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Relationship between childhood maltreatment and geriatric depression: the mediator effect of personality traits

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ABSTRACT

Background: Childhood maltreatment is an important factor associated with adverse mental health outcomes including geriatric depression and the “big five” personality characteristics. The objective of this study was to evaluate a model where personality characteristics mediate the relationship between childhood maltreatment and geriatric depression.

Method: In this cross-sectional study, elderly subjects from socioeconomically disadvantaged neighborhoods of Porto Alegre, Brazil (n = 260) completed the Childhood Trauma Questionnaire (CTQ), NEO-Five Factor Inventory (NEO-FFI), and Mini International Neuropsychiatric Interview 5.0 (MINI plus). We used structural equation modeling (SEM) to evaluate the mediation hypothesis.

Results: The five personality factors (neuroticism, extraversion, agreeableness, openness, and conscientiousness) were related to childhood maltreatment and depression. Mediation analysis revealed that neuroticism and extraversion are complete mediators, agreeableness and conscientiousness are partial mediators, and openness is not a mediator.

Conclusions: These findings support the hypothesis in which childhood maltreatment is associated with geriatric depression and mediated by personality factors. These results suggest that reducing the maladaptive personality trait in elderly people who suffered childhood maltreatment could prevent geriatric depression.

Key words: childhood maltreatment, geriatric depression, personality traits, elderly

INTRODUCTION

Depression is one of the most frequent mental diseases in the elderly (Kuhlman et al., 2013; Penninx et al., 1999; Raposo et al., 2014). It is associated with worse outcomes from clinical diseases, worse quality of life (Dube et al., 2003), and increased suicide risk (Conwell et al., 2002; Sachs-Ericsson et al., 2016). The city of Porto Alegre, Brazil has a high prevalence (30.6%) of geriatric depression among the socioeconomically disadvantaged elderly (Nogueira et al., 2014).

Childhoodmaltreatment is widely associated with the risk of mental disease (Gilbert et al., 2009; Taillieu et al., 2016). Childhood maltreatment is associated with an increased incidence, a worse clinical course, and a poor response to the treatment of depression (Tunnard et al., 2014; Wingo et al., 2010).

The impact of childhood maltreatment seems to last a lifetime. In the elderly, it has a significant impact on physical and mental health (Draper et al., 2008; Maschi et al., 2012). Childhood maltreatment is extensively associated with the development of geriatric depression (Comijs et al., 2013; Dannlowski et al., 2012; Ege et al., 2015; Kuhlman et al., 2013; Raposo et al., 2014). Thus, it is crucial to understand how childhood maltreatment impacts further development leading to pathology. It is also important to understand how multiple possible outcomes could be affected by personality traits.

The big five personality traits (neuroticism, extroversion, agreeableness, conscientiousness, and openness) are associated with longevity and successful aging. Low scores of neuroticism and high scores of extroversion, openness, agreeableness, and conscientiousness are related to health characteristics of ageing with a high level of daily life activity and good cognitive outcomes (Baek et al., 2016).

The big five personality traits are widely related to mental disease and childhood maltreatment. High levels of neuroticism and low levels of extraversion are associated with geriatric depression (Hayward, 2013; Koorevaar et al., 2013; O’Shea et al., 2017; Weber et al., 2010). High levels of neuroticism are also associated with treatment resistance and cognitive symptomatology in those who have depression (Kendler et al., 2006; Manning et al., in press; Steffens et al., 2017). Neuroticism is consistently associated with childhoodmaltreatment (Hengartner et al., 2015; Mc

Elroy and Hevey, 2014). The literature on childhood maltreatment, geriatric depression, and personality traits suggests amediating model with a temporal relationship between exposure to childhood maltreatment influencing the development of personality traits and increased risk of geriatric depression. These personality traits could be mediators that affect the risk of depression (Hovens et al., 2016).This model is important because it could help develop treatments focused on personality traits that better treat geriatric depression.
The objective of this study is to test the big five personality traits as mediators of the relationship between childhood maltreatment and geriatric depression.

METHOD

Study sample

The Cerebral Aging Program (PENCE) is longitudinal cohort study that aims to examine mental health in a socioeconomically disadvantaged sample of elderly people. This sub-project is a cross-sectional study with a sample of persons 60 years old or older.
This research was conducted from July 2015 to July 2016 in collaboration with the Family Health Strategy (FHS) program of Porto Alegre, Brazil.
General practitioners in family health facilities and health care workers in the PENCE programrecruited the subjects. They were evaluated at the reference hospital. The inclusion criteria included being 60 years old or older. The exclusion criteria included the diagnosis of bipolar disorder; drug or alcohol abuse evaluated by theMini InternationalNeuropsychiatric
Interview (MINI plus); history of neurological disease such as tumors, cerebral ischemia, and epilepsy; serious or incapacitating clinical disease that could interfere with the interview such as cancer or visual defects; and those who had a cognitive inability to understand the questions (based on clinical judgment). Assessment and registry weremade by boardcertified psychiatrists and psychologists experienced in late-life neuropsychiatric disorders.
A total of 346 subjects were evaluated in the hospital, and 260 were included in the final sample after the inclusion and exclusion criteria were met and written informed consent collected. All subjects who had clinical needs were referred to specialized neurologic and psychiatric consultations in the same hospital.
The research protocol was fully approved by both the research ethics committees of PUCRS and the Public Health Secretary of the City of Porto Alegre (Brazil). All participants or their legal representatives gave informed written consent.

MEASUREMENTS

Assessment of depression

Depression was measured with the Mini International Neuropsychiatric Interview 5.0 plus Portuguese version (MINI plus) (Amorim, 2000). The MINI plus is a gold-standard validated diagnostic tool. Its accuracy is similar to more complex psychiatric interviews in different settings (Lecrubier et al., 1997). The major depression module is composed of questions based on the DSM IV criteria. MINI plus depression module was used as a latent variable composed of the MINI questions. The dependent variable used in the mediation model is composed of ten dichotomous questions (range 0-10).
Assessment of childhood maltreatment Childhood maltreatment was diagnosed with the shorter version of the Childhood Trauma Questionnaire (CTQ) (Bernstein et al., 2003). It was translated into Brazilian Portuguese (Grassi-Oliveira et al., 2006) and validated for community and clinical samples with good reliability and validity (Grassi-Oliveira et al., 2014). The CTQ is composed of 28 questions that evaluate the subtype of maltreatment experience (emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect) as well as its intensity through a five-point Likert scale.
The cut-off mild-high was used in accordance with the author´s manual. The five maltreatment subtypes include the following: Emotional abuse includes verbal assaults on a child's sense of worth or well-being or any humiliating behavior directed toward a child by an older
person. Physical abuse includes bodily assaults on a child by an older person that confers a risk of or result in injury. Sexual abuse is sexual conduct between a child and an adult or older person. Emotional neglect is the failure of an adult tomeet the children's emotional and psychological needs. Physical neglect is the failure of adults to provide for a child's basic physical needs (food, shelter, clothing, safety, and health care).

Assessment of personality traits

To assess personality factors, the NEO-Five Factor Inventory (NEO-FFI) (Costa and McCrae, 1995) was used. The NEO-FFI is a shortened version of the NEO Personality Inventory-Revised translated and validated to Brazilian Portuguese (Costa and McCrae, 2007).The 60-itemquestionnairemeasures the main big five domains: neuroticism (emotionally unstable, susceptibility to psychological stress, maladjustment, and negative emotionality); extraversion (energetic, assertive); openness to experience (imaginative, independent-minded, intellectual curiosity); conscientiousness (responsible, dependable, orderly); and agreeableness (empathic, cooperative).

The extent to which a statement applies to the participant is rated on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree.” The cut-off no-low was used in accordance with the author´s manual.

Assessments of sociodemographic variables

Age, gender, and education were used to describe the sample.

Statistical analysis

Calculations used the software Statistical Package for the Social Sciences 20.0 SPSS®. Descriptive statistics were used to describe socioeconomic, personality traits, and history of childhood maltreatment.

We tested five independent mediation models using structural equation modeling (SEM), corrected normal theory method was performed using robust standard errors with weighted least squares estimation (WLS) and the corrected model test statistics using the Satorra-Bentler statistic (Kline, 2011). In each model, the independent variable was the total CTQ score. The dependent variable included questions from the MINI plus depression module. We used goodness-of-fit measures to evaluate how well the hypothesized model fit the observed data including $\chi 2$, Tuker Lewis index (TLI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). A well-fittingmodel is seen when TLI or CFI is at least .90 and the RMSEA is .06 or lower.

Statistical significance was considered to be $P<0.05$.

Results

Descriptive Statistics

The sample included 260 participants with a mean age of 72.2 (SD 7.11) and a majority female (76.9%). The mean years of study (education level) were 4.72 (SD 3.75). Childhood maltreatment was common in this sample (physical neglect 50.4%; emotional neglect 99.2%; physical abuse 29.6%; emotional abuse 29.6%; and sexual abuse 13.5%).

The personality traits presented high prevalence of high scores in this sample, except for openness. A high neuroticism score was seen in 69% of the sample (n = 180) (Table 1).

{INSERT Table 1}

The five personality traits were correlated with childhood maltreatment: Extroversion, agreeableness, openness, and conscientiousness correlated positively; neuroticism correlated negatively.

Mediation model

The independent model of mediation between childhood maltreatment and geriatric depression was tested via the big five personality characteristics. The full structural model showed acceptable fit: χ_2 (53) = 39.1, P = 0.922;RMSEA = 0.001; SRMR = 0.061; and CFI = 1.000. These are presented in Figure 1 and Table 2.

{INSERT Figure 1}

{INSERT Table 2}

NEUROTICISM MEDIATION

Neuroticism has a strong total mediation effect. The CTQscore effect on theNEO-FFI neuroticism score was significant (β = 0.37 SE = 0.052, P<0.001), neuroticism is associated with MINI plus depression diagnosis (β = 0.66, SE = 0.050, P<0.001).The indirect effect of childhood maltreatment on depression was significant (β = 0.24, SE = 0.040, P<0.001).
The direct effect of CTQ score on depression was negative and not significant (β = − 0.06, SE = 0.061, P = 0.302). The full model effect of CTQ score on depression was significant (β = 0.18, SE = 0.068, P = 0.009).

EXTRAVERSION MEDIATION

Extraversion has a total mediation effect. The CTQ score effect on the NEO-FFI extraversion score was inverse and significant (β = − 0.24, SE = 0.045, P<0.001); extraversion is associated with MINI plus depression diagnosis (β = − 0.36, SE = 0.062, P<0.001). The indirect effect of childhood maltreatment on depression was significant (β = 0.09, SE = 0.022, P<0.001). The direct effect of CTQ score on depression was negative and not significant (β = 0.09, SE = 0.064, P = 0.138). The full model effect of CTQ score on depression was significant (β = 0.18, SE = 0.068, P = 0.009).

OPENNESS MEDIATION

There was no evidence for openness as a mediator.
The CTQ score effect on NEO-FFI openness score was negative and significant (β = − 0.14, SE = 0.056, P = 0.013). Openness is associated with MINI plus depression diagnosis (β = − 0.14, SE = 0.063, P = 0.022). The indirect effect of childhood maltreatment on depression was not significant (β = 0.02, SE = 0.012, P = 0.091). The direct effect of CTQ score on depression was significant (β = 0.16, SE = 0.067, P = 0.018). The full model effect of CTQ score on depression was significant (β = 0.18, SE = 0.068, P = 0.009).

AGREEABLENESS MEDIATION

Agreeableness has a partial mediation effect. The CTQ score effect on the NEO-FFI agreeableness score was negative and significant (β = − 0.21, SE = 0.058, P<0.001). Neuroticism is associated with MINI plus depression diagnosis (β = − 0.16, SE = 0.068, P = 0.017). The indirect effect of childhood maltreatment on depression was significant (β = 0.03, SE = 0.017, P = 0.047). The direct effect of CTQ score on depression was not significant (β = 0.15, SE = 0.068, P = 0.030). The full model effect of CTQ score on depression was significant (β = 0.18, SE = 0.068, P = 0.009).

CONSCIENTIOUSNESS MEDIATION

Conscientiousness has a partialmediation effect. The CTQ score effect on NEO-FFI conscientiousness score was negative and significant (β = − 0.17, SE = 0.048, P<0.001). Conscientiousness is associated with the MINI plus depression diagnostic (β = − 0.27, SE = 0.062, P < 0.001). The indirect effect of childhood maltreatment on depression was significant (β = 0.05, SE = 0.016, P = 0.005). The direct effect of CTQ score on depression was negative and not significant (β = 0.13, SE = 0.066, P = 0.041).
The full model effect of CTQ score on depression was significant (β = 0.18, SE = 0.068, P = 0.009).

Discussion

This study tested the hypothesis that personality traits mediate childhood maltreatment and depression in the elderly. The results demonstrated that neuroticism and extraversion are complete mediators; agreeableness and conscientiousness are partial mediators' and openness does not mediate the relationship.

Socioeconomic profile of the population

This sample was mostly females who studied an average of four years. These individuals live in poor communities of Porto Alegre where violence, unemployment, and poor health are common. They tend to live in large families and deal with many stress factors daily. This environment can lead to increasing vulnerability at the edges of circle of life such as the elderly and children. This picture can be extended to a majority of the elderly population who live in poor or developing countries—especially those in populous cities.

In these resource-scare settings, elderly people often receive less health care, and children can be exposed to childhood maltreatment. The exposure to maltreatment decreases educational achievement and leads to low levels of employment and a significant loss of economic productivity. This can lead in turn to increased maltreatment (Boden et al., 2007; Currie and Widom, 2010). This bidirectional relationship leads to a cycle of increasing vulnerability to mental disease.

The mediation model of personality Our results corroborate the widely studied association of childhood maltreatment and geriatric depression presented in the literature. In another study using the same population as this work, childhood abuse and neglect correlated with developing more severe forms of depression (Novelo et al., 2018).

Although many depression treatments are available, they bring a number of difficulties to the patient such as a lack of efficacy and a poor side effect profile. Turning our attention to identifying high-risk depression groups of individuals who were initially exposed to childhood maltreatment and have maladjusted personality traits could address new treatment options. (Beddington et al., 2008; Kessler et al., 2010; Ormel et al., 2015)

We studied the big five personality traits because they are important constructs that seem to be robust, culturally invariable, and stable (Allik, 2005; Ormel et al., 2015). They consistently correlate with childhood maltreatment (Hengartner et al., 2015) and geriatric depression (Manning et al., in press; O'Shea et al., 2017; Steffens et al., 2013).

Our results demonstrated that neuroticism and extraversion are complete mediators, agreeableness and conscientiousness are partial mediators, openness is not a mediator. In accordance with our findings, another study in adults showed that high levels of neuroticism and low levels of extraversion mediate the relationship between childhood maltreatment and a 4-year remission of depression and anxiety disorders (Hovens et al., 2016). Similar studies showed that cognitive emotion dysregulation was an important mediator affecting depression and anxiety symptoms in patients with childhood maltreatment (Hopfinger et al., 2016; Huh et al., 2017).

Psychotherapy modalities focusing on high-risk individuals who experienced childhood maltreatment could also be studied. Probably, addressing as a psychotherapy objective the management of neuroticism's emotional instability, susceptibility to psychological stress, maladjustment, and negative emotionality could reduce the probability of experiencing geriatric depression. It could enhance extraversion, agreeableness, and conscientiousness.

Finally, enhancing life events that diminish the degree of maladaptive personality traits as good social support in adulthood, social relationship and work could be preventive strategies (Caspi et al., 2005; Lüdtke et al., 2011). For example, high resilience was related to improved physical well-being and metabolic biomarkers in schizophrenic individuals who suffered severe childhood trauma (Lee et al., 2018)'.

Strengths and limitations

The strength of this study is its focus on the mediation hypothesis of personality between childhood trauma and depression. To the best of our knowledge, there are only a few studies that evaluate this important subject. We are unaware of any studies that evaluate the psychopathology of the end of life with a focus on personality mediation factors. There are very few studies with socioeconomically disadvantaged elderly, but these persons represent the majority of global elderly population.

The study has some limitations. This crosssectional design limits our conclusions on causality.

Methodological limitations include retrospective reports of childhood trauma and personality characteristics measured at the same time. There is a tendency to recall bias and a tendency for the elderly to respond negatively to questions with aversive content. This can underestimate the results.

The prevalence of childhood maltreatment and personality traits might be higher in this population (MacDonald et al., 2016). The measurement of personality traits at the same timeas the childhood trauma refers to actual personality characteristics despite the already proven relative stability of these traits.

Data was collected in the hospital specific to the population. Some participants may not have been able to reach the facility. The transport structure available in the poor neighborhoods could also affect the mobility of some of the elderly subjects. Finally, other mediator factors could influence the results including attachment characteristics, past history of psychopathology, or other important sociodemographic factors like education. Future studies that expand this mediation hypothesis to

other variables are warranted.

Conclusion

This study evaluates a model where personality characteristics mediate the relationship between childhood maltreatment and geriatric depression.

Mediation analysis showed that neuroticism and extraversion are complete mediators, agreeableness and conscientiousness are partial mediators, and openness is not a mediator. Treatments enhancing extraversion, agreeableness and conscientiousness, and diminishing neuroticism could reduce geriatric depression in high-risk elderly exposed to childhood trauma.

Conflict of interest

None.

Authors' roles

I. Gomes da Silva Filho, A. von Gunten, E. L. Nogueira, and A. Cataldo Neto designed the study, supervised the data collection, and supervised the writing of the manuscript. P. K. Ziegelmann and D. B. Bumaguin planned and performed the statistical analyses and supervised the writing of the manuscript. P. Engroff coordinated the data collection and the manuscript revision. G. B. G. Jardim collected data, analyzed the data, and wrote the manuscript.

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Annexes

Table 1. Descriptive statistics ($n = 260$)

VARIABLE	MEAN (SD) (RANGE)	FREQUENCY, *N* (%)
Socioeconomic Variables		
Age (Years)	72.2(7,11)(60–95)	
Female Gender		200 (76.9%)
Education Level Years	4.72(3.75)(0–15)	
Depression Diagnostic (MINI)	2,55(3.32)(0–10)	83 (31.9%)
Personality Characteristics (NEO-FFI)*		
Neurticism	37.6(9.25)(16–60)	180 (69.2%)
Extraversion	37.9(6.6)(21–56)	173 (66.5%)
Openness	34.9(3.9)(23–46)	67 (25.8%)
Agreeableness	40.8(3.82)(32–53)	216 (83.1%)
Conscientiousness	45.4(4.8)(29–59)	242 (93.1%)
Childhood trauma (CTQ)**		
CTQ Total	45.4(10.7)(31–105)	
Physical Neglect	8.5(3.6)(4–20)	131 (50.4%)
Emotional Neglect	15.7(1.9)(8–21)	258 (99.2%)
Physical Abuse	7.4(3.8)(4–25)	77 (29.6%)
Emotional Abuse	7.9(4.4)(4–25)	77 (29.6%)
Sexual Abuse	5.6(2.6)(4–25)	35 (13.5%)

Notes: Mini International Neuropsychiatric Interview (MINI); NEO-Five Factor Inventory (NEO-FFI); Childhood Trauma Questionnaire (CTQ).

*Frequency: mild-high cut-off.

**Frequency: no-low cut-off.

Table 2. Mediation analysis of personality characteristics (PC) on the relationship between childhood maltreatment (CM) score and depression (D)

MEDIATING VARIABLE	EFFECT OF CM ON PC (A)	EFFECT OF PC ON D (B)	INDIRECT EFFECT	DIRECT EFFECT OF CM ON D (C)	TOTAL EFFECT
Neuroticism	0,37**	0,66**	0.24**	. – 0.06	0.18
Extraversion	. – 0.24**	. – 0.36**	0.09**	0.09	0.18
Openness	; – 0.14*	. – 0.14*	0.02	0.16	0.18
Agreeableness	. – 0.21**	. – 0.16*	0.03*	0.15*	0.18
Conscientiousness	. – 0.17**	. – 0.27**	0.05**	0.13*	0.18

*P ≤ 0.05,**P ≤ 0.001.

Figure 1

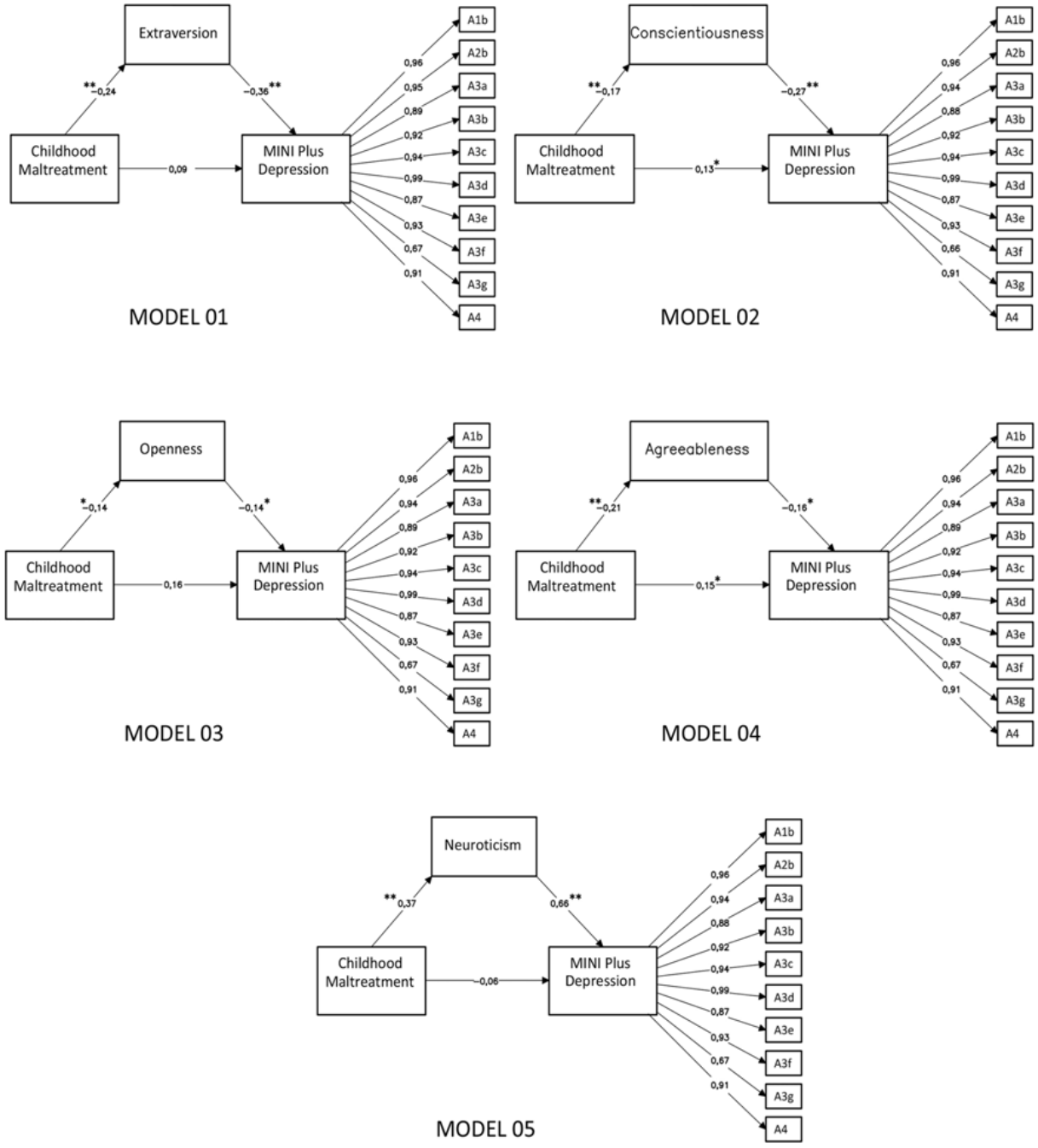

Figure 1
The structural equation model of personality mediating childhood maltreatment and geriatric depression (n = 260). Note: MINIquestions, A1b Depressed mood; A2b Anhedonia; A3a Weight or appetite disturb; A3b Sleep disturb; A3c Psychomotor agitation orretardation; A3d Fatigue or loss of energy; A3e Worthlessness or guilt; A3f Concentration disturb; A3g Thoughts of death or suicidal ideation; A4 Daily functioning. *P ≤ 0.05, **P ≤ 0.001.