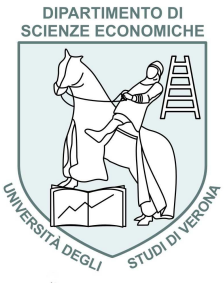

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The Shadow of the Past: Does Personality Change After Lifetime Traumas?

Alessandro Bucciol, Luca Zarri

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THE SHADOW OF THE PAST: DOES PERSONALITY CHANGE AFTER LIFETIME TRAUMAS?

Alessandro Bucciol
University of Verona and Netspar

Luca Zarri*
University of Verona

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Abstract

Using large-scale survey data from the four 2006-2012 waves of the US Health and Retirement Study, we shed light on the stability of personality traits by exploring the relationship between individuals' personality and the occurrence of negative life events out of their control. Our results show that, after controlling for standard socio-demographic variables, i) Openness to Experience is positively correlated with having been victim of physical attacks, personal or familiar illnesses or accidents; ii) Extraversion, Agreeableness, and Neuroticism are also correlated with negative life events; iii) Conscientiousness is unaltered by traumas; iv) a child death has no bearings on personality. We also offer evidence that the timing of the event matters, as a physical attack becomes relevant only after 20 or more years. Our findings indicate that, even though one's personality traits are relatively stable, they are not set in stone, as some negative life events can affect one's personality.

Keywords: Personality Traits; Negative Lifetime Events; Stability of Personality.

JEL Classification: D03; D12.

PsycINFO Classification: 3120.

* Corresponding author: Luca Zarri. Postal address: University of Verona, Department of Economics, Via Cantarane 24, 37129 Verona, Italy. Phone: +39 045 802 8101. Email: luca.zarri@univr.it.

"In most of us, by the age of thirty,
the character has set like plaster,
and will never soften again"
William James (1890)

1. Introduction

While a long-standing tradition in economics has deemed cognitive ability as central to individual decision-making processes, in the last years a burgeoning literature has been shedding light on the key role played by so called personality traits (see e.g. Almlund et al., 2011; Rustichini et al., 2012). So far, personality traits have been mainly investigated within the framework of so called personality psychology, that defined them as the "*relatively enduring patterns of thoughts, feelings, and behaviors* that reflect the tendency to respond in certain ways under certain circumstances" (Roberts, 2009, p. 140; italics added). In economics and finance, individual-specific factors such as personality traits have been shown to be significantly associated with several economically relevant variables, such as earnings (Mueller and Plug, 2006), unsecured debt and savings (Brown and Taylor, 2014) and portfolio decisions (Bucciol and Zarri, 2015b).[1] Next, as noted by Almlund et al. (2011), intervention studies, along with studies in biology and neuroscience, interestingly point to a causal link from personality traits on economic and social outcomes.

Insofar as we acknowledge the relevance of personality traits for economic and financial decisions, it is crucial to specifically address the following question: are adults' personality traits *stable* or do they *change* over time? Providing a rigorous answer to this question would help us shed light on the validity of the assumption, made in some theoretical and empirical studies, that adults' personality traits are fixed (Heineck and Anger, 2010;

[1] Using data from laboratory experiments and representative samples, Becker et al. (2012) find only low degrees of association between economic preferences and personality traits.

Mueller and Plug, 2006; Nyhus and Pons, 2005).[2] Cobb-Clark and Schurer (2012) find that personality traits are a relatively stable feature of adult individuals. On the other hand, Almlund et al. (2011) claim that personality traits can be influenced by parental behavior, investments in education and policy interventions.

In this paper, we hypothesize that personality traits, while being relatively stable over time, are to some extent malleable, as some environmental factors might modify one's personality as time unfolds. More specifically, drawing on prior research showing that traumatic events can influence one's dispositions in later life, we address the following question: do potentially traumatic personal events occurred earlier in life play a relevant role in shaping one's current personality structure? Our conjecture is that personality traits to some extent can change for individuals who have experienced negative events out of their control in their personal history, as if negative lifetime occurrences were able to cast a long shadow (the "shadow of the past"; see, for this expression, also Bucciol and Zarri, 2015a) extending to current decision-making and personality traits.

For our analysis, we use data from the 2006-2012 waves of the US Health and Retirement Study (henceforth HRS). This survey, collecting information on a sample representative of the US population aged 50 or more, is an ideal dataset for our research question as it conveys information on both personality and lifetime traumas.

The remainder of the paper proceeds as follows. Section 2 provides a selective review of the strands of literature exploring the relationship between personality traits and prior life experiences. Section 3 describes our data and methodology. Section 4 contains our key findings and Section 5 concludes. A final appendix lists the raw variables used to identify personality traits and lifetime traumas.

[2] This idea is consistent with the commonly held opinion, clearly expressed by the influential psychologist William James' claim used in this paper as an epigraph, that significant alterations in personality cease to occur once individuals enter into adulthood.

2. Related Literature

Personality psychology includes both universal traits and individual differences. The so called Big Five model (Costa and McCrae, 1992) so far is regarded as the most widely accepted taxonomy of personality traits in the psychology literature. At the broadest level of abstraction, it posits that five traits (i.e., Openness to Experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism) are fundamental and universal. As Almlund et al. (2011) highlight, for several outcomes the predictive power of personality measures is similar to that of cognitive measures captured by IQ and achievement tests. In their work, they also present a detailed survey of the rich and growing body of evidence on the predictive validity of personality measures for education, crime, health, and labor market outcomes.

While today it is common in psychology to view personality traits as a relatively stable feature of adult individuals,[3] Almlund et al. (2011) warn us not to view them as set in stone. In particular, they point out that, even though personality traits, far from being merely situation-driven ephemera, are positively correlated over the life cycle, they are *more malleable* than (purely) cognitive factors, which become highly rank stable around age 10. In their work, they offer evidence showing that education, interventions and parental investment can influence personality throughout the life cycle. They also view interventions leading to personality change as promising avenues for addressing poverty and disadvantage. Roberts et al.'s (2006) meta-analysis focuses on cumulative lifetime change in Big Five traits and find that all of them vary across the life cycle.

The stability of personality issue is closely related with the following question: where do personality traits stand, in the classic *nature-nurture* debate? In this regard, Almlund et al. (2011) argue that the current psychology literature views genetic factors as largely responsible for stability in adults' personality and environmental factors as mainly responsible for change. However, based on recent evidence, they make clear that also the opposite can occur, with environmental factors contributing to stability in personality and genetic factors contributing to change. Almlund et al. (2011) present evidence that both purely cognitive factors and personality traits evolve over the life cycle, though at different

[3] As noted by Almlund et al. (2011), the once popular extreme situationist view, according to which constraints and incentives in situations almost entirely drive behavior, is no longer generally accepted in psychology.

rates at different stages. In particular, in their model personality traits may change over the life cycle as a result of experience (including social interactions), situations, biology (ontogeny) and investment (e.g. schooling).

Also in the prototypical model of personality presented by Roberts (2006), one of the leading personality psychologists, personality is viewed as the system of relationships that map traits and other determinants of behavior into measured actions, with *feedback processes* operating among all components of the model. As Almlund et al. (2011) correctly point out, his broad conception of personality allows for identity shaping traits and abilities, possibly through an epigenetic mechanism, by which environment influences gene expression. In this model, measured personality results from interactions among components of the system.

Therefore, it is plausible to believe that, among environmental factors, potentially traumatic life events play an important role in shaping individuals' personality traits later in life. A voluminous literature in psychology, medicine and psychiatry sheds light on the lasting effects on (mental and physical) health and decision-making of exposure to trauma (see e.g. Carmil and Breznitz, 1991; Tedeschi and Calhoun, 1996; Holman and Silver, 1998; Yehuda, 2002). This idea is consistent with Almlund et al.'s (2011) economic approach to personality (in turn inspired by the framework of Roberts, 2006), where personality is interpreted as a strategy function for responding to life situations and personality traits produce measured personality as the output of personality strategy functions. Measured personality exhibits both stability and variation across situations.

Prior work in the medicine literature has focused on the links between exposure to traumatic life events and personality change. Bunce et al. (1995) focus on differences in personality and daily life experiences of traumatized versus nontraumatized college students and show that traumatized subjects inter alia scored higher on Neuroticism and were more introverted than nontraumatized individuals. Next, they find that earlier age of trauma was linked to more pathological outcomes. Cox et al. (2004) examine high Neuroticism and Self-Criticism in relation with the presence versus absence of posttraumatic stress disorder in a sample of adults who experienced a traumatic stressor. Their findings indicate that, after controlling for types of traumas experienced and other relevant factors, Neuroticism was significantly associated with posttraumatic stress disorder among individuals who had

experienced one or more traumatic events. Allen and Lauterbach (2007) empirically analyze differences in personality between adult survivors of single-incident and repeated or prolonged childhood traumas. They show that traumatized individuals scored higher in Neuroticism and Openness to Experience.

Recent research in economics has shown that personality traits are a relatively stable feature of adult individuals. In their empirical analysis based on nationally representative Australian data mentioned above, Cobb-Clark and Schurer (2012) find that personality traits are stable among working-age adults, with small mean-level changes in Big Five traits and small variations across age groups. They also provide no evidence that intra-individual personality change can be significantly associated to adverse employment, health or family events experienced by individuals.

3. Data

We use data from the US Health and Retirement Study (henceforth, HRS), a biennial longitudinal survey managed by the University of Michigan. The survey, first developed in year 1992, was initially meant to explore the health and retirement habits of a representative sample of the US population aged 50 or more. Over the years the survey expanded the range of information it collected, and is now able to provide details, inter alia, on a variety of socio-economic, life history and psychological variables.

The questionnaire is made of different modules, each addressing a general topic, such as housing, employment history, and health conditions. In this study, we are especially interested in the "Participant Lifestyle" module. The module, included in HRS since 2004, is meant to gather information on psychological and social well-being and personal history variables. To reduce the survey collection burden, this module is presented in every wave to a randomly selected, rotating half of the sample; the remaining half of the sample answers the questions in the subsequent wave. With this design, a household faces the module every four years.

In this paper we focus on the four HRS waves from 2006 to 2012. We do not start earlier than 2006 because in 2004 the "Participant Lifestyle" module started with just a small number of variables. In particular, there were no variables on personality.

Our final sample is made of 16,738 observations on 9,909 household heads, containing full information on all the variables relevant for this study. These can be split in three categories: personality variables, lifetime potentially traumatic events, and control variables.

The personality variables are five indexes, normalized in the 0-100 scale, expected to proxy for the five personality traits (Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) of the "Big Five" taxonomy of personality described in Section 2. The Appendix reports the raw questions behind the indexes, that we construct following Smith et al. (2013). The lifetime trauma variables concern four events out of an individual's control: death of a child (whether a kid or an adult), having been victim of a serious physical attack or assault, having had a life-threatening illness or accident, and having had a spouse/child with a life-threatening illness or accident. The Appendix reports the exact wording of the questions on lifetime traumas, for which we also know the year when they arose. The control variables inform on standard socio-demographic variables (age, gender, ethnicity, marital status, occupation, and education) and self-assessed health status of the head, the financial and non-financial wealth holdings of the household, and the year of data collection.

To allow for a proper evaluation of the trauma of a child death, our sample includes only individuals with at least one child (alive or dead). Another sample restriction is on our decision to focus on individuals not older than 80, because the older elderly are over-sampled in the HRS design. In addition, we believe as Bucciol and Zarri (2015a) that such individuals may find it difficult to recall if and when they experienced lifetime traumas, especially when these occurred in their early life.

Table 1 shows summary statistics on the variables included in our final dataset. It is worth noting that, while some traumas are relatively rare (e.g., physical attacks occur in 6.3% of the cases), others are rather common (e.g., a life-threating illness or accident to the partner

or a child occurs in 29.6% of the cases); these figures are in line with those in Bucciol and Zarri (2015a).

TABLE 1 ABOUT HERE

Table 2 compares the average of each personality variable in two sub-samples of individuals, who experienced or not a given trauma. The final column of the table reports the output of a statistical *t*-test on the comparison of the average in the two sub-samples. This simple analysis reveals frequent differences in personality under the occurrence of a trauma. According to this preliminary analysis, the death of a child is observed under lower levels of Openness to Experience and Conscientiousness; a physical attack is observed under higher levels of Openness to Experience and Neuroticism, and lower levels of Extraversion; personal exposure to a serious illness or accident is observed under higher levels of Openness to Experience and Neuroticism, and lower levels of Conscientiousness and Extraversion; finally, family experience with a serious illness or accident is observed under higher levels of Openness to Experience and Agreeableness. Openness to Experience is the personality trait that seems to correlate more with the lifetime traumas.

The frequent statistical significance of the difference we observe in Table 2 could be just the consequence of comparing every time two sub-samples of individuals with different characteristics. The analysis in Section 4 is meant to solve this potential problem, and study the correlation between personality traits and lifetime traumas, controlling for the main observable characteristics of the individual.

TABLE 2 ABOUT HERE

4. Analysis

In this section we report the main results of our analysis. Sub-section 4.1 refers to the whole sample, while Sub-section 4.2 refers to a sub-sample of individuals who experienced one or more traumas during the sample period.

All our five dependent variables are likely correlated with each other. In addition, they all take values in the 0-1 interval. Standard OLS models are not suited to describe dependent variables with values in a limited interval. In the whole analysis, we then report estimates from a multivariate tobit model imposing for each dependent variable a lower bound of 0 and an upper bound of 1.[4]

The limited number of observations (one or two) we have for each individual prevents us from considering a model for panel data. We therefore apply models for cross-sectional data; to account for potential correlation of the observations, we use standard errors clustered at the individual level. In the following we take the convention to comment only on coefficients significant at the 5% or lower level.

4.1. Benchmark analysis

Table 3 reports the results of regression analyses where each personality trait is regressed over the lifetime traumas and control variables. Personality is highly correlated with the socio-demographic variables. In particular gender, employment and health status are found to be correlated with each personality trait. The estimates are in line with previous works from the literature. The strongest marginal effect is on the correlation between gender and Agreeableness (+8.801 for females); in general, we observe higher levels on personality in females, workers (whether employed or self-employed) and individuals in good health. The only exception is Neuroticism, that is higher among females but lower among workers and people in good health. Other variables that in two or more equations turn out to be relevant to describe personality are: ethnicity, marital status, and education (highly important to increase Openness to Experience). Age, income and (financial and real) wealth also have a significant correlation with personality, but their correlation is small in practice: for instance, the largest coefficient on age informs that Neuroticism falls by only 2.321 after a non-negligible age increase of 10 years. We also find significant effects of the year dummies, in all the equations with the exception of Agreeableness. It seems that four out of the five personality traits fell in years 2010 and 2012 (by a small amount, though: 1.878 at most), perhaps due to the economic crisis.

[4] Univariate OLS and tobit regressions, however, provide similar results that are available upon request.

Regarding the lifetime traumas, only a small part of the findings that we found significant in Table 2 are confirmed here in this analysis, where we control for the correlation of the personality traits across each other and with the trauma and socio-demographic variables. In particular, we learn that: i) physical attacks are positively correlated with Openness to Experience and Neuroticism; ii) personal or familiar illnesses or accidents are positively correlated with Openness to Experience and Agreeableness; iii) Conscientiousness and Extraversion are virtually uncorrelated with traumas; iv) a child death has no bearings on personality. The significant marginal effects of the lifetime traumas are generally small, with the largest coefficients being those involving Openness to Experience (physical attack: +3.276; personal illness or accident: +2.584). Compared to Table 2, we confirm that Openness to Experience is the personality trait most correlated with the lifetime events. Our interpretation of the positive coefficients on physical attacks and life-threatening illnesses or accidents is that people who experienced those devastating events, but are still alive to talk about them, strengthened themselves, and now have a more open-minded view of life that makes them more flexible and adaptive to new experiences. This finding is consistent with the idea that there can be a "positive legacy of trauma" (Tedeschi and Calhoun, 1996): as they observe, prior research has shown that the benefits reported by people who faced trauma include positive change in the perception of the self, in the nature of their relationships with others and in their philosophy of life.[5]

TABLE 3 ABOUT HERE

Table 4 replicates the analysis of Table 3, by adding to the specification information on the timing of the lifetime trauma. Specifically, we replace the dummy variables on the occurrence of the trauma with dummy variables informing whether each specific trauma has occurred within the last 5 years, between 6 and 20 years, or more than 20 years ago. The distinction in the three periods, in line with Bucciol and Zarri (2015a), is meant to understand

[5] Similarly, Collins et al. (1990) work on cancer patients shows that the most common positive change reported by them was feeling stronger and more self-assured.

if the correlation between personality and the traumas changes in the short, medium or long run.

The new estimates provide findings similar to those in Table 3: also here we find significantly positive correlation of physical attacks with Openness to Experience and Neuroticism, and positive correlation of life-threatening illnesses or accidents with Openness to Experience and Agreeableness. The timing information added in the table, however, suggests that a physical attack becomes relevant only in the long run (20 or more years), while illnesses and accidents are always relevant, disregarding the timing.[6]

TABLE 4 ABOUT HERE

4.2. Before and after occurrence of a lifetime trauma

In our sample, many of the individuals who experienced a trauma did so several years earlier. For instance, 27 percent of the respondents reported that a lifetime trauma occurred 20 years before or earlier. However, to properly address our research question we should investigate if personality changes *right after* the occurrence of a traumatic event. A better way to assess it is by taking a sub-sample of observations. Specifically, we consider only individuals interviewed in two waves, who reported no trauma at the time of their first interview, and one or more traumas at the time of their second interview. This way, the comparison of the observations allows us to understand if personality changed after the occurrence of the trauma.

Table 5 shows summary statistics on this sub-sample, which includes 3,004 observations on 1,502 individuals. Of course, lifetime traumas are more frequent in this sub-sample than in the whole sample; the remaining characteristics, measured in the personality

[6] In fact, even though occasionally the coefficients on illness or accident are not individually different from zero, they turn out to be statistically the same at all time ranges, for given personality. Chi-squared test of equality of the three coefficients: 4.24; p-value: 0.12 (Openness to Experience; personal illness); 0.42; p-value: 0.81 (Openness to Experience; illness to others); 1.19; p-value: 0.55 (Agreeableness; personal illness); 0.18; p-value: 0.91 (Agreeableness; illness to others).

and control variables, are similar.[7] This evidence supports the view that the traumas occur on a random basis.

TABLE 5 ABOUT HERE

Table 6 concludes our analysis by reporting the analog to Table 3 in the sub-sample of individuals who experienced a lifetime trauma during our sample period. We find a significant effect of a subset of coefficients only. Compared to Table 3, we still find: positive correlation of physical attacks with Openness to Experience, but no longer with Neuroticism; positive correlation of personal illnesses or accidents with Openness to Experience, but no longer with Agreeableness; positive correlation of family illnesses or accidents with Openness to Experience and Agreeableness, and in addition Extraversion. No other coefficient on lifetime traumas is significant. Overall, the Conscientiousness and Neuroticism traits seem not to be altered by negative life events, while the death of a child happens to be uncorrelated with personality traits.

TABLE 6 ABOUT HERE

Figure 1 and 2 summarize the findings from Table 6 in terms of predictions of the personality scores conditional on the reference year (Figure 1) and the occurrence of each trauma (Figure 2). The remaining explanatory variables are kept fixed and equal to their average in the sub-sample.

FIGURE 1 ABOUT HERE

Figure 1 highlights the large variation over time of Openness to Experience (panel a) and Extraversion (panel c) and the relative stability over time of Neuroticism (panel e).

[7] The only significant differences with the whole sample (significant at a 5% level to a mean-comparison t-test) reveal that this sub-sample is slightly more frequently populated by whites, natives and retirees who report a generally worse health condition.

Figure 2 suggests that Openness to Experience varies with the traumas (panel a), whereas Conscientiousness and Neuroticism are relatively unaltered (panels b and e, respectively). Overall it seems that, within the personality traits included in the "Big Five" taxonomy, Openness to Experience is the more responsive to variations in the environment, as described by the year and personal trauma dummies.

FIGURE 2 ABOUT HERE

5. Conclusions

Our analysis provides insight into the factors affecting individuals' personality traits, showing that some prior lifetime negative events out of individual's control are significantly correlated with some personality traits later in life. In particular, after controlling for classic socio-demographic characteristics, we show that i) Openness to Experience is positively correlated with having been victim of physical attacks, personal or familiar illnesses or accidents; ii) Extraversion, Agreeableness, and Neuroticism are also correlated with negative life events; iii) Conscientiousness is unaltered by traumas; iv) a child death has no bearings on personality. Therefore, the "shadow of the past" (Bucciol and Zarri, 2015a) also influences one's personality traits: what an individual experienced in her life has indeed important consequences on her patterns of thoughts, feelings, and behavior (i.e. on her personality) today.

A related important question in our empirical analysis was the following: are the effects of lifetime negative events on personality traits significant both in the short-run and in the long-run? When taking into account the timing of the lifetime trauma, we find that a physical attack becomes relevant only in the long run (20 or more years), while illnesses and accidents are always relevant, regardless of the timing of their occurrence.

Overall, Openness to Experience seems the personality trait that most correlates with the lifetime events included in our analysis. Our interpretation of the positive coefficients on physical attacks and life-threatening illnesses or accidents is that people who experienced those devastating events but could survive, are likely to attribute more importance to life (and

to the experiences it can offer) right because they felt they were close to losing it. This *positive* personality change following *negative* life events provides support to the idea that, as we pointed out in Section 4.1, there can be a "positive legacy of trauma" (Tedeschi and Calhoun, 1996), and resembles to some extent the "what doesn't kill you will only make you stronger" effect detected by Bernile et al. (2016) in the corporate policies domain, as they find that CEOs who experienced fatal disasters without extremely negative consequences in their early life lead firms that behave more aggressively.

Next, it is plausible to believe that our findings on the relationships between (some) personality traits and (some) negative life events contribute to account for the fact that, as shown by Bonanno (2004), many individuals who have been exposed to loss or potentially traumatic events at some points in their lives, are resilient and continue to have positive emotional experiences, show only minor disruptions in their ability to function. We believe that, taken together, our major findings, that is showing that i) (some) negative events are positively linked to Openness to Experience, ii) a trait like Conscientiousness does not turn out to be significantly affected by life events and iii) a traumatic event such as child death has no bearings on personality, contribute to our understanding of why some people succeed in coping with traumas while others do not.

Our results differ from Cobb-Clark and Schurer (2002), as they show that personality traits are stable among working-age adults – with small mean-level changes in Big Five traits and small variations across age groups – and provide no evidence that intra-individual personality change can be significantly associated to adverse employment, health or family events experienced by individuals. We believe that the difference between their findings and ours has mainly to do with the set of negative events taken into account in the empirical analysis: while they consider a broad set of adverse events which includes both events under and out of an individual's control, as well as both economically relevant and less economically relevant ones, in our analysis – as we made clear in the introductory section – we rely on the same set of negative lifetime events considered in Bucciol and Zarri (2015a). In particular, the events that we take into account share the following features: they are potentially traumatic ones; they are out of an individual's control and they have no obvious economic consequences in the medium-long run.

We claim that our work might be extended in several directions. First, it may be enriched by a finer, analysis of personality structure. Second, it would be interesting to go beyond the "Big Five" taxonomy and include further personality traits (not incorporated in the Big Five model) into the picture. Next, it would be interesting to see whether not only negative lifetime events but also positive events do play a role in shaping one's personality traits later in life. Finally, future work could also see whether the different degrees of stability exhibited over time by different Big Five traits in our analysis (with Openness to Experience displaying the largest variation and Conscientiousness and Neuroticism the highest degree of relative stability) also emerge when other events or environmental factors shaping personality over time are taken into account. These extensions of our analysis are left as interesting avenues for future empirical research on the determinants of personality change.

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Appendix. Key Variables in HRS

Within squared parentheses we report the name of the variable in HRS, wave 2012.

A.1. Variables on Lifetime Traumas[8]

"For each of the following events, please indicate whether the event occurred AT ANY POINT IN YOUR LIFE. If the event did happen, please indicate the year in which it happened MOST RECENTLY.

[lb037a] Has a child of yours ever died?

[lb037e] Were you the victim of a serious physical attack or assault?

[lb037f] Did you ever have a life-threatening illness or accident?

[lb037g] Did your spouse or a child of yours ever have a life-threatening illness or accident?"

Possible answers are: "Yes"; "No".

For each question, if the answer is ''Yes'', one further question asks "If Yes, what year?"

A.2. Variables on Personality[9]

"Please indicate how well each of the following describes you.

[lb033a] Outgoing

[lb033b] Helpful

[lb033d] Moody

[lb033e] Organized

[lb033f] Friendly

[lb033g] Warm

[lb033h] Worrying

[lb033i] Responsible

[8] *Source*: Krause, N., Shaw, B A., and Cairney, J. (2004). A Descriptive Epidemiology of Lifetime Trauma and the Physical Health Status of Older Adults. *Psychology and Aging*, *19*(4), 637-648.

[9] *Source*: Lachman, M.E., and Weaver, S.L. (1997). Midlife Development Inventory (MIDI) Personality Scales: Scale Construction and Scoring. Unpublished Technical Report. Brandeis University. (http://www.brandeis.edu/projects/lifespan/scales.html)

[lb033j] Lively

[lb033k] Caring

[lb033l] Nervous

[lb033m] Creative

[lb033n] Hardworking

[lb033o] Imaginative

[lb033p] Softhearted

[lb033q] Calm

[lb033s] Intelligent

[lb033t] Curious

[lb033u] Active

[lb033v] Careless

[lb033w] Broad-minded

[lb033y] Sympathetic

[lb033z2] Talkative

[lb033z3] Sophisticated

[lb033z4] Adventurous

[lb033z5] Thorough"

Possible answers are: "Not at all", "A little", "Some" and "A lot", to which we assign the value 1, 2, 3 and 4 respectively. We assign the reverse code to items lb033q and lb033v.
Scores are constructed following Smith et al. (2013), as the average of the following items:
Openness to Experience: lb033m, lb033o, lb033s, lb033t, lb033w, lb033z3, lb033z4.
Conscientiousness: lb033e, lb033i, lb033n, lb033v, lb033z5.
Extraversion: lb033a, lb033f, lb033j, lb033u, lb033z3.
Agreeableness: lb033b, lb033g, lb033k, lb033p, lb033y.
Neuroticism: lb033d, lb033h, lb033l, lb033q.
Each score is missing when more than half of the items are missing. For sake of comparability, in the analysis we rescale each score in the 0-1 range.

Table 1. Summary Statistics (16,738 observations)

Variable	Dummy	Mean	Std. Dev.	Min.	Max.
Personality variables					
Openness to Experience	No	64.563	18.364	0	100
Conscientiousness	No	68.688	13.498	0	100
Extraversion	No	73.474	18.402	0	100
Agreeableness	No	84.339	15.853	0	100
Neuroticism	No	44.601	15.834	0	100
Lifetime traumas					
Child death	Yes	0.164	0.370	0	1
Physical attack	Yes	0.063	0.242	0	1
Illness or accident (respondent)	Yes	0.260	0.439	0	1
Illness or accident (partner or child)	Yes	0.296	0.456	0	1
Control variables					
Age/10	Yes	6.701	0.757	5	8
Female	Yes	0.600	0.490	0	1
Non-white	Yes	0.170	0.375	0	1
Married	Yes	0.691	0.462	0	1
Worker	Yes	0.377	0.485	0	1
High school	Yes	0.180	0.384	0	1
College	Yes	0.097	0.295	0	1
Ln(income)	No	10.608	1.291	0	15.540
Ln(financial wealth)	No	7.963	4.618	0.668	17.308
Ln(real wealth)	No	10.876	3.242	0.668	18.295
Home owner	Yes	0.846	0.361	0	1
Self-ass. good health	Yes	0.444	0.497	0	1
Year 2008	Yes	0.258	0.437	0	1
Year 2010	Yes	0.253	0.435	0	1
Year 2012	Yes	0.213	0.410	0	1

Table 2. Personality and lifetime traumas

Negative event	Yes		No		Test
	Obs.	Average	Obs.	Average	(Yes-No)
Openness					
Child death	2,738	63.490	14,000	64.772	-3.344***
Physical attack	1,050	68.180	15,688	64.320	6.601***
Illness or accident (respondent)	4,354	65.933	12,384	64.081	5.731***
Illness or accident (partner or child)	4,953	65.531	11,785	64.155	4.426***
Conscientiousness					
Child death	2,738	67.876	14,000	68.847	-3.446***
Physical attack	1,050	67.998	15,688	68.735	-1.711*
Illness or accident (respondent)	4,354	68.175	12,384	68.869	-2.918***
Illness or accident (partner or child)	4,953	68.726	11,785	68.672	0.236
Extraversion					
Child death	2,738	73.641	14,000	73.441	0.520
Physical attack	1,050	71.983	15,688	73.574	-2.712***
Illness or accident (respondent)	4,354	72.716	12,384	73.741	-3.162***
Illness or accident (partner or child)	4,953	73.659	11,785	73.397	0.844
Agreeableness					
Child death	2,738	84.576	14,000	84.293	0.855
Physical attack	1,050	83.726	15,688	84.380	-1.294
Illness or accident (respondent)	4,354	84.039	12,384	84.444	-1.452
Illness or accident (partner or child)	4,953	85.543	11,785	83.833	6.377***
Neuroticism					
Child death	2,738	44.851	14,000	44.552	0.903
Physical attack	1,050	47.418	15,688	44.413	5.960***
Illness or accident (respondent)	4,354	45.121	12,384	44.419	2.517**
Illness or accident (partner or child)	4,953	44.790	11,785	44.522	1.002

Note. The table reports the average of the personality variables in the sub-sample of those who experienced or not the trauma. The final column lists the value of a t-test on the equality of the average in the two sub-samples. *** p<0.01, ** p<0.05, * p<0.1

Table 3. Regression Analysis

	(1) Openness	(2) Conscientious.	(3) Extraversion	(4) Agreeableness	(5) Neuroticism
Child death	0.077	0.182	0.431	-0.066	-0.094
	(0.458)	(0.348)	(0.458)	(0.392)	(0.390)
Physical attack	3.276***	-0.169	-0.868	-0.840	1.531***
	(0.641)	(0.477)	(0.684)	(0.571)	(0.568)
Illness or accident (respondent)	2.584***	0.423	0.675*	0.967***	0.322
	(0.358)	(0.267)	(0.375)	(0.309)	(0.306)
Illness or accident (partner or child)	1.026***	-0.082	0.044	0.977***	-0.025
	(0.342)	(0.248)	(0.355)	(0.287)	(0.287)
Age/10	-0.722***	0.158	1.506***	0.497**	-2.321***
	(0.259)	(0.188)	(0.264)	(0.222)	(0.211)
Female	0.692*	2.119***	3.362***	8.801***	3.391***
	(0.355)	(0.258)	(0.367)	(0.314)	(0.295)
Non-white	2.711***	0.341	3.763***	-0.100	-3.468***
	(0.489)	(0.357)	(0.468)	(0.414)	(0.408)
Married	-1.243***	0.085	0.102	0.109	1.037***
	(0.406)	(0.291)	(0.398)	(0.337)	(0.342)
Worker	1.368***	2.039***	1.835***	1.185***	-1.015***
	(0.375)	(0.267)	(0.381)	(0.318)	(0.311)
High school	5.086***	1.358***	-0.235	-0.225	-1.239***
	(0.441)	(0.305)	(0.475)	(0.385)	(0.369)
College	8.761***	2.519***	-0.473	-0.589	-1.300***
	(0.547)	(0.389)	(0.618)	(0.517)	(0.469)
Ln(income)	0.705***	0.261**	0.253*	0.327**	-0.365***
	(0.146)	(0.108)	(0.143)	(0.130)	(0.126)
Ln(financial wealth)	0.072*	0.186***	0.015	-0.017	-0.180***
	(0.040)	(0.030)	(0.041)	(0.035)	(0.035)
Ln(real wealth)	0.297***	0.177***	0.245***	0.159**	-0.208***
	(0.073)	(0.054)	(0.072)	(0.062)	(0.061)
Home owner	-0.564	-0.349	-0.947	-0.942*	-0.409
	(0.606)	(0.440)	(0.599)	(0.506)	(0.518)
Self-ass. good health	5.249***	4.161***	7.269***	2.773***	-4.117***
	(0.327)	(0.231)	(0.333)	(0.274)	(0.271)
Year 2008	-0.091	0.201	-0.441	0.221	-0.812**
	(0.373)	(0.270)	(0.381)	(0.317)	(0.330)
Year 2010	-0.827***	-1.424***	-1.348***	-0.371	-1.646***
	(0.266)	(0.215)	(0.266)	(0.233)	(0.262)
Year 2012	-1.126***	-1.570***	-1.878***	-0.567	-1.781***
	(0.408)	(0.303)	(0.417)	(0.349)	(0.355)
Constant	53.257***	57.808***	52.818***	69.509***	69.298***
	(2.357)	(1.730)	(2.375)	(2.090)	(1.991)
Sigma	17.573***	13.022***	17.878***	15.181***	15.343***
	(0.107)	(0.100)	(0.113)	(0.120)	(0.094)
Corr.: Openness		0.468	0.538	0.436	0.015
Corr.: Conscientious.	0.468		0.411	0.423	0.121
Corr.: Extraversion	0.538	0.411		0.555	-0.026
Corr.: Agreeableness	0.436	0.423	0.555		0.097
Corr.: Neuroticism	0.015	0.121	-0.026	0.097	

Note. Log-likelihood: -339,647.280; 16,738 observations on 9,909 households. Standard errors clustered at the individual level in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 4. Regression Analysis

	(1) Openness	(2) Conscientious.	(3) Extraversion	(4) Agreeableness	(5) Neuroticism
Child death					
0-5 years ago	-0.923	0.163	-1.286	-0.826	1.242
	(0.952)	(0.745)	(0.991)	(0.851)	(0.811)
6-20 years ago	-0.110	-0.104	0.713	-0.336	-1.172*
	(0.774)	(0.606)	(0.773)	(0.676)	(0.624)
20+ years ago	0.830	0.716	0.954	0.777	0.059
	(0.606)	(0.445)	(0.605)	(0.493)	(0.526)
Physical attack					
0-5 years ago	3.937*	2.560	0.773	0.603	0.889
	(2.294)	(1.595)	(2.354)	(2.419)	(2.066)
6-20 years ago	2.581*	-0.194	-2.540	0.388	0.896
	(1.526)	(1.101)	(1.624)	(1.247)	(1.304)
20+ years ago	3.476***	-0.296	-0.648	-0.728	1.453**
	(0.760)	(0.569)	(0.813)	(0.653)	(0.682)
Illness or accident (respondent)					
0-5 years ago	2.125***	0.061	-0.113	1.254**	0.294
	(0.595)	(0.462)	(0.637)	(0.521)	(0.530)
6-20 years ago	1.916***	0.129	0.670	0.995**	-0.181
	(0.558)	(0.409)	(0.584)	(0.461)	(0.471)
20+ years ago	3.276***	0.514	1.002*	0.572	0.266
	(0.515)	(0.388)	(0.539)	(0.448)	(0.452)
Illness or accident (partner or child)					
0-5 years ago	1.233**	0.107	0.380	0.944**	-0.514
	(0.566)	(0.399)	(0.590)	(0.476)	(0.473)
6-20 years ago	0.788	-0.110	0.363	1.026**	-0.227
	(0.504)	(0.374)	(0.522)	(0.420)	(0.416)
20+ years ago	1.030**	-0.328	-0.244	1.183***	-0.577
	(0.524)	(0.378)	(0.543)	(0.420)	(0.446)

(Continues in the next page)

Table 4. Regression Analysis (continues from previous page)

	(1) Openness	(2) Conscientious.	(3) Extraversion	(4) Agreeableness	(5) Neuroticism
Age/10	-0.741***	0.160	1.508***	0.509**	-2.317***
	(0.259)	(0.188)	(0.263)	(0.222)	(0.211)
Female	0.680*	2.106***	3.349***	8.799***	3.383***
	(0.353)	(0.257)	(0.366)	(0.313)	(0.294)
Non-white	2.690***	0.304	3.737***	-0.119	-3.491***
	(0.487)	(0.355)	(0.464)	(0.411)	(0.406)
Married	-1.261***	0.089	0.106	0.134	0.999***
	(0.406)	(0.291)	(0.397)	(0.336)	(0.341)
Worker	1.315***	2.031***	1.818***	1.182***	-1.029***
	(0.374)	(0.266)	(0.378)	(0.316)	(0.312)
High school	5.123***	1.380***	-0.221	-0.222	-1.214***
	(0.439)	(0.304)	(0.472)	(0.383)	(0.370)
College	8.818***	2.531***	-0.451	-0.581	-1.278***
	(0.544)	(0.386)	(0.611)	(0.513)	(0.467)
Ln(income)	0.707***	0.261**	0.249*	0.325***	-0.360***
	(0.143)	(0.104)	(0.138)	(0.126)	(0.127)
Ln(financial wealth)	0.070*	0.187***	0.015	-0.016	-0.181***
	(0.040)	(0.030)	(0.041)	(0.034)	(0.035)
Ln(real wealth)	0.296***	0.177***	0.243***	0.163***	-0.208***
	(0.072)	(0.053)	(0.070)	(0.060)	(0.061)
Home owner	-0.583	-0.355	-0.949	-0.935*	-0.427
	(0.603)	(0.438)	(0.596)	(0.502)	(0.518)
Self-ass. good health	5.156***	4.133***	7.236***	2.753***	-4.157***
	(0.325)	(0.230)	(0.330)	(0.273)	(0.270)
Year 2008	-0.099	0.197	-0.447	0.225	-0.825**
	(0.372)	(0.269)	(0.379)	(0.315)	(0.329)
Year 2010	-0.974***	-1.428***	-1.371***	-0.423*	-1.651***
	(0.267)	(0.216)	(0.266)	(0.234)	(0.262)
Year 2012	-1.298***	-1.573***	-1.899***	-0.610*	-1.801***
	(0.409)	(0.304)	(0.417)	(0.349)	(0.355)
Constant	53.662***	57.834***	52.901***	69.396***	69.487***
	(2.335)	(1.701)	(2.339)	(2.057)	(2.001)
Sigma	17.574***	13.020***	17.871***	15.178***	15.341***
	(0.107)	(0.100)	(0.113)	(0.093)	(0.093)
Corr.: Openness		0.468	0.538	0.436	0.016
Corr.: Conscientious.	0.468		0.411	0.423	0.121
Corr.: Extraversion	0.538	0.411		0.555	-0.026
Corr.: Agreeableness	0.436	0.423	0.555		0.098
Corr.: Neuroticism	0.016	0.121	-0.026	0.098	

Note. Log-likelihood: -339,632.410; 16,738 observations on 9,909 households. Standard errors clustered at the individual level in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 5. Summary Statistics on the Subsample (3,004 observations)

Variable	Dummy	Mean	Std. Dev.	Min.	Max.
Personality variables					
Openness to Experience	No	0.652	0.182	0	1
Conscientiousness	No	0.688	0.134	0	1
Extraversion	No	0.731	0.186	0	1
Agreeableness	No	0.844	0.153	0	1
Neuroticism	No	0.450	0.158	0	1
Lifetime traumas					
Child death	Yes	0.230	0.421	0	1
Physical attack	Yes	0.107	0.309	0	1
Illness or accident (respondent)	Yes	0.382	0.486	0	1
Illness or accident (partner or child)	Yes	0.411	0.492	0	1
Control variables					
Age/10	Yes	6.718	0.709	5	8
Female	Yes	0.590	0.492	0	1
Non-white	Yes	0.145	0.352	0	1
Married	Yes	0.697	0.460	0	1
Worker	Yes	0.344	0.475	0	1
High school	Yes	0.172	0.377	0	1
College	Yes	0.099	0.290	0	1
Ln(income)	No	10.612	1.116	0	14.806
Ln(financial wealth)	No	7.847	4.644	0.668	16.077
Ln(real wealth)	No	10.814	3.228	0.668	16.636
Home owner	Yes	0.845	0.362	0	1
Self-ass. good health	Yes	0.408	0.492	0	1
Year 2008	Yes	0.239	0.426	0	1
Year 2010	Yes	0.262	0.440	0	1
Year 2012	Yes	0.238	0.426	0	1

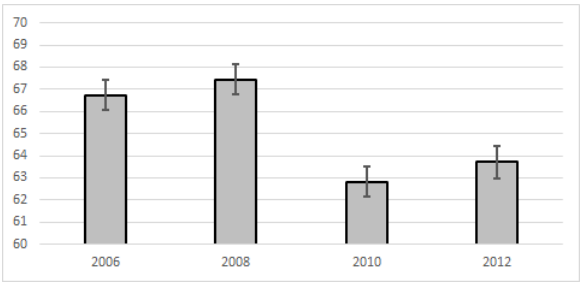
Table 6. Regression Analysis on the Subsample

	(1) Openness	(2) Conscientious.	(3) Extraversion	(4) Agreeableness	(5) Neuroticism
Child death	0.242	-0.049	0.478	0.170	0.087
	(0.898)	(0.718)	(0.977)	(0.771)	(0.804)
Physical attack	2.416**	-0.889	-1.156	-1.794*	0.291
	(1.204)	(0.915)	(1.256)	(1.036)	(0.970)
Illness or accident (respondent)	3.796***	-0.037	1.049	0.970	0.063
	(0.789)	(0.631)	(0.844)	(0.678)	(0.694)
Illness or accident (partner or child)	2.363***	-0.147	2.211***	2.048***	-0.856
	(0.752)	(0.570)	(0.782)	(0.661)	(0.684)
Age/10	-1.013	0.660	1.495**	1.049*	-2.760***
	(0.685)	(0.489)	(0.707)	(0.564)	(0.563)
Female	0.174	1.804***	2.349***	7.683***	3.913***
	(0.830)	(0.620)	(0.892)	(0.726)	(0.699)
Non-white	3.889***	0.783	4.687***	0.329	-2.719**
	(1.241)	(0.927)	(1.214)	(1.103)	(1.064)
Married	-2.207**	0.185	0.492	-0.743	-0.672
	(0.920)	(0.688)	(0.956)	(0.771)	(0.826)
Worker	0.953	2.357***	2.781***	2.295***	-1.347*
	(0.877)	(0.646)	(0.911)	(0.770)	(0.744)
High school	6.437***	1.689**	0.557	0.392	-2.441***
	(1.065)	(0.739)	(1.205)	(0.911)	(0.911)
College	9.746***	2.841***	0.106	-2.173*	-1.748
	(1.323)	(0.953)	(1.552)	(1.319)	(1.102)
Ln(income)	1.151***	0.630**	0.293	0.346	-0.439
	(0.367)	(0.264)	(0.358)	(0.318)	(0.335)
Ln(financial wealth)	0.128	0.160**	0.122	-0.047	-0.145*
	(0.093)	(0.068)	(0.098)	(0.081)	(0.082)
Ln(real wealth)	0.035	0.011	-0.056	-0.011	-0.251
	(0.180)	(0.126)	(0.174)	(0.143)	(0.155)
Home owner	0.080	-0.158	-0.721	0.620	1.705
	(1.393)	(0.956)	(1.446)	(1.194)	(1.211)
Self-ass. good health	6.649***	3.820***	7.846***	2.473***	-4.445***
	(0.762)	(0.541)	(0.803)	(0.623)	(0.652)
Year 2008	0.703	0.710	-0.485	-0.052	-0.157
	(0.890)	(0.649)	(0.942)	(0.753)	(0.814)
Year 2010	-3.929***	-1.575**	-2.910***	-1.394**	-0.895
	(0.816)	(0.666)	(0.854)	(0.700)	(0.765)
Year 2012	-3.031***	-0.596	-2.729**	-1.309	-0.310
	(1.120)	(0.842)	(1.186)	(0.948)	(1.026)
Constant	52.898***	52.723***	53.785***	67.556***	72.690***
	(6.117)	(4.437)	(6.212)	(5.161)	(5.286)
Sigma	17.120***	12.905***	17.981***	14.694***	15.287***
	(0.255)	(0.235)	(0.278)	(0.280)	(0.218)
Corr.: Openness		0.445	0.532	0.409	0.031
Corr.: Conscientious.	0.445		0.382	0.402	0.128
Corr.: Extraversion	0.532	0.382		0.551	-0.022
Corr.: Agreeableness	0.409	0.402	0.551		0.106
Corr.: Neuroticism	0.031	0.128	-0.022	0.106	

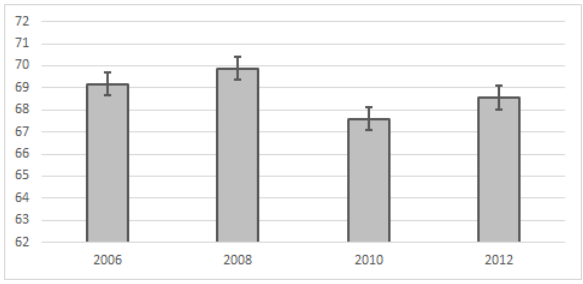
Note. Log-likelihood: -60,845.072; 3,004 observations on 1,502 households. Standard errors clustered at the individual level in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Figure 1. Personality over time

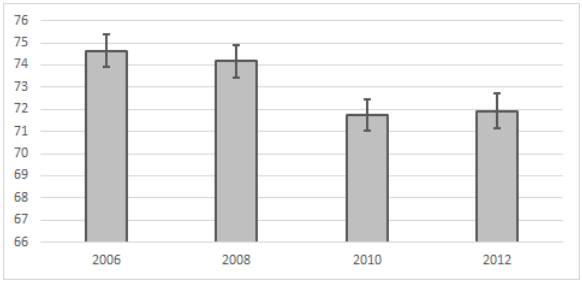
a) Openness to Experience



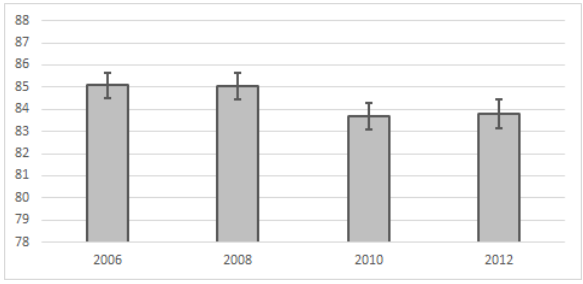
b) Conscientiousness



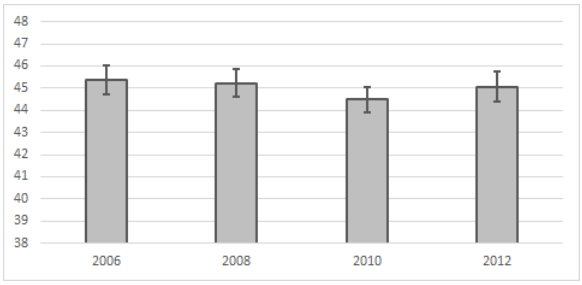
c) Extraversion



d) Agreeableness



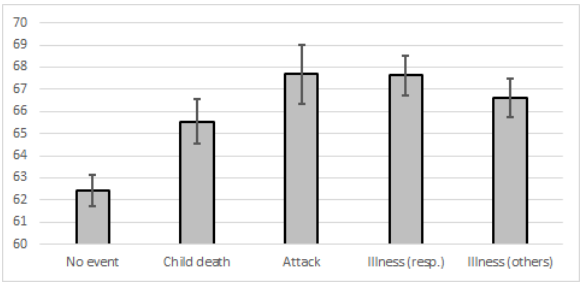
e) Neuroticism



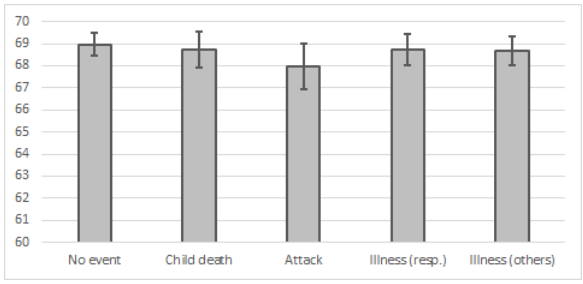
Note: Predictions based on the model of Table 6, keeping all the other explanatory variables constant at their average value in the sample. Lines report standard errors.

Figure 2. Personality by lifetime trauma

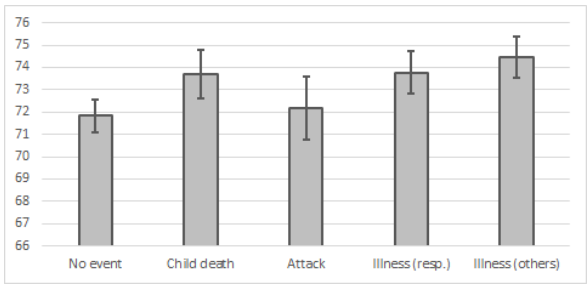
a) Openness to Experience



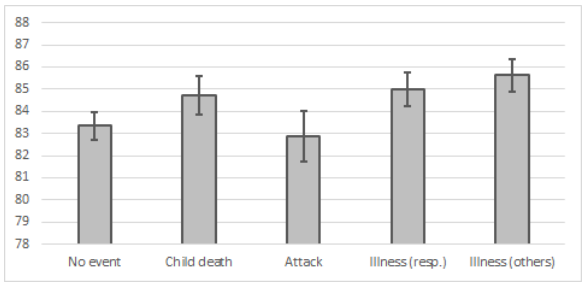
b) Conscientiousness



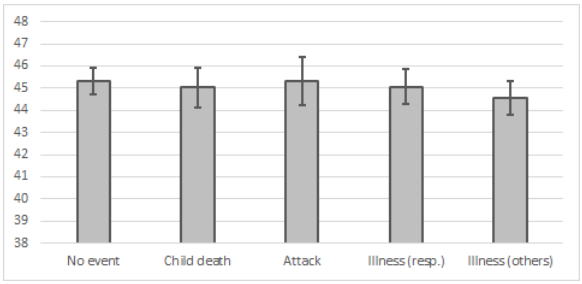
c) Extraversion



d) Agreeableness



e) Neuroticism



Note: Predictions based on the model of Table 6, keeping all the other explanatory variables constant at their average value in the sample. Lines report standard errors.