wives could be tested. Separate estimates for husbands and wives were calculated using a two-intercept multilevel model, which simultaneously estimates husband and wife effects while controlling for their interdependence (Kenny et al., 2006). Although the two-intercept model gives separate estimates for husbands and wives, it does not test for significant differences between the sexes. A separate model tested gender interactions, and we report significant results from this model.

To provide comparable estimates of effect size across analyses, we converted regression weights to correlation coefficients, first transforming the regression weights into *z* scores and then using an *r*-to-*z* transformation to create effect-size estimates in the *r* metric.

RESULTS

We first ran a baseline unconditional means model (i.e., random-intercept-only model) to get estimates of the within- and between-dyads variance and to compute an intraclass correlation. For both overall subjective health and physical limitations, the intraclass

correlation was .25. This suggests that 25% of the total variation in health occurred between dyads, and the remaining 75% was within dyads.

Does Conscientiousness Predict Health?

As in past research (Goodwin & Friedman, 2006; Hampson et al., 2007), conscientiousness offered a protective effect for overall subjective health among both men (b = 0.46, SE = 0.05, r = .20, p < .05) and women (b = 0.34, SE = 0.05, r = .26, p < .05). Similarly, greater conscientiousness predicted fewer physical limitations in both men (b = -1.51, SE = 0.16, r = -.20, p < .05) and women (b = -1.80, SE = 0.17, r = -.23, p < .05). As noted, these effects reflect the contribution of conscientiousness beyond the effects of age and education.

Does Partner Conscientiousness Influence Health?

A compensatory-conscientiousness model tested the influence of partner conscientiousness on the actor's health above and beyond the effect of the actor's own level of conscientiousness. Results supported a compensatory model. Husbands' greater conscientiousness was related to better subjective health of their wives (b = 0.16, SE = 0.03, r = .07, p < .05). Similarly, wives' conscientiousness predicted husbands' subjective health (b = 0.17, SE = 0.04, r = .09, p < .05). These effects were above and beyond those of the actors' own conscientiousness. Compensatory-conscientiousness effects were also found for total number of physical limitations; again, husbands benefited from their wives' greater conscientiousness (b = -0.29, SE = 0.16, r = -.04, p < .05), and wives benefited from their husbands' greater conscientiousness (b = -0.58, SE = 0.16, r = -.08, p < .05). These findings suggest that both men and women experience health benefits from their spouse's conscientiousness, and that these effects are above and beyond the effects of their own levels of conscientiousness.

Is There a Synergistic Effect of Conscientiousness on Health?

In addition to having a direct effect on health, actor and partner conscientiousness might enter into multiplicative relationships. For example, a partner effect might occur only if the actor has a low level of conscientiousness. We found no significant interaction between actor and partner conscientiousness in predicting subjective health (b = 0.02, SE = 0.06, r = .02, p > .05) or number of physical limitations (b = -0.10, SE = 0.23, r = -.01, p > .05) for either sex. These results suggest that a conscientious partner is beneficial to an individual's health no matter how conscientious that individual is.

How Does Neuroticism Shape Health Outcomes?

Given that neuroticism is another personality trait that contributes to health processes, we examined how health was affected by both actor and partner neuroticism, while controlling for actor conscientiousness. Results were consistent with the literature, in that both men and women higher in neuroticism reported lower subjective health (b = -0.21, SE = 0.02, r = -.21, p < .05; b = -0.21, SE = 0.02, r = -.22, p < .05) and more functional limitations (b = 0.75, SE = 0.08, r = .21, p < .05; b = 0.79, SE = 0.08, r = .22, p < .05). However, in contrast with the results for conscientiousness, partner neuroticism did not predict actor's health.

Because neuroticism could be beneficial if it led someone to be more attuned to and responsible for his or her health, we tested for an interaction between actor conscientiousness and actor neuroticism. Being both high in conscientiousness and high in neuroticism was related to having fewer functional limitations, for both men and women (b = -0.32, SE = 0.15, r = -.05, p < .05; b = -0.36, SE = 0.14, r = -.05, p < .05). These interactions suggest that neuroticism can be partially beneficial when paired with high levels of conscientiousness.

Given the synergistic effect of an individual's high conscientiousness and high neuroticism on positive health outcomes for that individual, we also tested whether this combination of personality traits acted in a compensatory manner. Was it beneficial for health to be married to someone who was both high in conscientiousness and high in neuroticism? To answer this question, we tested whether the interaction between partner conscientiousness and partner neuroticism predicted health outcomes above and beyond actor conscientiousness, actor neuroticism, and the interaction between actor conscientiousness and neuroticism. We found an effect for wives' subjective health ($b = 0.09$, $SE = 0.04$, $r = .05$, $p < .05$), but not for husbands' subjective health. Thus, wives reported better subjective health when their husbands were high in both conscientiousness and neuroticism.[1]

DISCUSSION

This study extends the substantial corpus of evidence that personality plays a unique role in health outcomes by demonstrating that this effect does not occur solely within an individual, but also reflects the personality of a close partner. Most previous research examining the role of personality in health—and, in particular, the role of conscientiousness in positive health—has been based on the reasonable assumption that a person's own personality is important for that person's health. However, research focusing on couples and families has indicated that the personalities of people in an individual's social networks might also play a role in that individual's positive outcomes, including good health. And the present study, involving a large national sample, shows that having a partner who is more self-controlled, persistent, and organized facilitates better health outcomes in middle-aged and older couples.

The key personality traits we considered were conscientiousness and neuroticism. Higher levels of conscientiousness were associated with better self-rated health and fewer physical limitations. Moreover, the effect of conscientiousness was compensatory. Having a spouse who was more conscientious predicted better health and physical condition above and beyond a participant's own conscientiousness. These results further bolster the argument that conscientiousness is a critical epidemiological factor that contributes to better health (Roberts, Walton, & Bogg, 2005), but also raise the question of how a partner's conscientiousness facilitates an individual's health. Partners higher in conscientiousness might be more reliable and consistent providers of support and might be a source of more constructive advice and feedback about health-related issues. A partner's communications about health may be solicited by the actor or may be unsolicited, and may be perceived by the actor as pleasant or interfering (J. Smith & Goodnow, 1999). Such communications include specific reminders to take medicine, walk rather than drive, eat healthy foods, and not smoke, as well as general exchanges about appearance, weight, and the health-related habits of other people. Such forms of support from a spouse may be especially beneficial if the spouse is conscientious and one is conscientious oneself.

One question that could be raised is whether an additive or multiplicative (e.g., moderator) model is more appropriate for testing and establishing the existence of the compensatory effect of partner's conscientiousness. The conceptual idea of compensation provides little help in choosing between these two models, as it usually implies that people make up for their own failings with other strengths (e.g., Baltes, 1997) or that one person makes up for another person's weaknesses (Backman & Dixon, 1992). The appropriateness of the additive

[1]Participants also completed measures of the other Big Five traits: extraversion, agreeableness, and openness. We ran models for these other traits, and all showed actor effects, as in past studies. Some partner effects were also significant. However, partner effects for the other traits disappeared when we controlled for conscientiousness. Moreover, controlling for the rest of the Big Five traits did not change any of the reported results. We feel that these results for the remaining traits demonstrate that the effects of conscientiousness and neuroticism are the primary ones.

or multiplicative model rests, in part, on one's assumptions about the appropriate level of analysis. For example, if one assumes that the individual is the appropriate unit of analysis, then the moderator model would be the correct model for testing the compensatory effect. This is the case because one would assume that no compensation is required for a person high in conscientiousness, because that person's high conscientiousness would be sufficient. Therefore, the compensatory effect would be best demonstrated with an interaction between partner's and participant's conscientiousness such that low conscientiousness in an individual is compensated for by being married to someone who is highly conscientious.

Given the definitional ambiguity of the idea of compensation, however, there is no reason to assume that the person alone is the appropriate level of analysis, or that any one person's maximum level of conscientiousness would ever be sufficient. Thus, an additive model may be just as appropriate for testing and inferring the existence of compensatory effects. Consistent with this idea is the proposal by some evolutionary theorists that humans have been subject to group-level selection pressures, in addition to individual-level selection. That is, these theorists argue that the survival of an individual's gene line has been determined in part by the psychological makeup of the group surrounding that person's ancestors (Wilson, Van Vugt, & O'Gorman, 2008). Wilson et al. have argued that specific features of human personality, such as being conscientious, are the result of groups of people being more effective at dealing with selection pressures than any one person is. Consequently, no level of conscientiousness within any given person would be enough to fully account for outcomes, such as health. This perspective suggests that one could always benefit from being surrounded by supportive individuals who are high in conscientiousness. Thus, the results of the present study support the notion of an additive compensatory effect whereby extra conscientiousness located in the group is always beneficial and compensates for deficits inherent in each individual.

As in past research, neuroticism had a deleterious effect on health outcomes. People who were more neurotic rated their health lower and reported a greater number of physical limitations. The significance of these findings is bolstered by recent evidence showing that increases in neuroticism in old age are associated with increased mortality (Mroczek & Spiro, 2007). People higher in neuroticism may experience greater stress, which has widespread ramifications for health through decreased immunity and increased difficulty handling serious health issues (T.W. Smith, 2007).

The effect of neuroticism on mortality is heterogeneous, however (Roberts et al., 2007). In some cases, higher levels of neuroticism have been associated with longevity. The synergistic relation between neuroticism and conscientiousness points to the fact that under certain circumstances, neuroticism may be beneficial. Being nervous and worried while simultaneously being more conscientious provides a context for neuroticism to have a positive effect on health. In this study, people with higher levels of both conscientiousness and neuroticism were healthier. Moreover, wives with husbands who possessed both traits were healthier still. We assume that this combination of personality traits would lead people to be more diligent about health-related issues and that, in the case of men, it would lead them to be more diligent both for themselves and for their wives. For example, men who worry about their wives might be more inclined to remind their wives to take their medications, exercise, or eat a healthier diet.

One obvious limitation of the present study is that it is cross-sectional, which makes it difficult to determine the causal direction of the associations. Numerous longitudinal studies have demonstrated the prospective effect of personality traits on health and relationship outcomes (Roberts et al., 2007), implying that personality traits may play a causal role. For example, individuals who are more neurotic are more likely to find successive relationships

less satisfying despite changing relationship partners over time (Robins, Caspi, & Moffitt, 2002). However, theoretical models of coping with chronic illness and physical limitations, for example, suggest that the onset of a health problem can be a catalyst for the development of dyadic adjustment strategies, as well as a test of a relationship's quality, vulnerability, and efficacy in terms of social support (e.g., Berg & Upchurch, 2007; Stanton, Revenson, & Tennen, 2007). Moreover, several studies have linked changes in health-related factors to changes in personality (Mroczek & Spiro, 2007; Roberts & Bogg, 2004; Siegler et al., 2003). Given the range of findings, it would be prudent to assume that the relation between personality and health is reciprocal until further tests show otherwise.

To date, few large samples of older couples have been available to study questions about the social and interpersonal contexts of health within a marriage or partnership. The nationally representative HRS offers a rare opportunity to redress this gap. However, the sheer size of the sample creates several issues. For example, many of the interaction effects were quite small, though still statistically significant because of the large sample size. The meaning and importance of these small effects should be addressed in new samples, using techniques that tie the effects to a concrete outcome, such as mortality. Then, the meaning and significance of these effects would be clearer. Also, despite the large sample, there still may be questions concerning the generalizability of these results. The majority of the HRS participants are over the age of 50. Older adults are reported to be higher in conscientiousness and lower in neuroticism than younger adults (Roberts, Walton, & Viechtbauer, 2006; Srivastava, John, Gosling, & Potter, 2003). Furthermore, older couples have, on average, lived together longer than young couples, so the likelihood of significant compensatory and synergistic personality influences is increased among older couples. For example, older marriages are characterized by less potential for conflict, greater potential for pleasure, and higher levels of collaborative expertise in problem solving and planning (e.g., Berg & Upchurch, 2007; Dixon & Gould, 1996; Levenson, Carstensen, & Gottman, 1993; J. Smith, 1996). Therefore, the associations observed in the present study should be explored in younger cohorts.

In addition to testing these associations in alternative samples, future research could address several omissions of the present study. The measure of personality traits was relatively short, which may undermine its validity. Using more expanded models of conscientiousness and neuroticism would afford the opportunity to identify the aspects of these personality domains that are most important for health. Furthermore, although independent ratings of personality were used, alternative methods, such as observer ratings or experience-sampling measures of personality, would provide much needed confirmation of our results. Also, future research should move beyond self-reported health outcomes and assess more objective indices of physical health, such as physicians' ratings of health, or physiological measures, such as blood pressure, body composition, and physical conditioning. Finally, many of the processes through which personality may affect health in a couples context remain untested. These effects may be the result of direct behavioral interventions or may be due to relationship norms that develop over time. These and other mechanisms should be investigated in future research.

In summary, the present research showed that conscientiousness not only directly affects health, but also has a compensatory effect on health through a partner. Furthermore, neuroticism, though typically negatively related to health, has a synergistically positive effect on health when paired with high levels of conscientiousness.

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