Personality as a Predictor of Dietary Quality in Spouses During Midlife

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*The authors evaluated the NEO Personality Inventory-Revised (NEO-PI-R) as a predictor of dietary quality in 850 married couples, focusing on associations among each participant's personality as a predictor of their own dietary quality and their spouses' dietary quality. Diet was based on a modified version of the US Department of Agriculture Healthy Eating Index. Openness was associated with self-ratings of dietary quality for wives (*r *= .28) and husbands (*r *= .27). Wives' levels of the characteristic openness were also related to their spouses' ratings of dietary quality (*r *= .22). The primary facets of openness accounting for the domain-level findings were O2–aesthetics and O4–actions. The remaining personality domains (neuroticism, extraversion, agreeableness, and conscientiousness) were not associated with self or spousal ratings of dietary quality (*rs *= .08–.09). Openness was associated with healthy eating habits—findings that may affect disease prevention during midlife.*

Index Terms*: diet, NEO-PI-R, personality, spouses*

Consuming healthy foods—such as fresh fruits and vegetables, whole grains, lean meat, and lowfat dairy—during midlife results in lowered risks for various cancers and cardiovascular diseases.[1] Personality has been associated with dietary practices. Goldberg and Strycker[2] found that higher total fiber consumption and avoidance of meat fats was positively related to the character trait openness to experience. Other traits of the five-factor model (FFM) also showed associations with healthy eating: the trait conscientiousness was positively associated with avoidance of fats, and neuroticism was negatively related to avoidance of food flavored with fat. De Bruijn et al[3] found that openness and agreeableness are associated with increased fruit and vegetable consumption. Kikuchi and Watanabe[4] found that female students with higher levels of openness were less likely to intake animal fat or prefer salty foods. Regardless of sex, participants with high levels of conscientiousness were more likely to consume vegetables. Those with elevated levels of agreeableness and lower extraversion reported exhibiting more healthy behaviors, whereas results for neuroticism were mixed: men scoring high in neuroticism avoided cholesterol-rich foods, and all students scoring high in neuroticism preferred salty and sweet foods.

Past research generally supports these results regarding personality and healthier living. Those exhibiting high levels of openness are generally more willing to try alternative medicines,[5] and Cechova[6] found links between vegetarianism and openness. Using the Healthy Eating Index (HEI), Tangney et al[7] observed inverse links between responses on the HEI and depression, which is a component of neuroticism. Researchers have found that people exhibiting high levels of conscientiousness have better health-related behaviors[8] and are at a lower risk for all-cause mortality.[9] Combinations of the factors also yield useful information concerning health behaviors: high levels of neuroticism and low levels of conscientiousness have been associated with smoking behavior.[10]

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Health psychologists stress the importance of the environment in which personality is studied because environmental and social contexts work together to influence the effect that personality may have on health.[11] Marriage is one such important social context. Spousal relationships are likely related to health in many ways, such as influencing the partners' weight management[12–14] and dieting behavior[15] as well as affecting adherence to health behaviors.[16,17] Therefore, examination of dietary risk factors during midlife within the social context of marriage, with a focus on the impact of personality, seems highly appropriate. In the present study, we focused on couples who are long-term members of the University of North Carolina Alumni Heart Study (UNCAHS). We examined prospective associations between scores on the NEO personality inventory-revised (NEO-PI-R[18]) and both self and spouse scores on the modified Healthy Eating Index (MHEI),[19–21] which reflects overall dietary quality. We conducted separate analyses for wives and husbands.

To our knowledge, no investigators to date have examined associations among assessments of the FFM personality domains and an index of dietary quality that summarizes healthy eating patterns according to US Department of Agriculture (USDA) guidelines. In addition, we extended prior observations linking personality to healthy eating habits by examining the ability to replicate such findings prospectively over a 2- to 4-year interval in a sample of approximately 1,700 individuals (850 couples). Furthermore, we are unaware of any study in which investigators have examined the potential influence of spousal personality ratings on eating habits. In light of past research and consistent results regarding openness, we hypothesized that we would find the strongest relations, for both self and spouse ratings, between openness and its facets and better overall dietary quality. We also expected the constructs of conscientiousness and low levels of neuroticism for self and spouse ratings to be associated with better eating habits, although at smaller magnitudes of association than those concerning openness.

METHODS

Sample

We obtained data from the UNCAHS, an ongoing prospective study of coronary heart disease and coronary heart disease risk factors.[22,23] In 1986–1987, UNC researchers located members of the entering UNC classes of 1964–1966 who had taken the Minnesota Multiphasic Personality Inventory[24] after admission and invited them to join the study. That sample was reflective of the sociodemographic characteristics of the UNC students in the 1960s (eg, primarily male, with minority enrollment less than 1%). The researchers mailed follow-up questionnaires to participants at 12 and 18 months, asking for permission to enroll their spouses in the study. In July 1992, 89% of spouses had been enrolled. In the present investigation, we studied approximately 850 couples (number varies by construct) who remained married to each other. The median number of years married was 24 (range = 6–30 years). The Duke University Medical Center Institutional Review Board approved this study.

Measures

NEO Personality Inventory-Revised

The NEO-PI-R[18,25] is a measure of the dimensions of the FFM,[26] with 6 facet scales assessing specific aspects of neuroticism (N), extraversion (E), openness (O), agreeableness (A), and conscientiousness (C).[18,27] With 240 items, it assesses 30 traits, yet most respondents can complete it in about 30 minutes. We summed NEO-PI-R items and converted them to sex-normed *t* scores for each domain, with higher scores reflecting a greater presence of the personality construct. The NEO-PI-R has been extensively used in psychological research over the past 15 years and has adequate psychometric properties (ie, stability over time,[27] reliability, and validity[18,25]).

The Modified Health Eating Index

The MHEI is a modified version of the USDA Healthy Eating Index[19,21] and the Alternate Healthy Eating Index.[28] Development and design measures, along with its psychometric properties, for the HEI can be found elsewhere.[19] We used information from the UNCAHS food frequency questionnaire[20] to develop the MHEI. Components of the index include the division of alcohol intake into 2 variables (red wine and other alcohol); addition of dietary cholesterol, calcium, and sodium; and removal of the trans fat component. Prior to the MHEI, researchers used the USDA Food and Nutrient Database for Dietary Studies to update nutrient values from 1994–1996 food intake frequency data to include individual fatty acids and other micronutrients. This database includes the dates during which the USDA collected food and nutrient data and thus allows for the extrapolation of accurate consumption pattern data from specific time periods.[29] Last, following a strategy similar to that of Kennedy et al[19] and McCullough et al,[28] we used the updated nutrient values to form a summary index of a healthy diet. The components of the MHEI are vegetables (servings/d), fruit (servings/d), nuts and soy protein (servings/d), red wine (servings/d), other

alcohol (servings/d), the ratio of polysaturated to saturated fat (g/d), fiber (g/d), cholesterol (mg/d), calcium (mg/d), sodium (mg/d), and the ratio of white to red meat (servings/d). We scored daily consumption for each of the 10 components on a scale of 0 to 10, with a USDA-recommended consumption level receiving a 10. Thus, MHEI scores range from 0 to 100, with higher scores reflecting a healthier diet. (A detailed scoring algorithm is available from the authors.)

Time of Assessment

UNC researchers conducted the NEO-PI-R for participants and spouses during baseline enrollment (1988–1992) and gathered the dietary measures used to calculate the MHEI from 1994–1996.

Statistical Analyses

We examined the following correlations: (1) participants' NEO assessments with their MHEI and (2) participants' NEO assessments with spousal MHEI. We conducted separate analyses by sex. Primarily to give consideration to effect size—but also to guard against type I error, given the number of tests conducted—we refer only to correlation coefficients of $r \geq .20$ as significant. This is a conservative strategy because within a sample of 850, a correlation of $r = .07$ is significant at the $p < .05$ level.

RESULTS

Descriptive Statistics

We found no extreme mean values for wives or husbands on NEO-PI-R measures. In other words, the range of mean scores fell between 46.6 and 54.9 (sex-normed *t* scores with a mean of 50, *SD* of 10). Table 1 provides the sample's demographic characteristics as well as descriptive statistics with respect to the MHEI. MHEI values are similar to those reported in population samples for the HEI.[19,21,28] The within-couple correlations (ie, the correlation of wives' and husbands' values) for NEO-PI-R domains were $r = .08$ (neuroticism), $r = .10$ (extraversion), $r = .27$ (openness), $r = .15$ (agreeableness), and $r = .08$ (consciousness).

The within-couple correlation for MHEI ratings was $r = .47$ ($p < .001$). To further characterize the study sample, we divided wives and husbands at the respective mean MHEI score and created groups of either more or less healthy dietary habits. From the resulting 4 groups, we found that (1) in 32.4% of couples, both spouses had MHEI values above the mean; (2) in 17.7% of couples, wives had MHEI values above the mean and husbands had values below the mean; (3) in 17.9% of couples, husbands had MHEI values above the mean and wives had values below the mean; and (4) in 32.0% of couples, both spouses had MHEI values below the mean. Thus, as indicated by the significant correlation for MHEI scores between husbands and wives, the majority of couples (64.4%) had similar dietary habits.

Personality and the MHEI

Table 2 shows spousal associations among NEO-PI-R domains and facets and the MHEI. Openness was associated with self-ratings of dietary quality for both wives and husbands. For wives, the facets of openness most strongly associated with self-ratings of dietary quality were O2–aesthetics ($r = .26$) and O4–actions ($r = .26$); the remaining facets had correlations ranging from $r = .13$–$.17$. Similarly for husbands, O4–actions was associated with self-ratings of dietary quality ($r = .25$); the remaining openness facets were correlated at $r = .14$–$.19$.

The domain of openness was also related to spouses' ratings of dietary quality for wives ($r = .22$), with the strongest facet-level association for O6–values ($r = .21$). Openness

TABLE 1. Participant Characteristics and Modified Healthy Eating Index (MHEI) Score

	Wives			Husbands		
Characteristic	*M*	*SD*	%	*M*	*SD*	%
MHEI score	61.8	8.7		59.8	9.0	
Age (y)	43.1	3.9		44.9	2.9	
Body mass index (kg/m^2)	23.1	4.0		25.4	3.2	
Education						
High school			3.2			0.5
Some college			17.8			5.7
4-year college degree			46.9			38.8
Advanced college degree			32.1			55.0

TABLE 2. Correlations of the NEO Personality Inventory-Revised (NEO-PI-R) and the Modified Healthy Eating Index: Self and Spouse

	Wives		Husbands	
NEO-PI-R domain/facet	Self	Spouse	Self	Spouse
N–Neuroticism	–.09	–.02	–.03	–.02
N1–Anxiety	–.08	.01	–.02	–.02
N2–Hostility	–.08	–.02	< .001	–.05
N3–Depression	–.04	–.03	–.03	< .001
N4–Self-conscientiousness	–.10	–.05	–.05	–.01
N5–Impulsiveness	–.07	–.01	–.01	–.01
N6–Vulnerability	–.05	–.01	–.05	–.03
E–Extraversion	.08	.03	.08	–.01
E1–Warmth	.01	–.01	.07	< .001
E2–Gregariousness	.01	–.01	.02	–.02
E3–Assertiveness	.10	.06	.07	–.02
E4–Activity	.11	.07	.13	.06
E5–Excitement-seeking	–.01	–.03	–.03	–.09
E6–Positive emotions	.08	.03	.08	.03
O–Openness	.28*	.22*	.27*	.10
O1–Fantasy	.16	.13	.14	.02
O2–Aesthetics	.26*	.18	.25*	.12
O3–Feelings	.13	.10	.14	.07
O4–Actions	.26*	.17	.19	.08
O5–Ideas	.17	.13	.19	< .001
O6–Values	.17	.21*	.16	.11
A–Agreeableness	.02	–.04	.01	.07
A1–Trust	.12	.10	.10	.09
A2–Straightforwardness	–.03	–.08	–.01	.04
A3–Altruism	< .001	–.06	.03	.03
A4–Compliance	–.03	–.04	–.04	.04
A5–Modesty	–.09	–.11	–.07	.03
A6–Tender-minded	.10	.04	.06	.07
C–Conscientiousness	.05	–.01	.02	.02
C1–Competence	.06	< –.001	.04	.04
C2–Order	.04	< .001	–.08	.07
C3–Dutifulness	–.01	–.06	–.03	< .001
C4–Achievement striving	.08	.03	.16	.07
C5–Self-discipline	.01	–.01	< .001	.01
C6–Deliberation	.02	–.02	–.01	.01

Note. Data are presented as *r* values.
*$p > .20$.

was not related to spouses' ratings of dietary quality for husbands ($r = .10$), with facet-level associations ranging from $r = .02$–.12. Neuroticism, extraversion, agreeableness, and conscientiousness were not associated with self- or spousal ratings of dietary quality.

Secondary Analyses

We conducted secondary analyses to determine whether adjustment for ones' own age, education level, and body mass index (BMI) would alter the findings for both wives and husbands. These analyses included the computation of correlation coefficients partialed for assessments of age, education, and BMI. Results for the domains and facets of neuroticism, extraversion, agreeableness, and conscientiousness were not substantially different (ie, all correlations remained less than our critical value of $r \geq .20$). In regard to our analyses of openness, we found 2 minimal changes: the correlation between the wives' domain of

openness and their spouse's MHEI score ranged from r = .19–.22, and the correlation between the wives' facet of O6–values and their spouse's MHEI score ranged from r = .18–.21. Thus, the correlation coefficients no longer reached our critical value; however, the changes in the effect sizes were minimal. It would appear, therefore, that adjustment for age, education, and BMI had little if any reliable effect on our overall findings.

COMMENT

For wives and husbands alike, as hypothesized, openness was associated with one's own patterns of healthy eating, such that higher levels of openness were associated with more healthy dietary practices. Openness was likewise positively related to spousal eating patterns for wives; however, the relationship of husbands' openness levels with their wife's dietary practices was less than half the magnitude between wives' openness levels and their husbands'. In other words, the level of her husband's openness had less of an effect on how healthy the wife's diet is, but the wife's level of openness has a greater effect on how healthy her husband eats. Thus, we believe that the personality construct of openness in female spouse partners may have a substantial influence on the healthy eating patterns of a marital couple. This may be due, in part, to the fact that wives more often are responsible for shopping and food preparation.

We observed no moderate to strong relations for personality factors other than openness, which although unexpected, is not inconsistent with past studies in this area in which openness was the only consistent factor found associated to dietary quality. Although neuroticism and conscientiousness are associated with other health behaviors, they may not directly relate to healthy eating. Also note that we adopted a stringent criterion for statistical significance (ie, we focused on effect size rather than adopting the typical level of $p < .05$). A more traditional approach would involve noting that 2 facets—N4–self-consciousness for wives and C4–achievement striving for husbands—were associated with dietary practices, along with several other facets within the domains of agreeableness and extraversion.

In prior work on the full UNCAHS cohort, researchers examined associations among NEO domains and change in BMI over 14 years.[30] Openness, agreeableness, and conscientiousness were negatively associated with BMI in both sexes, and BMI was positively associated with neuroticism in women and extraversion in men. Furthermore, conscientiousness has been associated with many health behaviors.[31] Thus, given the demonstrated associations among conscientiousness, agreeableness, and neuroticism with BMI and health-related behaviors, we might have expected these domains to be related to healthier eating habits. Yet, as previously noted, that was not the case.

The fact that openness for both wives and husbands is associated with healthier eating may reflect not a greater health consciousness among more open individuals but rather a consequence of their heightened interest in the experiential aspects of eating. According to this interpretation, the good diet of people exhibiting high levels of openness is a byproduct of their predilection for novel and varied of foods, which leads to balanced diets. Two other studies support our observed association between openness and dietary practices.[3,5]

Not surprisingly, couples in the present sample seemed to share similar dietary practices. In addition, wives and husbands were similar to one another with respect to the personality domains of openness, extraversion, and agreeableness. These findings contradict some studies on assortative mating in couples that show little or no within-couple similarities on these measures of personality.[32,33] However, investigators in many of these studies conducted their research among smaller samples of newlywed couples.[32,33] Thus, our findings add to the literature by suggesting that in respect to personality, couples in long-term relationships may be more similar to one another than are those recently married.

Although the UNCAHS contains a fairly large sample of marital couples, it is generally homogeneous with respect to age and race. Thus, our results may not apply to more diverse populations. Also, self-report assessment of dietary practices may not reflect an exact representation of dietary intake. Dietary patterns also may be influenced by secular trends, making it impossible to determine the generalizability of our findings.

In sum, our findings suggest that openness is an important personality construct to consider in respect to personal dietary choices that may ultimately influence dietary pathways to disease and health. In addition, not only does one's own level of openness seem to affect personal eating habits, but the same is likely true for one's spouse's level of openness. Given the reciprocal nature of close relationships, interventions aimed at increasing openness in spousal pairs may lead to less obesity and healthier eating habits for both members.

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NOTE

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