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Your Friends Know How Long You Will Live: A 75-Year Study of Peer-Rated Personality Traits

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Abstract

Although self-rated personality traits predict mortality risk, no study has examined whether one's friends can perceive personality characteristics that predict one's mortality risk. Moreover, it is unclear whether observers' reports (compared with self-reports) provide better or unique information concerning the personal characteristics that result in longer and healthier lives. To test whether friends' reports of personality predict mortality risk, we used data from a 75-year longitudinal study (the Kelly/Connolly Longitudinal Study on Personality and Aging). In that study, 600 participants were observed beginning in 1935 through 1938, when they were in their mid-20s, and continuing through 2013. Male participants seen by their friends as more conscientious and open lived longer, whereas friend-rated emotional stability and agreeableness were protective for women. Friends' ratings were better predictors of longevity than were self-reports of personality, in part because friends' ratings could be aggregated to provide a more reliable assessment. Our findings demonstrate the utility of observers' reports in the study of health and provide insights concerning the pathways by which personality traits influence health.

Keywords

personality, longevity, mortality, informant reports, survival analysis, conscientiousness, peers

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Personality traits are some of the best psychological predictors of physical health and mortality (Hampson & Friedman, 2008; Weston, Hill, & Jackson, 2014) and can be used to help identify behavioral pathways that affect health (Deary, Batty, Pattie, & Gale, 2008). Personality traits can predict longevity as well as or better than socioeconomic status and intelligence can, and their predictive power is apparent from childhood through late adulthood (Chapman, Roberts, & Duberstein, 2011; Deary et al., 2008). Among the Big Five personality traits, the most consistent predictor of mortality risk is conscientiousness (Friedman, Kern, Hampson, & Duckworth, 2014; Jokela et al., 2013), although previous studies have also found effects for the other Big Five traits (extraversion, agreeableness, emotional stability, and openness; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007; Turiano, Spiro, & Mroczek, 2012).

Previous mortality studies have been limited by an overreliance on self-reported personality measures, which may lead to underestimating the influence of personality on mortality risk. Observers' reports of personality overlap considerably with self-reports, although not perfectly (Connelly & Ones, 2010) because observers' reports include novel information that people do not see in themselves and are also immune to various self-biases (Vazire, 2010). Such reports, especially from friends and family, can be particularly useful because observers form their impressions on the basis of behaviors in numerous contexts. An additional advantage of observers' reports is

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that the unique views of any particular observer can be averaged across multiple observers (Hofstee, 1994). As a result, observers' reports outperform self-reports as predictors of outcomes in some contexts (Connelly & Ones, 2010; Vazire & Mehl, 2008).

No study of mortality risk in adulthood has used peer reports or tested the relative contribution of self-reports and any type of observers' reports. We are aware of only two instances in which observers' reports of personality have been used to predict mortality risk, and both studies involved teachers rating their students (Deary et al., 2008; Martin, Friedman, & Schwartz, 2007). Although teachers' ratings of students can be valid, teachers see their students in only a single context and do not necessarily have access to the personal beliefs and feelings of their students. Moreover, teacher-reported childhood personality traits and self-reported adult personality appear to influence later health outcomes through separate pathways (Martin et al., 2007). It is currently unknown (a) whether peers can discern characteristics that relate to mortality risk, (b) whether observers' reports offer additional utility above and beyond self-assessments, and (c) whether observers' reports of personality are best suited to identify characteristics that decrease mortality risk or that increase risk.

In this study, we used data from the Kelly/Connolly Longitudinal Study (KCLS), in which 600 young adults were observed for more than 75 years. Thus, the current study is the longest study of personality and mortality risk to date. The sample offers a rare opportunity to investigate the link between personality and mortality risk because peer ratings of participants were obtained from five close friends. Additional advantages of the data set include the availability of data for an expanded set of personality traits compared with previous life-span studies and the availability of mortality data for virtually all participants.

Method

Sample

Between 1935 and 1938, 600 individuals (300 engaged heterosexual couples) began participating in the KCLS, a longitudinal study on personality and newly formed marriages. Participants were recruited through newspaper advertisements, other advertisements, and word of mouth in the state of Connecticut. The participants were primarily from middle-class backgrounds; 67% had at least 1 year of college (median years of schooling = 15, *SD* = 2.7). At the first assessment, the average age of participants was 24.8 years (*SD* = 3.5; birth dates were from 1885 through 1919). Sixty-nine percent of participants were Protestant, 9% were Catholic, 7% were Jewish, and 15% had no religious affiliation. Additional details about the sample can be found in Kelly (1955).

Peer ratings were obtained from people that participants identified as knowing them well enough to provide accurate ratings; most of these friends had been in the participants' wedding parties (Kelly, 1977). Each participant named three to eight friends, and the majority of participants were rated by five friends. In all, 2,909 peer ratings were obtained. We were unable to ascertain any additional information concerning the raters' ages or length of acquaintance with participants because of the archival nature of the data set.

Measures

Personality. Self-ratings and peer ratings of personality were obtained using the 36-item Kelly Personality Rating Scale (PRS; Kelly, 1940; see Kelly Personality Ratings Scale in the Supplemental Material available online). The Kelly PRS uses a 25-point scale that is anchored with an adjective or phrase at each extreme and with the phrase "most people" at the scale's midpoint. The PRS has been successfully used in previous studies (Conley, 1985; Kelly & Conley, 1987).

Previously, we conducted a study to validate the PRS using more modern personality measures: the Big Five Inventory (John & Srivastava, 1999), the Iowa Personality Questionnaire (Donnellan, Conger, & Burzette, 2005), and the Mini International Personality Item Pool (Donnellan, Oswald, Baird, & Lucas, 2006). Big Five–equivalent factors were created for the PRS by first using PRS items to predict composite Big Five factor scales derived from the three modern measures. Items related to the Big Five were retained, and then a factor analysis was conducted. The resulting five-factor solution reflected the Big Five factor structure. Extraversion was assessed with five items (e.g., *quiet*, *popular*), agreeableness with six items (e.g., *courteous*, *sincere*), conscientiousness with five items (e.g., *persistent*, *reliable*), emotional stability with four items (e.g., *nervous*, *temperamental*), and openness with four items (e.g., *cultured*, *intelligent*). Analyses indicated that the model adequately captured variation in modern Big Five composite scores (mean R = .72, range = .62–.88). (For additional details and analyses, see Jackson, Garrison, Levine, & Connolly, 2014.)

In the current study, we used the PRS items to predict mortality risk by creating latent factors with Mplus (Muthén & Muthén, 2011). For peer-rated personality, we performed a hierarchical confirmatory factor analysis in which a latent factor was created for each of the five raters and then a superordinate latent factor was created from the five latent peer factors. For self-reported personality, each item served as an indicator. All 10 models fit the data well (confirmatory fit indices > .95, root-mean-square errors of approximation < .10).

Time of death. The precise dates and places of birth of all KCLS participants were determined in 1935 through 1938. These data facilitated searches for death records. The search for information on date of death was also facilitated by a later data collection in 1979 and 1980, when participants provided staff members the names and addresses of their children with the understanding that the children would be contacted in future follow-up studies. Using this information, KCLS staff were able to determine exact dates of death for the great majority of KCLS participants. Dates of death were missing for only 28 individuals from the original sample. Correspondence with the participants or their children allowed staff members to determine that 7 of the men and 14 of the women in the KCLS were alive as of 2013. We were unable to locate the final 7 women or find death records for them, so we could not determine whether they were alive. Thus, we were able to ascertain the mortality status (and death dates for the deceased) for almost 99% of KCLS participants.

The dates of death for the deceased KCLS participants were obtained from a variety of sources, but the primary sources were the Social Security Death Index and state death indices. The primary state death index was for Connecticut, which was the state of residence of most of the KCLS participants in 1935 through 1938 and was also where approximately 35% of the participants were living when they died. Other major sources of information included newspaper obituaries, cemetery and grave information, and veterans' death records. However, for information on the dates of death for those participants who died in the earlier decades of the study, the primary source was correspondence between KCLS staff members and next of kin. (Federal and state death indices were not readily available before about 1960.) The types of records we used to verify the deaths of the 293 men and 279 women for whom we had dates of death are given in Table S1 in the Supplemental Material. The average life span for men was 75.2 years (range = 23–98 years, *SD* = 15.5). The average life span for women was 81.3 years (range = 23–102 years, *SD* = 13.4). The 21 surviving participants had an average age of 97.2 years (*SD* = 2.1) in 2013.

Analyses. In our analyses, we used peer ratings and self-ratings of personality from the 1930s to predict participants' mortality through 2013.[1] We implemented a series of Cox proportional hazard models in the R software environment (Version 3.1.0; R Development Core Team, 2012) using the survival package (Therneau, 1999). A Cox regression model was used to estimate the relationship between survival time to event occurrence (i.e., mortality) and personality predictor variables, accounting for the variance in age at entry into the study. For ease of interpretation, we used standardized units, which yielded hazard ratios (HRs) that can be interpreted as the percentage difference in mortality risk associated with an increase of 1 standard deviation in the predictor variables (Singer & Willett, 2003). For individuals whose date of death was unknown, death data were censored according to the date of last known correspondence. Husbands and wives were analyzed separately to avoid violating assumptions of independence. Models were run separately for each personality trait.

Results

Do peer ratings of personality traits predict mortality risk?

In accordance with previous findings linking personality traits with mortality risk, peer-rated personality traits predicted mortality risk across our 75-year study (Table 1). Male participants seen by their friends as more conscientious (Fig. 1) and open tended to live longer: A 1-*SD* increase in conscientiousness was associated with a 29% decrease in mortality risk, and a 1-*SD* increase in openness was associated with a 15% decrease in mortality risk. For men, peer-rated extraversion, agreeableness, and emotional stability were not associated with mortality risk. Different associations emerged for peer ratings of female participants: Higher levels of both peer-rated emotional stability and peer-rated agreeableness diminished mortality risk by 15%. Peer-rated extraversion, conscientiousness, and openness were not related to mortality risk for women.

When we adjusted for covariates (childhood socioeconomic status, education level, household income at the time of personality ratings, and IQ), these effects remained, with only a slight attenuation (see Table S2 in the Supplemental Material). Together, these findings indicate that self-selected peers can identify important aspects of personality that have long-term associations with mortality risk.

Do peer ratings and self-ratings of personality traits differentially predict mortality risk?

As did peer ratings of men's personality traits, men's self-ratings of personality traits predicted mortality risk across the study's 75-year time frame (Table 1). Again, both conscientiousness and openness were associated with diminished mortality risk (13% reduction in risk in each case). Self-ratings of personality traits were not related to longevity for women.

In general, peer ratings of personality were stronger predictors of mortality risk than were self-ratings. Peer

Table 1. Peer and Self-Ratings of Personality Traits as Predictors of Mortality Risk for Men and Women

	Hazard ratio	
Rating	Men	Women
Peer ratings		
Extraversion	0.99 [0.89, 1.10]	0.98 [0.88, 1.09]
Agreeableness	0.90 [0.80, 1.01]	0.85* [0.76, 0.96]
Conscientiousness	0.71* [0.63, 0.81]	0.94 [0.83, 1.06]
Emotional stability	0.92 [0.68, 1.04]	0.85* [0.76, 0.96]
Openness	0.85* [0.76, 0.96]	0.96 [0.84, 1.09]
Self-ratings		
Extraversion	0.99 [0.88, 1.10]	1.02 [0.90, 1.14]
Agreeableness	0.96 [0.86, 1.08]	0.94 [0.84, 1.07]
Conscientiousness	0.87* [0.77, 0.98]	0.95 [0.84, 1.07]
Emotional stability	0.91 [0.81, 1.02]	0.90 [0.80, 1.02]
Openness	0.87* [0.78, 0.98]	0.94 [0.83, 1.06]

Note: Values in brackets are 95% confidence intervals.
*$p < .05$.

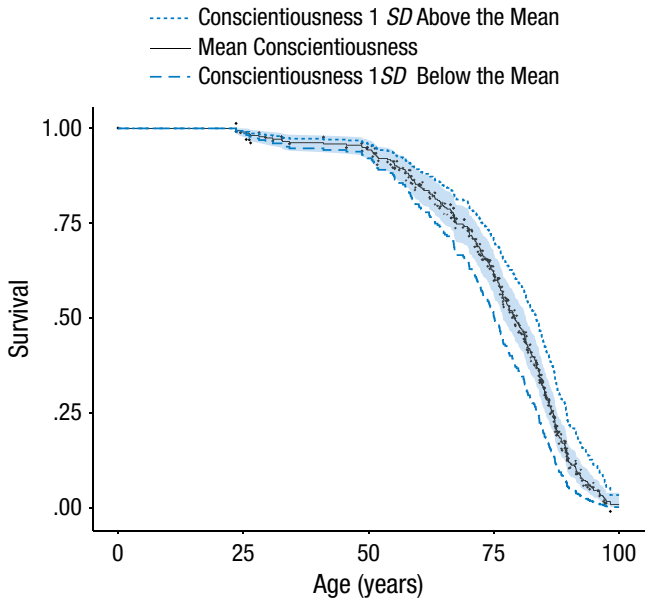

Fig. 1. Predicted probability of survival as a function of age for male participants 1 standard deviation above and below the average peer rating of conscientiousness. The shaded area represents the 95% confidence interval. Dots represent individual cases.

ratings of personality accounted for significant variance above and beyond the variance accounted for by self-ratings in the case of male conscientiousness (self-ratings only: $R^2 = .02$; self- and peer ratings: $R^2 = .09$, $\Delta R^2 = .07$), $p < .05$, female agreeableness (self-ratings only: $R^2 = .00$; self- and peer ratings: $R^2 = .03$, $\Delta R^2 = .03$), $p < .05$, and female emotional stability (self-ratings only: $R^2 = .00$; self- and peer ratings: $R^2 = .03$, $\Delta R^2 = .03$), $p < .05$. Peer-rated openness was largely redundant with self-rated openness for men (self-ratings only: $R^2 = .02$; self- and peer ratings: $R^2 = .02$, $\Delta R^2 = .00$), $p > .05$. These findings indicate that peer raters were able to identify components of participants' personalities above and beyond the components that participants identified themselves.

The greater strength of peer ratings of personality as predictors of participants' mortality may have been due to the greater reliability of the peer ratings, given that they were estimated using five raters, whereas self-reports rely on only a single rating. To examine this hypothesis, we tested whether the ratings of a single randomly selected peer for each participant would predict mortality risk better than the self-ratings. In a model including all five traits, a single peer report was no longer a predictor of mortality risk (men's conscientiousness: HR = 0.88, 95% confidence interval, or CI = [0.77, 1.02]; men's openness: HR = 0.88, 95% CI = [0.77, 1.02]; women's agreeableness: HR = 0.88, 95% CI = [0.77, 1.02]; women's emotional stability: HR = 0.88, 95% CI = [0.77, 1.02]). These analyses indicate that the superiority of peer ratings was due largely to the aggregation of ratings from multiple peers, which averaged out idiosyncratic tendencies of particular raters.

Do peers identify characteristics that increase or decrease mortality risk?

The association between peer ratings and mortality risk may arise because peers can detect and differentiate characteristics that increase mortality risk, decrease risk, or both. To examine this idea, we tested whether being rated above the mean or below the mean was more strongly associated with mortality risk (cf. Jokela et al., 2013). Participants who had peers who rated them low on conscientiousness were at especially great risk, whereas those rated above the mean had modest decreases in risk (see Fig. S1 in the Supplemental Material). The increase in risk associated with a rating below the mean (HR = 0.69, 95% CI = [0.54, 0.88]) was greater than the decrease in risk associated with a rating above the mean (HR = 0.93, 95% CI = [0.69, 1.31]). For the remaining traits, no meaningful departure from linearity was detected (see Table S3 in the Supplemental Material). These analyses indicate that much of the mortality risk associated with conscientiousness occurred because peers were able to identify characteristics that led to shorter life spans. In other words, the increase in risk for people rated 1 standard deviation below the mean in conscientiousness, relative to those at the mean, is greater than the decrease in risk for people rated 1 standard deviation above the mean. For the remaining traits, the more linear associations suggest that peers identified characteristics that both increased and decreased mortality risk.

Discussion

The KCLS data demonstrated that peer-rated personality traits predict mortality risk across a time span of 75 years. Furthermore, this study replicates and extends previous work on the importance of self-rated Big Five traits for mortality risk (e.g., Turiano, Chapman, Gruenewald, & Mroczek, 2013). Although self-ratings were associated with mortality risk in our study, peer ratings were stronger predictors. Our findings indicate that the predictive advantage of peer reports results from the increased reliability achieved by averaging multiple peer reports, although we cannot rule out the possibility that peers can identify unique information that people might not see in themselves (Vazire, 2010). Although peers were able to identify characteristics both positively and negatively related to mortality risk, the greatest mortality risk was associated with low peer ratings for conscientiousness (see Table 1). Overall, these findings demonstrate the utility of informant reports in the study of health and provide further evidence that personality traits are fundamental to the health process.

The present study is one of the longest studies of mortality risk to date, spanning more than 75 years. It complements the only two other long-term studies of mortality risk and personality: the Terman Life Cycle study (Martin et al., 2007) and the Lotharian birth cohort study (Deary et al., 2008). Using data from long-standing studies is necessary to address discrepancies found in previous studies that call into question what personality traits predict mortality risk (Jokela et al., 2013; Roberts et al., 2007), because long-standing studies can safeguard against biasing factors (e.g., reverse causality). Our results are consistent with results from both the Terman and Lotharian samples: Among the Big Five personality traits, conscientiousness is most strongly associated with mortality risk. In addition, in our study, both self- and peer-rated male openness predicted mortality risk, which is especially noteworthy given that the Terman and Lotharian studies did not include assessments of openness.

Predictors of mortality risk were different for women than for men; among women, only peer ratings, not self-ratings, were associated with mortality risk. These results must be interpreted within the historical context of this cohort, the members of which reached adulthood in the first few decades of the 20th century. Only a minority of female KCLS participants had an occupation other than being a housewife. It is likely that high levels of peer-rated emotional stability and agreeableness reduced mortality risk because they largely reflect positive characteristics indicative of a supportive and easy-going wife, such as the characteristics described in the social theory of the time. For example, Bales (1951) described women as socioemotional leaders and men as task leaders.

Despite the many advantages of this multireport, long-term study of mortality risk, it has some limitations. The sample consists of White individuals from New England and is therefore not fully representative of the North American population. Furthermore, the archival nature of the study makes it impossible to know some important characteristics of the raters, such as their length of acquaintance with the participants. Finally, it is unclear whether the mechanisms that link personality and longevity (e.g., health behaviors; Lodi-Smith et al., 2010) are the same when personality is assessed by peer ratings as when it is assessed by self-ratings.

In conclusion, these findings indicate that the processes that relate personality with longevity are visible to observers and are better assessed through multiple peer reports of personality than through self-reports alone. Thus, to best understand the processes linking personality with health and the relevance of personality traits for public-health issues (Cuijpers et al., 2010), researchers need to use multiple methods of personality assessment.

Author Contributions

J. J. Jackson, J. J. Connolly, and M. M. Leveille developed the study concept. Data collection was performed by J. J. Connolly, M. M. Leveille, and S. L. Connolly. J. J. Jackson and S. M. Garrison performed the data analysis. J. J. Jackson drafted the manuscript, and all authors provided critical revisions. All authors approved the final version of the manuscript.

Declaration of Conflicting Interests

The authors declared that they had no conflicts of interest with respect to their authorship or the publication of this article.

Supplemental Material

Additional supporting information can be found at http://pss.sagepub.com/content/by/supplemental-data

Note

1. These models tested for premature mortality risk, because everyone is at risk of dying. Nonetheless, for ease of discussion, we refer to these models as predicting mortality risk.

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