

# **SUB-SAHARA AFRICAN JOURNAL OF PSYCHOLOGY AND CONTEMPORARY ISSUES**

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Vol. 1, No. 1.

March, 2021

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**A PUBLICATION OF  
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**SAJPCI**  
**Sub-Sahara African Journal of Psychology and**  
**Contemporary Issues**

Vol. 1, No. 1.

March, 2021

**ISSN: 2805-380X.**

A Publication of  
Department of Psychology  
Faculty of the Social Sciences  
University of Ilorin, Ilorin, Nigeria.

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## Personality Traits and Perceived Social Support on Cognitive Functioning of Elderly Attending Adeoyo Maternity Teaching Hospital (AMTH), Yemetu, Ibadan

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### Abstract

Cognitive health is one of the most important problems for older people, since cognitive decline can lead to a loss of functional status, thus the need to identify factors affecting this decline. Psychological traits, social support have been implicated in several studies. However, the few studies on personality traits, and prospective changes in cognition with advancing age have been mixed. Based on this, this study investigates the role of personality traits, social support in cognitive functioning of aged person. The study adopted a cross sectional research design. This study was conducted in Adeoyo Maternity Teaching Hospital Yemetu Ibadan. The study population comprised the elderly attending AMTH Yemetu Ibadan. The total number of 208 was used for this study. Structured standardized questionnaire was used to gather data. Both descriptive and inferential statistics was used in the analysis of the data collected in testing the stated hypothesis at 0.05 level of significance. There was significant positive relationship among extraversion ( $r(208) = .18, p < .01$ ), agreeableness ( $r(208) = .19, p < .01$ ), conscientiousness ( $r(208) = .24, p < .01$ ) and openness to experience ( $r(208) = .24, p < .01$ ) and cognitive functioning. However, significant inverse relationship existed between Neuroticism ( $r(208) = -.38, p < .01$ ) on cognitive functioning. The Big-five personality traits and perceived social support jointly predicted cognitive functioning and accounted for 28% of the change observed in the self-report cognitive functioning ( $R^2 = 0.28, F(6,202) = 13.05, p < .01$ ). Neuroticism ( $\beta = -.36, t = -5.54, p < .01$ ), conscientiousness ( $\beta = .18, t = 2.92, p < .05$ ), openness to experience ( $\beta = .16, t = 2.55, p < .05$ ) and perceived social support ( $\beta = .17, t = 2.68, p < .01$ ) independently and significantly predicted cognitive functioning.

This have large implications for strategies to prevent or delay the onset of cognitive impairment.

**Key words:** Cognitive functioning, Neuroticism, conscientiousness, openness to experience, perceived social support

### Introduction

Cognitive ability refers to the internal mental processes, such as memory and thinking. It is of importance to identify, measure, and distinguish between abilities that underlie the complex nature of thinking and the processing of information (Newman & Newman, 2020). Cognitive ability refers to General intelligence (g) is a cognitive capacity that is necessary for human adaptability and survival (Newman & Newman, 2020). It encompasses the ability to "reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly, and learn from experience," among other things. Intelligence supports the capacity to grasp events, figure out what is required, and plan a course of action, in addition to memory and imitation. Educational attainment, profession, and health consequences are all linked to cognitive functioning (Plomin

& Von Stumm, 2018). Cognitive abilities is the term used when referring to information reception, processing, expression and executive functions (Ardila, 2018).

The decrease in cognitive processing that happens as people age is known as cognitive ageing. Age-related problems with thinking, memory, and processing speed can start in maturity and develop into old age. Cognitive health is one of the most important problems for older people, since cognitive impairment can lead to a loss of functional status (Luchetti, Terracciano, Stephan, & Sutin, 2016) and dementia (Luchetti, Terracciano, Stephan, & Sutin, 2016). (Luchetti et al., 2016). However, cognitive decline is a normal aspect of ageing, and the pace of change varies greatly from person to person (Wilson et al., 2002). Although lifestyle and other behavioural variables have been linked to cognition, they only account for a tiny part of the variance.

Psychological traits, such as our unique ways of thinking, feeling, and acting, may also play a role in this variation (Curtis, Windsor, & Soubelet, 2015). When personality characteristics and cognitive performance are assessed simultaneously in middle-aged and older individuals, they are linked (Aiken-Morgan et al., 2012; Soubelet & Salthouse, 2011). Neuroticism has been linked to worse performance on cognitive activities due to the tendency to experience unpleasant emotions and issues with impulse control (Soubelet & Salthouse, 2011; Williams et al., 2010). Extraversion, a sociable, high-energy, and excitement-seeking personality trait, and cognition appears to be more domain specific (Baker & Bichsel, 2006; Soubelet & Salthouse, 2011): Individuals with strong extraversion scores perform better on speed-based activities but poorer on those that involve effortful thinking and reasoning (Graham & Lachman, 2012; Pearman, 2009).

Openness, a measure of creativity and a love for diversity, has been related to improved cognitive performance, specifically executive functioning and verbal memory indices (Aiken-Morgan et al., 2012; Sharp, Reynolds, Pedersen, & Gatz, 2010; Soubelet & Salthouse, 2011; Williams et al., 2010). Conscientiousness, or the ability to be organised and disciplined, has mixed results, with studies reporting both significant (Wilson, Schneider, Arnold, Bienias, & Bennett, 2007) and non-significant (Aiken-Morgan et al., 2012; Williams et al., 2010) concurrent associations across a variety of cognitive measures. There is no convincing evidence that agreeability (the inclination to be trusting and altruistic) and cognition are linked (Aiken-Morgan et al., 2012; Graham & Lachman, 2012; Williams et al., 2010). In addition to measured cognition, personality traits have also been linked to subjective cognitive complaints (e.g., Pearman & Storandt, 2004). Individuals high in neuroticism and low in conscientiousness, for example, tend to report more complaints about their memory (e.g., Steinberg et al., 2013); such complaints have been associated with subsequent dementia (Geerlings, Jonker, Bouter, Adèr, & Schmand, 1999).

The relatively few studies on personality traits and prospective changes in cognition with advancing age have been mixed. For example, higher Conscientiousness and lower Neuroticism are associated with slower rate of cognitive decline in some studies (Chapman et al., 2012; Wilson et al., 2007), but not in others (e.g., Hock et al., 2014; Williams, Suchy, & Kraybill, 2013). Neuroticism and Conscientiousness have also been linked to memory decline, but not with decline in other cognitive domains (e.g., visuospatial ability; Wilson et al., 2007). In addition, although Openness is thought to be protective later in life (Williams et al., 2013), it may be unrelated to maintaining cognitive function over time (Sharp et al., 2010). Such differences may be due partly to differences in methodology across studies, such as the use of specific populations (e.g., clergy; Wilson et al., 2007), the age range considered (i.e., the inclusion of relatively young- and middle-aged adults; Hock et al., 2014; Sharp et al., 2010), the follow-up length, the cognitive and

personality domain assessed, and the analytic approach and covariates included. More research is clearly needed to elucidate which traits are prospectively associated with cognitive decline.

The decrease in cognitive processing that happens as people age is known as cognitive ageing. Age-related problems with thinking, memory, and processing speed can start in maturity and develop into old age. Cognitive health is one of the most important problems for older people, since cognitive decline can lead to a loss of functional status and dementia (Luchetti et al., 2016). However, cognitive decline is a normal aspect of ageing, and the pace of change varies greatly from person to person (Wilson et al., 2002). Biological mechanisms, genetic inheritance, psychological variables, and social interaction all play a role in cognitive ageing (Harling, Kobayashi, Farrell, et al., 2020). Although, lifestyle and other behavioural variables have been linked to cognition, they only account for a tiny part of the variance. Psychological traits, such as our unique ways of thinking, feeling, and acting, may also play a major role in this variation (Curtis, Windsor, & Soubelet, 2015). When personality characteristics and cognitive performance are assessed simultaneously in middle-aged and older individuals, they are linked (Aiken-Morgan et al., 2012; Soubelet & Salthouse, 2011). Neuroticism has been linked to worse performance on cognitive activities due to the tendency to experience unpleasant emotions and issues with impulse control (Soubelet & Salthouse, 2011; Williams et al., 2010). Extraversion, a sociable, high-energy, and excitement-seeking personality trait, and cognition appears to be more domain specific (Baker & Bichsel, 2006; Soubelet & Salthouse, 2011): Individuals with strong Extraversion scores perform better on speed-based activities but poorer on those that involve effortful thinking and reasoning (Graham & Lachman, 2012; Pearman, 2009).

Another fundamental factor affecting cognitive decline and functioning in the array of factors indicted in cognitive decline is social support and interaction (Cai, 2021; Costa-Cordella, Arevalo-Romero, Parada & Rossi, 2021; Harling et al., 2020). Any resource that comes via and from social interactions is referred to as social support (Waite, 2018). These connections are formed via social encounters and might be virtual, inferred, imagined, actual, temporary, or continuous. Social support is defined in as the accessible assistance for a person through social relationships with other people, groups, or the community as a whole (Ozbay et al., 2008). Again, accessible assistance might be virtual, implied, imagined, actual, temporary, and/or ongoing. Instrumental assistance, emotional support, guidance or information, financial support, provision of care, moral support, and social ties to others are all examples of social support (Waite, 2018). In at least three types of causal mechanisms relating social connection and cognitive decline, interpersonal engagement has been shown to protect against cognitive decline. The “use it or lose it” theory states that increased social engagement protects against cognitive decline by activating cognitive processes and strengthening brain connections (Costa-Cordella et al., 2021). That having more social interaction and involvement is linked to having less cognitive decline, and that having less social connection is linked to having incident cognitive decline and dementia. Interpersonal interaction is one modifiable element that can protect against cognitive decline, however the majority of research on this topic has been done in higher-income countries (Harling et al., 2020). Harling et al., (2020) found that generally worse cognitive performance was linked to receiving less social assistance, although the link was greater for emotional and informational support than for financial and physical support. Impairment was linked to larger disparities in individuals aged 40–59 and those with some school attainment compared to those without. Elderly with reduced cognitive function had smaller, denser social networks than their peers, which were more local and kin-based. In support of these; Cai, (2021) found that participating in social activities has significantly positive impacts on cognitive function among the elderly. The

point estimates indicate that engaging in social activity raises cognitive scores by 29% of a standard deviation. To further understand the mechanisms that generate correlations between social connection and cognitive function, evidence of the interaction between social connection and cognitive impairment is needed. Less social contact or involvement has been linked to cognitive decline and dementia in Nigeria (Ejechi, 2015; Gureje et al., 2011), however this assumption has not been validated in its interaction with personality traits of the elderly in Nigeria. Based on this, this study will investigate personality traits, social support and cognitive functioning of aged Person in AMTH. The main objective of this study is to investigate how biopsychosocial factors (perceived social support, personality traits) predict cognitive functioning among elderly attending AMTH Ibadan. The following specific objectives will be achieved at the end of the study.

1. To assess the relationship among personality traits (extroversion, neuroticism, openness to experience, agreeableness and conscientiousness), perceived social support and cognitive functioning of elderly attending AMTH Ibadan.
2. To determine whether personality traits (extroversion, neuroticism, openness to experience, agreeableness and conscientiousness) will jointly and independently predict cognitive functioning of elderly attending AMTH Ibadan.
3. To examine whether perceived social support will significantly predict influence on cognitive functioning of elderly attending AMTH Ibadan.

### **Hypotheses**

H<sub>1</sub>: There will be significant relationship among personality traits, perceived social support and cognitive functioning among elderly.

H<sub>2</sub>: Personality traits and perceived social support will have joint and independent prediction of cognitive functioning among elderly attending AMTH Yemetu Ibadan

### **Method**

#### **Research design**

The researcher adopted a cross sectional research design.

#### **Participants**

This study was conducted in Adeoyo Maternity Teaching Hospital Yemetu Ibadan. AMTH is located in Ibadan North Local Government Area (LGA), at the heart of the ancient city of Ibadan. The study population comprised the elderly attending AMTH Yemetu Ibadan. Therefore, the study considered aged people whose age ranges from 65 years and above. The total number of 208 was used for this study. The sample size formula was calculated using Yamani (1965) formulae and adjusting for 10%. Accidental sampling technique was adopted in selection of available participants. All consenting participants attending AMTH Ibadan participated in the study.

#### **Instruments**

Structured questionnaire was used to gather data. The questionnaire comprises of socio-demographic items such as age, gender, level of education, marital status, etc. Social support was measured using 12-item scale of perceived social support (MSPSS). The scale was jointly developed by Dahlem, Zimet, and Farley, (1988). It is a 7 point rating scale, ranging from very strongly disagree "1", to 7 "very strongly agree". The items tended to divide into factor groups

relating to the source of the social support, namely family, friends or significant other. A Cronbach Alpha of .72 was obtained for this research. Personality was captured using Ten-Item Personality Inventory-(TIPI) developed by Gosling et al. (2003) for measuring Big-Five personality dimensions using two items for each of the Big-Five personality dimensions. The response categories range from 1: „disagree strongly“ up to 5: agree strongly“. They were 0.77 for Extraversion, 0.71 for Agreeableness, 0.76 for Conscientiousness, 0.70 for Emotional Stability and 0.62 for Openness, indicating that the scale provides a stable measure of personality over time. Cognitive functioning was measured using 11-item assessment manual developed by Nasreddine (2010). The assessment consists of various cognitive tests to be performed by the test taker. This includes among others, naming, memory, attention, etc.

**Procedure**

First of all, a proposal, consisting of what the researchers set out to achieve was submitted to Oyo state ministry of health for ethical approval. Having obtained the ethical approval; a consent statement was issued to the participants and told that all responses given will be treated with utmost confidentiality. Data was then gathered from the potential participants after informing them about the objective of the study.

**Data Analysis**

Both descriptive and inferential statistics was used in the analysis of the data collected. Descriptive analysis presented the frequencies and percentages of socio-demographic variables in the study, while inferential statistics tested the stated hypothesis in this study.

**Results**

Hypothesis 1 stated that there will be significant relationship among personality traits, perceived social support and cognitive functioning among elderly attending AMTH Yemetu Ibadan. This hypothesis was tested using Pearson Product Moment Correlation.

**Table 1: Pearson Product Moment Correlation showing the relationship between personality traits, perceived social support and cognitive functioning**

	Mean	SD	1	2	3	4	5	6	7
Cognitive functioning	18.99	6.14	--						
Extraversion	6.90	2.49	.180**	--					
Agreeableness	6.22	2.20	.187**	.160*	--				
Conscientiousness	8.13	1.61	.236**	.029	.022	--			
Neuroticism	5.45	2.04	-.382**	-.116	-.351**	.006	--		
Openness to experience	6.16	1.36	.238**	.134	.031	.175*	.006	--	
Perceived social support	70.55	8.70	.276**	.097	.190**	.167*	-.091	.217**	--

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\*. Correlation is significant at the 0.05 level (2-tailed).

Table 1 reveals that there was significant positive relationship among extraversion ( $r(208)= .18, p<.01$ ), agreeableness ( $r (208)= .19, p<.01$ ), conscientiousness ( $r (208)= .24, p<.01$ )and openness to experience ( $r (208) = .24, p<.01$ ) and cognitive functioning indicating that increasing scores on extraversion, agreeableness, conscientiousness, openness to experience and

social support significantly relate to increasing in cognitive functioning. However, significant inverse relationship existed between Neuroticism ( $r(208)=-.38, p<.01$ ) and cognitive functioning. Decreasing levels of neuroticism personality traits was associated with increasing level of cognitive functioning. Thus, the hypothesis is accepted.

Hypothesis 2 stated that personality traits and perceived social support will jointly and independently predict cognitive functioning among elderly attending AMTH Yemetu Ibadan. This was tested using multiple regression analysis. The results are presented in Table 2.

**Table 2: Summary of Multiple Regression Analysis Showing the Influence of perceived social support and Personality traits on cognitive functioning**

Predictors	$\beta$	t	P	R	$R^2$	F	P
				.53	.28	13.05	0.00
Extraversion	.094	1.538	.126				
Agreeableness	.006	.098	.922				
Conscientiousness	.179	2.923	.004				
Neuroticism	-.355	-5.544	.000				
Openness to experience	.159	2.547	.012				
Perceived social support	.169	2.679	.008				

a. Dependent Variable: Cognitive functioning

The result revealed that big five (extraversion, agreeableness, conscientiousness, neuroticism and openness to experience) personality traits and perceived social support jointly predicted cognitive functioning ( $R^2 = 0.28, F(6,202) = 13.05, p<.01$ ). When combined the big five personality traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience) accounted for 28% of the change observed in the self-report cognitive functioning. This revealed that the collective presence of big five personality traits has significant influence on Cognitive functioning. The result further revealed that Neuroticism ( $\beta = -.36, t = -5.54, p<.01$ ), conscientiousness ( $\beta = .18, t = 2.92, p<.05$ ), openness to experience ( $\beta = .16, t = 2.55, p<.05$ ) and Perceived social support ( $\beta = .17, t = 2.68, p<.01$ ) significantly predicted cognitive functioning. The result implies that respondent low on neuroticism, but high on conscientiousness, openness to experience personality traits who received greater amount of social support have increasing higher functional cognitive performance, significantly reported high cognitive functioning. The hypothesis is thus supported.

## Discussion

This study investigated personality traits, social support, as predictors of cognitive functioning among the aged persons attending a medical facility in Ibadan, Oyo State Nigeria. Result demonstrated that extraversion, agreeableness, conscientiousness, openness to experience and social support were significantly associated with high cognitive functioning. However, decreasing levels of neuroticism personality traits was associated with increasing level of cognitive functioning. This is in agreement with studies which demonstrated that higher conscientiousness and lower neuroticism are associated with slower rate of cognitive decline in elderly populations (Chapman et al., 2012; Wilson et al., 2007). In addition, the finding is in the same trend with Williams et al., (2013), which demonstrated that openness to experience personality traits is

thought to be protective cognitive functioning later in life and over time (Sharp et al., 2010). The findings however disagree with studies of Hock et al., (2014) and Williams et al (2013) which did not find significant associations between neuroticism and conscientiousness personality traits and cognitive functioning. The association found to exist between social support and cognitive functioning agrees with Harling et al., (2020) who demonstrated that lack of emotional and informational support supportive assistance was linked to poor cognitive performance.

The study findings also demonstrated that personality traits and perceived social support jointly predicted cognitive functioning. However, independently, neuroticism, conscientiousness, openness to experience and Perceived social support were predictors of cognitive functioning. These are in agreement with findings that personality traits play major roles in this variation (Curtis et al, 2015). These findings confirmed the literature that personality characteristics and cognitive performance in older individuals are linked (Aiken-Morgan et al., 2012; Soubelet & Salthouse, 2011). The findings agree with Soubelet and Salthouse, (2011); Williams et al., (2010) who demonstrated that high neuroticism was linked to poor performance on cognitive activities due to the tendency to experience unpleasant emotions and issues with impulsivity. In the same trend Aiken-Morgan et al., (2012), Sharp, Reynolds, Pedersen, and Gatz, (2010) found that being high on openness to experience for example being involved in creativity and a love for diversity were demonstrated to significantly improve cognitive performance. In addition, Soubelet and Salthouse, (2011), Williams et al., (2010) found that being high on openness to experience traits significantly improve executive functioning and verbal memory indices among the elderly. Conscientiousness also demonstrated significant concurrent associations with cognitive performance overtime (Wilson et al., 2007). Individuals high in low in Conscientiousness reported more tendency to complain about their memory (Steinberg et al., 2013); such complaints have been associated with subsequent dementia (Geerlings et al., 1999).

Perceived social support was demonstrated to predict cognitive performance in the current study. This finding supports findings from Cai, (2021) that participating in social activities has significantly positive impacts on cognitive function among the elderly. The study confirms the findings from Ejechi, (2015) and Gureje et al., (2011) that less social contact or involvement is associated with significant cognitive decline and dementia in Nigeria. The findings support Myrrella et. al. (2019) that higher social support and having a sense of purpose in life are each associated with higher cognitive functioning in middle-aged and older persons, while loneliness has a detrimental effect on cognition.

### **Conclusion and Recommendation**

In conclusion, this study strengthens the evidence that personality traits and social support are significant correlates of cognitive aging. This growing literature suggests that there may be a benefit to social connectivity for older adults in developing countries in terms of protecting cognition, and possibly an impact of declining cognition on social connection. Less social contact may reflect disengagement by others due to the increased difficulty of interaction, or respondents with impairment finding connections increasingly difficult to maintain, or those with more initial connectivity being better able to maintain their cognitive capacity. Furthermore, those with cognitive impairment received less social support of all type. In addition, the study expands previous knowledge by demonstrating that personality traits, particularly neuroticism, conscientiousness and openness to experiences, are linked with cognitive persons in elderly persons. Of note, personality can be altered with behavioral intervention, and therefore can be viewed as a modifiable risk factors for cognitive

impairment. This may have large implications for strategies to prevent or delay the onset of cognitive impairment. Furthermore, incorporating personality traits in risk assessment models of brain aging may improve predictive validity. Lastly, characterization of personality traits as biomarkers of depression and cognition in the aged who might benefit the most from behavioral and pharmacological interventions to slow cognitive decline. The study also has several limitations, including its cross-sectional design impeding inference regarding temporal relationships between personality traits and cognitive performance; as there is evidence for personality changes both preceding and following cognitive decline.

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