



Big Five Personality Characteristics, Neuropsychological Performance, & Subjective Cognitive Functioning in Older Adults

Taylor Lazzari¹, Kirk Erickson PhD², Briana Sprague PhD³

Department of Psychiatry, University of Pittsburgh School of Medicine¹, Department of Psychology, University of Pittsburgh²
Division of General Internal Medicine & Geriatrics, Indiana University School of Medicine³

Background

- Dementia is the leading cause of disability and death within the elderly population.¹
- Cognitive decline in older adults can become recognized through memory complaints from the individual or neuropsychological testing.²
- The alignment of self rated cognition to neuropsychological testing performance can vary from individual to individual.³
- Personality factors could explain this variability.
- Higher levels of Neuroticism and lower levels of Conscientiousness are commonly seen in those with dementia or experience cognitive decline.¹

Methods

Protocol: This study examined the association between neuropsychological test performance and subjective cognition ratings with the Big Five Inventory (44 Item) of personality among participants in the Investigating Gains in Neurocognition in an Intervention Trial of Exercise (IGNITE) trial. The IGNITE trial was designed to examine the effect of an aerobic exercise intervention on neurocognitive outcomes among cognitively healthy but physically inactive older adults.⁴

Participants: Participants included 606 older adults (20% men, 20% Black/minority status, 65-80 years old) who were enrolled in IGNITE trial.

Evaluation: We assessed neuropsychological test performance through Hopkins Verbal Learning Task (HVLN) and Trailmaking B Time, while subjective cognition was examined through the Everyday Cognition Questionnaire (ECOG).

Analytic approach: Multiple regressions controlling for demographic and health characteristics (age, gender, race, education, screening site, routine through IDAL scores, and depression through GDS scores). Personality traits were assessed separately. Significance for all analyses were evaluated at $p < .05$.

Results

Table 1: Covariate-Adjusted Relationships Between Personality with Neuropsychological, Subjective Cognition

Characteristic	Unstandardized B	P-Value	Unstandardized B	P-Value	Unstandardized B	P-Value
	HVLN Total Recall		Trailmaking B		E-Cog	
Extroversion	.004 (.063)	.952	1.29 (.480)	.008	-.017 (.004)	<.001
Agreeableness	-.073 (.063)	.248	.950 (.508)	.062	-1.74E ⁻⁵ (.005)	.997
Conscientiousness	.062 (.059)	.293	.646 (.475)	.175	.003 (.004)	.446
Neuroticism	-.010 (.057)	.866	-.039 (.458)	.932	.003 (.004)	.559
Openness to New Experiences	.027 (.039)	.487	.050 (.874)	.874	-.007 (.003)	.017

Conclusions

- In demographics and health-adjusted regression, we found higher extroversion was negatively associated with neuropsychological performance in Trailmaking B (unstandardized B = 1.29, $p = .008$), and negatively associated with subjective cognitive function (unstandardized B = -.017, $p < .001$).
- Additionally, higher openness to new experiences was negatively associated with subjective cognitive function (unstandardized B = -.007, $p = .017$).
- No significant results were found for conscientiousness, neuroticism, or agreeableness personality traits, and HVLN performance scores.

Clinical Significance

- Certain personality traits, specifically extroversion and openness to new experiences, may be important personality traits to consider for older adult cognitive function. Future research should examine whether these traits are associated with future cognitive decline or impairment.

References

- 1Terracciano, A., Stephan, Y., Luchetti, M., Albanese, E., & Sutin, A. R. (2017). Personality traits and risk of cognitive impairment and dementia. *Journal of Psychiatric Research*, 89, 22-27. <http://dx.doi.org/10.1016/j.jpsychires.2017.01.011>
- 2Schmand, B., Jonker, C., Hooijer, C., & Lindeboom, J. (1996). Subjective memory complaints may announce dementia. *Neurology*, 46(1), 121-125. <https://doi.org/10.1212/WNL.46.1.121>
- 3Smith, G. E., Petersen, R. C., Ivnik, R. J., Malec, J. F., & Tangalos, E. G. (1996). Subjective memory complaints, psychological distress, and longitudinal change in objective memory performance. *Psychology and Aging*, 11(2), 272-279. <http://dx.doi.org/10.1037/0882-7974.11.2.272>
- 4Erickson, K. I., Grove, G. A., Burns, J. M., Hillman, C. H., Kramer, A. F., McAuley, E., Vidoni, E. D., Becker, J. T., Butters, M. A., Gray, K., Huang, H., Jakicic, J. M., Kamboh, M. I., Kang, C., Klunk, W. E., Lee, P., Marsland, A. L., Mettenberg, J., Rogers, R. J., ... Wollam, M. E. (2019). Investigating gains in neurocognition in an intervention trial of exercise (IGNITE): Protocol. *Contemporary Clinical Trials*, 85. <https://doi.org/10.1016/j.cct.2019.105832>

Figure 1: Five Factor Model of Personality

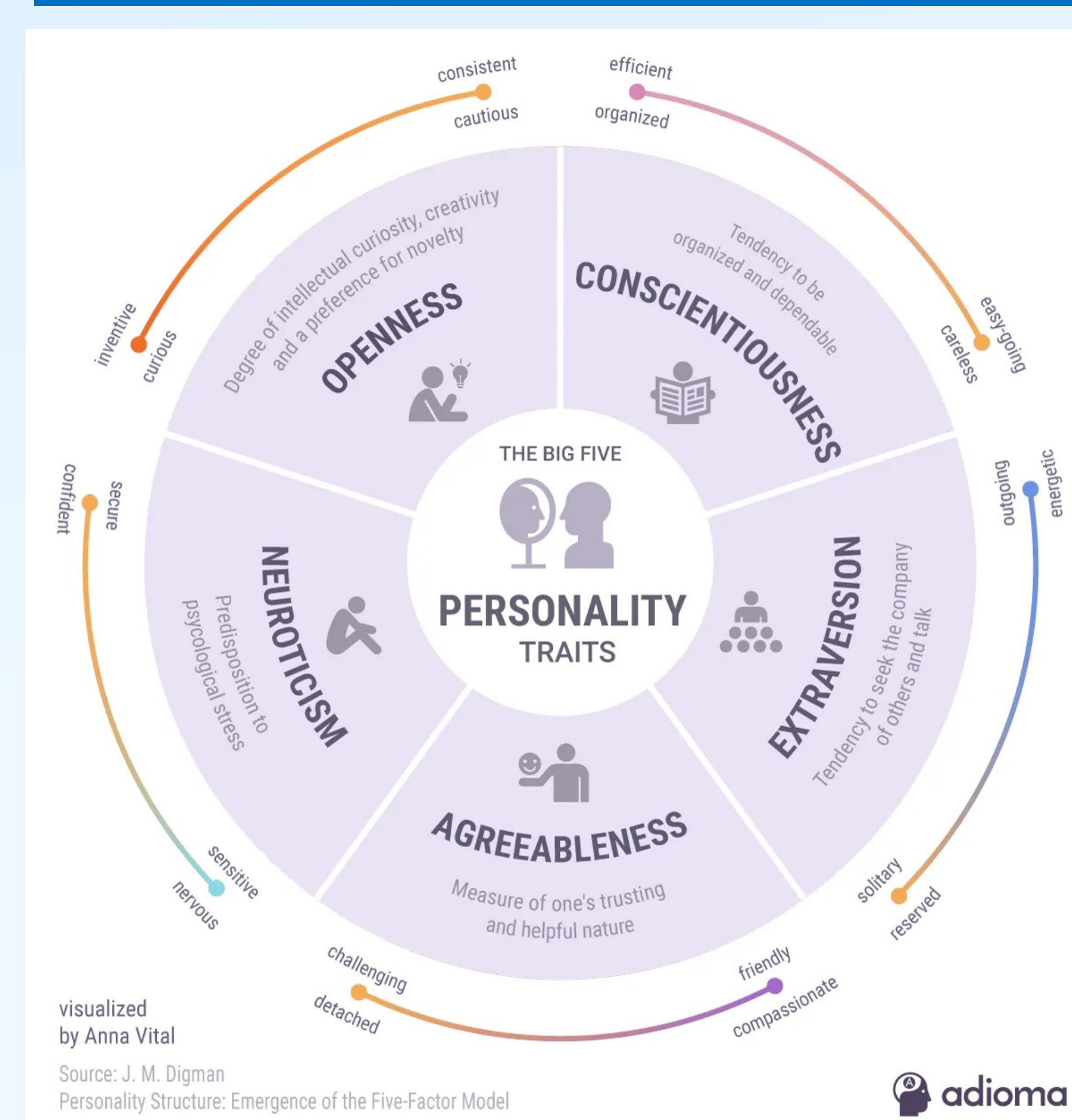


Figure 2: Neuropsychological Performance and Subjective Cognitive Function

Measures of Cognition

Neuropsychological Test Performance

- Observes how the brain health affects your cognitive skills and behavior
- **Hopkin Verbal Learning Task (HVLN)** - assess episodic verbal memory, measures immediate and delayed recall.
 - task involves memorizing a list of 12 nouns, asked to recall this list immediately after the list was read, then after a delayed period.
 - Higher score = more words accurately recalled
- **Trailmaking B Time** - observes executive function, measures time completion.
 - task conducted on paper, must connect 25 circles (half with numbers & half with letters) in an ascending pattern alternating numbers and letters.
 - Higher score = worse performance

Subjective Cognitive Function

- assessed either through self-reported questionnaires or by a participant proxy who can provide their opinions and observations of the participant's cognition
- **Everyday Cognition Questionnaire (ECOG)**
 - a 12-item questionnaire that asks participants of any perceived changes they have experienced in various cognitive tasks, such as remembering the location of items and understanding instructions.
 - response options included "1 - better or no change compared to 10 years earlier, 2 - questionable/occasionally worse, 3 - consistently a little worse, 4 - consistently much worse."

Contact Information

Taylor Lazzari
Office Email: lazzaritg@upmc.edu
Email: taylorglazzari@gmail.com
Office Phone: 412-246-5685