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Personality Traits and Mental Health: Considering the Role of Age

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Abstract: Personality traits are dispositional characteristics that capture basic individual differences. The Big Five model is one of the most studied personality models and can be conceptualized using other personality models as well. Personality traits are also closely associated with mental health, which is our general state of well-being. However, it is largely unknown how the relationships between the Big Five personality traits and mental health may differ with age. By analyzing data using hierarchical regression and multiple regressions, the current research found that age modulates the associations between all Big Five personality traits (i.e., Neuroticism, Agreeableness, Openness, Conscientiousness, and Extraversion) and mental health. These findings can be mostly explained by predominant development theories. The current study indicates the necessity for considering age differences when investigating the relationships between the Big Five personality traits and mental health. Psychologists may want to work out a way to improve mental health based on age and personality characteristics.

Keywords: personality; Big Five; mental health; age

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1. Introduction

Personality refers to dispositional characteristics in terms of how one perceives, thinks, and behaves [1]. The Big Five is one of the most studied models of personality, which can also be conceptualized using other personality models. Specifically, there are five domains/traits known as the Big Five: Neuroticism, Agreeableness, Openness, Conscientiousness, and Extraversion [2]. Neurotic individuals tend to be emotionally unstable and have a lot of affective issues, which puts them at higher risk of poor mental health [3]. People with high Openness tend to be appreciative of art, beauty, and various new experiences [4]. Conscientious individuals tend to be self-disciplined, task-focused, goal-driven, and competent [5]. Given the importance of personality, investigating the associations between personality traits and mental health is warranted.

Mental health is "a condition of well-being in which each person fulfills his or her own potential, can cope with typical stressors of life, can work successfully and fruitfully, and can contribute to her or his community" [6]. Indeed, personality traits have been suggested to be strong predictors of psychological health [7–9], which is made up of mental health/well-being [10–12]. Healthy development of personality may benefit well-being and it is necessary to consider the role of personality in interventions for mental health [12–14]. The literature generally agrees that Neuroticism has a negative association with mental health, whereas the other traits are positively connected to mental health (e.g., [7–10,15–19]).

However, the role of age in the relationships between these personality traits and mental health is largely ignored in the literature, although both the Big Five personality traits (e.g., [20,21]) and mental health (e.g., [22,23]) change with age. Personality traits tend to evolve over time, with adolescence and early adulthood being critical periods for emotional development, where traits such as Neuroticism and Extraversion may shift in

response to social and environmental changes [21]. Research has shown that traits like Conscientiousness and Agreeableness often increase, while Neuroticism tends to decrease with age, reflecting greater emotional stability and adaptability in adulthood [20]. Similarly, mental health conditions exhibit distinct age patterns, with studies indicating that the onset of many mental disorders, such as anxiety and depression, typically occurs during adolescence and early adulthood due to heightened stress, biological changes, and life transitions [23]. For example, Furnham and Cheng [22] found that psychological distress tends to peak in late adolescence and may improve in early adulthood as individuals gain coping skills and adapt to life's demands. As individuals age, their mental health can also be shaped by accumulating life experiences and social roles, such as career and family obligations, influencing their resilience or vulnerability to mental health challenges. Thus, age-related patterns in both personality development and mental health are intertwined, making age a crucial variable when investigating psychological well-being across a person's lifespan.

Moreover, there are a lot of reasons why age may moderate the relationships between personality traits and general mental health. For example, the concept of emerging adulthood proposes that young adulthood is a period of time where young people have to become independent and that is accompanied by changes in their roles in society and some norms for their behaviors (see [24,25] for reviews), which may make them more vulnerable to certain personality traits, such as Extraversion and Openness, that relate to behaviors such as illegal drug use [26], which can negatively affect mental health. Moreover, the predominant socioemotional selectivity theory (SST) proposes that people become increasingly conscious about how they should use their time in later life [27] as they realize their time left is limited. Such awareness makes older people pursue goals and lifestyles that make their life as enjoyable as possible. Accordingly, older adults tend to focus on the emotional aspect of their social network rather than the size of it [28]. Along with this, the benefits of Extraversion on their mental health may be weak, as Extraversion tends to be associated with bigger social network sizes [29,30], which can promote mental health.

Taken together, although previous studies have explored the associations between the Big Five and mental health, much less is known about how age may play a role in their associations. The objective of the current research is to test the moderating role of age in the relationships between the Big Five and general mental health. The current study hypothesizes that the association between Neuroticism and poorer mental health will be stronger in younger adults compared to older adults, while the positive effect of Extraversion on mental health will be more pronounced in younger adults due to their higher social demands [8,31]. We also predict that Conscientiousness will have a stronger positive impact on mental health in older adults, as it is associated with greater life satisfaction and healthier behaviors [32,33]. Additionally, the effects of Agreeableness and Openness on mental health are expected to vary across age groups, given the mixed findings in previous research regarding their influence on well-being [32].

2. Methods

2.1. Data

Data from Wave 3, Understanding Society: the UK Household Longitudinal Study [34] were extracted and analyzed in the current study, which were collected between 2010 and 2011. Ethical committees at the University of Essex have approved all data collections, and participants gave their informed consent before the study began. Data from Wave 3 were used because only data from Wave 3 contain personality measures. Participants with any missing variables were removed. Thus, there were 33,217 participants with a mean age of 45.77 (S.D. = 17.95) left for further analysis. Their detailed demographic characteristics are shown in Table 1.

Table 1. Descriptive statistics of demographic characteristics, personality traits, and mental health as measured by the GHQ-12.

Variables	Mean	S.D.	Skewness	Kurtosis
Age	45.77	17.95		
Monthly income	1364.24	1364.34		
Neuroticism	3.56	1.44	0.26	2.59
Agreeableness	5.63	1.05	−0.69	3.35
Openness	4.58	1.31	−0.30	2.86
Conscientiousness	5.46	1.12	−0.53	2.96
Extraversion	4.60	1.30	−0.18	2.72
GHQ-12 (reverse-coded)	24.95	5.51	−1.44	5.62
	N	**%**		
Sex				
Male	14,643	44.08		
Female	18,574	55.92		
Highest educational qualification				
Below college	23,166	69.74		
College	10,051	30.26		
Legal marital status				
Single	16,343	49.20		
Married	16,874	50.80		
Residence				
Urban	25,548	76.91		
Rural	7669	23.09		

2.2. Measures

2.2.1. Personality Traits

Participants responded to the 15-item version of the Big Five Inventory, which has good internal consistency, test–retest reliability, convergent validity, and discriminant validity [35,36]. The scores for each item range from 1 ("disagree strongly") to 5 ("agree strongly"). The scores of these items were reverse-coded where appropriate. The items in this 15-item version of the Big Five inventory can be accessed at the following link: https://www.understandingsociety.ac.uk/documentation/mainstage/variables/?s=scptrt&post_type=variable_mainstage&submit=Search (accessed on 20 July 2024). Some exemplary items would be "I see myself as someone who has a forgiving nature", "I see myself as someone who does a thorough job", and "I see myself as someone who is original, comes up with new ideas".

2.2.2. Mental Health

The GHQ-12 (a 12-item version of the general health questionnaire) is a 12-item unidimensional measure of mental health [37]. The GHQ-12 uses the Likert method of scoring and ranges from 0 ("Not at all") to 3 ("Much more than usual"). The scores of these items were reverse-coded where appropriate. A summary score across all 12 items was used. Scores were reverse-coded, so a higher score represents better mental health. The questions in this 15-item version of the GHQ-12 can be accessed via the following link: https://www.understandingsociety.ac.uk/documentation/mainstage/variables/?s=scghq&post_type=variable_mainstage&submit=Search (accessed on 15 March 2023). Some exemplary items would be "Have you recently been able to concentrate on whatever you're doing?", "Have you recently felt capable of making decisions about things?", and "Have you recently been feeling unhappy or depressed?".

2.2.3. Demographic Variables

The control variables used include age, sex, monthly income, the highest educational qualification obtained, present legal marital status, and residence. The coding of each item is displayed in Table 1.

2.3. Analysis

The current research analyzed the dataset using a hierarchical linear regression [38]. Personality traits (i.e., Neuroticism, Agreeableness, Openness, Conscientiousness, and Extraversion), demographic variables (i.e., age, sex, monthly income, the highest educational qualification, present legal marital status, and residence), and age (continuous), by personality trait interactions [38], were used in linear models as independent variables to predict mental health. To test the direction of the strength of the associations between personality traits and mental health in each age group, participants were divided into three groups—young (−1 S.D.), mean-age, and older (+1 S.D.)—and then three simple slope regression models were created by taking the Big Five personality traits and demographic controls as predictors of the mental health in each group.

3. Results

Table 1 displays the descriptive statistics obtained.

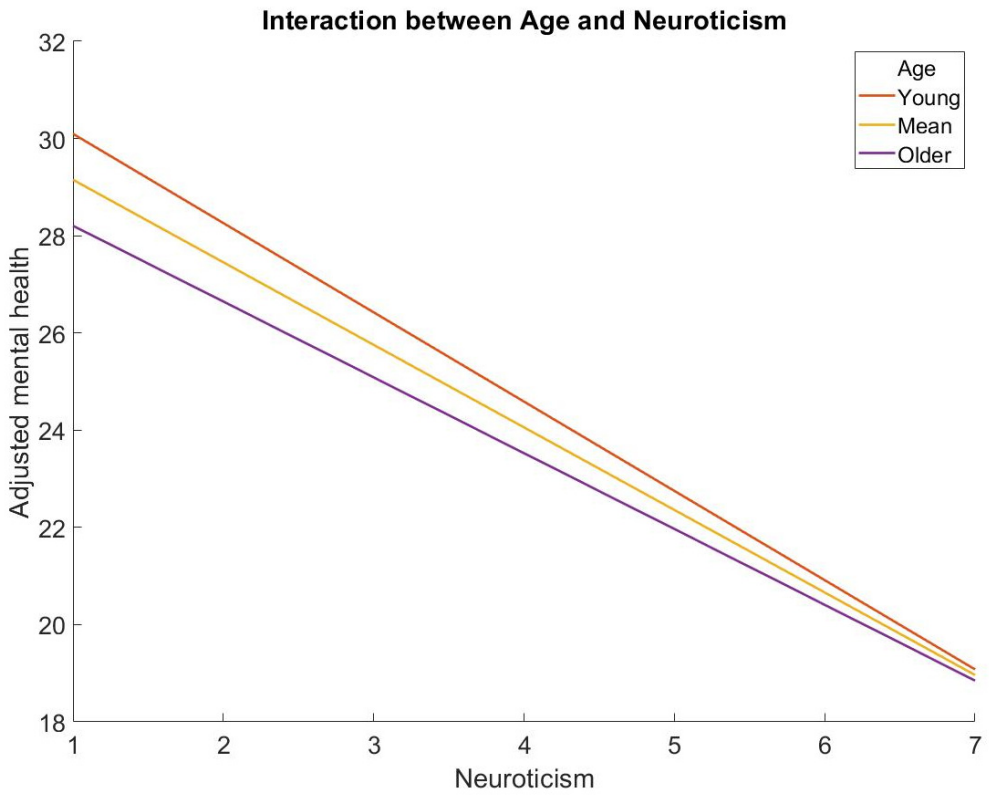
Importantly, the current study found that age is a significant moderator in the relationships between general mental health and Neuroticism ($b = 0.003$, $p < 0.01$, 95% C.I. [0.001, 0.005]), Agreeableness ($b = -0.004$, $p < 0.01$, 95% C.I. [−0.007, −0.001]), Openness ($b = 0.003$, $p < 0.01$, 95% C.I. [0.001, 0.005]), Conscientiousness ($b = 0.003$, $p < 0.01$, 95% C.I. [−0.008, −0.007]), and Extraversion ($b = -0.005$, $p < 0.001$, 95% C.I. [−0.008, −0.003]) after controlling for demographic variables (Table 2). As shown in Figure 1A, the negative relationship between Neuroticism and general mental health ($b = -1.72$, $p < 0.001$, 95% C.I. [−1.82, −1.62]) was strong in young people (−1 S.D.), stronger ($b = -1.80$, $p < 0.001$, 95% C.I. [−1.85, −1.75]) in mean-age people, and the least strong ($b = -1.39$, $p < 0.001$, 95% C.I. [−1.46, −1.75]) in older people (+1 S.D.). Moreover, Agreeableness was only positively associated with mental health ($b = 0.33$, $p < 0.001$, 95% C.I. [0.20, 0.45] in young people (−1 S.D.; Figure 1B). As shown in Figure 1C, Openness was negatively related to mental health ($b = -0.21$, $p < 0.001$, 95% C.I. [−0.32, −0.11]) in young people but positively related to mental health in older people ($b = 0.09$, $p < 0.05$, 95% C.I. [0.02, 0.17]). However, this association was not significant in mean-age adults. The positive relationship between Conscientiousness and mental health was strongest in mean-age people ($b = 0.50$, $p < 0.001$, 95% C.I. [0.43, 0.57]), less strong in young people ($b = 0.44$, $p < 0.001$, 95% C.I. [0.31, 0.56]), and the least strong in older people ($b = 0.40$, $p < 0.001$, 95% C.I. [0.31, 0.49]; Figure 1D). Finally, the positive relationship between Extraversion and mental health was the strongest among young people ($b = 0.30$, $p < 0.001$, 95% C.I. [0.19, 0.41]), weaker among mean-age people ($b = 0.16$, $p < 0.001$, 95% C.I. [0.10, 0.21]), and insignificant among older adults (Figure 1E).

Table 2. The regression coefficients (*b*) for demographics, personality traits, age by personality trait interactions, and total explained variances (R^2). All numbers were rounded up to three decimal places.

Variables	*b*	*SE*
Age	−0.009 ***	0.011
Sex	−0.269	0.057
Monthly income	0.000 *	0.000
Highest educational qualification	0.155 ***	0.061
Present legal marital status	0.409 ***	0.056
Residence	0.403 ***	0.063
Neuroticism	−1.885 ***	0.052
Agreeableness	0.261 *	0.072
Openness	−0.073 **	0.059
Conscientiousness	0.197 **	0.069
Extraversion	0.444 ***	0.060
Age × Neuroticism	0.003 **	0.001
Age × Agreeableness	−0.004 **	0.001
Age × Openness	0.002 *	0.001
Age × Conscientiousness	0.004 **	0.001
Age × Extraversion	−0.005 ***	0.001
R^2	0.246	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

(**A**)



(**B**)

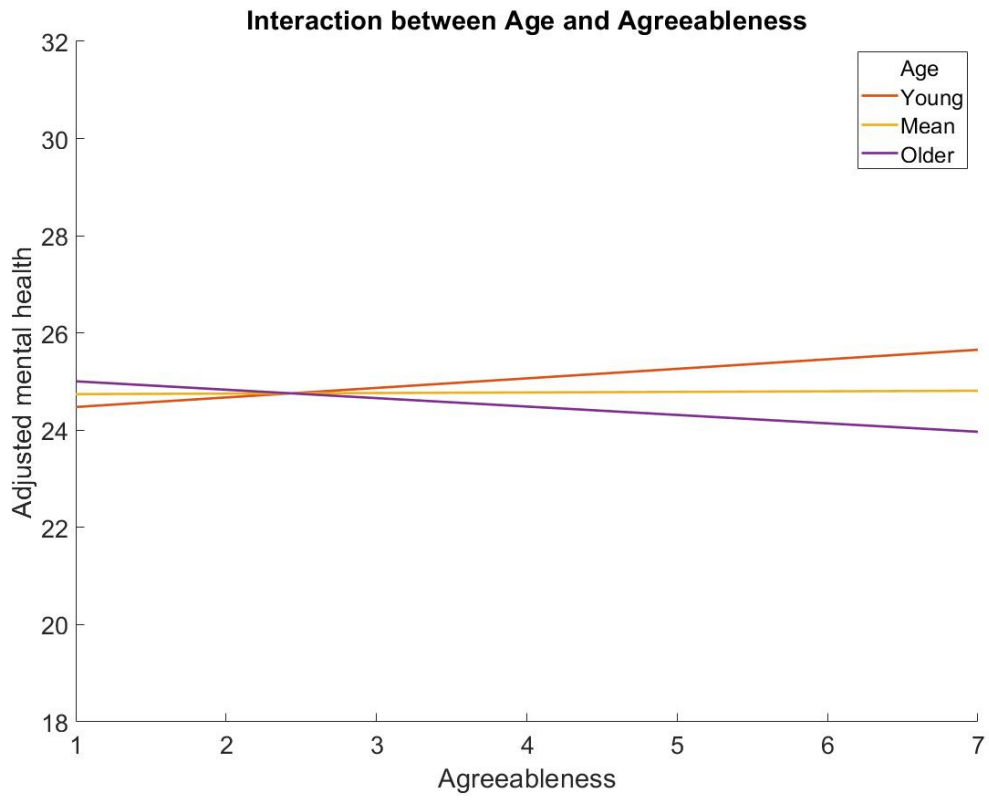
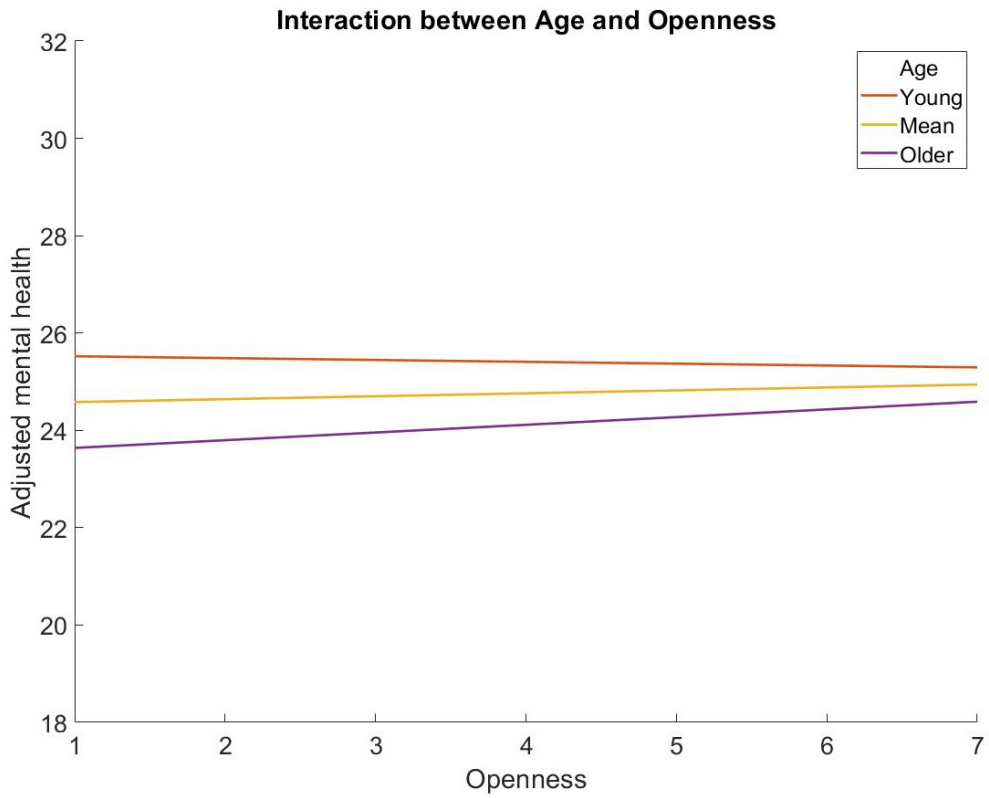


Figure 1. *Cont.*

(**C**)



(**D**)

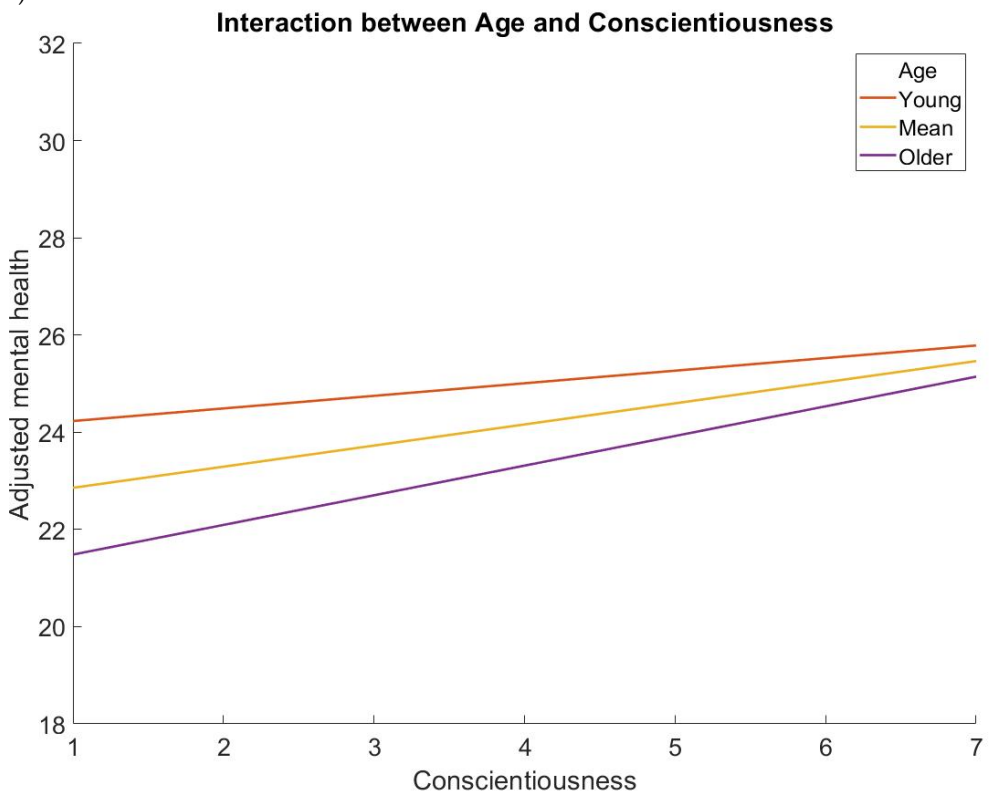


Figure 1. *Cont.*

(**E**)

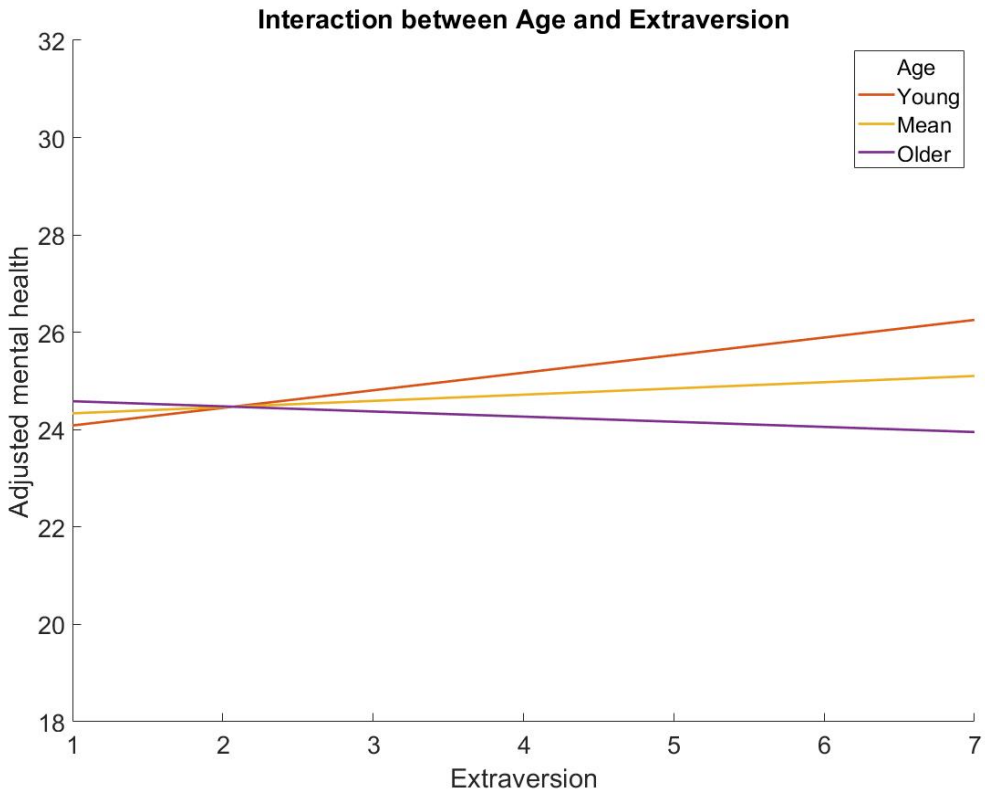


Figure 1. The moderating role of age on the associations between general mental health and Neuroticism (**A**), Agreeableness (**B**), Openness (**C**), Conscientiousness (**D**), and Extraversion (**E**).

4. Discussion

The current work aimed to understand age differences in the relationships between personality traits and general mental health. In order to do so, the current study analyzed data from UKHLS and found that age moderates the relationships between all Big Five personality traits and mental health. Specifically, the negative association between Neuroticism and general mental health was strong in young people (−1 S.D.), stronger in mean-age people, and the least strong in older people. Moreover, Agreeableness was only positively associated with mental health in young people and not in mean-age or older people (+1 S.D.). Openness was negatively related to mental health in young people but positively associated with mental health in older adults. However, this association was not significant in mean-age adults. The positive association between Conscientiousness and mental health was strongest in mean-age people, less strong in young people, and the least strong in older people. Finally, the positive association between Extraversion and mental health was the strongest among young people, weaker among mean-age people, and insignificant among older adults.

Neuroticism had a strong negative relationship with mental health, which seems to be largely consistent with studies that found such an association (e.g., [7–10,15–19]). Specifically, individuals who are more neurotic have more negative affects, anxiety, insecurity, and impulsivity [12]; lower subjective well-being [14]; more depressive and anxiety symptoms; and a higher chance of substance use [8,18,26,39–41]. Interestingly, the current study found significant age differences in the association between Neuroticism and mental health, with a strong association in young adults, which could be explained by the concept of emerging adulthood, which is a period of time in which individuals have to find their position in society (see [24,25] for reviews). In addition, Neuroticism is linked to impulsivity [12], which is associated with various events that may negatively affect mental health. However, underlying inhibitory networks are still developing, with there being an immature

inhibitory control ability during young adulthood (see [42] for a review), which may in turn explain the strong link between Neuroticism and mental health in young people. Importantly, this association was the strongest among mean-age people, which could be due to the fact that higher Neuroticism is related to difficulties in middle adulthood [43]. Finally, this association was the weakest among older adults, which can be explained by the fact that older people may have better emotional regulation and coping skills (see [44] for a review), be more resilient to events that may have adverse impacts on their mental health, and avoid being involved in situations that are detrimental to their mental health, which then reduces the deterministic role of dispositional factors such as personality on their mental health.

However, Agreeableness was only positively related to mental health in young participants and not related to mental health in mean-age participants and older people, which seems to agree with several previous studies. Agreeable people tend to be considerate, cooperative, kind, and trustworthy, which tends to be connected to better mental health. However, one study found that Agreeableness was negatively related to psychological health, as measured by the GHQ-12 in people who were married [17]. Thus, it will be necessary for future studies to test how marital status may moderate the relationship between Agreeableness and mental health. Moreover, the relationship between Agreeableness and mental health was rather weak in previous studies (e.g., [17]). Thus, it could potentially be explained by the fact that previous studies did not take age and personality traits into account.

Openness was negatively associated with mental health in young people but positively related to mental health among older people. People with high Openness scores are open to new experiences. However, during emerging adulthood, they may be more likely to be involved in some risky behaviors that may have a negative influence on their mental health, such as risky sexual behavior, substance use [26], and reckless driving behavior [42]. Thus, young people with higher Openness scores tend to have worse mental health. However, at later stages of life, people may need to reflect on their past [45]. Thus, being more open may result in people having a broad perspective while reflecting on their past, facilitating various interests and group activities and encouraging them to live in a more socially cohesive neighborhood, which may result in better mental health.

The positive connection between Conscientiousness and mental health has been well established in the literature [17,19]. Individuals with high Conscientiousness tend to have better health and abstain from substance use [26], which may explain why Conscientiousness tends to be positively associated with mental health. Moreover, the current study showed that this association was the strongest in mean-age adults, which may be explained by midlife crises, which result in lower well-being compared to younger or older adults. Thus, being conscientious may help middle-aged adults to overcome the loss of their well-being. Indeed, studies have found that high Conscientiousness in mid-life is associated with more satisfying romantic relationships [31], larger medial prefrontal cortex volume, and less gray matter decline [46], which then contribute to better mental health [47]. In addition, this association was stronger in younger adults compared to older adults, which may indicate a more important role of Conscientiousness in young adulthood compared to older adulthood, which may be explained by the fact that Conscientiousness is negatively related to the risky behaviors (e.g., [26]) that young people are more vulnerable to and that are detrimental to mental health in young adulthood.

Finally, Extraversion was positively associated with mental health across all age groups, which seems to be consistent with previous studies. Indeed, Extraversion is positively related to perceived health [48], well-being [49–52], resilience, positive affects [50,53,54], and good mental health [50]. More importantly, findings revealed that the strength of the positive link between Extraversion and mental health decreases with age, which is consistent with what would be predicted by the SST, which proposes that older adults are more conscious about what they want, which is typically accompanied by a shrinkage in social network

size. Thus, older adults may not enjoy a lot of the mental health benefits brought about by Extraversion, such as a bigger social network [29,30].

There are some caveats to the current study as well, despite its strengths. First, one of the most obvious changes with age is declining health, which may in turn affect mental health. However, the current study did not control for health. Future studies should assess health and control for it if feasible. Second, the current research was cross-sectional, which makes it impossible to infer how changes in personality may relate to changes in general mental health. Third, the current study analyzed a British sample, which makes it impossible to generalize these findings to other cultures and countries. Further multi-country studies using data on a large scale should be conducted. Fourth, the current study only focused on the moderating role of age in the associations between personality traits and mental health; future studies should consider the possible moderating role of other demographics such as sex and marital status as well. Finally, it is important to consider the distinction between statistical significance and clinical meaningfulness. Given our large sample size, it is easier to detect statistically significant associations. However, the clinical significance of these associations must be carefully evaluated in future studies, especially in terms of the moderating role of age on the association between Openness and mental health, which has a p-value of less than 0.05.

To sum up, the objective of the current research was to assess the age differences in the relationships between the Big Five personality traits and mental health in a nationally representative cohort of participants from Britain. The main finding was that age moderates all personality traits and mental health associations. These findings can be explained by predominant development theories. The current study suggests that there is a need to consider age differences when investigating the relationships between the Big Five personality traits and mental health. Psychologists may want to work out a way to improve mental health based on their patients' age and personality characteristics.

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