Executive functioning and dysfunctional personality traits in young adults: a dimensional approach focused on impulsivity

Cómo citar este artículo:
Pardo, V., Manjarrez, A., Caicedo, R., Ayala, S., Mendoza, D., Pino, M. (2026). Executive functioning and dysfunctional personality traits in young adults: a dimensional approach focused on impulsivity. Revista Encuentros, Vol. 24 (01), 33-49. DOI: 10.15665/ckfhjs58

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Recibido: enero 26, 2026 / Aceptado: julio 28, 2026

ABSTRACT

Executive functioning (EF) comprises a set of higher-order cognitive processes that support cognitive, behavioral, and emotional self-regulation. Several theoretical models propose that individual differences in these processes are selectively associated with personality traits related to self-regulation, particularly impulsivity. However, empirical evidence addressing this relationship in non-clinical young adults remains limited.

The present study examined the association between executive functioning and dysfunctional personality traits from a dimensional perspective in a sample of 100 university students (55 women; mean age = 21.9 years). A cross-sectional correlational design was employed using the Ineco Frontal Screening (IFS) and

the Salamanca Screening Test. Associations were examined using Spearman correlations with correction for multiple comparisons, complemented by multiple linear regression models with HC3 robust standard errors and penalized regression techniques (Elastic Net and LASSO).

After correction for multiple comparisons, only the impulsive trait was significantly associated with lower global executive functioning, showing a small-to-moderate effect size ($\rho = -0.32$, pFDR = 0.013). Domain-level analyses revealed bivariate associations between impulsivity and inhibitory control and working memory, whereas subcomponent-level analyses identified significant associations with tasks assessing inhibitory control, verbal and visuospatial working memory, and verbal abstraction. Penalized regression models converged on the same executive profile, supporting the stability of the observed associations.
Overall, the findings indicate that impulsivity is the dysfunctional personality trait most closely associated with subclinical variability in executive functioning during young adulthood. These results support the view that impulsivity reflects individual differences in executive self-regulation and highlight executive processes as theoretically grounded targets for preventive strategies and psychological and neuropsychological interventions aimed at strengthening adaptive self-regulation.

Keywords: executive functioning; impulsivity; personality; self-regulation; young adults.

Funcionamiento ejecutivo y rasgos de personalidad disfuncionales en adultos jóvenes: un enfoque dimensional centrado en la impulsividad

RESUMEN

El funcionamiento ejecutivo (FE) comprende un conjunto de procesos cognitivos de orden superior que sustentan la autorregulación cognitiva, conductual y emocional. Diversos modelos teóricos proponen que las diferencias individuales en estos procesos se asocian de manera selectiva con rasgos de personalidad relacionados con la autorregulación, particularmente con la impulsividad. Sin embargo, la evidencia empírica sobre esta relación en adultos jóvenes no clínicos sigue siendo limitada.

El objetivo del presente estudio fue examinar la relación entre el funcionamiento ejecutivo y los rasgos disfuncionales de personalidad desde una perspectiva dimensional en una muestra de 100 estudiantes universitarios (55 mujeres; edad media = 21.9 años). Se empleó un diseño correlacional transversal y se utilizaron el Ineco Frontal Screening (IFS) y el Test de Salamanca. Las asociaciones se analizaron mediante correlaciones de Spearman con corrección por comparaciones múltiples, complementadas con modelos de regresión lineal múltiple con errores estándar robustos (HC3) y técnicas de regresión penalizada (Elastic Net y LASSO).

Tras aplicar la corrección por comparaciones múltiples, únicamente el rasgo impulsivo se asoció significativamente con un menor funcionamiento ejecutivo global (Rho = −0.32, p-FDR = 0.013). Los análisis por dominios revelaron asociaciones bivariadas entre la impulsividad y el control inhibitorio y la memoria de trabajo, mientras que los análisis por subcomponentes identificaron asociaciones significativas con tareas que evalúan el control inhibitorio, la memoria de trabajo verbal y visuoespacial, y la abstracción verbal. Los modelos de regresión penalizada convergieron en un mismo perfil ejecutivo, lo que respalda la estabilidad de las asociaciones observadas.

Los hallazgos indican que la impulsividad es el rasgo disfuncional de personalidad más estrechamente asociado con la variabilidad subclínica del funcionamiento ejecutivo durante la adultez joven. Estos resultados respaldan la concepción de la impulsividad como una manifestación de diferencias individuales en la autorregulación ejecutiva y destacan la relevancia de los procesos ejecutivos como objetivos teóricamente fundamentados para el diseño de estrategias preventivas e intervenciones psicológicas y neuropsicológicas orientadas al fortalecimiento de la autorregulación adaptativa.

Palabras clave: funcionamiento ejecutivo; impulsividad; personalidad; autorregulación; adultos jóvenes.

Funcionamento executivo e traços de personalidade disfuncionais em adultos jovens: uma abordagem dimensional centrada na impulsividade

RESUMO

O funcionamento executivo (FE) compreende um conjunto de processos cognitivos de ordem superior que sustentam a autorregulação cognitiva, comportamental e emocional. Diversos modelos teóricos propõem que as diferenças individuais nesses processos se associam de forma seletiva a traços de personalidade relacionados à autorregulação, particularmente à impulsividade. No entanto, a evidência empírica sobre essa relação em adultos jovens não clínicos ainda é limitada.

O objetivo do presente estudo foi examinar a relação entre o funcionamento executivo e os traços disfuncionais de personalidade a partir de uma perspectiva dimensional em uma amostra de 100 estudantes universitários (55 mulheres; idade média = 21,9 anos). Foi empregado um delineamento correlacional transversal, utilizando-se o Ineco Frontal Screening (IFS) e o Teste de Salamanca. As associações foram analisadas por meio de correlações de Spearman com correção para comparações múltiplas, complementadas por modelos de regressão linear múltipla com erros-padrão robustos (HC3) e técnicas de regressão penalizada (Elastic Net e LASSO).

Após a aplicação da correção para comparações múltiplas, apenas o traço impulsivo apresentou associação significativa com um menor funcionamento executivo global (Rho = −0,32, p-FDR = 0,013). As análises por domínios revelaram associações bivariadas entre impulsividade e controle inibitório e memória de trabalho, enquanto as análises por subcomponentes identificaram associações significativas com tarefas que avaliam o controle inibitório, a memória de trabalho verbal e visuoespacial, e a abstração verbal. Os modelos de regressão penalizada convergiram para um mesmo perfil executivo, o que reforça a estabilidade das associações observadas.

Os achados indicam que a impulsividade é o traço disfuncional de personalidade mais estreitamente associado à variabilidade subclínica do funcionamento executivo durante a adultez jovem. Esses resultados sustentam a concepção da impulsividade como uma manifestação de diferenças individuais na autorregulação executiva e destacam a relevância dos processos executivos como alvos teoricamente fundamentados para o desenho de estratégias preventivas e intervenções psicológicas e neuropsicológicas voltadas ao fortalecimento da autorregulação adaptativa.

Palavras-chave: funcionamento executivo; impulsividade; personalidade; autorregulação; adultos jovens.

Introduction

Executive functioning (EF) refers to a set of higher-order cognitive processes that enable the regulation of behavior, emotion, and goal-directed thought, including behavioral inhibition, cognitive flexibility, planning, and working memory (Miyake et al., 2000; Friedman & Robbins, 2022). These processes rely heavily on the functional integrity of prefrontal systems and are essential for individuals' adaptation to changing contexts and complex environmental demands (Diamond, 2013). According to Barkley's self-regulation model (2001, 2011), executive functions constitute a central control system that modulates automatic responses in accordance with long-term goals, thereby acting as a proximal mechanism for behavioral and emotional self-regulation.

Personality traits, in turn, represent relatively stable individual differences in patterns of thinking, feeling, and behaving. Several theoretical models propose that these traits reflect enduring variations in cognitive and emotional control mechanisms (DeYoung, 2010; Allen & DeYoung, 2023). In particular, research grounded in the Five-Factor Model has identified systematic associations between EF and traits such as conscientiousness and neuroticism, suggesting that greater executive efficiency is linked to more effective behavioral and emotional regulation, whereas deficits in these processes are associated with impulsivity and emotional vulnerability (Roberts et al., 2014; Wright et al., 2021).

From the perspective of personality neuroscience, dispositional traits have been proposed to partially emerge from the functional organization of frontal systems and their connectivity with limbic structures (DeYoung et al., 2010). In line with Kahneman's dual-process framework (2011), executive functioning can be conceptualized as a controlled processing system analogous to System 2, responsible for regulating the automatic and affect-driven responses generated by System 1. Empirical studies have shown, for example, that neuroticism is negatively associated with inhibitory control and cognitive flexibility, whereas conscientiousness exhibits positive associations with planning and working memory capacities (Friedman et al., 2016).

Neuropsychological evidence further supports this relationship. Studies involving patients with prefrontal cortex lesions indicate marked impairments in both executive performance and personality functioning, including disinhibition, cognitive rigidity, and difficulties in decision-making (Damasio, 1994; Stuss & Levine, 2002). These alterations have been attributed to disruptions in the interaction between prefrontal systems—considered the neural substrate of EF—and limbic structures associated with emotional reactivity, as demonstrated by research on amygdala–prefrontal cortex connectivity in emotion regulation (Phelps, 2005; Blair, 2007).

Importantly, this association is not restricted to clinical populations. In non-clinical samples, dysfunctional personality traits can be conceptualized as dimensional expressions of less efficient self-regulatory styles that do not meet formal diagnostic criteria (Widiger & Smith, 2008; Michelini et al., 2021). Within this framework, impulsive and antisocial traits have been linked to deficits in inhibitory control and decision-making even in community-based samples of young individuals (Raine et al., 2011; Steward et al., 2022), whereas obsessive and rigid traits have been associated with reduced cognitive flexibility (Fineberg et al., 2014). These findings suggest that variability along the executive functioning continuum may underlie the expression of personality traits in the general population.

Young adulthood constitutes a particularly relevant developmental period for examining these associations, as executive functioning continues to mature into the third decade of life, while substantial interindividual variability in personality traits remains evident (Luna et al., 2015; Rømer et al., 2023). During this stage,

relatively subtle differences in executive efficiency may consolidate into stable behavioral patterns with significant implications for academic, social, and emotional adjustment. (Sanchez-Kuhn et al., 2023)

Despite the accumulated evidence, relatively few studies have jointly examined executive functioning and dysfunctional personality traits in non-clinical young adult populations using brief and ecologically valid screening instruments (Romer & Pizzagalli, 2021). In particular, the combined use of global measures of EF, such as the Ineco Frontal Screening (Torralva et al., 2009), and personality screening tools, such as the Salamanca Test (Pérez Urdániz et al., 2007), remains underexplored. This gap limits understanding of how subclinical variations in executive functioning relate to personality patterns in community samples, especially when considering specific domains such as inhibitory control and working memory, which are regarded as core components of the executive system (Miyake & Friedman, 2012).

Within this context, the present study aims to examine the relationship between executive functioning and dysfunctional personality traits in a sample of non-clinical young adults, adopting a dimensional approach to both constructs. The general objective was to analyze the association between executive functioning and dysfunctional personality traits assessed through screening instruments. Specifically, the study sought to: (a) examine the relationship between global executive functioning and different personality traits; (b) identify, for traits showing robust associations with global executive functioning, the executive domains involved—particularly inhibitory control and working memory; and (c) explore which specific executive subcomponents are associated with these traits through an analysis of the Ineco Frontal Screening subtests.

Based on previous literature, it was hypothesized that poorer executive performance would be associated with a greater presence of dysfunctional personality traits, particularly those linked to difficulties in cognitive and behavioral self-regulation.

Method

Design

The present study employed a cross-sectional, non-experimental correlational design aimed at examining the relationship between executive functioning and dysfunctional personality traits from a dimensional perspective. The research was conducted in a university setting and did not involve manipulation of independent variables or random assignment of participants. Given the cross-sectional nature of the design, causal inferences cannot be drawn.

Participants

The sample consisted of 100 university students recruited through non-probabilistic convenience sampling. Of the total participants, 55 were women (55%) and 45 were men (45%), with a mean age of 21.9 years (SD = 2.53).

Inclusion criteria required voluntary participation, formalized through the signing of an informed consent form approved by the institutional ethics committee. Exclusion criteria included: (a) the presence of a current psychiatric or neuropsychiatric diagnosis at the time of assessment, and (b) the presence of a medical condition that could affect cognitive performance. Both criteria were verified through participants' self-report.

Instruments

Executive Functioning

Executive functioning was assessed using the Ineco Frontal Screening (IFS), developed by Torralva et al. (2009). The IFS is a brief instrument designed for the global evaluation of executive functioning, with particular sensitivity to alterations associated with frontal lobe dysfunction. It has been widely used in both clinical and research contexts and demonstrates adequate psychometric properties, with reported specificity of 0.91 and sensitivity of 0.96.

The maximum possible score on the IFS is 30 points, with lower scores indicating greater executive impairment. The instrument assesses executive functioning through eight subtests: Luria Motor Series, Conflicting Instructions, Go/No-Go, Hayling Test, Months Backward, Backward Digit Span, Corsi Block-Tapping Test, and Proverbs. Performance across these tasks yields a total executive functioning score reflecting overall executive performance.

For the purposes of the present study, two composite indices were derived to examine specific executive domains. An Inhibitory Control Index (ICI) was calculated as the mean score of the Luria Motor Series, Conflicting Instructions, Go/No-Go, and Hayling Test subtests. A Working Memory Index (WMI) was computed as the mean score of the Months Backward, Backward Digit Span, and Corsi Block-Tapping Test subtests. These indices were used for analytical purposes in accordance with theoretical models that conceptualize executive functioning as a multidimensional system, with inhibitory control and working memory representing core components (Miyake & Friedman, 2012).

Personality Traits

Dysfunctional personality traits were assessed using the Salamanca Screening Test, developed by Pérez Urdániz, Rubio Larrosa, and Gómez Gazol (2007). This instrument is a screening measure designed for the dimensional identification of dysfunctional personality traits based on prototypical personality disorder profiles.

The test consists of 22 dichotomous-response items that assess eleven personality traits grouped into three major clusters: Cluster A (paranoid, schizoid, schizotypal), Cluster B (histrionic, antisocial, narcissistic, impulsive, borderline), and Cluster C (anankastic, dependent, anxious). Each trait yields a maximum score of 6 points, with scores equal to or greater than 3 indicating a higher presence of the corresponding trait.

The Salamanca Test is not intended for diagnostic purposes; rather, it allows for a dimensional assessment of personality traits and is particularly suitable for research in non-clinical populations. In the present study, scores for each trait were treated as continuous variables for statistical analyses.

Procedure

Data collection was conducted over a three-month period (March–May 2025). Assessments were carried out in person at the Laboratory of Neuroscience and Basic Psychological Processes of the Psychology Program at Universidad de San Buenaventura, Cartagena campus.

Each assessment session lasted approximately 30–40 minutes and was conducted individually. At the beginning of each session, participants received information about the study objectives and provided written informed consent, ensuring the confidentiality and voluntary nature of their participation.

A brief initial interview was conducted to collect sociodemographic information and to verify the absence of medical, psychiatric, or neuropsychiatric diagnoses based on self-report. Participants who reported the presence of any such condition were excluded from the study.

Subsequently, the instruments were administered in a fixed order. First, participants completed the Salamanca Screening Test as a self-report measure. This was followed by the administration of the Ineco Frontal Screening (IFS), conducted in accordance with standardized instructions. Throughout the assessment process, efforts were made to ensure appropriate environmental conditions and to minimize potential sources of distraction.

Data Analysis

Data were initially entered into a spreadsheet (Microsoft Excel) and subsequently imported into R software (version 4.4.3) for data cleaning and statistical analysis. A systematic review of the dataset was conducted to verify variable consistency, coding accuracy, and the presence of missing values. No missing data were identified; therefore, no imputation procedures were required.

Given that several variables consisted of discrete and ordinal scores, and considering potential deviations from normality, non-parametric statistical methods were employed for initial analyses. The level of statistical significance was set at $\alpha = .05$ for all tests.

Phase 1: Association between global executive functioning and personality traits

In the first phase, associations between the total IFS score and the personality traits assessed by the Salamanca Test were examined using Spearman's rank-order correlations. To account for multiple comparisons, the Benjamini–Hochberg false discovery rate (FDR) correction was applied to control for Type I error and to prioritize robust associations (Benjamini & Hochberg, 1995). Only traits that remained statistically significant after FDR correction were retained for subsequent analyses.

Given the moderate sample size (N = 100), effect sizes were emphasized alongside statistical significance. In this context, Spearman's rho was interpreted not only as an index of association but also as a direct measure of effect size, in line with methodological recommendations for correlational research (Cohen, 1988; Funder & Ozer, 2019).

For the traits retained after FDR correction, multiple linear regression models were estimated with global executive functioning as the dependent variable and personality traits as predictors, controlling for age and sex. To improve the robustness of statistical inference in the presence of potential heteroscedasticity, HC3 robust standard errors were used (Long & Ervin, 2000). Regression results were complemented with standardized regression coefficients (β) and semi-partial R^2 values (sr^2) to quantify the unique contribution of each predictor to explained variance.

Phase 2A: Analysis by executive domains

In the second phase, the specific executive domains underlying the observed associations were examined. Spearman correlations were computed between the selected personality traits and the composite indices of inhibitory control (ICI) and working memory (WMI). As in the previous phase, Spearman's rho was interpreted as an estimate of effect size.

Subsequently, multiple regression models with HC3 robust standard errors were estimated, simultaneously including both executive domains along with age and sex as covariables, in order to assess their relative contributions. This approach allowed for the examination of whether associations with global executive functioning were driven by specific executive processes, in line with multidimensional models of executive functioning (Miyake & Friedman, 2012).

Phase 2B: Analysis of executive subcomponents

in Phase 2B, a micro-level analysis was conducted to examine the associations between the selected personality traits and each IFS subtest. Spearman correlations were estimated, and the false discovery rate (FDR) correction was applied within each set of comparisons to control for Type I error. This analysis enabled the identification of the executive tasks most strongly associated with the personality traits of interest, providing greater neuropsychological specificity.

Complementary Analysis: Predictor Selection Using Elastic Net

As a complementary analysis, a penalized regression model using Elastic Net was implemented with 10-fold cross-validation. IFS subtests, age, and sex were entered as predictors of the selected personality traits. Elastic Net combines L1 (LASSO) and L2 (Ridge) penalties, allowing for more stable variable selection in contexts characterized by multicollinearity and a relatively large number of correlated predictors (Zou & Hastie, 2005).

This analysis was not intended for inferential purposes but rather as a confirmatory predictive strategy to evaluate the consistency of the association patterns identified through correlational and classical regression analyses. The use of Elastic Net is particularly appropriate in exploratory and correlational research aimed at identifying relevant subsets of predictors while minimizing overfitting (Hastie et al., 2009).

Results

Descriptive Characteristics of the Sample

The final sample consisted of 100 university students, including 55 women (55.0%) and 45 men (45.0%), with a mean age of 21.9 years (SD = 2.53). Executive functioning, assessed using the Ineco Frontal Screening (IFS), showed a mean total score of 21.46 (SD = 3.68). This level of performance does not suggest the presence of clinically significant executive dysfunction. However, previous normative studies have shown that IFS scores are strongly influenced by educational attainment, with higher mean scores typically observed among individuals with more than 11–12 years of formal education (Sierra Sanjurjo et al., 2018). In this context, the observed mean score may reflect variability in executive functioning within a non-clinical university sample, rather than optimal executive performance relative to education-adjusted normative expectations.

With respect to dysfunctional personality traits assessed by the Salamanca Screening Test, mean scores were generally below the suggested cutoff point (≥ 3) for clinically significant trait expression, consistent with a subclinical profile in this community sample. Descriptive statistics for all traits are presented in Table 1.

Table 1. Descriptive statistics of dysfunctional personality traits (N = 100).

Trait	*Mean*	*SE*	*Min*	*Max*
PAR	2.14	1.39	0	5
SCH	2.92	1.64	0	6
SCT	1.26	1.46	0	6
HIST	3.12	1.68	0	6
ANT	0.55	1.01	0	4
NAR	1.99	1.43	0	5
IMP	2.48	1.76	0	6
BOR	2.79	1.85	0	6
ANA	2.82	1.51	0	6
DEP	1.47	1.62	0	6
ANX	2.55	1.99	0	6

Note. PAR = paranoid; SCH = schizoid; SCT = schizotypal; HIST = histrionic; ANT = antisocial; NAR = narcissistic; IMP = impulsive; BOR = borderline; ANA = anankastic (obsessive–compulsive); DEP = dependent; ANX = anxious

Phase 1: Global Executive Functioning and Personality Traits

Correlational Analysis

In the first phase, the association between global executive functioning (IFS total score) and the eleven dysfunctional personality traits was examined using Spearman's rank-order correlations. Given the number of comparisons performed, p-values were adjusted using the Benjamini–Hochberg procedure to control the false discovery rate (FDR).

After FDR correction, only the impulsive trait (IMP) showed a statistically significant negative association with global executive functioning (Rho = −0.320, p_FDR = 0.013), indicating that higher levels of impulsivity were associated with poorer executive performance. The histrionic (HIST) trait showed a nominally significant correlation prior to correction (Rho = −0.212, p = 0.034), but this association did not remain significant after FDR adjustment. No other traits were significantly associated with executive functioning (all p_FDR > 0.05).

Given these results, the impulsive trait was the only personality dimension retained for subsequent analyses.

Table 2. Spearman correlations between total IFS score and personality traits.

Trait	*Rho*	*p*	*p_FDR*
IMP	-0.32	0.001	0.013
HIST	-0.212	0.034	0.186
SCH	0.146	0.147	0.539
ANA	-0.108	0.283	0.778
SCT	0.041	0.689	0.779
ANT	0.082	0.415	0.779
NAR	-0.045	0.655	0.779
BOR	-0.06	0.551	0.779
DEP	-0.068	0.502	0.779
ANX	-0.038	0.708	0.779
PAR	-0.003	0.980	0.980

Note. p_FDR values were obtained using the Benjamini–Hochberg procedure.

Regression Analysis

To further examine the association between impulsivity and executive functioning, a multiple linear regression model with HC3 (Heteroscedasticity-Consistent robust standard errors) was estimated. The total score of the Ineco Frontal Screening (IFS) was entered as the dependent variable, with impulsivity as the main predictor, controlling for age and sex.

Results revealed a significant negative association between impulsivity and global executive functioning ($b = -0.594$, SE HC3 = 0.231, $t = -2.57$, $p = 0.012$). In practical terms, each one-point increase in impulsivity was associated with an average decrease of approximately 0.59 points in the IFS total score, holding age and sex constant. Neither age nor sex showed statistically significant effects ($p > 0.21$).

The standardized regression coefficient indicated a small-to-moderate effect size ($\beta = -0.283$). Moreover, impulsivity uniquely accounted for 6.5% of the variance in executive functioning ($sr^2 = 0.065$), above and beyond the effects of age and sex. Overall, the model explained 13.0% of the variance in executive functioning ($R^2 = 0.130$; adjusted $R^2 = 0.102$). This magnitude is consistent with effect sizes typically observed in individual differences research, where associations between cognitive and personality variables tend to be modest yet theoretically and practically meaningful. In fact, an explained variance of approximately 10–15% falls within the range of effects considered relevant for complex psychological phenomena and exceeds the threshold for a medium effect according to classical benchmarks (Cohen, 1988; Gignac & Szodorai, 2016).

Table 3. HC3 regression model predicting global executive functioning.

Predictor	*b*	*SE HC3*	*t*	*p*	*β*	*sr²*	*R²*	*adj. R²*
Intercept	19.60	3.30	5.95	< .001	—	—	0.130	0.102
Impulsivity	−0.594	0.231	−2.57	0.012	−0.283	0.065	0.130	0.102
Age	0.172	0.143	1.20	0.232	0.117	0.015	0.130	0.102
Sex (Male)	−0.911	0.730	−1.25	0.215	−0.124	0.016	0.130	0.102

Note. b = unstandardized regression coefficient; SE HC3 = heteroscedasticity-consistent robust standard error (HC3); β = standardized regression coefficient; sr^2 = semi-partial R^2 (unique variance explained by each predictor). Sex was coded as 0 = female and 1 = male. R^2 and adjusted R^2 reflect overall model fit.

Phase 2A: Executive Domain Analysis

In the second phase, specific executive domains underlying the association between impulsivity and global executive functioning were explored. At the correlational level, impulsivity showed significant negative associations with both the Working Memory Index (WMI; Rho = −0.287, p = 0.0038) and the Inhibitory Control Index (ICI; Rho = −0.222, p = 0.0265), suggesting that higher impulsivity was related to poorer performance in both executive domains.

Subsequently, a multiple regression model with HC3 robust standard errors was estimated, simultaneously including WMI and ICI as predictors, along with age and sex. In this model, none of the predictors reached conventional levels of statistical significance ($p < 0.05$), although marginal trends were observed for working memory ($b = -0.191$, $p = 0.085$) and male sex ($b = 0.685$, $p = 0.057$). The overall model explained 11.3% of the variance in impulsivity (adjusted $R^2 = 0.075$).

Table 4. Regression model predicting impulsivity from executive domains adjusted for age and sex.

	b	SE HC3	t	p	r2	adjr2
(Intercept)	4.07	2.34	1.74	0.085	0.113	0.075
ICI	-0.0810	0.09	-0.87	0.386	0.113	0.075
WMI	-0.191	0.11	-1.74	0.085	0.113	0.075
age	-0.002	0.09	-0.02	0.979	0.113	0.075
Sex (Male)	0.685	0.35	1.93	0.057	0.113	0.075

Note. b = unstandardized regression coefficient; SE = robust standard error (HC3). ICI = Inhibitory Control Index; WMI = Working Memory Index. The model was estimated using HC3 robust errors to reduce the impact of potential heteroscedasticity.

Phase 2B: Executive Functioning Subcomponent Analysis

At a more fine-grained level, associations between impulsivity and each IFS subtest were examined using Spearman correlations. After applying FDR correction within this set of comparisons, significant negative associations were observed with Backward Digit Span, the Corsi Block-Tapping Test, the Go/No-Go task, and the Proverbs subtest. These results indicate that impulsivity was particularly related to poorer performance in tasks tapping working memory, inhibitory control, and abstract reasoning.

No significant associations were observed for the Luria Motor Series, Conflicting Instructions, Hayling Test, or Months Backward after correction.

Table 5. Spearman correlations between impulsivity and IFS subtests.

Subtest	Rho	p	pFDR
Go/No-Go	−0.258	0.009	0.019
Digit Span (Backward)	−0.291	0.003	0.019
Corsi Test	−0.278	0.005	0.019
Proverbs	−0.267	0.007	0.019
Conflicting Instructions	−0.151	0.134	0.215
Luria Motor Series	−0.123	0.222	0.295
Hayling Test	−0.083	0.414	0.473
Months Backward	0.036	0.726	0.726

Note. pFDR = p value adjusted using the Benjamini–Hochberg procedure

Complementary Analysis: Elastic Net and LASSO

As a complementary and confirmatory approach, penalized regression models using Elastic Net ($\alpha = 0.5$) and LASSO ($\alpha = 1$) with 10-fold cross-validation were estimated, using IFS subtests and sex as predictors of impulsivity. Both models converged on the same subset of predictors, showing highly consistent coefficient patterns across methods.

Male sex and poorer performance on the Proverbs subtest emerged as the strongest predictors of impulsivity, followed by performance on the Corsi Block-Tapping Test, Backward Digit Span, and Go/No-Go task. These findings replicate and reinforce the pattern identified in the correlational and classical regression analyses, supporting the robustness of the observed executive profile associated with impulsivity.

Table 6. Predictors of impulsivity selected by Elastic Net and LASSO.

Predictor	Elastic Net (α = 0.5)	LASSO (α = 1)
Demographic variable		
Sex (Male)	0.275	0.271
IFS subtests		
Proverbs	−0.248	−0.251
Corsi Test	−0.132	−0.130
Digit span (backward)	−0.126	−0.126
Go/No-Go	−0.122	−0.117
Conflicting instructions	−0.063	−0.045

Note. Only predictors with non-zero coefficients at the optimal value of the regularization parameter **λ**min are presented. The sign of the coefficient indicates the direction of the association with the impulsive trait.

Discussion

The present study examined the relationship between executive functioning and dysfunctional personality traits in non-clinical young adults from a dimensional perspective. The findings provide theoretically meaningful support for the proposed hypothesis, indicating that subclinical variations in executive functioning are selectively associated with impulsivity. Although the observed association was small to moderate, effect sizes of this magnitude are typical and substantively meaningful in individual differences research involving complex psychological constructs such as executive functioning and personality (Gignac & Szodorai, 2016). Overall, the results suggest that impulsivity constitutes the dysfunctional personality trait most closely linked to executive self-regulatory capacity in non-clinical young adults.

Global Executive Functioning and Impulsivity

Consistent with this interpretation, impulsivity emerged as the only personality trait robustly associated with global executive functioning. Poorer performance on the Ineco Frontal Screening was associated with higher impulsivity scores even after correction for multiple comparisons and adjustment for age and sex. These findings reinforce the notion that impulsivity reflects, at least in part, reduced efficiency in cognitive mechanisms supporting behavioral regulation rather than a broad vulnerability shared across dysfunctional personality traits.

From a theoretical perspective, the findings are consistent with models conceptualizing executive functions as a supervisory control system responsible for inhibiting automatic responses, regulating behavior, and maintaining goal-directed activity (Barkley, 2012; Diamond, 2013). Within this framework, impulsive behavior may represent the behavioral expression of less efficient executive control, particularly when prepotent responses must be inhibited or behavior must be flexibly adjusted to situational demands. Converging neurobiological evidence further supports this interpretation by implicating prefrontal-striatal circuits as key substrates underlying both executive control and impulsive behavior (Friedman & Robbins, 2022).

Importantly, no other dysfunctional personality trait demonstrated a robust association with executive functioning after controlling for multiple comparisons. Although the histrionic trait showed a nominal association, this effect did not remain statistically significant following FDR correction, emphasizing the importance of distinguishing exploratory findings from robust and reproducible associations. Collectively, these results suggest that executive functioning is not uniformly related to dysfunctional personality dimensions in non-clinical populations but instead shows a functionally selective relationship with impulsivity.

Executive Domains and Functional Integration

The domain-level analyses further refined this relationship. At the bivariate level, impulsivity was negatively associated with inhibitory control and working memory, two core executive domains within the unity–diversity framework of executive functioning (Miyake & Friedman, 2012). These findings are consistent with previous research linking impulsivity to difficulties suppressing inappropriate responses while maintaining and manipulating goal-relevant information (Sharma et al., 2014; Steward et al., 2022). However, when both domains were entered simultaneously into the regression model, neither remained independently significant. Rather than indicating the absence of meaningful associations, this attenuation likely reflects the substantial overlap among executive processes. Contemporary hierarchical models propose that executive domains share a common executive factor that supports coordinated cognitive control across tasks (Miyake & Friedman, 2012). From this perspective, impulsivity may be more closely associated with the overall efficiency of the executive control system than with isolated executive domains, explaining why individual components lose predictive strength once their shared variance is considered.

Executive Function Subcomponents

The subcomponent-level analyses provided a more detailed characterization of the executive profile associated with impulsivity. Significant associations were observed with tasks assessing behavioral inhibition (Go/No-Go), verbal and visuospatial working memory (Backward Digit Span and Corsi Block-Tapping Test), and verbal abstraction (Proverbs). Together, these findings indicate that impulsive tendencies in non-clinical young adults are primarily linked to executive processes responsible for suppressing automatic responses, actively manipulating information, and integrating abstract conceptual representations.

These findings may also be understood in light of contemporary conceptualizations of impulsivity as a multidimensional construct. Rather than representing a unitary personality characteristic, impulsivity encompasses partially independent facets involving deficits in inhibitory control, heightened reward sensitivity, sensation seeking, and emotionally driven impulsive actions (Whiteside & Lynam, 2001; Cyders & Smith, 2008; Sharma et al., 2014). Although the Salamanca Screening Test assesses impulsivity as a global personality trait, the present pattern of associations appears to correspond more closely to those facets reflecting deficient cognitive control than to motivational or affective dimensions. In particular, the consistent relationships with inhibitory control and working memory support theoretical models proposing that executive dysfunction primarily contributes to failures in behavioral regulation, whereas other expressions of impulsivity may depend more strongly on emotional reactivity, reward processing, or motivational influences that were not directly assessed in the present study.

The association with verbal abstraction also deserves consideration. Successful performance on proverb interpretation requires suppressing literal interpretations, integrating contextual information, and selecting higher-order semantic representations, processes that depend on coordinated executive regulation. Consequently, reduced abstraction performance may reflect broader limitations in cognitive flexibility and controlled information integration that accompany impulsive behavioral tendencies.

By contrast, no significant associations were observed for tasks involving relatively basic motor sequencing or verbal fluency, including the Luria Motor Series, the Hayling Test, and Months Backward. This selective pattern reinforces the view that executive functioning is not a unitary construct and suggests that only specific executive processes contribute meaningfully to individual differences in impulsivity. Accordingly, examining executive subcomponents provides a more informative characterization of personality-related self-regulatory processes than relying exclusively on global executive scores.

Robustness of Findings: Penalized Regression Analyses

The complementary penalized regression analyses provided converging support for the stability of the identified executive profile. The convergence between Elastic Net and LASSO indicates that the observed associations are unlikely to reflect sample-specific statistical fluctuations or model overfitting. Instead, both approaches consistently highlighted executive processes involving working memory, inhibitory control, and verbal abstraction, together with male sex, as the variables most strongly related to impulsivity. From a methodological perspective, these findings illustrate the value of combining regularization techniques with conventional inferential analyses when examining multiple correlated neuropsychological predictors. Implications for Psychological and Neuropsychological Intervention

The present findings have several practical implications for psychological and neuropsychological intervention in non-clinical young adults. The selective association between impulsivity and executive functioning suggests that impulsive traits may be understood, at least partially, as behavioral expressions of less efficient executive self-regulation, even in the absence of clinically significant psychopathology.

From a psychological perspective, these findings support the incorporation of interventions aimed at strengthening cognitive and behavioral self-regulation within university support programs. Approaches targeting inhibitory control, planning, behavioral monitoring, and emotion regulation may contribute to reducing impulsive tendencies while promoting more adaptive academic, interpersonal, and everyday functioning.

From a neuropsychological perspective, the identification of specific executive processes associated with impulsivity offers a more precise basis for intervention planning. Programs incorporating progressive verbal and visuospatial working memory training, together with exercises designed to strengthen inhibitory control, have demonstrated beneficial effects on behavioral regulation and decision-making in non-clinical populations (Diamond & Ling, 2016). More recent evidence likewise supports the potential of targeted executive function interventions to reduce impulsive behaviors in young adults (Sánchez-Kuhn et al., 2023). Taken together, the present findings contribute to refining the theoretical understanding of impulsivity while providing empirically grounded guidance for designing interventions that target the executive mechanisms most closely related to individual differences in self-regulatory capacity.

Limitations and Future Directions

Although the findings demonstrated a high degree of internal consistency, several limitations should be acknowledged. First, the cross-sectional design precludes causal inferences regarding the directionality of the relationship between executive functioning and impulsivity. Longitudinal studies are therefore needed to determine whether reduced executive efficiency precedes impulsive tendencies or whether impulsive behavior contributes to subsequent changes in executive functioning.

Second, the relatively modest sample size and the use of a non-probabilistic university sample limit the generalizability of the findings. Although the observed effect sizes are consistent with those typically reported in individual differences research, replication in larger, more diverse, and culturally heterogeneous samples is needed to strengthen external validity.

Third, the reliance on screening instruments limits the clinical specificity of the conclusions. Nevertheless, this approach is appropriate for examining subclinical variability in community samples and is consistent with the dimensional framework adopted in the present study. Future research could extend these findings by incorporating ecological assessments of impulsive behavior, executive tasks with greater ecological

validity, and multimethod approaches integrating behavioral, self-report, and neuropsychological measures. Given the multidimensional nature of impulsivity, future studies should also examine whether specific impulsivity facets—including deficits in inhibitory control, emotion-driven impulsive actions, or reward sensitivity—show distinct patterns of association with executive processes. Such work would help clarify the mechanisms underlying the selective relationships observed in the present study and further refine dimensional models linking personality and executive functioning.

Finally, longitudinal and intervention-based designs would be particularly valuable for determining whether improvements in executive functioning lead to sustained reductions in impulsive tendencies, thereby clarifying the functional and potentially causal role of executive processes in self-regulation.
Despite these limitations, the convergence of findings across correlational analyses, robust regression models, and penalized regression techniques supports the internal validity of the observed pattern and increases confidence in the stability of the identified associations.

Conclusion

The present study provides empirical evidence that, in non-clinical young adults, variability in executive functioning is selectively associated with impulsivity, even within the subclinical range. Lower overall executive performance was consistently related to higher levels of impulsivity, whereas no robust associations were observed for the remaining dysfunctional personality traits after correction for multiple comparisons.

Analyses conducted at the domain and subcomponent levels identified a distinctive executive profile characterized by reduced inhibitory control, working memory, and verbal abstraction. These findings support the view that impulsivity reflects individual differences in executive self-regulation rather than a diffuse or nonspecific personality vulnerability.

The convergence of results across correlational analyses, HC3-robust regression models, and penalized regression techniques further strengthens confidence in the robustness and stability of this executive profile. Collectively, these findings support a dimensional account of the relationship between executive functioning and dysfunctional personality traits, highlighting impulsivity as the trait most closely linked to executive control mechanisms in young adulthood.

From an applied perspective, the findings identify executive functioning as a theoretically grounded and clinically relevant target for preventive strategies and psychological and neuropsychological interventions designed to strengthen self-regulation and promote adaptive functioning during the transition to adulthood.

References

Allen, T. A., & DeYoung, C. G. (2023). Personality neuroscience: A developmental perspective. Personality Neuroscience, 6, e2. https://doi.org/10.1017/pen.2023.1

Barkley, R. A. (2001). The executive functions and self-regulation: An evolutionary neuropsychological perspective. Neuropsychology Review, 11(1), 1-29. https://doi.org/10.1023/A:1009085417776

Barkley, R. A. (2011). Barkley deficits in executive functioning scale (BDEFS). Guilford Press.

Barkley, R. A. (2012). Executive functions: What they are, how they work, and why they evolved. Guilford Press.

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. Journal of the Royal Statistical Society: Series B (Methodological),

57(1), 289–300. https://doi.org/10.1111/j.2517-6161.1995.tb02031.x

Blair, R. J. R. (2007). The amygdala and ventromedial prefrontal cortex in morality and psychopathy. Trends in Cognitive Sciences, 11(9), 387-392. https://doi.org/10.1016/j.tics.2007.07.003

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.

Damasio, A. R. (1994). Descartes' error: Emotion, reason, and the human brain. Putnam.

DeYoung, C. G. (2010). Personality neuroscience and the biology of traits. Social and Personality Psychology Compass, 4(12), 1165-1180. https://doi.org/10.1111/j.1751-9004.2010.00327.x

DeYoung, C. G., Hirsh, J. B., Shane, M. S., Papademetris, X., Rajeevan, N., & Gray, J. R. (2010). Testing predictions from personality neuroscience: Brain structure and the Big Five. Psychological Science, 21(6), 820-828. https://doi.org/10.1177/0956797610370159

Diamond, A. (2013). Executive functions. Annual Review of Psychology, 64, 135-168. https://doi.org/10.1146/annurev-psych-113011-143750

Diamond, A. (2020). Executive functions. In S. T. Fiske (Ed.), Handbook of Clinical Neurology (Vol. 173, pp. 225-240). Elsevier. https://doi.org/10.1016/B978-0-444-64150-2.00020-4

Diamond, A., & Ling, D. S. (2016). Conclusions about interventions, programs, and approaches for improving executive functions that appear justified and those that, despite much hype, do not. Developmental Cognitive Neuroscience, 18, 34-48. https://doi.org/10.1016/j.dcn.2015.11.005

Fineberg, N. A., Chamberlain, S. R., Goudriaan, A. E., Stein, D. J., Vanderschuren, L. J., Gillan, C. M., ... & Potenza, M. N. (2014). New developments in human neurocognition: Clinical, genetic, and brain imaging correlates of impulsivity and compulsivity. CNS Spectrums, 19(1), 69-89. https://doi.org/10.1017/S1092852913000801

Friedman, N. P., & Robbins, T. W. (2022). The role of prefrontal cortex in cognitive control and executive function. Neuropsychopharmacology, 47(1), 72-89. https://doi.org/10.1038/s41386-021-01132-0

Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. Advances in Methods and Practices in Psychological Science, 2(2), 156–168. https://doi.org/10.1177/2515245919847202

Gignac, G. E., & Szodorai, E. T. (2016). Effect size guidelines for individual differences researchers. Personality and Individual Differences, 102, 74–78. https://doi.org/10.1016/j.paid.2016.06.069

Hastie, T., Tibshirani, R., & Friedman, J. (2009). The elements of statistical learning: Data mining, inference, and prediction (2nd ed.). Springer. https://doi.org/10.1007/978-0-387-84858-7

Kahneman, D. (2011). Thinking, fast and slow. Farrar, Straus and Giroux.

Long, J. S., & Ervin, L. H. (2000). Using heteroscedasticity consistent standard errors in the linear regression model. The American Statistician, 54(3), 217–224. https://doi.org/10.1080/00031305.2000.10474549

Luna, B., Marek, S., Larsen, B., Tervo-Clemmens, B., & Chahal, R. (2015). An integrative model of the maturation of cognitive control. Annual Review of Neuroscience, 38, 151-170. https://doi.org/10.1146/annurev-neuro-071714-034054

Michelini, G., Barch, D. M., Tian, Y., Watson, D., Klein, D. N., & Kotov, R. (2021). Multiple pathways to impulsivity: A transdiagnostic approach to neurocognitive mechanisms. Biological Psychiatry: Cognitive Neuroscience and Neuroimaging, 6(3), 286-295. https://doi.org/10.1016/j.bpsc.2020.09.016

Miyake, A., & Friedman, N. P. (2012). The nature and organization of individual differences in executive functions: Four general conclusions. Current Directions in Psychological Science, 21(1), 8-14. https://doi.org/10.1177/0963721411429458

Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex frontal lobe tasks: A latent variable analysis. Cognitive Psychology, 41(1), 49-100. https://doi.org/10.1006/cogp.1999.0734

Pérez Urdániz, A., García Gutiérrez, A., & Alvarado Izquierdo, J. M. (2007). Cuestionario Salamanca de Personalidad (CSP). Tea Ediciones.

Phelps, E. A. (2005). The interaction of emotion and cognition: Insights from studies of the human amygdala. In A. S. R. Manstead, N. Frijda, & A. Fischer (Eds.), Feelings and emotions: The Amsterdam symposium (pp. 51-66). Cambridge University Press.

Roberts, B. W., Lejuez, C., Krueger, R. F., Richards, J. M., & Hill, P. L. (2014). What is conscientiousness and how can it be assessed? Developmental Psychology, 50(5), 1315-1330. https://doi.org/10.1037/a0031109

Romer, A. L., & Pizzagalli, D. A. (2021). Is executive dysfunction a risk factor or consequence of psychopathology? A test of executive function as a prospective predictor and outcome of general psychopathology in the Adolescent Brain Cognitive Development Study®. JAMA Psychiatry, 78(11), 1204-1212. https://doi.org/10.1001/jamapsychiatry.2021.2421

Rømer, T. B., Mørup, A. H., Petersen, L. V., Pedersen, C. B., & Plessen, K. J. (2023). The dimensional structure of psychopathology and personality traits in emerging adulthood. Journal of Psychopathology and Clinical Science, 132(2), 171-184. https://doi.org/10.1037/abn0000804

Sánchez-Kuhn, A., Pérez-Fernández, C., Medina, J. A., García-Martín, M. B., & Sánchez-Santed, F. (2023). Executive functions and personality traits in university students: A network analysis approach. Journal of Personality Assessment, 105(3), 345-358. https://doi.org/10.1080/00223891.2022.2155842

Sharma, L., Markon, K. E., & Clark, L. A. (2014). Cognitive and personality correlates of impulsive behaviour in healthy adults. Journal of Personality Assessment, 96(1), 96-106. https://doi.org/10.1080/00223891.2013.834440

Sierra Sanjurjo N, Saraniti AB, Gleichgerrcht E, Roca M, Manes F, Torralva T. The IFS (INECO Frontal Screening) and level of education: Normative data. Appl Neuropsychol Adult. 2019 Jul-Aug;26(4):331-339. doi: 10.1080/23279095.2018.1427096. Epub 2018 Feb 12. PMID: 29432039.

Steward, T., Muela, A., Martínez, J., García, A., & Aguirre, N. (2022). Neurocognitive correlates of impulsive aggression in youth: A systematic review. Neuroscience & Biobehavioral Reviews, 138, 104705. https://doi.org/10.1016/j.neubiorev.2022.104705

Stuss, D. T., & Levine, B. (2002). Adult clinical neuropsychology: Lessons from studies of the frontal lobes. Annual Review of Psychology, 53, 401-433. https://doi.org/10.1146/annurev.psych.53.100901.135220

Torralva, T., Roca, M., Gleichgerrcht, E., López, P., & Manes, F. (2009). INECO Frontal Screening (IFS): A brief, sensitive, and specific tool to assess executive functions in dementia. Journal of the International Neuropsychological Society, 15(5), 777-786. https://doi.org/10.1017/S1355617709990345

Verdejo-García, A., & Albein-Urios, N. (2021). Impulsivity traits and neurocognitive mechanisms conferring vulnerability to substance use disorders. Neuropharmacology, 183, 108402. https://doi.org/10.1016/j.neuropharm.2020.108402

Widiger, T. A., & Smith, G. T. (2008). Personality and psychopathology. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), Handbook of personality: Theory and research (3rd ed., pp. 743-769). Guilford Press.

Wright, A. G. C., Gates, K. M., Arizmendi, C., Lane, S. T., Woods, W. C., & Edershile, E. A. (2021). The hierarchical structure of human personality: A meta-analysis of the predictive validity of the Five-Factor Model. Psychological Bulletin, 147(5), 477-503. https://doi.org/10.1037/bul0000324

Zou, H., & Hastie, T. (2005). Regularization and variable selection via the elastic net. Journal of the Royal Statistical Society: Series B (Statistical Methodology), 67(2), 301–320. https://doi.org/10.1111/j.1467-9868.2005.00503.x