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Language-Related Expressions of Personality

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The present research aims to bridge the gap between prospective multi/plurilingual education and overarching personality psychology by examining how language constructs and basic personality traits are interrelated in pre-service teachers who are fundamental to language education. The first part of the study identifies items within the International Personality Item Pool that are indicative of language constructs, revealing intricate language-related expressions of personality involving listening, learning, speaking, reading and writing. The second part investigates the links between these language constructs and the Big Five personality traits based on a sample of 124 female pre-service primary school teachers aged 19 to 27. The results show significant multivariate relationships, indicating that individuals high in conscientiousness, openness and extraversion, and low in neuroticism, tend to exhibit preferences for listening, learning, speaking and reading. The findings suggest that there are personality-embedded nuanced language-related expressions of trait structures reflecting psychological needs for language competence, relatedness and autonomy in (co-)creation. The research underscores the importance of considering both language constructs and internationally validated personality traits in teachers and their students. It suggests that some teachers and students may naturally align with language-trait structures conducive to quality language teaching and, prospectively, to multi/plurilingual proficiency. Additionally, educational interventions can potentially influence the development of these identified conducive structures over time, offering insights into the stable psychological foundations for language development and consequent pluricultural competence.

Keywords: Big Five personality traits, language constructs, multi/plurilingual education, personality psychology, pre-service teachers

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Jezikovni izrazi osebnosti

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Namen raziskave je ugotoviti medsebojno povezanost jezikovnih konstruktov in temeljnih osebnostnih lastnosti pri študentih – bodočih učiteljih – kot nosilcih jezikovnega izobraževanja ter tako premostiti vrzel med več-/raznojezičnim izobraževanjem in psihologijo osebnosti. V prvem delu študije gre za prepoznavanje tistih trditev v okviru Mednarodnega nabora osebnostnih lastnosti, ki kažejo na jezikovne konstrukte in razkrivajo zapletene osebnostne izraze, povezane z jezikom, ter vključujejo poslušanje, učenje, govorjenje, branje in pisanje. Drugi del raziskuje povezave med prepoznanimi jezikovnimi konstrukti in osebnostnimi lastnostmi po teoriji Velikih petih na vzorcu 124 študentk – bodočih učiteljic razrednega pouka, starih od 19 do 27 let. Rezultati kažejo značilne multivariatne povezave: respondentke z visoko stopnjo vestnosti, odprtosti in ekstravertnosti ter nizko stopnjo nevroticizma izražajo preference za poslušanje, učenje, govorjenje in branje. Ugotovitve kažejo, da obstajajo z osebnostjo povezani niansirani jezikovni izrazi struktur lastnosti, ki odražajo psihološke potrebe po jezikovni kompetenci, povezanosti in avtonomiji pri (so)ustvarjanju. Raziskava poudarja pomen upoštevanja jezikovnih konstruktov ter mednarodno potrjenih osebnostnih lastnosti pri učiteljih in njihovih učencih. Predvideva, da se nekateri učitelji in učenci lahko samodejno uskladijo s strukturami jezikovnih lastnosti, ki spodbujajo kakovostno poučevanje jezikov in perspektivno več-/raznojezično znanje. Poleg tega lahko vzgojno-izobraževalne intervencije potencialno vplivajo na razvoj teh ugotovljenih ugodnih struktur skozi čas, kar ponuja vpogled v stabilne psihološke temelje za jezikovni razvoj in posledično raznokulturno kompetenco.

Ključne besede: Velikih pet osebnostnih lastnosti, jezikovni konstrukti, več-/raznojezično izobraževanje, psihologija osebnosti, bodoči učitelji

Introduction

A bookworm, an erudite, a chatterbox, a keen listener, a storyteller, a wordsmith and a literary connoisseur, among others, illustrate how language constructs convey personality traits figuratively. When these language constructs describe individuals who consistently enjoy reading, are good listeners, speak fluently in public, enjoy learning languages and communicate effectively in writing, they collectively facilitate the identification, quantification and interpretation of enduring psychological structures supporting these behaviours, their expressions and their consequences across various situations and over time.

It is essential to understand how language constructs and the presence of stable personality traits intersect in pre-service teachers, as they play a culturally significant role in providing fundamental language development practices to young students. In psychology, language is used extensively as a method to study individuals when measuring abilities and the content of the human mind in general (McCrae & Costa, 1997; McCrae et al., 2005). As individual differences in cognitive functions, the verbal declarative and procedural knowledge acquired during formal schooling and general life, as well as other broad group ability factors such as reading and writing and general (domain-specific) knowledge, belong within the three-strata human ability hierarchy (Ackerman & Lohman, 2006). Individual differences in abilities are related to individual differences in trait structures, specifically the openness trait (Ackerman & Rolfhus, 1999; DeYoung et al., 2005) within the Big Five personality trait framework (Costa & McCrae, 1985, 2008; Goldberg, 1993, 1999, 2010; Goldberg et al., 2006; Jerneić et al., 2007; Mlačić & Goldberg, 2007). Prototypically open people may be imaginative and appreciative of art and beauty, have rich and deep emotional reactions, readily adopt new ways of doing things, have wide intellectual interests, and tend to be socially and politically liberal (McCrae & Greenberg, 2014). Teachers of basic literacy are expected to fulfil various roles, including being interpersonally and interculturally competent listeners, learners, readers, speakers and writers. Using their enabling language-related personality structures, they may incorporate information about individual needs and cultural identities into everyday teaching practices, fostering a greater appreciation and expression of diversity and a sense of belonging in multicultural societies (Brumen & Dagarin Fojkar, 2012; Iversen, 2022; Morea & Fisher, 2023; Schroedler & Grommes, 2019; Unruh & McCord, 2010).

The present study addresses two primary research questions. Firstly, it examines the conceptual breadth and structure of language-related personality

items from the International Personality Item Pool (IPIP; Goldberg, 1993, 1999; Goldberg et al., 2006) with the objective of developing new scales for language-related expressions of personality. Secondly, it investigates the relationships between the identified language-related structures and the empirically derived Big Five personality traits (i.e., openness, conscientiousness, extraversion, agreeableness and neuroticism) and their facets in prospective teachers.

Method

Sample

The participants in the study were 131 female pre-service primary school teachers aged between 19 and 27 years (M = 21.43, SD = 1.27). Their academic performance in the upper secondary state examination in Croatian (M = 3.34, SD = 0.62) and English (M = 3.45, SD = 0.75), as well as their university grade point average (GPA; M = 3.98, SD = 0.37; all on the scale 1–5, poor to excellent), indicated good language proficiency and adherence to university educational standards. Seven participants had missing data, resulting in a final sample of 124 participants who completed all of the questionnaires, of whom 37 participated in item sorting.

Instruments

Measurement of language-related expressions of personality. In order to answer the first research question, the publicly available IPIP item assignment table, containing 3,805 items, was employed to obtain language-related personality items accessible online (Jerneić, n.d.). Following the framework of the Cattel-Horn-Carroll (CHC) cognitive ability definitions (Ackerman & Lohman, 2006), all of the personality items reflecting any verbal learning abilities and verbal declarative and procedural knowledge acquisition during formal schooling and general life, including foreign language aptitude and proficiency, as well as reading and writing usage in any form, were preserved, yielding an initial sample of 191 items. After the removal of duplicates, metaphors and extremes, a final set of 103 items, consensually agreed upon by two professional researchers, was chosen for further analyses. To ensure initial overinclusion and therefore construct breadth in the studied language-related personality item space, more than a hundred items were used, in line with the Act Frequency Approach to measuring traits (Buss & Craik, 1983). All of the items, which are listed in full in Table 1, were utilised in their original form.

Measurement of the Big Five personality traits and facets. Personality traits and facets were measured using the Croatian Translation of the IPIP

NEO PI Facets from Goldberg's IPIP-300 questionnaire (Jerneić et al., 2007). Based on the Big Five model, this tool consists of six facets per personality trait, making a total of 30 facets. The items are available online for reference. The participants rated the accuracy of each item on a seven-point scale. Internal reliability estimates (ω) for the traits ranged from acceptable to high: Openness (.78), Conscientiousness (.93), Extraversion (.90), Agreeableness (.79) and Neuroticism (.95).

Creative writing measure. The Linguistic Creativity Scale (LCS; Rački et al., 2015) gauges creative expression in language. Originally, it assessed creative behaviours across three language styles, portraying a versatile writer involved in literary, scientific and journalistic pursuits. In the present study, the LCS was used to confirm validity and differentiate between five language activities: listening, learning, speaking, reading and writing. The modified instructions prompted the participants to report the types and quantities of writing they had engaged in since they began their teacher studies. This approach quantified overall productivity in creative writing, with an omega (ω) coefficient of .87 (Table 3).

Procedures

In order to address the first research question, data collection comprised of (1) collecting items from the IPIP (Jerneić, n.d.) database, which was undertaken by two professional researchers, and (2) sorting the collected items by participants into meaningful groups for exploratory factor analysis. Serving as anonymous and voluntary item sorters, the 37 female participants, all in their third year of university teacher studies in Croatia, provided written consent and took part in a one-hour group study session during which they individually sorted 103 cut items based on similarity, unaware of their trait of origin. Q methodology, which examines human behaviour from an internal perspective, has been previously applied in language studies (e.g., Li, 2022). The approach used in the present study, which is akin to Q methodology, allowed the participants to subjectively categorise items based on their meaning. They worked at their own pace, creating between 2 and 20 item piles, with an average of 12 piles per participant. The sorted item piles were recorded, resulting in a new dataset of 444 separate item groups used for factor analyses. Following the session, the participants received a debriefing and course credit compensation.

In order to address the second research aim, a month apart, all 124 participants provided written consent and participated anonymously in a face-to-face study lasting two hours. This part of the study used items representing language-related expressions of personality, as well as the Big Five and the creative

writing measure. The participants rated how accurately each item described them on a seven-point scale, ranging from *very inaccurate* (1) to *very accurate* (7). After extensive exploratory and confirmatory factor analyses, the final items for each language scale, listed in Table 2, along with their assigned trait of origin as listed in IPIP (Jerneić, n.d.), descriptive statistics, reliabilities and correlations with other constructs, are presented in Table 3. Higher statistics for the five scales of Listening (i.e., negatively worded items; recoded), Learning, Speaking, Reading and Writing, listed in descending order of means in Table 3, indicate individuals who: a) attentively listen to and comprehend information, b) are active learners, c) speak masterfully in public, d) read extensively, and e) engage in creative writing. The ω coefficients for these scales are .70, .80, .77, .94 and .75, respectively.

Results

The results comprise sections on the factor structure of 103 items indicative of language-related expressions of personality (Table 1), the Confirmatory Factor Analyses (Table 2) of these identified structures in a sample of the participants, and the descriptive statistics, reliabilities (ω and α) and intercorrelations of all study variables (Table 3). A two-dimensional solution from Multidimensional Scaling (MDS) explores the dimensionality of all study variables (Figure 1), while a Canonical Correlation Analysis (CCA) solution examines the linear relationships between the Big Five personality traits and language-related expressions of personality (Table 4). These analyses collectively elucidate relationships within the conceptual space, latent structures and multivariate patterns between language-related constructs and the basic personality traits within the Big Five framework.

The Conceptual Space and Structure of Language-Related Expressions of Personality

The first research question on the structure of language-related expressions of personality was tested in (1) the Q-sort data set, and (2) the participant sample. In (1) the Q-sort item data set consisted of 103 items as columns and 444 rows representing item group memberships (0 denoting items not belonging and 1 indicating items belonging to specific item piles). The exploratory Principal Component Analysis (PCA; Varimax) was conducted to explore latent structures of the item groupings. The analysis yielded five interpretable and orthogonal factors with Eigenvalues ≥ 1 and roots at 15.67, 8.59, 7.97, 5.59 and

5.21, explaining 41.77% of the variance, as determined by a scree plot. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .81, indicating good sampling adequacy. An intricate and discernible structure, as illustrated in Table 1, revealed a consistent grouping of items into five factors, tentatively labelled: Reading, Learning, Writing, Not Listening and Speaking. The data-driven suggested factor names are given in bold. The "Not Listening" factor suggests that by not listening the adults may exhibit behaviours that oppose cultural participation, highlighting the need for further investigation of the willingness to take part as a possible prerequisite for language development and use. In (2) the Confirmatory Factor Analyses (CFA) of the same items but in the participant sample yielded unifactorial solutions for Listening, Learning, Speaking, Reading and Writing (Table 2), retaining 37 saturated items, although issues persisted, particularly with the Listening and Speaking scales. Despite limitations in the sample size, reliability coefficients ranged from acceptable to very high (ω from .70 to .94). Skewed distributions were (log-)transformed to enhance linearity. To illustrate relationships between variables (Table 3), Multidimensional Scaling (MDS) generated a two-dimensional conceptual space (Figure 1). Stress measures indicated a good fit. MDS suggested conceptual distinctions between Speaking, Learning and Listening, in comparison to Reading and Writing. The CFA (ML) of the five language scales supports the aforementioned correlated two factors, with a second-order solution reflective of a common language factor, $\chi^2(3) = 4.00$, $p = .26$; CFI = .99, TLI = .97, SRMR = .03, and RMSEA = .05 [90% CI .00–.17], $p = .39$. Distinguishing these two language factors within personality space is of relevance to further analyses and interpretations.

Table 1

Results of a Factor Analysis of the Sample of 103 Language Items

A sample of IPIP items	Factor loading				
	1	2	3	4	5
Factor 1: Reading / Reading enthusiasm					
Read in bed before going to sleep. (ORAIS: Love of Reading)	.79				
Read a car magazine or book. (ORAIS: Interest in Vehicles)	.79				
Read a book. (ORAIS: Love of Reading)	.78				
Read newspaper ads for non-grocery items. (ORAIS: Interest in Shopping)	.78				
Read a book about the things that I collect. (ORAIS: Interest in Collecting)	.78				
Read news on the Internet. (ORAIS: Interest in Computing)	.77				
Have read the great literary classics. (HEXACO_PI: Aesthetic Appreciation/Artistic Interests)	.76				
Read music-related news. (ORAIS: Interest in Music)	.75				
Read a fashion-related magazine. (ORAIS: Appearance-Consciousness)	.75				
Read a news magazine. (ORAIS: Love of Learning)	.75				
Read a book on a financial topic. (ORAIS: Interest in Money)	.74				
Read a self-help book. (ORAIS: Interest in Self-Improvement)	.74				
Read a book about religion or spirituality. (ORAIS: Spirituality/ Religiousness)	.72				
Read a large variety of books. (VIA: Love of Learning)	.71				
Read the Bible or other sacred text. (ORAIS: Spirituality/ Religiousness)	.71				
Read a story to a child. (ORAIS: Interest in Children)	.70				
Read poetry. (ORAIS: Love of Learning)	.69				
Read comics to a child. (ORAIS: Interest in Children)	.69				
Read a fashion-related book. (ORAIS: Appearance-Consciousness)	.68				
Read a lot. (16PF: Sensitivity)	.68				
Read the editorial page of a newspaper. (ORAIS: Love of Learning)	.68				
Read many books. (ORVIS: Language Mastery)	.68				
Spend a lot of time reading. (6FPQ: Comprehension / HPI-HIC: Love of Reading)	.66				
Read all the time. (VIA: Love of Learning)	.66				
Like to read. (16PF: Sensitivity/ 6FPQ: Comprehension / CPI: Comprehension/ HPI: Quickness/ HPI-HIC: Love of Reading)	.64				
Love to read challenging material. (6FPQ: Comprehension/AB5C: Quickness/BFAS-20: Intellect /BIG5: Intellect/Cacioppo1982: Need for Cognition /CPI: Comprehension/HEXACO_PI: Inquisitiveness/ HPI: Creativity/Originality /HPI-HIC: Curiosity /JPI: Intellectual-Breadth /NEO: Intellect)	.63				

A sample of IPIP items	Factor loading				
	1	2	3	4	5
Read quickly. (CPI: Comprehension /HPI: Quickness /HPI-HIC: Intellect /HPI-HIC: Love of Reading)	.59				
Have read a lot. (HPI-HIC: Love of Reading)	.58				
Read an entire book in one sitting. (ORAIS: Love of Reading)	.58				
Read slowly. (HPI: Quickness / HPI-HIC: Intellect / HPI-HIC: Love of Reading)	.43				
Sometimes laugh out loud when reading or watching TV. (Barchard2001: Positive Expressivity)					
Factor 2: Learning / Learning enthusiasm					
Look forward to the opportunity to learn and grow. (VIA: Love of Learning)		.83			
Am thrilled when I learn something new. (VIA: Love of Learning)		.83			
Learned a new skill. (ORAIS: Interest in Self-Improvement)		.81			
Am a true lifelong learner. (VIA: Love of Learning)		.81			
Go out of my way to attend educational events. (VIA: Love of Learning)		.78			
Love to learn new things. (6FPQ: Culture / JPI: Intellectual-Breadth)		.74			
Consult the library or the Internet immediately if I want to know something. (VIA: Love of Learning)		.73			
Looked something up in an encyclopaedia. (ORAIS: Love of Learning)		.72			
Want to increase my knowledge. (6FPQ: Intellectual Openness/ CPI: Depth)		.69			
Visited a public library. (ORAIS: Love of Reading)		.58			
Learn quickly. (16PF: Intellect /AB5C: Competence)		.49			
Looked up a word in a dictionary. (ORAIS: Love of Learning)		.48			
Watched an educational channel on TV. (ORAIS: Love of Learning)		.41			
Bought a book about the things that I collect. (ORAIS: Interest in Collecting)		.38			
Bought a book. (ORAIS: Love of Reading)		.37			
Read someone's personal web page. (ORAIS: Interest in Social Media)		.36			
Help others learn new ideas. (ORVIS: Altruism)					
Learn things slowly. (BFAS: Intellect)					
Bought a self-help book. (ORAIS: Interest in Self-Improvement)					
Factor 3: Writing / Creative writing (Writing proficiency)					
Wrote a postcard. (ORAIS: Interest in Journaling)			.92		
Wrote a handwritten letter. (ORAIS: Interest in Journaling)			.91		
Write short stories or novels. (ORVIS: Creativity/Originality)			.90		
Keep a diary or journal. (ORVIS: Language Mastery)			.90		

A sample of IPIP items	Factor loading				
	1	2	3	4	5
Wrote poetry. (ORAIS: Creativity/Originality, Interest in Journaling)			.90		
Wrote a thank you note. (ORAIS: Interest in Journaling)			.90		
Write songs. (ORVIS: Creativity/Originality)			.89		
Wrote a love letter. (ORAIS: Interest in Romance)			.88		
Worked on a scrap book. (ORAIS: Interest in Journaling)			.73		
Edit a newspaper. (ORVIS: Language Mastery)			.50		
Make up word puzzles. (ORVIS: Language Mastery)			.43		
Factor 4: Not listening / Cognitive and cultural disengagement					
Don't like to visit museums. (VIA: Love of Learning)				.76	
Dislike works of fiction. (16PF: Sensitivity)				.75	
Don't like poetry. (6FPQ: Culture)				.75	
Don't like to learn new things. (VIA: Love of Learning)				.74	
Dislike learning. (AB5C: Intellect /CPI: Comprehension /HPI-HIC: Curiosity /HPI-HIC: Problem-solving)				.71	
Don't read nonfiction books for fun. (VIA: Love of Learning)				.69	
Seldom read comics. (HPI-HIC: Interest in Game-Playing)				.56	
Don't like reading or hearing opinions that go against my way of thinking. (CAT-PD: Rigidity)				.49	
Avoid difficult reading material. (6FPQ: Comprehension /7FACTOR: Intellect /AB5C: Quickness /BFAS: Intellect /BFAS: Intellectual Openness /BFAS-20: Intellect /BIG5: Intellect /Cacioppo1982: Need for Cognition /CPI: Intellect /HEXACO_PI: Inquisitiveness /HPI: Creativity/Originality /HPI-HIC: Love of Reading /JPI: Intellectual-Breadth /NEO: Intellect)				.43	
Seldom feel weepy while reading the sad part of a story. (HEXACO_PI: Sentimentality)				.40	
Skip difficult words while reading. (16PF: Intellect /AB5C: Intellect /CPI: Comprehension /HPI: Quickness)				.39	
Would be afraid to give a speech in public. (HEXACO_PI: Social Boldness)				.39	
Be a foreign correspondent. (ORVIS: Language Mastery)				-.38	
Don't pay enough attention when others are speaking to me. (Span2002: ADHD)				.38	
Be a translator or interpreter. (ORVIS: Language Mastery)				-.38	
Have a poor vocabulary. (16PF: Intellect /6FPQ: Comprehension / AB5C: Intellect / CPI: Comprehension /HPI: Quickness /HPI-HIC: Language Mastery)				.37	
Be a professor of English. (ORVIS: Language Mastery)				-.37	
Have been told I'm not listening when others are speaking to me. (Span2002: ADHD)				.32	
Be a librarian. (ORVIS: Language Mastery)				-.30	

A sample of IPIP items	Factor loading				
	1	2	3	4	5
Speak ill of others. (HEXACO_PI: Gentleness /HPI: Calmness / HPI-HIC: Pleasantness)					
Use swear words. (16PF: Dutifulness /BIDR: Impression-Management /CPI: Self-control, Self-regulation /HPI: Dutifulness / TCI: Rebelliousness)					
Speak softly. (IPIP-IPC: Submissiveness /7FACTOR: Extraversion / AB5C: Talkativeness /HEXACO_PI: Expressiveness)					
Am sometimes so preoccupied with my own thoughts I don't realise others are trying to speak to me. (CAT-PD: Fantasy Proneness)					
Don't speak my mind freely when there might be negative results. (VIA: Bravery/Courage/Valor)					
Have been left speechless by the beauty depicted in a movie. (VIA: Aesthetic Appreciation/Artistic Interests)					
Factor 5: Speaking / (Public) Speaking proficiency					
Speak fluently on any subject. (ORVIS: Language Mastery)					.81
Never at a loss for words. (7FACTOR: Extraversion / AB5C: Leadership)					.75
Am never at a loss for words. (HEXACO_PI: Expressiveness)					.74
Speak loudly. (IPIP-IPC: Dominance /AB5C: Talkativeness)					.74
Use difficult words. (AB5C: Intellect /BFAS-20: Intellect /BIG5: Intellect /HPI-HIC: Language Mastery)					.71
Am good at making impromptu speeches. (6FPQ: Extraversion /HEXACO_PI: Social Boldness /JPI: Social-Confidence /MPQ: Assertiveness /Snyder1974: Self-monitoring)					.70
Have a rich vocabulary. (6FPQ: Comprehension /7FACTOR: Intellect /AB5C: Intellect /BFAS: Intellect /BFAS: Intellectual Openness /BFAS-20: Intellect /BIG5: Intellect /CPI: Comprehension /HEXACO_PI: Inquisitiveness /HPI: Quickness / HPI-HIC: Intellect /HPI-HIC: Language Mastery /JPI: Intellectual-Complexity /NEO: Intellect /NEO5-20: Openness to Experience)					.70
Show a mastery of language. (6FPQ: Comprehension /AB5C: Intellect /CPI: Comprehension/ HPI-HIC: Intellect /HPI-HIC: Language Mastery)					.65
Can handle a lot of information. (HPI-HIC: Language Mastery)					.55
Choose my words with care. (6FPQ: Deliberateness /CPI: Planfulness /NEO: Cautiousness)					.38
Know many languages. (ORVIS: Language Mastery)					.36
Am able to read the minds of others. (CAT-PD; Irrational Beliefs)					.34
Can't help noticing whether something I read is grammatically correct. (M23)					
Wrote a letter to a newspaper or politician. (ORAIS: Interest in Political Activism)					
Speak up in protest when I hear someone say mean things. (VIA: Bravery/Courage/Valor)					

A sample of IPIP items	Factor loading				
	1	2	3	4	5
Enjoy discussing movies and books with others. (6FPQ: Comprehension /AB5C: Reflection /JPI: Intellectual-Complexity)					
Think before I speak. (VIA: Prudence)					

Note. N = 444 item groups. Principal Component Analysis (PCA) with orthogonal (Varimax) rotation was employed for extraction. Factor loadings ≥ .30 are listed; the remaining items exhibited inconsistent grouping and low item-total correlations. Certain IPIP items may measure multiple constructs. For instance, an IPIP item like 'Like to read' may assess psychological constructs similar to those identified in commonly utilised psychological inventories (International Personality Item Pool, 2023).

Table 2

Results of Confirmatory Factor Analyses (CFA) for the Unifactorial Solution of Scales of Listening, Learning, Speaking, Reading and Writing in the Participant Sample

Scale labels, items, instruments of origin and item factor loadings	χ^2	*df*	CFI	TLI	RMSEA	RMSEA [90% CI]	SRMR
Listening (7 items⁻): ***Have been told I'm not listening when others are speaking to me*** (Span2002; ADHD; .65); ***Have a poor vocabulary*** (16PF; Intellect, etc.; .59); ***Don't pay enough attention when others are speaking to me*** (Span2002; ADHD; .53); ***Dislike learning*** (AB5C; Intellect, etc.; .48); ***Avoid difficult reading material*** (6FPQ; Comprehension, etc.; .44); ***Skip difficult words while reading*** (16PF; Intellect, etc.; .44); ***Don't like to learn new things*** (VIA; Love of Learning; .36).	34.83***	14	.83	.74	.11	[.06, .16]	.08
Learning (7 items⁺): ***Love to learn new things*** (6FPQ; Culture, etc.; .81); ***Go out of my way to attend educational events*** (VIA; Love of Learning; .64); ***Look forward to the opportunity to learn and grow*** (VIA; Love of Learning; .63); ***Want to increase my knowledge*** (6FPQ; Intellectual Openness; .59); ***Learned a new skill*** (ORAIS; Interest in Self-Improvement; .56); ***Am thrilled when I learn something new*** (VIA; Love of Learning; .53); ***Am a true lifelong learner*** (VIA; Love of Learning; .53).	23.62	14	.96	.93	.07	[.00, .12]	.05
Speaking (8 items⁺): ***Have a rich vocabulary*** (O5; 6FPQ; Comprehension, etc.; .75); ***Show a mastery of language*** (6FPQ; Comprehension, etc.; .63); ***Speak fluently on any subject*** (ORVIS; Language Mastery; .60); ***Am good at making impromptu speeches*** (6FPQ; Extraversion, etc.; .53); ***Can handle a lot of information*** (O5; HPI-HIC; Language Mastery; .53); ***Am never at a loss for words*** (HEXACO_PI; Expressiveness, .51); ***Never at a loss for words*** (7FACTOR; Extraversion, etc.; .47); ***Use difficult words*** (AB5C; Intellect, etc.; .44).	89.10***	20	.73	.62	.17	[.13, .20]	.10

Scale labels, items, instruments of origin and item factor loadings	χ^2	*df*	CFI	TLI	RMSEA	RMSEA [90% CI]	SRMR
Reading (8 items+): ***Read a lot*** (16PF; *Sensitivity*; .96); ***Spend a lot of time reading*** (6FPQ; *Comprehension, etc.*; .90); ***Have read a lot*** (HPI-HIC; *Love of Reading*; .86); ***Read many books*** (ORVIS; *Language mastery*; .84); ***Read a book*** (ORAIS; *Love of Reading*; .81); ***Read all the time*** (VIA; *Love of learning*; .79); ***Like to read*** (16PF; *Sensitivity, etc.*; .70); ***Read a large variety of books*** (VIA; *Love of learning*; .61).	64.98***	20	.95	.93	.13	[.10, .17]	.04
Writing (7 items+): ***Write songs*** (ORVIS; Creativity/Originality; .75); ***Wrote poetry*** (ORAIS; Creativity/Originality; .71); ***Wrote a love letter*** (ORAIS; Interest in Romance; .63); ***Write short stories or novels*** (ORVIS; Creativity/Originality; .60); ***Wrote a handwritten letter*** (ORAIS; Interest in Journaling; .48); ***Edit a newspaper*** (ORVIS; Language Mastery; .36); ***Keep a diary or journal*** (ORVIS; Language Mastery; .36).	27.58*	14	.92	.89	.09	[.04, .14]	.06

Note. N = 124. Items are listed in full in the descending order of factor loadings, followed by the factor loading size in the unifactorial CFA solution of that scale in the study sample. CFI = Comparative Fit Index. TLI = Tucker-Lewis Index. RMSEA = Root Mean Square Error of Approximation. The estimator is ML. The average variance extracted (AVE) for the factors, in the same order, is 27, 37, 30, 66 and 32%. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Table 3

Descriptive Statistics and Intercorrelations for Study Variables

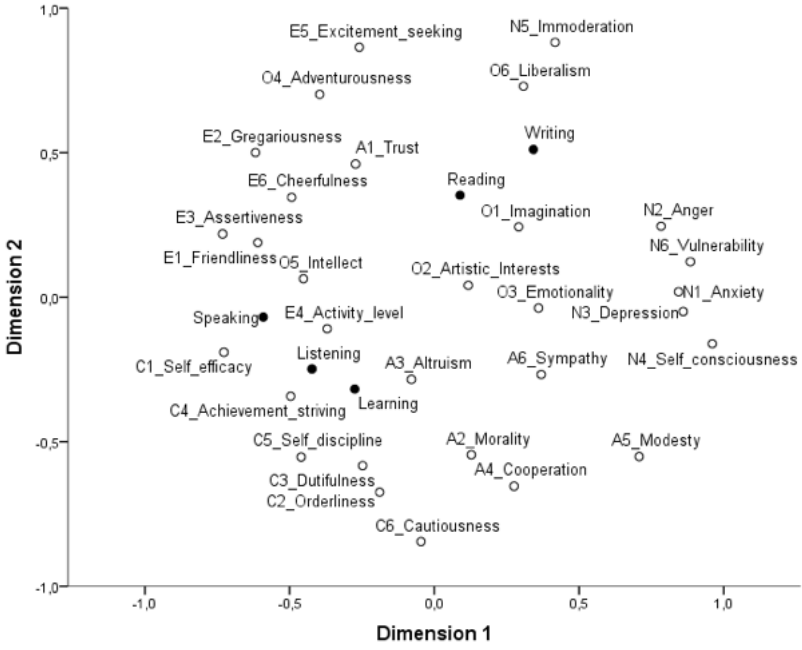
Study variables	Skew	*M*	*SD*	ω	α	1	2	3	4	5
Language constructs (LLSRW)										
1. Listening	-1.13	6.08	0.85	.70	.70	—				
2. Learning	-0.20	5.38	0.98	.80	.80	.44***	—			
3. Speaking	0.10	4.46	1.04	.77	.78	.49***	.60***	—		
4. Reading	0.09	4.08	1.57	.94	.94	.20*	.21*	.30**	—	
5. Writing	1.50	1.95	1.08	.75	.74	.02	.19*	.21*	.28**	—
The Big Five traits (OCEAN)										
Openness (O)	-0.80	5.13	0.47	.78	.81	.39***	.30**	.34***	.27**	.20*
O1_Imagination	-0.72	5.42	0.93	.77	.76	.13	.13	.16	.33***	.13
O2_Artistic_interests	-1.00	6.11	0.69	.69	.68	.30***	.29**	.14	.19*	.30**
O3_Emotionality	-0.33	5.42	0.78	.67	.65	.26**	.32***	.12	.10	.09
O4_Adventurousness	-0.55	4.87	0.79	.66	.64	.07	-.01	.06	-.03	-.05
O5_Intellect	-0.29	5.09	0.89	.71	.70	.56**	.45***	.61***	.34***	.19*
O6_Liberalism	0.28	3.89	0.76	.44	.46	-.03	-.14	.05	-.07	.06
Conscientiousness (C)	-0.19	5.15	0.69	.93	.92	.55***	.50***	.41***	.12	-.11
C1_Self_efficacy	-0.27	4.86	0.81	.70	.71	.54***	.40***	.54***	.04	-.09

Study variables	Skew	*M*	*SD*	ω	α	1	2	3	4	5
C2_Orderliness	-0.79	5.40	1.17	.85	.85	.39**	.32***	.21*	.16	-.15
C3_Dutifulness	-0.62	6.13	0.63	.72	.71	.40***	.37***	.27**	-.07	-.09
C4_Achievement_striving	-0.48	5.05	0.80	.68	.68	.49***	.54***	.43***	.15	.07
C5_Self_discipline	-0.14	4.89	1.17	.81	.86	.42***	.42***	.35**	.17	.00
C6_Cautiousness	-0.15	4.61	1.05	.79	.77	.25**	.19*	.12	-.02	-.15
Extraversion (E)	-0.55	4.92	0.64	.90	.90	.34***	.20*	.38***	.08	.01
E1_Friendliness	-0.66	5.47	1.04	.85	.85	.39***	.24**	.33***	.08	-.06
E2_Gregariousness	-0.56	4.79	1.09	.78	.79	.19*	.00	.07	.01	-.14
E3_Assertiveness	0.03	4.75	0.87	.66	.67	.33***	.23*	.56***	.16	.11
E4_Activity_level	-0.08	4.36	0.72	.42	.51	.35**	.31***	.43***	.22*	.15
E5_Excitement_seeking	-0.60	4.42	1.03	.79	.78	.00	-.08	.03	.04	.03
E6_Cheerfulness	-0.89	5.70	0.89	.80	.79	.28**	.30**	.32**	.12	.07
Agreeableness (A)	-0.15	5.23	0.45	.79	.82	.25**	.16	-.08	.08	-.06
A1_Trust	-0.68	4.46	0.92	.77	.76	.14	.15	.17	.14	.02
A2_Morality	-0.74	6.13	0.61	.63	.63	.33***	.28**	.12	.07	.00
A3_Altruism	-0.56	6.14	0.58	.67	.67	.37***	.33***	.19*	.03	-.00
A4_Cooperation	-0.50	5.38	0.78	.59	.60	.15	.17	-.12	-.07	-.14
A5_Modesty	-0.18	4.42	1.06	.81	.80	-.06	-.13	-.34***	.01	-.05
A6_Sympathy	-0.29	4.87	0.78	.54	.60	.18*	-.00	-.04	.09	.00
Neuroticism (N)	0.04	3.85	0.90	.95	.95	-.22*	-.09	.04	.04	.11
N1_Anxiety	-0.03	4.23	1.14	.84	.84	-.12	-.01	.00	.00	.05
N2_Anger	-0.06	4.03	1.46	.91	.92	-.12	.02	.01	.01	.06
N3_Depression	0.74	2.93	1.28	.90	.90	-.11	-.04	-.07	.20*	.19*
N4_Self_consciousness	0.14	3.80	1.06	.79	.79	-.28**	-.14	-.41***	-.05	.04
N5_Immoderation	-0.30	4.13	0.75	.52	.53	-.27**	-.30**	-.20*	.02	.11
N6_Vulnerability	-0.06	3.99	1.02	.75	.77	-.25**	-.11	-.30**	.01	.06
Linguistic creativity scale (LCS)	0.17	1.18	0.63	.87	.85	.14	.25**	.26**	.17	.27**
Grade point average (GPA)	0.05	3.98	0.38	—	—	.14	.18*	.16	-.09	.02

Note. $N = 124$. Pearson *r*. All skewed variables were (log-)transformed to ensure univariate normality. Mardia's Test detected no departure from multivariate normality of ten transformed variables used in CCA (i.e., LLSRW and OCEAN variables; with skewness at $p = .39$ and kurtosis at $p = .06$). This table has 40 variables with a section of correlations of relevance to the study presented here.
*$p < .05$. **$p < .01$. ***$p < .001$.

Figure 1

Two-Dimensional Solution Derived From Multidimensional Scaling of Study Variables



Note. N = 124. The 30 Big Five facets and the five scales of Language constructs were included in the analysis (PROXSCAL; Squared Euclidian distance; *z*-scores by transformed variables). Normalised Raw Stress = .05, Stress-I = .23, Stress-II = .56, Dispersion Accounted For (D.A.F.) = .95 and Tucker's coefficient of congruence at .97.

Table 4

Canonical Correlation Analysis (CCA) Solution for Multiple Personality Traits Predicting Multiple Language Constructs

Variable sets	First Canonical Variate		Second Canonical Variate		Third Canonical Variate	
	Correlation	*Coefficient*	*Correlation*	*Coefficient*	*Correlation*	*Coefficient*
Language set						
Listening	.88	.59	.13	.40	.00	.00
Learning	.76	.36	.13	.71	−.16	−.12
Speaking	.75	.25	−.63	−1.26	−.03	.36
Reading	.30	.07	−.04	.17	−.67	−.55
Writing	.02	−.13	−.30	−.22	−.84	−.74
Percent of variance	40%		10%		24%	
Redundancy	22%		2%		2%	

Variable sets	First Canonical Variate		Second Canonical Variate		Third Canonical Variate	
	Correlation	*Coefficient*	*Correlation*	*Coefficient*	*Correlation*	*Coefficient*
The Big Five traits set						
Openness	.56	.44	−.14	−.34	−.71	−.91
Conscientiousness	.85	.81	.25	.17	.37	.22
Extraversion	.50	.22	−.47	−.27	.22	.37
Agreeableness	.27	−.06	.83	.89	−.16	.09
Neuroticism	−.30	.08	.24	.18	−.57	−.36
Percent of variance	29%		21%		21%	
Redundancy	16%		4%		2%	
Canonical correlation (R_c)	.74		.42		.29	

Note. N = 124. *Correlation* = canonical loadings (structure correlations). *Coefficient* = canonical weights (standardised coefficients).

Multivariate Patterns of Language-Related Expressions of Personality

The second research question addressed the degree of relationships between multiple continuous variables, i.e., identified language constructs or the language-related expressions of personality, on the one hand, and the Big Five traits, on the other. Since language constructs are conceptually related but not the same (as previously listed in the CFAs), and personality traits are related but not the same, the Canonical Correlation Analysis (CCA) was used as the analytic technique to maximally correlate their possible linear combinations. The first two CCA canonical correlations (.74, .42, .29, .16 and .00) were significant. With all five canonical correlations included, $\chi^2(25) = 129.28$, $p < .001$, and with the first canonical correlation removed, $\chi^2(16) = 35.38$, $p = .004$. The first two root pairs therefore accounted for the significant relationships between the two sets of variables, Wilks $\lambda = .33$, $F(25, 424.99) = 5.86$, $p < .001$, and Wilks $\lambda = .74$, $F(16, 351.97) = 2.79$, $p = .004$. The first pair had a 55% overlapping variance. The second pair of canonical variates, as the proportion of variance extracted from the residual after the first pair has been extracted, explained an additional 17% of the overlapping variance between the second pair of variates. Subsequent χ^2 tests were not statistically significant, as the third pair was only minimally related (.29; 8% overlapping variance), Wilks $\lambda = .89$, $F(9, 282.46) = 1.47$, $p = .157$, and $\chi^2(9) = 13.12$, $p = .157$. The third pair was retained for its contribution to the understanding of the studied research problem. Based on the percentage of variance, redundancy analyses and the statistical significance tests, the first

function should be accepted and the interpretations of the remaining two are questionable. The variables within the sets with correlations of .30 and above will be interpreted.

The canonical solution is listed in full in Table 4.

Discussion

Structures and Patterns of Language-Related Expressions of Personality

The language-related personality items display an intricate internal structure (Tables 1 and 2) and demonstrate considerable diversity, embeddedness and breadth, reflecting psychologically ubiquitous measures that encompass diverse psychological constructs of intrapersonal and interpersonal importance. This underscores the need for further investigation, particularly in multilingual contexts, as these items serve as crucial indicators of complex language dynamics and their profound dependence on, influence upon and expression of individual personality. Table 3, Table 4 and Figure 1 investigate the detailed relationships between these language constructs and the Big Five traits/facets. On the trait level, listening, learning and speaking tell more about conscientiousness (i.e., the Learning scale correlates significantly and positively with the student GPA, $r(121) = .18$, $p = .040$), while the reading and writing scales tell more about the openness of the person, tapping onto different trait structures in their expression. The results of the study highlight the nuances in complex relationships between language constructs and the Big Five personality traits, challenging simplistic associations.

The multivariate patterns in the first significant pair of canonical variates indicate that participants who rate themselves as more conscientious (.85), more open (.56), more extraverted (.50) and with relatively lower scores on neuroticism (–.30) are more accurately described as listening more (.88), learning more (.76), speaking more (.76) and relatively reading more (.30). The first canonical variate strongly indicates competence, performance and achievement, aligning with previous research linking the Big Five personality traits, particularly conscientiousness, to academic and job performance (Ackerman et al., 2011; Andersen et al., 2020; Miyamoto et al., 2023; Poropat, 2009; Zell & Lesick, 2022; Zhang & Ziegler, 2016). These findings are consistent across longitudinal studies (Caspi, 2000; Chamorro-Premuzic & Furnham, 2003), with conscientiousness consistently showing the strongest effect, supported by meta-analytic research (Mammadov, 2022; Meyer et al., 2023), which also

emphasises the relevance of openness, particularly in the context of second language learning (Chen et al., 2022).

The second pair of canonical variates suggests that participants who describe themselves as more agreeable (.83) and more introverted (–.47) also describe themselves as people who speak less (–.63) and write less (–.30). The interpretation of canonical loadings may also be made consistently in the opposite direction, as they are not unidirectional. For example, more disagreeable and extraverted participants describe themselves as speaking more and relatively writing more. Careful interpretation is necessary within a broader dispositional framework, considering courage (see Peterson & Seligman, 2004, for more on virtues and strengths), especially in educational contexts where recognising character virtues can support valour and dispel fear in public speaking situations, as character strengths are predictors of job performance beyond the aforementioned cognitive ability and the Big Five traits (Harzer et al., 2021).

The third pair of canonical variates, although of limited use due to its marginal canonical correlation of .29, refers specifically to reading and writing, and was therefore retained, as it is of special interest to the present study. More open participants (.71), those with higher scores in neuroticism (.57) and relatively less conscientious participants (–.37) describe themselves as both writing (.84) and reading more (.67). This is in line with previous research linking openness to intelligence (e.g., Ackerman & Lohman, 2006; Chamorro-Premuzic & Furnham, 2006; DeYoung et al., 2005), and implicating openness as the core of the creative personality (e.g., Oleynick et al., 2017; Puryear et al., 2017, 2019; Silvia et al., 2009). The Writing scale correlates with the Linguistic creativity scale (LCS), a previously explored measure of creative writing across functional language styles, $r(124) = .26$, $p = .003$, and Croatian language state final exam grade, $r(122) = .21$, $p = .023$. This offers initial support to the validity of the Writing scale, suggesting that this scale addresses creative competence in writing. Creativity, as cultural participation (Glăveanu, 2011), also has previously well-studied affective underpinnings (Baas, 2019; Benedek et al., 2020; Ivcevic & Hoffmann, 2019; Silvia et al., 2021), and the personalities of creative writers (Piirto, 2009), including studies on mental illness and the art-therapeutic benefits of joy and a sense of well-being by expressing and processing emotions through writing (Shafir et al., 2020), corroborate these conclusions even more strongly (Kaufman & Baer, 2002; Lindauer, 2009; Silvia & Kaufman, 2010; Silvia et al., 2021). A multigroup randomised controlled study across five countries and four languages showed that working on creative tasks leads to an increase in positive emotions through an increase in feelings of *autonomy* (i.e., freedom to express ideas and opinions; Bujacz et al., 2016). What these findings

jointly imply about affect is that daily motivated active reading and honing of creative writing habits probably function as emotion up-regulation strategies that provide meaning and joy.

Language-Related Expressions of Personality: Implications and Strategies for Effective Language Teaching

The three pairs of canonical variates as multivariate synthetic variables with prominent combinations of (1) C/O/E, (2) A/E, and (3) O/N traits, in that order of pairs, seem to stand for mutual influences of language constructs and personality traits in (1) intellectual, (2) social and (3) affective processes, as evident in language usage, in that same order, and reflected in the orthogonal latent themes of (1) competence/achievement motivation, (2) relatedness/speaking out/rebellion, and (3) autonomous creation/cultural participation. Therefore, they are reminiscent of the underlying basic human psychological needs of competence, relatedness and autonomy (Deci & Ryan, 2000; Deci et al., 2001). The educational implications of understanding these relationships, as depicted in Figure 1, suggest that educators should be mindful of how personality traits influence language learning and expression, and how language use can, in turn, affect personality traits, emphasising the need for a nuanced approach to fostering communication and values in education. A general point of discussion that is of utmost importance to educators is the fact that some personality traits are comparatively more predictive of some language constructs than others, as our study shows. All of the language constructs (i.e., to listen, learn, speak, read and write) are also commonly demanded of students, communicated as expectations to be displayed, and evaluated as educational objectives. This suggests that some students may express personality traits and language domain-specific structures that are significantly more education-congruent, reaping the benefits of academic success. Nevertheless, the expected language competencies may be disentangled from the significant effects of the language users' naturally existing personality trait structures by intentionally deconstructing language into separate behavioural acts or easily attainable behavioural emulations of prototypical others, portrayed by the given individual items within the scales of language constructs as behaviour scripts. This may be done by focusing on using personas or roles or actively taking on different behaviourally prototypical personalities of a listener, learner, reader, speaker and/or writer to act out scripts (i.e., the language construct scale items, and similar prompts) and reap the rewards for that persona's individually discernible acts. The younger the intended audience is, the more playful the language prototype should be (see

Russ, 2003, 2013, and Vygotsky, 2004, for more on play and development). One should keep in mind that the younger the person the educator communicates with – and the participants in the present study will teach students as young as six years – the less stable and more malleable the personality traits are, as is evident in the level of trait stability coefficients across a lifetime (Bleidorn et al., 2022; Roberts & DelVecchio, 2000; Roberts et al., 2017). The study may suggest that when one is explicitly expected to listen, learn, speak, read or write as the contingently rewarded educational outcomes, one may over time be conditioned to display (if having) or emulate and develop (if not having) the necessary, sufficient or supportive personality traits and their effective multivariate combinations for that language construct. This, of course, succinctly summarises not just the expectations from multi/plurilingual education in particular, but from education in general. Some resistance and rebellion are inevitable, because psychological traits, although pliable, show remarkable stability over time. The educator needs to keep in mind that by shunning those who disagree or rebel, they are not actively partaking in eradicating those who are disagreeable and outspoken as currently undesirable, but possibly productive future authors. By recognising the nuanced correlations between personality traits and language constructs, educators can gain insight into how individual differences influence language learning. Understanding these complex relationships can inform teaching strategies tailored to students' diverse personalities, thus facilitating more effective language acquisition. Specifically, by identifying underlying student basic psychological needs related to competence, relatedness and autonomy, educators can design meaningful and challenging language learning activities that resonate with students on a psychologically deeper level, promoting engagement and proficiency. By being mindful of how needs and traits influence language use and expression, educators can create inclusive learning environments in which students feel empowered to compete, relate and express themselves authentically across various cultural boundaries. Additionally, by acknowledging resistance and rebellion in educational settings, educators can facilitate meaningful discussions on cultural differences and encourage students to embrace diversity in language and communication.

There is a tautology, of course, in educating for and then evaluating stable personality trait-dependent language constructs, and in education affecting the development of such personality traits in (predictable) ways. Acknowledging this tautology is an informed starting point for using (existing) traits as psychological substrates and using (expected and graded) language constructs as competence signatures to skilfully, authentically and creatively communicate and foster humanity's overarching universal values towards the common good.

Conclusions

The present study provides both theoretical and practical contributions to the fields of psychology, language studies, education and the arts. Theoretically, it deepens our comprehension of the relations between common language patterns and the stable personality traits outlined in the Big Five framework worldwide. On a practical level, the study sheds light on how various expressions of personality through language may reflect underlying basic psychological needs. The results of the study therefore suggest that paying attention to the patterns of language-related expressions of personality may serve to more effectively identify, prioritise and address these needs in personal, interpersonal and cross-cultural interactions.

Limits and Implications for Further Studies

This study is subject to certain limitations that warrant caution against overgeneralisation of the results. These include the relatively small sample size consisting of female students enrolled in university teacher studies, as well as the reliance on self-assessments for measuring personality constructs. Additionally, the reliability of the IPIP personality measures was deemed satisfactory but not optimal, hovering around approximately .70. This limitation affects the size of correlations and consequently diminishes their predictive accuracy. Despite these constraints, however, all of the materials and measurements used in the study are meticulously described and made available online, facilitating replication by other researchers. The primary value of the study lies in the extensive data it provides on thirty personality facets and five traits, along with their correlations with listening, learning, speaking, reading and writing. This wealth of information can serve as a foundation for posing new research questions and formulating hypotheses for future investigations.

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Data availability statement

The data supporting the conclusions of this study are available from the corresponding author upon reasonable request.

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