RESEARCH ARTICLE

Personality and longevity: findings from the Georgia Centenarian Study

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Abstract Centenarians are thought of as unique and exceptional survivors. This study evaluated specific personality traits and configurations of traits among participants of the Georgia Centenarian Study. Two hundred and eighty five centenarians and their nominated proxies participated in this study. Self ratings and proxy informant ratings were obtained for different traits and facets of the Big-5 personality typology. Results suggested that centenarians overall had low levels of Neuroticism, but high levels of Extraversion, Competence, and Trust. When compared to centenarian self ratings, proxies provided significantly higher ratings for Neuroticism, Hostility, and Vulnerability, but lower ratings for Competence and Trust. Among Centenarians, the personality configuration of low Neuroticism, high Competence, and high Extraversion traits is over-represented relative to chance. The results confirm that centenarians show several unique single traits, but that a special combination of traits (i.e., low levels of Neuroticism, high Competence, and high Extraversion) are also notable in this group of exceptional survivors.

Introduction

Most studies on centenarians point out that these survivors are without question exceptional individuals and that there is something "special and vibrant" about them (Poon et al. 1992). The fact that centenarians have outlived almost all of their contemporaries, and the fact that many individuals in that age group maintain a sense of autonomy and independence (Martin et al. 2000), suggest that survivorship into very old age is in part dependent on unique individual characteristics of centenarians. The purpose of this study was to assess important personality traits among those who have reached centenarian status.

The previous literature on longevity and personality can be divided into studies that have assessed personality characteristics in survivorship studies at relatively young ages and studies that have assessed unique personal characteristics among centenarians. It

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is not clear whether survivorship into late life (e.g., into the sixties or seventies) is different from survivorship to an age of exceptional longevity (i.e., 100 years of age). Therefore, these studies need to be reviewed separately. We agree with Thomae (1993) who pointed out that it is important to distinguish between relative longevity (i.e., survivorship relative to other adults at any age of the adult life-span) and absolute longevity (survivorship to 100 years).

Personality and relative longevity

Personality predictors of mortality in adulthood have been reported in several studies (Mroczek et al. 2006), and the Big-5 typology (i.e., the traits of Neuroticism, Extraversion, Openness to Experience, Conscientiousness and Agreeableness, Costa and McCrae 1999; John and Srivastava 1999) has often been used to assess the role of personality in survivorship studies. Wilson et al. (2004) investigated the association between personality and mortality in older Catholic clergy members. The authors concluded that high levels of Neuroticism were associated with probability of mortality, and high levels of Conscientiousness reduced the relative risk of death by 50% compared to those with low Conscientiousness. Openness to Experience and Agreeableness were not related to mortality. Extraversion reduced mortality risk in some cases. In another study, Wilson et al. (2005), with a population-based sample in Chicago and 4-item estimates of NEO FFI scales, investigated the association between personality traits and mortality concluding that high levels of Extraversion and low levels of Neuroticism were related to lower risk of death in old age. Another study (Christensen et al. 2002) of adults 18 years and older with chronic renal disease found an association between personality and mortality, indicating that low Conscientiousness and high Neuroticism predicted mortality.

Friedman (1999), however, could not find any evidence that sociability or other elements of Extraversion measured early in life were related to longevity. Friedman et al. (1993) investigated whether other personality characteristics in childhood predicted later life health and longevity. The authors concluded that Conscientiousness in childhood and adulthood was associated with survival into middle to old age, but Conscientiousness was not related to longevity for women. Cheerfulness (optimism and sense of humor) was, however, inversely associated

with longevity. Friedman et al. pointed out that conscientious individuals may have better health behaviors, engage more easily in medical treatment, and are more prepared for challenges in later life. Bogg and Roberts (2004) also noted possible explanations for the association between Conscientiousness and longevity. The authors speculated that individuals with this trait may tend to avoid risk behaviors and may be more likely to engage in healthy behaviors that may lead to longevity. Almada et al. (1991) investigated the relationship of Neuroticism and Cynicism (agreeableness vs antagonism) and risk of death in a middle-aged sample. They reported that Neuroticism was not associated with risk of death, but Cynicism was correlated with risk of death from coronary disease. Weiss and Costa (2005), in 1,445 community residents from Rochester, New York, evaluated 3- to 5-year mortality in a sample aged 65–100 with the NEO-FFI, and performed supplementary analysis with the full NEO PI-R . Higher Neuroticism and lower Agreeableness were related to increased mortality and Conscientiousness was protective. Current work in the UNC Alumni Heart Study (Siegler et al. 2006) found that Hostility in college predicts premature mortality before age 60.

Work in samples of patients post myocardial infarction has found Hostility predicts mortality (Boyle et al. 2004) and that this interacts with age (Boyle et al. 2005). Furthermore, measures of depressive affect (a facet of Neuroticism) and positive emotion (a facet of Extraversion) from the NEO predicted survival when tested independently. When tested together, only depressive affect predicted survival (Brummett et al. 2005).

Several authors have pointed out that the mechanisms explaining the relationship between personality traits and longevity may be through a link to physical and mental health variables. Siegler and Brummett (2000), for example, noted that Neuroticism, Extraversion, and Conscientiousness were all related to psychological well-being, and psychological well-being may be an important link to longevity. In a similar vein, Aldwin et al. (2001) pointed out that individuals with high levels of Neuroticism and low levels of Agreeableness possessed poor health profiles that were associated with higher mortality. It is not clear, however, whether the same personality traits (particularly Neuroticism and Conscientiousness) important for relative survivorship are also important for

survivorship to exceptional ages, such as those who achieve centenarian status. Therefore, centenarian studies can further inform us about the relationship between personality and longevity.

Personality and absolute longevity

Only a few centenarian studies have addressed the question as to what extent personality characteristics affect survivorship into very late life. A Swedish centenarian study (Samuelsson et al. 1997) used the ratings from the MMPI to assess personality traits. Close relatives were asked to think back and remember the centenarian family member at midlife. The personality ratings of centenarians were then compared to norms for elderly persons, and in three scales the results were just outside the normal zone: centenarians were low on the MA subscale (i.e., mild degrees of excitement, elated but unstable mood, psychometric excitement, over activity and irritability), low on the PT subscale (i.e., obsessive thoughts, guilt feelings and anxiety), and high on PA subscale (interpersonal sensitivity, moral righteousness and suspiciousness). The results suggest that centenarians in the Swedish study were seen as sensitive and rational, secure, emotionally stable and relaxed, dependable, mature and conscientious.

Results of a personality study from the first Georgia Centenarian Study using the Cattell 16PF indicated that centenarians had higher scores in Dominance, Suspiciousness, and Shrewdness, whereas they were lower in Imagination and Tension when compared to two younger groups (Martin 2002). When retesting centenarians after 18 months, the Georgia team found that centenarians had decreased scores in Sensitivity, but higher scores in Radicalism (Martin et al. 2002). Martin (2002) argued that the "robust personality" among these highly selected centenarians was not only an indication of survivorship but also an important resource that may help centenarians adapt well to later life.

Perls et al. (1999) noted that centenarians were relatively immune to negative emotions, such as fear, guilt, sadness, depression, anger, anxiety, hostility, self consciousness, impulsiveness, and vulnerability. Finally, a Japanese centenarian study reported that centenarians had high scores in Femininity and low scores in Type-A behavior (Shimonaka et al. 1996).

Although it is important to assess specific personality traits that may relate to adaptation and longevity, some have argued that it is time to move beyond the Big-5 trait concept to focus on combinations and configurations of personality traits. Eysenck (1986), for example, introduced different combinations of Extraversion and Neuroticism and related these combinations to pleasant and unpleasant affect. According to this model, highly neurotic and highly introverted persons were classified as "unhappy" individuals, whereas extraverted and emotionally stable persons were classified as "happy." In a similar vein, Caspi (1998) suggested three personality patterns that can be directly related to the Big-5: the "well adapted" or resilient personality (i.e., persons who score moderately high on Extraversion, Emotional Stability, Openness, Conscientiousness, and Agreeableness), the "overcontrolled" personality (i.e., persons particularly low on Extraversion and Emotional Stability), and the "undercontrolled" personality (i.e., persons who scored high on Extraversion, but low on Agreeableness, and Conscientiousness). By focusing on three established longevity traits (i.e., Neuroticism, Extraversion, and Conscientiousness), we would expect a configuration of low Neuroticism, high Extraversion and high Conscientiousness to occur more often in survivors than would be expected by chance. The NEO styles (cf. Costa and McCrae 1998; Costa and Piedmont 2003) may be the more appropriate level of analysis when relating personality to mortality.

Research questions

The literature regarding relative and absolute longevity consistently points to two major factors that appear to be associated with longevity: low levels of Neuroticism and high levels of Conscientiousness. Less clear is the role that Extraversion, Openness to Experience, and Agreeableness play as survivorship traits.

Even though the literature has pointed out that several factors are important components for relative and absolute longevity, most studies to date have focused on self reports. A direct comparison of self and proxy informant ratings has not been reported in the literature. Second, most personality assessments in centenarians are only based on relatively well-functioning centenarians. Additional studies are needed that include a representative sample of centenarians. Third,

so far personality studies have looked at the major Big-5 traits, whereas the assessment of more specific personality facets has not received sufficient attention (Siegler and Brummett 2000). Finally, most personality trait studies have focused on single traits, disregarding the combination of several personality traits.

Our research therefore addressed the following important questions. First, how can centenarians be characterized by personality traits and facets? Second, which personality traits and facets are reported by proxy informants? Third, are personality traits of centenarians with high cognition scores different from personality ratings of centenarians with relatively low cognition scores? Fourth, is there a combination of personality traits that occurs more or less often in centenarians than we would expect by chance?

Materials and methods

This study used data from the Georgia Centenarian Study (Poon et al. 2006), a population-based sample of 285 centenarians and near-centenarians (98 years and older) from northern Georgia that was conducted between 2002 and 2005. The main goal was to investigate factors related to survival and functioning of centenarians. This study included 285 community-dwelling and institutionalized older adults (mean age was 100.33 years) and 273 proxies who provided additional information on our centenarian participants. In this study, 82% of the participants were women, and 18% were men. Two ethnic groups were included; 77.5% of the participants were White and 22.5% were Black. The majority of the proxies (61.1%) were adult children of centenarians. Additional proxies included nieces and nephews (13.9%), granddaughters (9.9%), and miscellaneous informants, such as spouses, siblings, or friends (15.1%).

The names of the participants were obtained from the voter registration rolls from the State of Georgia and from calls to a random subset of care facilities. Our sampling frame included 44 counties in Northeast Georgia within a two-hour drive from Athens. They were first recruited by telephone and mail, and subsequent face-to-face interviews were conducted. Questionnaires were either left with or mailed to a close family member or care provider (a proxy informant) in order to obtain information about

centenarians. Complete details on sampling and data collection are provided in Poon et al. (2006).

Measures

Two versions of the NEO personality inventory were used in our study (Costa and McCrae 1992). First, selected dimensions and facets of the NEO Personality Inventory (NEO-PI-R) were used to obtain self reports of personality by centenarians. It would have been impossible to conduct the entire personality inventory for the centenarian population, so items were selected based on important dimensions obtained in our previous work on centenarian personality (Martin 2002; Martin et al. 2002). Second, the entire NEO Personality Inventory (NEO PI-R) was used to obtain personality assessments by caregiver proxies. To reduce their burden of responding, our oldest participants answered personality questions on three-point scales, whereas proxies used the original five-point scales. When direct comparisons were made between centenarians and proxies, the five-point scaling for proxies was reduced to a three-point scale by collapsing the extreme scores with the neighboring scores.

The NEO used with the centenarian group included 68 questions, which assessed the following dimensions: Extraversion (e.g., friendly and sociable), Neuroticism (e.g., anxious or fearful), Hostility (e.g., irritable, impatient), Vulnerability (e.g., helpless, stressed), Trust (e.g., others are honest and trustworthy), Tender-mindedness (e.g., having sympathy for others, focus on human needs), Competence (common sense, efficient and effective), and Ideas (e.g., intellectual curiosity and interests). Even though Hostility and Vulnerability are dimensions measuring Neuroticism, no items were overlapping between these dimensions. The questions were rated on a three-point scale, which ranges from D=disagree (= −1), N=neutral (=0), and A=agree (=1). High scores indicate high levels in the personality domain or trait. The reliability was $\alpha=0.60$ for Extraversion, 0.85 for Neuroticism, 0.70 for Competence, 0.65 for Hostility, 0.67 for Vulnerability, 0.55 for Trust, and 0.73 for Ideas. The facet "Tender-mindedness" was excluded because of low reliability ($\alpha=0.46$).

The NEO PI-R has five broad domains or factors of personality with six specific traits within each domain. This measure includes 240 items. We used the entire measure with proxies in order to assess

centenarians' personalities. The NEO PI-R uses a five point scale that ranges from SD=strongly disagree (=−2), D=disagree (=−1), N=neutral (=0), A=agree (=1), and SA=strongly agree (=2). Higher scores indicate higher levels of the personality trait or facet assessed. Some of the questions asked were "she/he really likes most people she/he meets" (Extraversion), "sometimes she/he feels completely worthless" (Neuroticism) and, "she/he is known for his/her prudence and common sense" (Conscientiousness). In this study, the reliability for Extraversion was $\alpha=0.81$, 0.87 for Neuroticism, 0.80 for Competence, 0.85 for Hostility, 0.80 for Conscientiousness, 0.80 for Vulnerability, 0.86 for Trust, and 0.84 for Ideas. For the configural frequency analyses, participants were divided into high and low groups at the scale midpoint. Positive scores reflect high scores on a given trait; negative scores reflect low scores on a trait.

Design and analyses

Four analyses were conducted. First, descriptive analysis was computed in order to assess means and standard deviations. Second, several paired t-tests were conducted in order to compare personality scores of centenarians with proxy informant reports on centenarians' personalities. Independent t-tests were computed in order to compare personality dimensions given by proxies of centenarians with high functioning scores and for proxies of centenarians with low cognitive functioning scores. The division into high and low cognitive functioning scores was accomplished by using scores from the Mini Mental Status Examination (MMSE; Folstein et al. 1975). The high group had at least a score of 17 on the MMSE (45%), the low group scored 16 or fewer points on the MMSE (55%).

Finally, Configural Frequency Analyses were computed using Neuroticism, Extraversion, and Conscientiousness (competence) in order to assess types and antitypes of our sample. Configural frequency analysis is a multivariate statistical method that identifies discrete and uniquely constituted groups of individuals (Von Eye 1990) by comparing observed to expected frequencies in a cross-tabulation. Significant differences suggest the presence of groups (configurations) that include either more or less individuals than would be expected under an assumption of complete independence. The significant configurations are referred to as types and antitypes (cf. Von Eye 1990).

In this study, types represent the grouping of individuals on compatible and shared personality characteristics, such that more participants display this pattern than would be expected. Antitypes represent the grouping of individuals on incompatible and non-shared personality characteristics, such that fewer participants display this pattern than would be expected.

Results

The findings of this study are divided into two sections: first, descriptive results and mean group differences for centenarians and proxies; and second, results from the configural frequency analyses on Neuroticism, Competence, and Extraversion for centenarians and for the proxy informant ratings.

Table 1 displays results of means and standard deviations for the personality variables for centenarians and ratings given by their proxies. Centenarians had low levels of Neuroticism, Hostility, Vulnerability, and Ideas, and they had higher scores for Extraversion, Competence, and Trust. In general,

Table 1 Means and standard deviations of personality variables for centenarians and proxies.

Variables	Centenarians			Proxies		
	n	M	SD	n	M	SD
Neuroticism (12 items)	134	−7.34	5.37	247	−4.93	5.89
Extraversion (12 items)	128	1.98	4.15	235	1.88	4.89
Competence (7 items) Conscientiousness	110	5.63	2.19	243	4.18	2.94
Hostility (7 items)	126	−4.37	2.67	244	−2.40	3.85
Vulnerability (6 items)	123	−4.58	2.06	245	−3.30	2.93
Trust (8 items)	127	6.28	2.03	242	4.60	3.88
Ideas (8 items)	105	−1.53	4.05	237	−0.25	4.26

Table 2 Mean personality differences – cognitive functioning centenarians and proxies ratings.

Personality	Centenarians			Proxy informants			t
	n	M	SD	n	M	SD	
Extraversion	103	2.18	4.04	103	2.09	4.52	−0.15
Neuroticism	111	−7.39	5.37	111	−4.20	6.21	4.26***
Competence	91	5.73	2.20	91	3.97	3.08	−4.50***
Hostility	105	−4.21	2.75	105	−2.17	4.12	4.34***
Vulnerability	100	−4.62	2.04	100	−3.06	2.92	4.92***
Trust	104	6.45	1.92	104	4.04	4.16	−5.23***
Ideas	82	−1.35	4.07	82	−1.04	4.20	0.50

***$p<0.001$

proxy ratings matched this profile of centenarian personality traits. One sample t-tests evaluating whether the mean ratings were significantly different from zero indicated that all self ratings were highly significant, as were proxy informant ratings, except for Ideas, $t(237)=−0.10$, $p=0.32$.

Pearson correlations were computed between self and proxy informant ratings. Except for Vulnerability, bivariate correlations were low and not significant, ranging from $r(104)=−0.07$ for Trust to $r(103)=0.10$ for Extraversion. Vulnerability ratings were significantly related, $r(100)=0.22$, $p<0.05$.

Table 2 displays results from mean personality differences between centenarian self ratings and proxy informant ratings for cognitively functioning centenarians. Significant mean differences were obtained for five of the seven scales. Proxies rated the centenarians higher on Neuroticism, Hostility, and Vulnerability, whereas proxy informant ratings for Competence and Trust were lower when compared to self ratings. No personality differences were obtained for Extraversion and Ideas.

Table 3 summarizes mean differences for personality traits of cognitively functioning centenarians and cognitively impaired centenarians as rated by the proxies. There were no significant mean differences for any of the personality traits.

Table 4 shows results from the configural frequency analyses for centenarians with high and low scores on Neuroticism, Competence, and Extraversion. Two specific types emerged: first, there were more centenarians with low scores on Neuroticism, high scores on Competence, and high scores in Extraversion than would be expected by chance, while the second type included centenarians low in Neuroticism, high in Competence, and low in Extraversion. These types were also obtained in the proxy informant ratings for cognitively functioning centenarians (Table 5). When we included proxy informant ratings of all centenarians (cognitively functioning and cognitively impaired) and when we only assessed cognitively impaired centenarians, only one type (low Neuroticism, high Competence, and high Extraversion) emerged for the cognitively impaired centenarians (data not shown).

Table 3 Mean personality differences by levels of cognitive impairment – proxy informant ratings.

Personality traits	Cognitive functioning centenarians			Cognitive impaired centenarians			t
	n	M	SD	n	M	SD	
Extraversion	126	1.56	4.86	107	2.27	4.93	1.10
Neuroticism	131	−4.75	6.08	114	−5.10	5.72	−0.46
Competence	110	4.44	2.80	131	3.93	3.06	1.33
Hostility	131	−2.51	4.03	111	−2.27	3.66	0.48
Vulnerability	128	−3.07	2.80	115	−3.53	3.08	−1.22
Trust	131	4.49	4.12	109	4.74	3.62	0.50
Ideas	125	−0.64	4.49	110	0.18	4.00	1.47

Table 4 Personality configuration including neuroticism, competence, and extraversion (self reports).

Configuration			Frequency		p	Type
Neuroticism	Competence	Extraversion	Observed	Expected		
Low	Low	Low	2	12.75	0.00	Antitype
Low	Low	High	1	12.75	0.00	Antitype
Low	High	Low	26	12.75	0.00	Type
Low	High	High	60	12.75	0.00	Type
High	Low	Low	2	12.75	0.00	Antitype
High	Low	High	1	12.75	0.00	Antitype
High	High	Low	4	12.75	0.00	Antitype
High	High	High	6	12.75	0.02	Antitype

Bonferroni-adjusted alpha=0.0062500

Discussion

Our investigation began with the question of whether centenarians have unique personalities that may in part explain their exceptional longevity. The Georgia Centenarian Study, from which these data are derived, allows for a very comprehensive assessment of personality traits and facets among this elite group of survivors. This is the first study to investigate the personality of centenarians through both self assessment and proxy assessment, for community-dwelling and cognitively impaired survivors. Four specific results were obtained: (1) centenarians as a group appeared relatively low on Neuroticism, Hostility, and Vulnerability and high on Competence and Trust when compared to the scale midpoints; (2) centenarians and proxies generally disagreed in personality ratings of the oldest old; (3) there were no significant differences in proxy informant personality ratings for different levels of cognitive impairment; and (4) the results point to a common combination of personality characteristics among centenarians that can be defined by the combination of relatively low Neuroticism, high Competence, and high Extraversion.

When considering the general personality profile of centenarians, our results support previous studies that had noted relatively low scores on Neuroticism as important predictors of survivorship. Studies assessing relative longevity (i.e., survivorship or mortality at younger ages) had noted the fact that survivors were relatively relaxed and less like to worry (Almada et al. 1991; Christensen et al. 2002; Wilson et al. 2004). These studies were corroborated by centenarian studies that found Emotional Stability (the opposite pole of Neuroticism) was a common trait among long living individuals (Martin 2002; Samuelsson et al. 1997; Shimonaka et al. 1996). It appears that a relatively low level of Neuroticism is an important survivorship trait. As Mroczek et al. (2006) noted, the association between mortality and Neuroticism may be explained by higher sensitivity to stress in neurotic individuals. Neuroticism is associated with greater exposure and reactivity to stress (Bolger and Schilling 1991), and the physical effects of stress may also explain the association between Neuroticism and mortality. This hypothesis is supported by studies demonstrating that older adults, especially those high in Neuroticism, were more

Table 5 Personality configuration including neuroticism, competence, and extraversion (proxy informant ratings of cognitively intact centenarians).

Configuration			Frequency		p	Type
Neuroticism	Competence	Extraversion	Observed	Expected		
Low	Low	Low	4	14.38	0.00	Antitype
Low	Low	High	5	14.38	0.00	Antitype
Low	High	Low	25	14.38	0.01	Type
Low	High	High	54	14.38	0.00	Type
High	Low	Low	12	14.38	0.25	
High	Low	High	2	14.38	0.00	Antitype
High	High	Low	13	14.38	0.35	
High	High	High	5	14.38	0.00	Antitype

Bonferroni-adjusted alpha = 0.0062500

emotionally reactive to daily stressors than younger or midlife adults (Mroczek and Almeida 2004). Mroczek et al. (2006) speculate that a lifetime of high Neuroticism and its concomitant stress sensitivity may be the cause of physical damage to the cardiovascular system, contributing to mortality.

Less clear is the relationship between Extraversion and survivorship. Only one study had specifically stated that Extraversion is related to survivorship (Wilson et al. 2005). Results of our study confirmed somewhat higher levels of Extraversion in centenarians—the mean values were above the midpoint. More clarity was obtained for the personality trait Conscientiousness. This trait was found to be a survivorship trait (Bogg and Roberts 2004; Friedman et al. 1993) in at least one previous centenarian study (Samuelsson et al. 1997). Mroczek et al. (2006) suggest that those high in Conscientiousness engage in healthier behavior, such as eating a healthy diet and exercising, which may keep them alive longer than those who score lower on Conscientiousness.

It was surprising to see that proxies rated centenarians differently on a number of dimensions when compared to self ratings. This was true for the rank order agreement as assessed by correlations and for the mean-level comparisons. Agreement existed only for the rank order correlation for Vulnerability and for the mean scores for Extraversion and Ideas. Even though the general personality assessment was comparable between centenarian assessment and proxy informant assessments, proxies were likely to rate centenarians as more neurotic, hostile, and vulnerable, and less competent and trusting. Proxies, who typically were family members, might project their own impressions into these two dimensions: to them, centenarians may appear more vulnerable, hostile, and anxious. On the other hand, centenarians may also respond in socially desirable ways or overestimate their own "invincibility," a perspective that may have helped carry them through a very long life.

A somewhat surprising finding was that proxies did not rate the personalities of cognitively impaired centenarians differently when compared to proxies who had no impairments. Even though proxies were prompted to evaluate the centenarians based on their current characteristics, longer enduring personality assessments may have influenced the proxy informant ratings. On the other hand, it is also possible that centenarians maintain their basic tendencies even if

they experience cognitive impairment. Siegler et al. (1991, 1994) found that ratings by family members of Alzheimer's Disease patients showed strong rank order stability on the NEO, except for the domain of Conscientiousness and the facet of Vulnerability. Thus, most of the personality traits appear to be well preserved.

Our final question explored the possibility that trait configurations could be relevant in addition to single personality traits. In other words, is it possible to find a cluster of personality trait combinations for centenarians? A trait configuration that emerged was the combination of low Neuroticism levels, high Competence, and high Extraversion. A secondary (i.e., less frequent) pattern was found for low Neuroticism, high Competence, and low Extraversion (or high Introversion). This finding is consistent with work highlighting the importance of specific personality traits, such as Emotional Stability, Conscientiousness, and Extraversion.

Why would this specific combination of traits be important? First, lower levels of Neuroticism suggest that centenarians may remain emotionally fairly stable even in the face of age-associated changes. A high level of Competence, on the other hand, may help survivors to cope with challenging situations. Finally, as survivors age, they may continue to reach out to other people by their extraverted nature. Because many centenarians inadvertently lose important members of their social support system (Martin 2002; Martin et al. 1996), relatively high levels of Introversion may also help survivors concentrate on their own strengths.

Interestingly enough, the same combination of traits (Neuroticism, Competence, and Extraversion) were replicated by the proxy informant ratings on cognitively functioning and cognitively impaired centenarians. Taken together, the results suggest that focusing on single personality traits may be provide a limited view of survivorship traits, and that it may be more fruitful to assess specific combinations of centenarian traits. The configuration obtained in this study supports Caspi's (1998) assertion that well adapted or resilient personality types score moderately high on Extraversion, Emotional Stability, and Conscientiousness.

This study has several limitations. Centenarians in this study were from only one region of the United States, and results cannot be generalized to the entire

U.S. population. In addition, assessments of centenarians are challenging, and so not all personality facets could be included in our study. Because of the limitations in assessment options, centenarians answered questions on three-point scales, whereas proxies used the original five-point scales. Finally, it is not possible to know whether centenarians have shown these personality traits for many years, or whether personality changes have slowly occurred over time.

In conclusion, our findings suggest that centenarians are characterized by specific personality traits, including low levels of Neuroticism and high levels of Competence. These traits appear to cluster in trait configurations, particularly a combination of low Neuroticism, high Competence, and high Extraversion. To become an exceptional survivor such as a centenarian is a rare event with a complex course, so it should come as no surprise that the personal characteristics of long-lived survivors are also extraordinary and complex.

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