

RESEARCH ARTICLE

Dual Personality Model: Adjustment Indexes Towards an Integrative View of Personality Traits in a Highly-educated Argentinian Sample

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Introduction: Differentiating between normal, pathological, and positive traits may be achieved by conceptualizing personality traits as a continuum in which these aspects could be placed as sickness or health poles. The tendency to focus on one aspect of the continuum to the detriment of the other has prompted the following question: What would be the outcome of studying both aspects conjointly?

Aims: This study aimed at assessing the appropriateness of different personality adjustment indexes proposed by the Dual Personality Model. These indexes combine positive and pathological aspects of personality in a single measure.

Methods: The sample was composed of 1061 individuals from the general Argentinian population ($M_{age}=39.87$, $SD=14.68$, 51% males).

Results: Individuals who scored higher on the personality adjustment index (PAI) had higher positive traits and well-being, and lower pathological traits, psychological symptoms, and lack of personality functioning. Also, higher scores on each trait continuum index were related to favorable outcomes.

Conclusions: It was concluded that PAI and trait continuum indexes are potentially useful measures for psychological research and for applied fields. The possibility of combining pathological and healthy aspects in a single measure makes it possible to view individuals in an integrated manner in any personality assessment. The indexes should be considered global measures which could be further complemented with a disaggregated analysis.

Keywords: personality, pathological traits, positive traits, integrated model, dual personality model

Introduction

The study of personality has been central and abundant in the field of psychology. From its early postulations (e.g., Allport, 1927) to the most recent notions (e.g., DeYoung & Allen, 2019), many theories and measures have been developed in attempts to explain what personality is. Among them, the trait perspective remains one of the most widely accepted and longest studied approaches in the scientific community (Deary, 2009). Personality traits have been studied mainly to understand individual differences and their association with other relevant aspects of human life and psychological variables, such as psychological symptoms (e.g., Nouri et al., 2019), well-being (e.g., Zhang & Renshaw, 2020), loneliness (e.g., Buecker et al., 2020) and other outcomes like job performance

(e.g., Tisu et al., 2020), academic achievement (e.g., Morales-Vives et al., 2020), and treatment adherence (e.g., Emilsson et al., 2020), among many others.

Normal, Pathological, and Positive Traits

As for normal or typical personality traits, the Five-Factor Model (FFM) is currently the dominant trait paradigm in personality research (McCrae, 2009). It postulates that personality may be more or less sufficiently explained by five broad domains or factors: neuroticism, extraversion, agreeableness, conscientiousness, and openness to experience. This model has been widely used in psychology in the educational (Poropat, 2009), organizational (Salgado, 2010), and psychotherapy fields (e.g. Tanzilli et al., 2018).

Regarding the pathological aspects of personality, or personality disorders (PDs), until the latest edition of the Diagnostic and Statistical Manual of Mental Disorders and its text revision (DSM-5 and DSM-5-TR, American Psychological Association, 2013, 2022), the diagnosis was guided by a categorical approach of the disorder's presence/absence by examining whether a certain number of symptoms (criteria) occur. The fifth edition complements this standard categorical way of diagnosing personality disorders with a new proposal: a dimensional approach. In this new methodology, introduced in Section III of the manual, personality traits are conceived of as consistent patterns of behavior, emotion, and thought (e.g., Allport, 1937; Cattell, 1965) of a dimensional nature (Goldberg, 1993). Given that studying traits in a dimensional manner enables one to conceive them as a *continuum* with a healthy pole and a pathological pole, these traits are believed to represent the pathological pole and are the pathological versions of FFM's traits. The model includes five pathological traits: negative affect (which replicates neuroticism), detachment (vs. extraversion), antagonism (vs. agreeableness), disinhibition (vs. conscientiousness), and psychoticism (vs. openness to experience). This new dimensional approach is thought to better represent PDs' degrees of severity and comorbidity and it has greater empirical support (Clark et al., 1997; Cloninger, 2000; Krueger et al., 2013; Trull & Durrett, 2005; Widiger & Samuel, 2005). In general, these maladaptive traits are related to poor mental health (e.g., Bach et al., 2018).

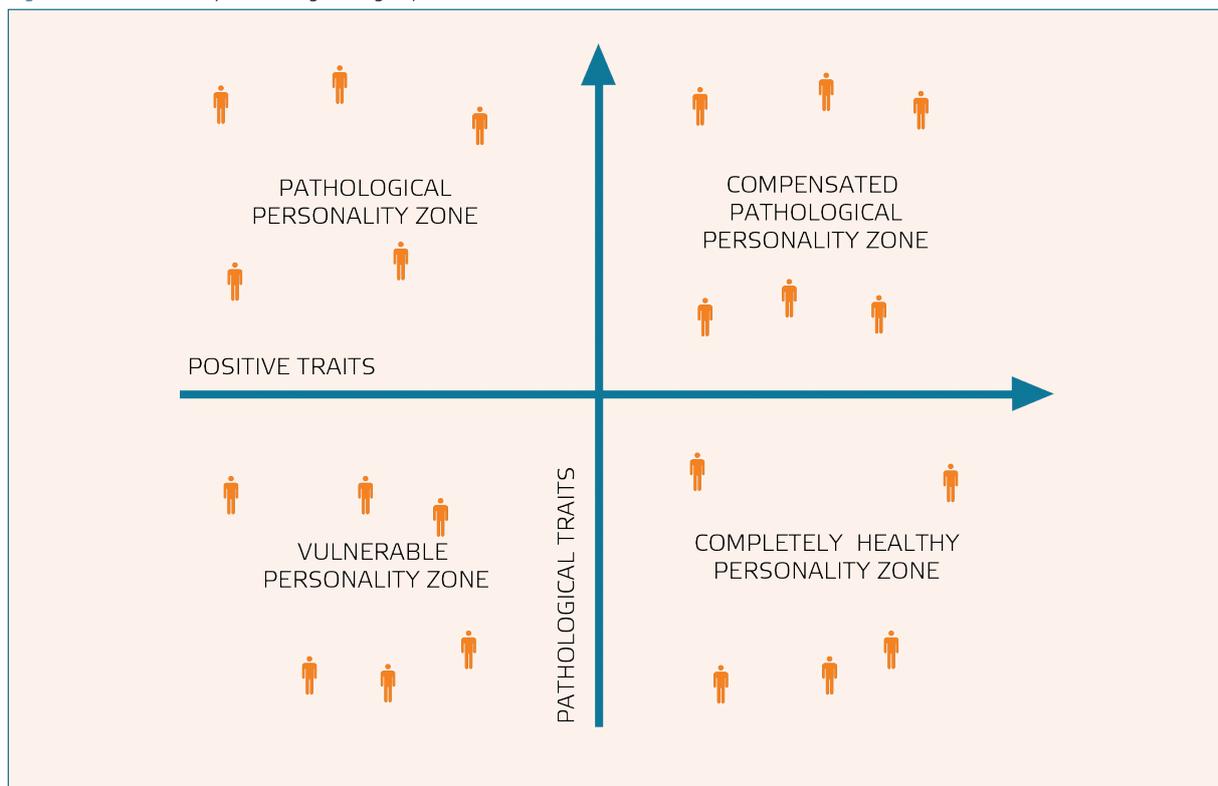
In the health or positive field of personality, the nosologies of traits have not reached such consensus. Although some models such as Peterson and Seligman's (2004) Values in Action (VIA) have been proposed, no clear agreement exists for a commonly used nosology of healthy characteristics. Therefore, there is no sanity manual for assessing the presence of mental health (Leising, 2008; Leising et al., 2009; Sadler & Fulford, 2006; Wakefield, 1992). In an attempt to explore this gap, de la Iglesia and Castro Solano (2018) postulated the Positive Personality Model (PPM). They aimed at completing the trait continuum and proposing a positive pole. To do this, they analyzed a model of positive traits involving the positive opposite of the pathological traits in the DSM-5 dimensional model. The positive traits obtained were serenity (vs. negative affect), humanity (vs. detachment), integrity (vs. antagonism), moderation (vs. disinhibition), and sprightliness (vs. psychoticism). When compared to the FFM normal traits (Costa & McCrae, 1985), the PPM traits were better predictors of well-being, job satisfaction and performance, academic achievement and adjustment, and the state of complete mental health (de la Iglesia & Castro Solano, 2018, 2019a, 2019b, de la Iglesia et al., 2019).

Dual Personality Model

Differentiating among normal, pathological, and positive traits requires conceptualizing personality traits as a continuum in which these aspects may be placed as sickness or health poles. Guided by the medical model, psychology as a science has developed a great amount of knowledge emphasizing the need to identify, classify, and treat mental disorders (Millon, 1996). Then, the proposals of positive psychology brought to light another main aspect of health: the characteristics related to good psychological functioning. The importance of this aspect was supported by a considerable amount of evidence obtained from research (e.g., Seligman et al., 2005). However, the focus on positive aspects somehow resulted in the same shortcoming as that of the medical model: exclusively studying a single aspect of the phenomenon. This tendency to focus on one feature of mental health to the detriment of the other prompted the following question: What would be the outcome of studying both aspects conjointly?

In the field of psychological symptoms and mental health, some proposals have been made in this sense. Keyes (2005), for example, postulated the *Complete State of Mental Health Model* in which health and sickness are two correlated unipolar dimensions that together constitute a complete state of mental health, and through their

Figure 1. Dual Personality Model diagnostic groups



combination, subjects may be diagnosed as flourishing or languishing. Another proposal is the *Dual-Factor Model* (DFM; Greenspoon & Saklofske, 2001), which states that a decrease in symptomatology does not necessarily imply an increment in well-being and vice versa. Four possible scenarios may be assessed by the combination of well-being and symptomatology: (1) vulnerable subjects with low symptomatology and low well-being; (2) troubled subjects with high symptomatology and low well-being; (3) complete mental health, also called flourishing (Kelly et al., 2012), subjects with low symptomatology and high well-being; and (4) symptomatic but content, also labeled ambivalent (Eklund et al., 2010), subjects with high symptomatology and high well-being (Suldo & Shaffer, 2008). In general, the greatest contrasts are found between the complete mental health group and the troubled group (e.g., Antaramian, 2015; Eklund et al., 2010; Guerra Vargas, 2017; Lyons et al., 2013; Smith, 2018; Suldo & Shaffer, 2008; Suldo et al., 2011). However, the vulnerable group has also been characterized as exhibiting non-desirable outcomes (e.g., Antaramian et al., 2010).

In the field of personality psychology, de la Iglesia and Castro Solano (2021) formulated the Dual Personality Model (DPM), which replicates the DFM of Greenspoon and Saklofske (2001) in the personality arena. The central idea of the DPM is that personality traits may and must be assessed in their pathological and positive aspects conjointly. This assessment would provide a notion of the total personality adjustment that considers both aspects of the phenomenon as well as an integrated view of personality functioning as a whole, in contrast to a dissociated one. The combination of pathological and positive traits results in four possible diagnostic groups (Figure 1). The group with the greatest adjustment, namely the completely healthy personality group, is composed of subjects with high positive traits and low pathological traits. Those who present both positive and pathological traits belong to the compensated pathological personality group. Subjects with high pathological traits and low positive traits belong to the pathological personality group. Finally, those who have low positive and low pathological traits belong to the vulnerable personality group. Given the precedents mentioned regarding mental health integrating models, it may be hypothesized that those individuals who belong to the completely healthy and/or the compensated pathological groups should also present healthier or more desirable life outcomes. The model was operationalized by the *Five Continua Personality Inventory* (FCPI; de la Iglesia & Castro Solano, 2021), described in the Method section.

Personality Adjustment Measures

The study of personality adjustment via the combination of pathological and healthy aspects may also be assessed by means of indexes that combine these aspects. These types of integrative measures attempt to represent the interaction of opposite traits and are only informative of changes in the *continuum* they include. Any increment or decrement of the measure will not be informative of changes in the traits they comprise. Therefore, in any personality assessment they should be used as initial global indicators and later be complemented by more detailed single measures.

A clear precedent is Millon's Clinical Index (previously known as Adjustment Index), which combines positive and negative traits in a single score and has been proved to be useful in psychological assessments (Millon & Bloom, 2008). Following these standards, de la Iglesia and Castro Solano (2021) proposed the use of a Personality Adjustment Index (PAI) that combines positive and pathological traits in a single measure and makes it possible to diagnose the four personality adjustment groups described above. Using local norms, the index is calculated by (1) averaging the z-scores of positive traits, (2) averaging the z-scores of pathological traits, and (3) subtracting the pathological average from the positive average.

$$PAI = \left(\frac{RS - \bar{X}_{SE} + \frac{RS - \bar{X}_{HU}}{\sigma_{HU}} + \frac{RS - \bar{X}_{IN}}{\sigma_{IN}} + \frac{RS - \bar{X}_{MO}}{\sigma_{MO}} + \frac{RS - \bar{X}_{SP}}{\sigma_{SP}}}{5} \right) - \left(\frac{RS - \bar{X}_{NA} + \frac{RS - \bar{X}_{DA}}{\sigma_{DA}} + \frac{RS - \bar{X}_{AN}}{\sigma_{AN}} + \frac{RS - \bar{X}_{DI}}{\sigma_{DI}} + \frac{RS - \bar{X}_{PS}}{\sigma_{PS}}}{5} \right)$$

Note: PAI = Personality Adjustment Index; RS = Raw Score; SE = Serenity; HU = Humanity; IN = Integrity; MO = Moderation; SP = Sprightliness; NA = Negative Affect; DA = Detachment; AN = Antagonism; DI = Disinhibition; PS = Psychoticism

The PAI hypothetically allows one to assess both healthy and pathological aspects in a single measure. It should test whether the evidence of pathological and positive traits obtained separately is sustained when both aspects are considered conjointly. To this end, the association of the PAI and other criteria such as mental health, psychological symptoms, and measures of personality functioning must be studied. Also, the question arises as to whether the indexes for each trait are sufficiently valid to allow a more thorough study of personality adjustment. In order to confirm the adequacy of these new measures, they should be tested empirically. The aims of this research, therefore, were (1) to empirically study the performance of the Personality Adjustment Index in relation to personality traits, mental health measures, and personality functioning measures, and (2) to test the appropriateness of adjustment measures for each trait continuum.

Method

Sample

The sample was composed of 1061 individuals from the general Argentinian population. Their mean age was 39.87 years ($SD = 14.68$, $Min = 18$, $Max = 95$; 51% males, 49% females). Regarding their education, 22.7% had a high-school diploma or a lower level of education, 34.4% were attending college or had dropped out of college, and 42.9% had a college degree. As for their socio-economic status (SES), most of them (64%) reported middle, 19.9% upper-middle, 13.3% lower-middle, 1.9% high, and 0.9% low SES.

Procedure

This research had a cross-sectional design. Advanced psychology students supervised by a senior researcher collected a convenience sample in 2019. Data was obtained by a self-reported paper-pencil protocol that included all measures detailed in the following subsection. Participation was anonymous and voluntary, and participants were required to be Argentinian and at least 18 years of age. Participants gave their informed and written consent after being told about the objective of the research and the possibility to refuse or interrupt their participation at any time. No incentives were given either to participants or to data collectors. All procedures performed during studies involving human participants were in accordance with the ethical standards of the institutional and/or

national research committee and with the 1964 Helsinki declaration as well as its later amendments or comparable ethical standards. This research was approved by the Ethics Research Committee, Department of Psychology, University of Buenos Aires.

Measures

Five continua Personality Inventory (FCPI)

This is a 55-item measure that assesses ten personality traits as conceived by the Dual Personality Model (FCPI; de la Iglesia & Castro Solano, 2021). Five personality traits are pathological and agree with those proposed in Section III of DSM-5-TR as criterion B for diagnosing personality disorders (American Psychological Association, 2022): negative affect, detachment, antagonism, disinhibition, and psychoticism. The other five personality traits are of a positive nature and represent those postulated by the Positive Personality Model (PPM; de la Iglesia & Castro Solano, 2018): serenity, humanity, integrity, moderation, and sprightliness. In addition to the ten-trait scales, many other composite measures may be obtained by computing different combinations of items. The Personality Adjustment Index is one of the global indexes that allow one to assess personality from a single measure. As described, it combines the five pathological traits and the five positive traits in a single score. The measure also facilitates the assessment of both aspects involving criterion A of personality disorders: self-functioning (identity and self-direction) and interpersonal functioning (empathy and intimacy). Both aspects are measured as “lack of...” since an increment in their scores reflects impairments in those aspects. The FCPI went through a series of psychometric studies that provided abundant evidence of its psychometric properties. This analysis included a pilot study, expert judgment, exploratory and confirmatory factor analyses, internal consistency analysis, and convergent validity with external measures of mental health, psychological symptoms, and personality.

Symptom Checklist 27 (SCL-27)

This test is a short version of SCL-90-R (Derogatis, 1975). It has 27 items that are answered on a 5-point Likert scale ranging from 0 (not at all) to 4 (extremely) (Hardt & Gerbershagen, 2001). With the SCL-27, six measures of symptoms may be addressed – depressive, dysthymic, vegetative, agoraphobic, social phobia, and mistrust symptoms. A global total score that informs the person’s current discomfort may also be calculated: the Global Severity Index (GSI). In Argentina, Góngora and Castro Solano (2021) studied its psychometric properties. Cronbach’s alpha for the total score in this sample was .93

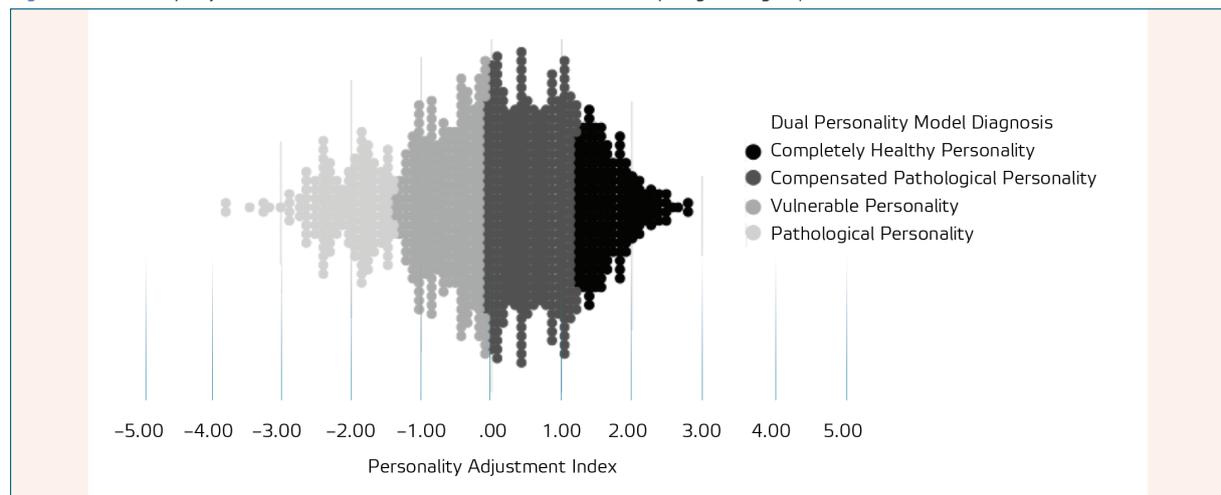
The Mental Health Continuum–Short Form (MHC-SF)

This test has 14 items that measure well-being by means of three sub-scales: emotional, psychological, and social (Keyes, 2005). The items are answered on a 6-point Likert scale that inquires how often the respondent has felt different well-being states (0 = never to 5 = every day). Its factorial structure was confirmed in its local adaptation, where the evidence of convergent validity was also obtained (Lupano Perugini et al., 2017). Cronbach’s alpha for the total score in this sample was .89.

Statistical Analysis

Firstly, the Personality Adjustment Index (PAI) was calculated using de la Iglesia and Castro Solano’s (2021) equation and the four groups of personality adjustment were formed according to the norms’ cutting-off values. Local norms were obtained in a previous study where the FCPI was psychometrically studied (de la Iglesia & Castro Solano, 2021). Using means and standard deviations, linear T scores were calculated for each composite score. The use of linear T scores has sometimes been questioned (Friedman et al., 2015), the debate centered on the possibility that some T scores may not correspond to the same percentiles across different scales due to the variables’ different distributions. Given that it is expected for most psychological variables to not follow a normal distribution, this is the most frequent scenario and to force these distributions would be unnatural and non-representative of the real phenomenon. This is why the use of linear T scores emerges as the most parsimonious option (Morey, 2018). Nevertheless, in the case of FCPI, percentiles across scales were compared and no substantial differences were observed (de la Iglesia & Castro Solano, 2021). Then, ANOVAs were calculated to determine whether the groups effectively differed in the positive and pathological traits that compose the PAI. Since most variables presented skewed distributions, and the homogeneity of variances was mostly not met, all ANOVAs were complemented with a Welch test. Additionally, effect sizes were provided for each result.

Figure 2. Personality Adjustment Index distribution and Dual Model Personality diagnostic groups



Later, product-moment Pearson correlations were calculated to explore the relations among the variables included in the research. This was complemented by a multiple linear regressions analysis in order to study the relations among the variables controlling for gender and age. Afterward, ANOVAs were calculated to test differences in psychological symptoms as well as well-being and criterion A variables according to PAI's diagnostic groups. Finally, the difference between the z-score of each positive trait and its pathological counterpart was calculated to test the appropriateness of using individual indexes for each personality trait continuum. For each index, four groups were outlined using the same guidelines for cutting-off values of PAI: $T \leq 39$ was the pathological group, $T40-49$ was the vulnerable group, $T50-59$ was the compensated group, and $T \geq 60$ was the positive group. Then, as with PAI, correlations, multiple linear regressions and ANOVAs were used to see how the indexes were related to the variables included in the research.

Results

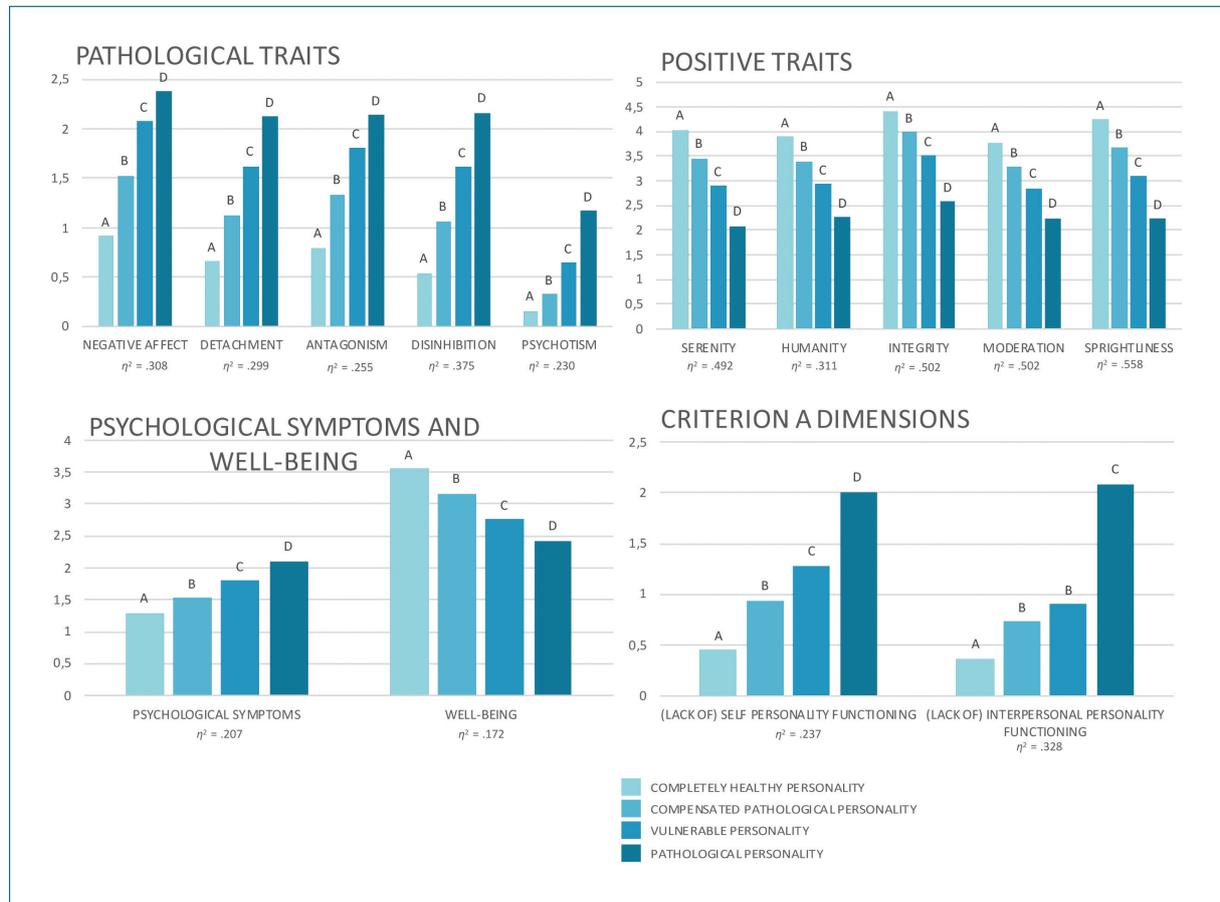
First, the Personality Adjustment Index (PAI) was calculated using de la Iglesia and Castro Solano's (2021) equation, and the four groups of personality adjustment were formed according to the cutting-off values of the local norms. As a result, 39.2% ($n = 416$) of the sample were in the compensated pathological personality group, 27.9% ($n = 296$) in the vulnerable personality group, 17.6% ($n = 187$) in the completely healthy personality, and 15.3% ($n = 162$) in the pathological personality group (see Figure 2).

Second, ANOVAs were calculated to determine whether the groups effectively differed in the positive and pathological traits that compose the PAI (Figure 3). Statistically significant differences were found in all pathological traits and in all positive traits in the ANOVAs and also in the Welch tests ($p < .05$). Bonferroni post hoc tests indicated that statistically significant differences were present in all pairwise comparisons. Pathological traits stood higher in the pathological personality group, followed by the vulnerable personality group, the compensated pathological personality group, and lastly the completely healthy personality group. In the case of the positive traits, the pattern exhibited exactly the reverse order: the group with the highest presence of positive traits was the completely healthy personality group, followed by the compensated pathological personality group, the vulnerable personality group, and lastly the pathological group. Effect sizes for each comparison are displayed in Figure 3.

Product-moment Pearson correlations were calculated to determine whether the PAI was related to measures of psychological symptoms, well-being, and personality functioning (criterion A). All associations were statistically significant ($p < .01$). PAI was negatively and strongly associated with the presence of psychological symptoms ($r = -.49$), the lack of self-personality functioning ($r = -.48$), and the lack of interpersonal personality functioning ($r = -.58$). The association between PAI and well-being was strong and positive ($r = .43$). Additionally, a multiple regression analysis was calculated in order to control for gender and age (as independent variables in the first Block) for each dependent variable. In all cases, PAI (introduced as an independent variable in Block 2) remained a statistically significant predictor ($p < .001$) and in the directions expected: β for psychological symptoms = $-.486$, β for lack of self-personality functioning = $-.499$, β lack of interpersonal personality functioning = $-.579$, β and for well-being = $.413$

Figure 3. Differences in pathological and positive traits, psychological symptoms and well-being, and criterion A dimensions regarding Personality Adjustment Index groups

Note: Same letter indicates no statistical difference between groups in the Bonferroni post hoc test.



After applying PAI's diagnostic groups, differences in psychological symptoms and well-being were studied by means of ANOVAs (Figure 3). Both results were statistically significant; furthermore, in the Welch tests ($p < .01$) and Bonferroni post hoc tests exhibited the expected pattern of differences between pairs, and all pairwise comparisons were statistically significant ($p < .01$). The pathological personality group had more symptoms, followed by the vulnerable personality group, the compensated pathological personality group, and lastly the completely healthy personality group. The reverse pattern was found for well-being, and the group with the greatest well-being was the completely healthy group.

Also, differences were studied regarding both personality functioning dimensions in criterion A of the personality disorder diagnosis (American Psychological Association, 2022; Figure 3). In both cases, the results were statistically significant in both F and Welch tests ($p < .05$), and the pathological personality group scored higher on (lack of) self-personality functioning and (lack of) interpersonal personality functioning. Bonferroni post hoc tests showed statistically significant differences in all pairwise comparisons ($p < .05$), except for the comparison between the vulnerable personality group and the compensated pathological personality group, which showed no differences in the interpersonal functioning dimension. Otherwise, the pathological personality group had higher scores in criterion A dimensions, and the pattern was the same as that previously found (Figure 3).

Then, the difference between the z-score of each positive trait and its pathological counterpart was calculated to test the appropriateness of using individual indexes for each personality trait continuum. The Negative Affect-Serenity continuum was labeled *Emotional Management Index* (EMI), the Detachment-Humanity continuum was labeled *Interest in Others Index* (IOI), the Antagonism-Integrity continuum was labeled *Adherence to Rules Index* (ARI), the Disinhibition-Moderation continuum was labeled *Impulse Control Index* (ICI), and the Psychoticism-Sprightliness continuum was labeled *Environmental Control Index* (ECI). Pearson product-moment correlations were calculated between each continuum index and measures of psychological symptoms, well-being, (lack of) self-personality functioning, and (lack of) interpersonal personality functioning. All correlations were statistically significant ($p < .01$) and, in general, associations remained between moderate and strong, negative in the case of

Table 1. Correlation between trait continuum indexes and measures of psychological symptoms, well-being, and personality functioning

	Psychological Symptoms	Well-being	(Lack of) self-personality functioning	(Lack of) interpersonal personality functioning
Emotional Management Index	-.53*	.44*	-.41*	-.44*
Interest in Others Index	-.31*	.44*	-.34*	-.52*
Adherence to Rules Index	-.24*	.20*	-.35*	-.51*
Impulse Control Index	-.32*	.23*	-.37*	-.33*
Environmental Control Index	-.48*	.34*	-.49*	-.51*

* < .01

psychological symptoms and lack of personality functioning, and positive regarding well-being (Table 1).

A multiple regression analysis was calculated for each independent variable in which gender and age were introduced in Block 1 as control variables, and all trait continuum indexes as predictors in Block 2. As Table 2 presents, all models were statistically significant ($p < .001$). Most results replicated the correlation results and a few lost their statistical significance or changed their sign. In the case of psychological symptoms, for example, IOI and ICI do not seem to play a relevant role in its prediction. IOI, ARI, and ICI were not statistically significant predictors of lack of personality functioning. ICI was not a statistically significant predictor in the case of lack of interpersonal functioning. And lastly, regarding well-being, ICI lost its statistical significance and ARI changed its sign and emerged as a negative predictor.

Table 2. Multiple linear regression analysis between trait continuum indexes and measures of psychological symptoms, well-being, and personality functioning

	β	$F(g)$	R^2	ΔR^2
<i>Psychological Symptoms</i>				
<i>Block 1: Control variables</i>		25.59(2,1058)***	.046	-
Gender (dummy, probability of being male)	-.103**			
Age	-.191***			
<i>Block 2: Trait continuum indexes</i>		82.57(7,1053)***	.350	.308***
Gender (dummy, probability of being male)	-.083**			
Age	-.111***			
Emotional Management Index	-.379***			
Interest in Others Index	-.048 ns			
Adherence to Rules Index	.096**			
Impulse Control Index	.039 ns			
Environmental Control Index	-.303***			
<i>(Lack of) Personality Functioning</i>				
<i>Block 1: Control variables</i>		0.50(2,339)ns	-.003	-
Gender (dummy, probability of being male)	-.016 ns			
Age	.052 ns			
<i>Block 2: Trait continuum indexes</i>		18.13(7,334)***	.260	.272***
Gender (dummy, probability of being male)	-.057 ns			
Age	.050 ns			
Emotional Management Index	-.174**			
Interest in Others Index	-.019 ns			
Adherence to Rules Index	.017 ns			
Impulse Control Index	-.082 ns			
Environmental Control Index	-.349***			

(continued on the next page)

Table 2. -continued

	β	$F(g)$	R^2	ΔR^2
<i>(Lack of) Interpersonal Personality Functioning</i>				
<i>Block 1: Control variables</i>		3.87(2,339)*	.017	–
Gender (dummy, probability of being male)	.088 ns			
Age	.124*			
<i>Block 2: Trait continuum indexes</i>		27.97(7,334)***	.356	.347***
Gender (dummy, probability of being male)	-.010 ns			
Age	.113*			
Emotional Management Index	-.133*			
Interest in Others Index	-.221***			
Adherence to Rules Index	-.203**			
Impulse Control Index	.021 ns			
Environmental Control Index	-.173*			
<i>Well-being</i>				
<i>Block 1: Control variables</i>		15.45(2,1058)***	.027	
Gender (dummy, probability of being male)	-.010 ns			
Age	.168***			
<i>Block 2: Trait continuum indexes</i>		62.85(7,1053)***	.290	.266***
Gender (dummy, probability of being male)	-.007 ns			
Age	.109***			
Emotional Management Index	.314***			
Interest in Others Index	.357***			
Adherence to Rules Index	-.170***			
Impulse Control Index	-.058 ns			
Environmental Control Index	.086*			

*** $p < .001$; ** $p < .01$; * $p < .05$; ns = statistically non-significant

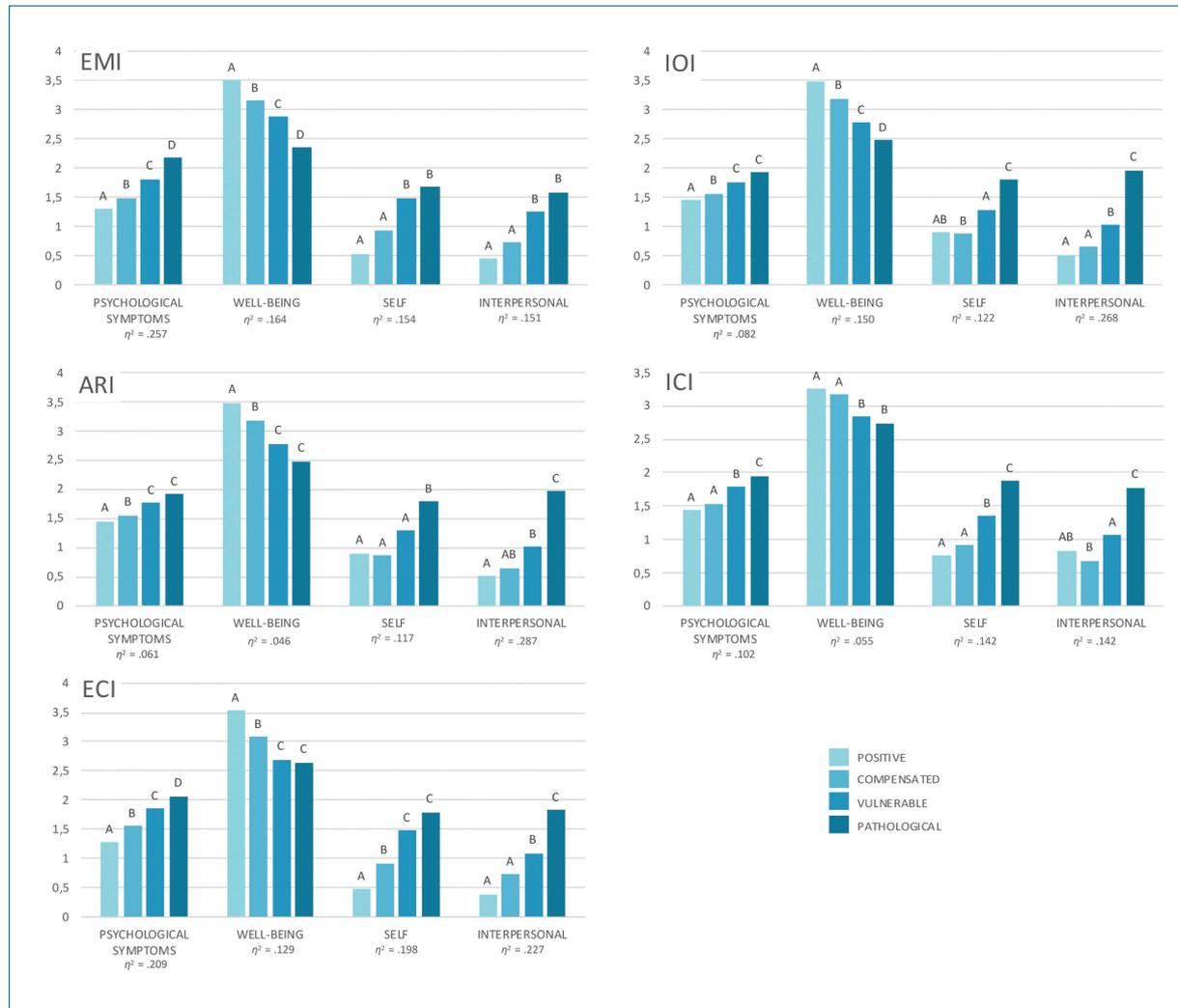
For each index, four groups were also outlined: pathological, vulnerable, compensated, and positive. Then, ANOVAs were calculated to identify differences in psychological symptoms and well-being in the groups (Figure 4). In the case of EMI, all tests were statistically significant in both F and Welch tests ($p < .01$). The Bonferroni post hoc test indicated differences between all combinations of pairs in the psychological symptoms and well-being, and the pattern replicated that found for PAI. Regarding personality functioning dimensions, differences were found between the positive and compensated groups versus the vulnerable and pathological groups. The positive and compensated groups showed fewer difficulties in self and interpersonal functioning.

In the IOI, the psychological symptom patterns were like those previously reported except that in psychological symptoms, no differences were found between the pathological and vulnerable groups ($p > .05$). As for personality functioning dimensions, the pathological group emerged as the one with the greatest difficulties in this aspect.

In the ARI, differences were found between the positive and compensated groups versus the vulnerable and pathological groups regarding psychological symptoms and well-being. The positive and compensated groups manifested fewer symptoms and higher well-being. For personality functioning, the pathological group emerged as the one with the greatest difficulties in comparison to the other groups.

As for the ICI, the pathological group had a greater number of psychological symptoms than the vulnerable group, and this group exhibited a greater number of symptoms than the positive and compensated groups. As for well-being, the positive and compensated groups had higher scores than the vulnerable and pathological groups. The pathological group exhibited greater difficulties in self and interpersonal personality functioning than the rest of the groups.

Figure 4. Differences in psychological symptoms, well-being, and criterion A dimensions regarding trait continuum indexes
Notes: Same letter indicates no statistical difference between groups in the Bonferroni post hoc test. EMI = Emotional Management Index (Negative Affect-Serenity continuum), IOI = Interest in Others Index (Detachment-Humanity continuum), ARI = Adherence to Rules Index (Antagonism-Integrity continuum), ICI = Impulse Control Index (Disinhibition-Moderation continuum), ECI = Environmental Control Index (Psychoticism-Sprightliness continuum).



Finally, the positive group had fewer symptoms than the compensated group, which in turn had fewer symptoms than the vulnerable and pathological groups. In addition, the pathological and vulnerable groups had less well-being while the vulnerable and pathological groups had higher difficulties in self-personality functioning, and the pathological group had the highest score in (lack of) interpersonal functioning.

Discussion

The main objective of this research was to test the appropriateness of a global index of personality adjustment and trait indexes that represent a pathological-positive continuum in a single measure. In general, all indexes showed the expected associations with measures of mental health and personality functioning.

First, it was confirmed that higher scores in the Personality Adjustment Index (PAI) matched higher scores in positive traits and lower scores in pathological traits. In other words, the PAI accurately represented the traits' dimensions in a single measure. Then, correlations indicated that those with higher PAI scores showed higher well-being as well as fewer psychological symptoms and lack of personality functioning (self and interpersonal). The results of the multiple linear regression analysis also supported this finding since it was replicated even when controlling for gender and age. When PAI was studied with the four diagnosis groups, researchers found better mental health for the completely healthy personality group. This finding also supported the adequacy of the PAI

because it replicated the results obtained separately for positive and pathological traits (e.g., Bach et al., 2018; de la Iglesia & Castro Solano, 2018).

As for the trait continuum indexes, the initial exploratory correlations were as expected, with all trait continuum indexes being positively associated with well-being and negatively associated with psychological symptoms and lack of personality functioning (self and interpersonal). In the case of the multiple linear regressions, not all correlations were supported when controlling for gender and age. IOI and ICI were not statistically significant predictors of psychological symptoms, IOI, ARI and ICI did not predict lack of personality functioning, and ICI did not predict well-being. Also, ARI changed its sign and negatively predicted well-being. These findings suggest that it is highly important to consider the interaction between indexes since outcomes vary depending on whether studying them apart or together. A study of personality traits profiles could be an appropriate way to achieve this.

Then, when the differences in these variables were studied using the four diagnostic groups, the Emotional Management Index showed the same pattern as that of PAI for well-being and psychological symptoms, and the positive group (completely healthy in the case of PAI) had better mental health. However, the main difference in personality functioning was found between the positive and compensated groups versus the vulnerable and pathological groups. This suggests that the difference lies in the presence/absence of positive traits, which possibly function as a protective factor. The positive and compensated groups, both characterized by the presence of positive traits, had higher personality functioning in self and interpersonal aspects. This result replicates that obtained for the Dual Factor Model in the mental health arena, where the completely healthy and the troubled groups showed no differences in some of the studied aspects (e.g. Antaramian, 2015; Eklund et al., 2010; Guerra Vargas, 2017; Lyons et al., 2013; Smith, 2018; Suldo & Shaffer, 2008; Suldo et al., 2011). The result also reinforces the idea that positive traits function as protective factors (e.g. Kim et al., 2018).

Similar results were observed in the Interest in Others Index, where differences were found between all groups, or between the positive and compensated subjects together on one hand, and the vulnerable and pathological subjects together on the other hand. In particular for this index, it is interesting to note that the pathological group showed a substantially different and higher score in the lack of interpersonal personality functioning scale. This supports the adequacy of the IOI since the index was intended to represent the continuum of the humanity-detachment traits, and lower scores on IOI (pathological IOI) represent a lack of interest in other people, avoidance of relationships and social meetings (high detachment), and no sensitivity towards others' suffering or unwillingness to help others in need (low humanity), which is clearly related to interpersonal difficulties as conceived by DSM-5-TR (American Psychological Association, 2022). The same happens with the Adherence to Rules Index, where antisocial behaviors such as aggressiveness and deceitfulness combined with a sense of grandiosity (high antagonism) and lack of honesty, inability to assume one's own flaws and mistakes and lack of humility (low integrity), also relate to interpersonal difficulties. Additionally, in the case of self-personality functioning, the vulnerable group showed no differences from the positive and compensated groups. This was an unexpected finding and it could suggest that the problem lies in a high presence of antagonism combined with low integrity and that low integrity does not seem to be a problem if it is combined with low antagonism. Finally, the results obtained from the Environmental Control Index were more similar to EMI findings: the positive group had higher well-being, lower psychological symptoms, and a lack of personality functioning. Besides, in some cases, the diagnostic groups just differed in the absence or presence of positive traits: positive and compensated on the one hand, and vulnerable and pathological on the other. This finding suggests, again, the alleged protective role of positive traits (Kim et al., 2018).

Strengths and Limitations

This research does not lack its limitations. First, its cross-sectional design and non-probabilistic sampling limit the interpretation of the results obtained. It would be interesting to assess whether these indexes are stable over time and whether these results replicate in other samples characterized differently in socio-demographic variables. For example, the sample studied does not adequately represent the lower-middle and lower groups. Future sampling should take this limitation into consideration and attempt to represent those groups as well. Second, given that the measures were all self-report, social desirability may have had an effect that was not controlled in this study. Finally, the number of variables remained limited in the sense that normal trait measures were not included.

An important issue to consider is the fact that the strength of the hypothetically augmented reach achieved by an integrated measure of pathological and positive aspects constitutes its own weakness as well. Any change in an integrated measure, whether it is an increment or a decrement, will provide information regarding the complete personality continuum but will entail uncertainty regarding where the change occurred, whether it was the positive aspects, the pathological aspects or both. Therefore, any assessment should not be isolated from the consideration of positive and pathological aspects as well. It is suggested then to use the continuum measures as global indicators of individual personalities that may constitute an initial step to further assessment using partial and more detailed measures.

Conclusion, Implications, and Future Directions

To conclude, the PAI and the trait continuum indexes are potentially useful measures for psychological research and for applied fields. The possibility of combining pathological and healthy aspects in a single measure allows one to view individuals in an integrated manner, which possibly represents them more accurately in comparison to disaggregated measures. However, the indexes were studied in a highly educated sample and this constitutes a sample bias that should be considered. We have no evidence of how the indexes perform in a lower-educated population. This stands as an important issue since the measures are obtained by a self-report that requires comprehending and rating sentences to describe oneself. The FCPI was designed to be used with subjects having at least completed primary school. The assessment of individuals with lower educational levels would require a revision of the whole psychometric instrument.

For psychological researchers, these measures may simplify the number of variables included for statistical analysis. Also, the indexes could provide information of how this combination interacts with other relevant variables and this may potentially provide different results than those already known for pathological and positive traits separately. In the applied field, this measure could be used in any personality assessment (e.g. clinical, forensic). As mentioned in the limitations, the indexes should be considered global measures which could be further complemented with a disaggregated analysis, if needed. In any case, the aim of scientifically studying these composite scores attempts to complement or enrich the study of personality.

The field of integrated personality models is rather new and further research will be needed in many different areas. It would be interesting to verify whether the evidence currently available for pathological and positive personality traits obtained from research where these variables were studied separately is sustained when both aspects are studied conjointly.

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Author contribution

Guadalupe de la IGLESIA: conceptualization, design, methodology, investigation, data management, formal analysis, interpretation, writing original draft, writing review and editing.

Alejandro CASTRO SOLANO: conceptualization, design, methodology, funding acquisition, investigation, project administration, interpretation, supervision, writing review and editing.

Declaration of interest statement

The authors declare no conflict of interest.

Ethical statement

The studies involving human participants were reviewed and approved by the Ethics Research Committee, Department of Psychology, University of Buenos Aires [Comisión para la evaluación de conductas responsables, Facultad de Psicología, Universidad de Buenos Aires].

All participants engaged in the research voluntarily and anonymously.

The participants provided their written informed consent to participate in this study.

Their data are stored in coded materials and databases without personal data.

Data Availability Statement

The data supporting this study's findings are available to the public. We have policies in place to manage and keep data secure.

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