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Patriarchal Beliefs Scale: Psychometric properties of the Portuguese version

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Abstract: Patriarchal beliefs convey the power discrepancy between men and women in society. The current study examines the psychometric properties for the Patriarchal Beliefs Scale (PBS) in the Portuguese context, including its construct and convergent validity, measurement invariance, and reliability. A sample of 488 adults (66.8% women) with ages ranging from 18 to 77 years old (M = 27.6 years, SD = 11.8) participated in this study. The results confirmed the original three-factorial structure of the PBS (Institutional power of men, Inherent inferiority of women, and Gendered domestic roles), the measurement invariance across gender, as well as convergent validity warranted by the positive and significant correlations between the patriarchal beliefs, social dominance, and sexism. Men significantly outscored women in all these dimensions. The current study provides evidence of the validity and reliability of the PBS in the Portuguese context, enabling further opportunities to implement cross-cultural studies in this field.

Keywords: *Patriarchal beliefs; psychometrics; social dominance; sexism; gender.*

Patriarchy can be defined as "a historical and social system of male domination in gender relationships in which men, who are of a higher status, dominate women, who are of a lower status, both structurally and ideologically" (Yoon et al., 2015, p. 264). Different definitions of patriarchy have been provided over the years. Still, they all convey the power discrepancy between men and women in society, with men being described as dominant and competent (Jahan, 2022), while entailing female subordination and oppression (Haj-Yahia, 2005; Hunnicutt, 2009; Mkhize & Njawala, 2016; Yoon et al., 2018).

Patriarchy seems to differ between cultural contexts depending on local social norms, i.e., cultural values and policies that support gender equality and female empowerment versus supporting traditional gender roles and male dominance (Ozaki & Otis, 2017). According to Hunnicutt (2009), the patriarchal system is embedded in the macro (e.g., government, law, religion) and micro (e.g., interactions, families, organisations, intimate relationships) levels of society, and they exist symbiotically. Yoon and colleagues (2015) also referred to the meso level (e.g., employment and education), reinforcing and portraying that the patriarchal system and its beliefs are embedded in all levels of society. The symbiotic relationship between the micro, meso, and macro levels entails that patriarchal views and practices carried out by social structures are sustained and perpetuated by individuals and their daily actions. Moreover, this is a reciprocal relationship in which individuals are more likely to maintain patriarchal views if their society and culture support them (Ogle & Batton, 2009). For instance, governments representing or endorsing patriarchal views and practices (i.e., macro level), such as holding more men in positions of power because they are considered more competent than women, may also mirror various family dynamics (i.e., micro level), where men are considered the leader and provider of the household, while women are the main caretakers. Finally, these family dynamics may also contribute to the imbalance between men and women in positions of power, mirroring family dynamics in other aspects of society (e.g., meso and macro levels).

Patriarchal beliefs are also related to other gender-related discrimination and abusive practices such as sexism (O'Neil, 2008) and violence against women (Espinoza et al., 2012; Haj-Yahia, 2003; Hunnicutt, 2009; Ozaki & Otis, 2017). These practices undermine women's ability to ask for help and support when needed (Abu-Ras, 2007). Sexism is described as "the social, political, economic, and personal

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expression of patriarchy in women's and men's lives" (O'Neil, 2008, p. 367) and involves discriminatory attitudes and behaviours based on the biological sex of individuals (Matlin, 2012). Sexism seems to be rooted in patriarchy, given that it highlights men's overall superiority over women, who are perceived as needing men's help for support and protection (Mkhize & Njawala, 2016). Studies have consistently shown that sexist attitudes are endorsed differently according to gender, with men endorsing higher levels of sexist attitudes than women (Chim et al., 2020; Magalhães et al., 2007). Same gender differences have been found regarding patriarchal beliefs (Tripathi, 2020; Yoon et al., 2015; Yoon et al., 2018; Yoon et al., 2019). Endorsing stereotypical gender roles and patriarchal and sexist beliefs is more beneficial for men (higher-status group), given that maintaining such views may endure male dominance over women (low-status group) at different levels of society (i.e., micro, meso, and macro levels; Crittenden & Wright, 2013; Fowers & Fowers, 2010; Yoon et al., 2018).

Social Dominance Orientation (SDO) may also play an important role in the maintenance of patriarchal systems, beliefs, and sexism. SDO refers to the endorsement of hierarchical, non-egalitarian relationships between groups and a preference for dominance over others (Pratto et al., 1994). Thus, it is deeply rooted in the need to maintain social group hierarchy (Canto et al., 2020). Individuals with higher SDO scores may endorse myths and beliefs that support unequal societies, thereby maintaining that hierarchy and higher status (Canto et al., 2020). Sidanius and Pratto (1999) suggested that one of the three distinct stratification systems that organise human social hierarchies is a gender system characterised by male dominance and female subordination (i.e., patriarchy). Men tend to score higher on SDO than women (Canto et al., 2020; Graça et al., 2018; Magalhães et al., 2022), which may serve to maintain their dominant and high-status position, particularly in more unequal societies and contexts (Batalha et al., 2011). Previous literature has shown associations between SDO and the maintenance of traditional values and gender relations common in patriarchal societies (Sibley et al., 2007), as well as a significant relationship between SDO and patriarchal beliefs (Janjua & Kamal, 2023).

Sidanius and Pratto (1999) also argued that sexism is a type of group-based inequality that aligns with SDO (Sibley et al., 2007; Ymamgulyyeva et al., 2021). Studies have shown an association between these constructs, particularly between SDO and hostile sexism, which is characterised by the belief in women's inferiority and antipathy towards them (Canto et al., 2020; Fowers & Fowers, 2010). Previous authors have claimed that these results stem from SDO being a competitive-driven motivation for intergroup dominance, predicting negative attitudes toward low-status and subordinate groups (in this instance, women; Sibley et al., 2007). This may be particularly relevant when men perceive women as challenging their dominance, which may result in higher levels of hostile sexism (Sibley et al., 2007). Furthermore, sexism may function to maintain and legitimise men's structural power (Canto et al., 2020; Glick et al., 2000), thus perpetuating gender hierarchies and patriarchal societies (Fowers & Fowers, 2010).

Patriarchal beliefs justify and maintain a patriarchal system (McKinley et al., 2021; Yoon et al., 2015) and are prevalent across cultures in several settings (e.g., family context, schools, and religious institutions; Haj-Yahia, 2003; Yoon et al., 2019). Studies on patriarchal ideology and beliefs have been conducted with various samples across the world, such as Israel (Haj-Yahia, 2003), Jordan (Haj-Yahia, 2005), African and Asian immigrants in the USA (Yoon et al., 2019), or India (Tripathi, 2020), and comparing samples between Asian and European countries (Ozaki & Otis, 2017). However, further evidence is needed in the Portuguese context. Developing or adapting trustworthy and valid scales to specific cultural contexts is critical to provide cross-cultural innovative insights, which in turn can inform the implementation of social interventions aiming at decreasing patriarchal beliefs.

Current study

Historically, the Portuguese society could be described as influenced by patriarchal beliefs, given that only in the 20th century were women allowed to work for the State, and girls could enrol in male high schools. Portugal was under a dictatorial regime for 41 years (from 1933 to 1974), with several setbacks in women's rights and gender equality in Portuguese society. Currently, although gender equality is ensured by law and policies, important differences remain across areas of society, such as education and employment (e.g., there are more women than men with higher education degrees, but they still earn less money than men; Comissão para a Cidadania e a Igualdade de Género [CIG], 2024) and household labour division (Perista et al., 2016).

To address the need for validated measures and systematic research in the European context focused on patriarchal beliefs, including the Portuguese context, the current study aims to provide additional psychometric evidence for the Patriarchal Beliefs Scale. Specifically, we aim to offer validity (i.e., construct and convergent validity, measurement invariance across gender) and reliability evidence (Cronbach's alpha and McDonald's omega) for this scale, which might enable cross-cultural studies using a reliable and trustworthy measure. Based on previous evidence, patriarchal beliefs are expected to be

positively associated with social dominance and sexism. Also, male participants might score higher on patriarchal beliefs than female participants do.

METHOD

Participants

A total of 783 participants accessed the link to the current study. However, three participants did not agree to participate, and 292 did not complete the questionnaires necessary for this analysis (dropout rate 37.7%). As such, the sample in this study comprises 488 participants, 326 women (66.8%) and 162 men (33.2%), with ages ranging from 18 to 77 years old (*M* = 27.6 years, *SD* = 11.8). Regarding civil status, 404 respondents were single (82.8%), 60 were married (12.3%), and 24 were divorced (4.9%). Two hundred and forty-three were employed (49.8%), 216 were students (44.3%), 219 had completed secondary education (44.9%), and 185 had a bachelor's degree (37.9%).

Measures

The data included in this study were collected as part of a broader project involving a larger set of measures about socio-cognitive factors associated with sexual abuse myths (e.g., social dominance orientation, empathy, sexism, propensity to morally disengage) lasting around 15 minutes. For this study, in addition to socio-demographic data (e.g., age, gender, marital status, education, and employment status), we also considered data on patriarchal beliefs, sexism, and social dominance to achieve our study's aims.

Patriarchal Beliefs Scale. The Patriarchal Beliefs Scale (PBS; Yoon et al., 2015) is a 35-item self-report scale, answered using a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (totally agree) and aiming to assess patriarchal beliefs, including social systems at a micro, meso, and macro level. The scale is organised into 3 factors: (F1) Institutional Power Of Men (12 items; α = .97) focuses on measuring beliefs regarding male authority and leadership at both macro and meso levels (e.g., politics, financial and religious institutions, workforce) (e.g., *I am more comfortable with men running big corporations than women*); (F2) Inherent Inferiority of Women (12 items; α = .97) measures individuals' views on female inferiority, subordination, and restriction/exclusion from various social roles with the majority of the items being macro- and meso-level focused (e.g., pay, employment, community involvement) (e.g., *Women do not belong in the workforce*); and (F3) Gendered Domestic Roles (11 items; α = .95) focuses only on the micro-level measuring gendered family roles (i.e., men as breadwinners and decision-makers and women as caretakers for children and housework) (e.g., *A man is the head of the household*) (Yoon et al., 2015; Yoon et al., 2019). Higher scores indicate greater endorsement of patriarchal beliefs.

The Ambivalent Sexism Inventory. The Ambivalent Sexism Inventory (Portuguese version by Magalhães et al., 2007) aims to assess Hostile Sexism (e.g., "Women are too easily offended"; α = .82) and Benevolent Sexism (e.g., "Many women have a quality of purity that few men possess"; α = .80) through 22 items answered using a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Satisfactory reliability evidence was also found in this study: Hostile Sexism (α=.78) and Benevolent Sexism (α = .77).

The Short Social Dominance Orientation Scale. The Short Social Dominance Orientation scale (Portuguese version by Magalhães et al., 2022) allows the assessment of individuals' tendency to endorse group-based hierarchy and their acceptance of the premise of superior groups dominating inferior groups. This scale contains four items (e.g., "Superior groups should dominate inferior groups"), answered using a seven-point Likert-type scale and ranged from 1 (Strongly Disagree) to 7 (Strongly Agree) (α = .63).

Data collection and analysis

This study is part of a larger project approved by the Ethical Committee of the Institute of Social Sciences of the University of Lisbon. First, permission was requested from the author of the original version of the PBS to translate and adapt this scale to the Portuguese context. Translation, back-translation, and expert review of the items (cf. Beaton et al., 2000) were performed. A researcher translated the items and then they were revised by three other independent researchers to solve differences and achieve a consensus version. This version was then back-translated by a bilingual speaker, and the back-translated version was compared to the original version, and a Portuguese version was achieved. Data collection was then performed through Qualtrics, and the link was distributed on social media (i.e., Facebook posts). As such, a non-probabilistic convenience sample was included in this study, considering the following inclusion criteria: (a) to understand the Portuguese language; and (b) to be at least 18 years old. Before filling out the questionnaires, the participants were informed about the study's conditions: it was voluntary,

confidential, and no other type of reward was provided. The informed consent form provided the contact details of the research team. It highlighted that participants could give up at any point and choose not to answer without providing any justification. Both general posts and the messaging feature inviting participants were used for data collection and data were collected in two periods (between March 2019 and August 2020 *n*=613; and between January and May 2023, *n* = 170).

After data collection, we first assessed item quality with a missing values analysis and descriptive analysis of items, including skewness and kurtosis, considering acceptable absolute values inferior to 3 and 8, respectively (Kline, 2005). We conducted a confirmatory factor analysis (CFA) using maximum likelihood estimation with robust standard errors and a Satorra-Bentler scaled test statistics (i.e., MLM estimator in lavaan's sem function) to account for the lack of normal distribution within the scale items. The model fit was assessed using the chi-square statistics, the Root Mean Square of Approximation (RMSEA), with values below .10 considered mediocre and below .08 an adequate fit. The Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) were used to compare our model against a baseline independent model, with values above .90 considered an adequate fit (Weston & Gore, 2006). The correlation of errors in the model was determined by the presence of modification indices above 100 between the items of the same factor.

Internal consistency was evaluated considering both Cronbach's alpha and McDonald's omega, with values above .90 considered acceptable values (Kline, 2023). Invariance was measured using a multigroup CFA, a first model free of constraints (i.e., configural invariance), constraining equal loadings (i.e., metric invariance), intercepts (i.e., scalar invariance), and finally residuals (i.e., full invariance). Configural, metric, scalar, and full invariance were assessed using the chi-square test significance combined with changes in CFI and RMSEA. A significant chi-square and changes of CFI and RMSEA bigger than -.010 and .015, respectively, indicate non-invariance (Chen, 2007). An additional step was taken to evaluate the source of the lack of measurement invariance and the specific items that could contribute to this. We used differential item functioning (DIF) in a three-step process suggested by He & van de Vijver (2012). Firstly, we computed a total score for each of the three factors. Secondly, the score was divided into four groups, ranging from -1 to +1 SD. Lastly, a two-way ANOVA was used with sex and group as independent values and item score as the dependent variable, and this process was repeated for each of the three factors. The presence of both significant effects in sex and the interaction between sex and group was considered a sign of item bias. Descriptive statistics and differential item functioning (DIF) were conducted using RStudio 2022.07.02 (R Development Core Team, 2005). The following packages were employed: psych (Revelle, 2017), lavaan (Rosseel, 2012), and lavaanPlot (Lishinsk, 2022). Convergent validity was tested through correlations between patriarchal beliefs, social dominance orientation, and sexism.

RESULTS

Descriptive statistics

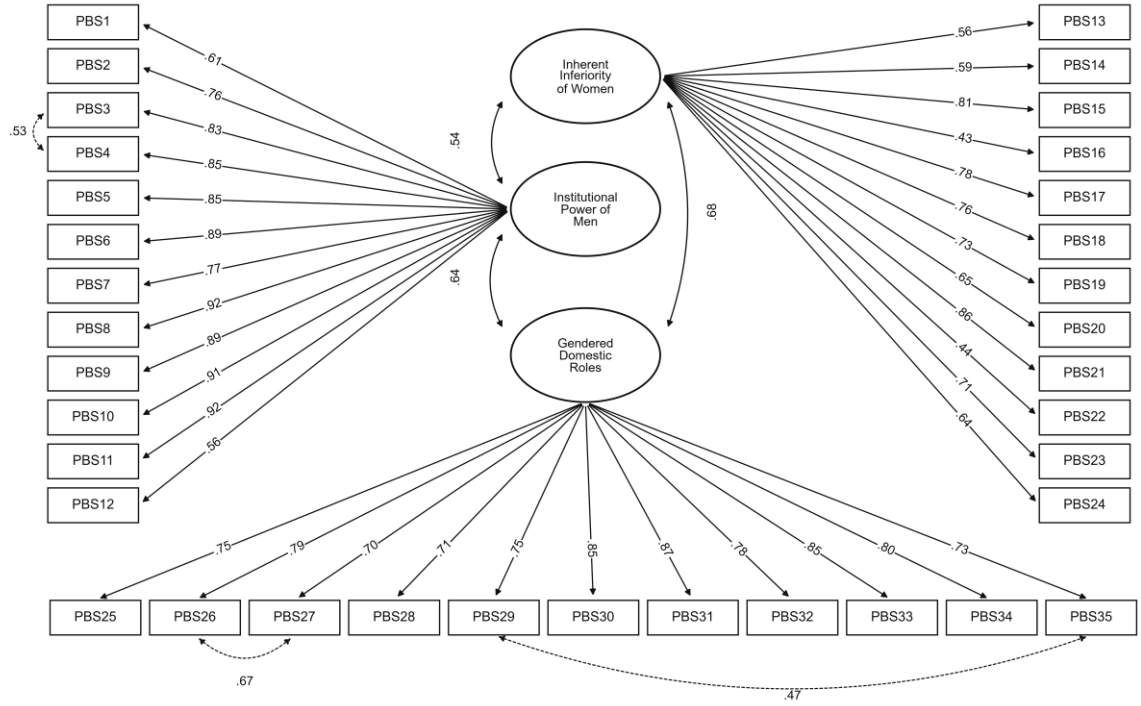
The descriptive statistics showed violations of normality, particularly in the items of factor 2, where kurtosis ranges from 11.43 to 66.45 and skewness from 3.28 to 7.65 (Table 1). This indicates a need to consider the data non-normal and to choose a robust estimator that takes this violation into consideration, in our case MLR (maximum likelihood robust).

Table 1. Descriptive Statistics

	N	Min	Max	Mean	Standard Deviation	Skewness	Kurtosis
PBS1	487	1	7	2.2	1.42	1.11	0.45
PBS2	488	1	7	2.0	1.31	1.30	0.86
PBS3	488	1	6	1.9	1.19	1.21	0.53
PBS4	488	1	6	2.0	1.22	1.26	0.66
PBS5	488	1	7	1.9	1.17	1.36	1.13
PBS6	488	1	7	1.9	1.17	1.41	1.35
PBS7	488	1	7	1.9	1.16	1.55	2.30
PBS8	488	1	6	1.8	1.03	1.49	1.52
PBS9	488	1	6	1.8	1.10	1.39	1.21
PBS10	488	1	6	1.8	1.11	1.41	1.24
PBS11	488	1	6	1.8	1.10	1.42	1.19
PBS12	488	1	7	2.1	1.31	1.16	0.57
PBS13	488	1	7	1.3	0.78	4.17	**21.22**
PBS14	488	1	7	1.3	0.70	4.53	**25.59**
PBS15	488	1	5	1.2	0.45	4.44	**27.17**
PBS16	488	1	7	1.1	0.59	7.65	**66.45**
PBS17	488	1	6	1.2	0.55	4.48	**26.42**
PBS18	488	1	7	1.3	0.72	4.31	**22.48**
PBS19	488	1	7	1.3	0.78	3.28	**12.35**
PBS20	487	1	6	1.3	0.69	3.39	**13.08**
PBS21	488	1	5	1.2	0.51	3.62	**16.28**
PBS22	488	1	7	1.4	1.07	3.69	**13.64**
PBS23	488	1	7	1.3	0.87	3.29	**11.43**
PBS24	488	1	6	1.1	0.49	5.73	**39.08**
PBS25	488	1	7	1.5	1.03	2.50	6.69
PBS26	488	1	7	1.4	0.85	3.56	**14.64**
PBS27	488	1	7	1.3	0.84	3.67	**15.57**
PBS28	488	1	7	1.6	1.02	2.19	4.82
PBS29	488	1	6	1.7	1.15	1.93	3.10
PBS30	488	1	7	1.6	1.04	2.30	5.29
PBS31	488	1	7	1.4	0.86	2.99	**10.51**
PBS32	488	1	7	1.9	1.57	1.81	2.23
PBS33	488	1	6	1.5	0.96	2.40	5.49
PBS34	488	1	6	1.5	1.04	2.40	5.50
PBS35	488	1	6	1.8	1.33	1.65	1.70

Confirmatory Factor Analysis

Considering the descriptive statistics, we selected an estimator for CFA that accounted for non-normal distributions. A first CFA reported fit indexes below the accepted thresholds, $\chi 2$ (557) = 1243; $p < 0.001$, CFI = .88, TLI = .88, RMSEA = .076, 95% CI [.070, .082]. To improve the model fit, we added a correlation between errors based on the modification indices and theoretical criteria, namely, content similarity. The following items were correlated: 26 ("Cleaning is mostly a woman's job") and 27 ("Cooking is mostly a woman's job"), (MI = 229); Item 3 ("I would feel more comfortable if a man was running the country's finances") and 4 ("I would feel more secure with a male president running the country than a female one") (MI = 135), and items 29 ("A woman should be the one who does most of the child rearing") and 35 ("A woman should be the primary caretaker for children") (MI = 109). The second CFA showed a significantly improved model, $\chi 2$ (554) = 1021; $p < 0.001$, CFI = .92, TLI = .92, RMSEA = .062, 95% CI [.056, .068]. A plot with the factorial structure, as well as the correlation added and the loadings are presented in Figure 1.



Note. *all loadings and correlations' significance level was <.001; Standard Errors: PBS2 - .07, PBS2 - .07, PBS3 - .08, PBS5 - .08, PBS6 - .08, PBS7 - .08, PBS8 - .08, PBS9 - .08, PBS10 - .08, PBS11 - .08, PBS12 - .07, PBS14 - .08, PBS15 - .11, PBS16 - .15, PBS17 - .17, PBS18 - .21, PBS19 - .17, PBS20 - .15, PBS21 - .12, PBS22 - .20, PBS23 - .18, PBS24 - .16, PBS26 - .089, PBS27 - .083. PBS28 - .097; PBS29 - .114, PBS30 - .104, PBS31 - .10, PBS32 - .13, PBS33 - .097, PBS34 - .11, PBS35 - .13

Figure 1. Factorial structure of the Patriarchy Beliefs Scale

Measurement invariance across gender

As seen in Table 2, the criteria for the significance of chi-square change supported only metric invariance, while both the CFI and RMSEA criteria indicated scalar invariance. Given that the chi-square criteria is overly sensitive to sample size, neglecting small changes in large sample sizes and non-normality (Chen, 2007), the alternative fit indexes were preferred in this analysis. Hence, we considered in this analysis to have achieved scalar invariance. This means that the PBS measures the same construct between men and women, and observed differences in means are not due to systematic errors, allowing us to interpret group mean contrasts (Kline, 2023).

Table 2. Confirmatory Factor Analysis

Model	$\chi 2$	Df	CFI	RMSEA	$\Delta\chi 2$	*p*	ΔCFI	ΔRMSEA
Configural	3393	1108	.90	.068				
Metric	3489	1140	.90	.067	35.3	.32	-0.001	0.001
Scalar	3587	1172	.89	.069	421	< .001	-0.008	0.001
Residual	6388	1207	.75	.101	84.2	< .001	-0.14	0.032

Given the kurtosis violations and the expected gender differences in patriarchal beliefs, with men endorsing more sexist attitudes, we further assessed individual items' impact on invariance by analysing differential item functioning (DIF). Items that had both a significant gender and interaction effect were considered potentially problematic (Table 3). Several items revealed differences: in factor 1, items 9 and 10; in factor 2, items 13, 17, 18, 21, 22, 23, and 24; and in factor 3, items 26, 27, 31, 32, 33, and 34.

Table 3. Differential item functioning: gender effects and interactions

	Women *M (SD)*	Men *M (SD)*	Gender E*FF*ect	Gender and Grou*p* Interaction
PSB9	1.59 (.90)	2.31 (1.31)	*F* (1, 481) = 8.77, *p* < .003, eta2 = .02	*F* (2, 481) = 6.97, *p* = .001, eta2 = .03
PSB10	1.58 (.89)	2.32 (1.33)	*F* (1, 481) = 9.60, *p* = .002, eta2 = .02	*F* (2, 481) = 5.07, *p* = .007, eta2 = .02
PSB13	1.10 (.36)	1.65 (1.17)	*F* (1, 481) = 32.01, *p* < .001, eta2 = .06	*F* (2, 481) = 16.5, *p* < .001, eta2 = .06
PSB17	1.07 (.26)	1.41 (0.83)	*F* (1, 481) = 6.74, *p* 0 .010, eta2 = .01	*F* (2, 481) = 3.15, *p* = .044, eta2 = .01
PSB18	1.05 (.22)	1.64 (1.11)	*F* (1, 481) = 48.68, *p* < .001, eta2 = .09	*F* (2, 481) = 15.90, *p* < .001, eta2 = .06
PSB21	1.07 (.25)	1.41 (0.75)	*F* (1, 481) = 10.53, *p* = .001, eta2 = .02	*F* (2, 481) = 5.43, *p* = .005, eta2 = .02
PSB22	1.30 (1.03)	1.46 (1.14)	*F* (1, 481) = 46.34, *p* < .001, eta2 = .09	*F* (2, 481) = 17.67, *p* < .001, eta2 = .07
PSB23	1.09 (.33)	1.81 (1.31)	*F* (1, 481) = 54.90, *p* < .001, eta2 = .10	*F* (2, 481) = 19.01, *p* < .001, eta2 = .07
PSB24	1.03 (.18)	1.3 (0.79)	*F* (1, 481) =7.69, *p* = .006, eta2 = .02	*F* (2, 481) = 6.28, *p* = .002, eta2 = .03
PSB26	1.16 (.51)	1.73 (1.21)	*F* (1, 482) = 18.70, *p* < .001, eta2 = .04	*F* (2, 482) = 8.41, *p* < .001, eta2 = .03
PSB27	1.15 (.47)	1.70 (1.22)	*F* (1, 482) = 20.19, *p* < .001, eta2 = .04	*F* (2, 482) = 8.67, *p* < .001, eta2 = .04
PSB31	1.21 (.59)	1.78 (1.15)	*F* (1, 482) = 9.21, *p* = .003, eta2 = .02	*F* (2, 482) = 4.24, *p* = .012, eta2 = .02
PSB32	1.51 (1.15)	2.72 (2.00)	*F* (1, 482) = 9.39, *p* = .002, eta2 = .02	*F* (2, 482) = 5.01, *p* = .007, eta2 = .02
PSB33	1.19 (.52)	2.04 (1.33)	*F* (1, 482) = 69.00, *p* < .001, eta2 = .13	*F* (2, 482) = 23.67, *p* < .001, eta2 = .09
PSB34	1.29 (.74)	1.98 (1.37)	*F* (1, 482) = 13.87, *p* < .001, eta2 = .03	*F* (2, 482) = 12.25, *p* < .001, eta2 = .05

Patriarchal beliefs, gender, social dominance, and sexism

All subscales of patriarchal beliefs, social dominance orientation, and sexism were positively and significantly correlated with each other: greater benevolent and hostile sexism and social dominance orientation were associated with greater patriarchal beliefs. Men significantly outscored women in all these subscales. Non-significant associations were found in participants' age for patriarchal beliefs; even older participants reported greater social dominance orientation (Table 4). Also, good and excellent reliability for the three factors: Institutional power of men, Inherent inferiority of women, and Gendered domestic roles (see Table 4's note).

Table 4. Intercorrelations between study variables

	M	*SD*	1	2	3	4	5	6	7
1. SDO	2.18	0.95	-						
2. BS	3.28	0.96	.245***	-					
3. HS	3.49	0.94	.248***	.640***	-				
4. IPM	1.93	0.98	.332***	.421***	.407***	-			
5. IIW	1.23	0.46	.314***	.253***	.246***	.519***	-		
6. GDR	1.55	0.85	.345***	.394***	.356***	.605***	.618***	-	
7. Gender	-	-	.202***	.195***	.215***	.307***	.382***	.380***	-
8. Age	27.60	11.75	.224***	-.006	.024	-.079	-.040	-.058	-.051

Note. ***p<.001; SDO= Social Dominance Orientation; BS= Benevolent Sexism; HS= Hostile Sexism; IPM= Institutional Power Of Men (α = .96; ω = .96); IIW= Inherent Inferiority of Women (α = .86; ω = .89); GDR= Gendered Domestic Roles (α = .94; ω = .94); Gender = female(0), male(1) - point-biserial correlation coefficients

DISCUSSION

This study aimed to provide evidence on the psychometric properties of the Portuguese version of the PBS (Yoon et al., 2015). These inherently unequal beliefs are linked with several forms of gender-based discrimination, such as sexism (O'Neil, 2008) and violence against women (e.g., Ozaki & Otis, 2017). Patriarchal beliefs are believed to be embedded at different levels of society (i.e., micro, meso, and macro levels) (Hunnicutt, 2009; Yoon et al., 2015) and across countries (Ozaki & Otis, 2017). Therefore, it is important to adapt and validate reliable instruments to provide cumulative evidence on this topic in different cultures.

This study adapted the PBS (Yoon et al., 2015) to the Portuguese context and provided support for a three-factorial structure of this scale: *Institutional Power of Men*, *Inherent Inferiority of Women,* and

Gendered Domestic Roles. Normality assessment showed results similar to those of the original study where the PBS was developed (Yoon et al., 2015). Factors 1 (*Institutional Power of Men)* and 3 (*Gendered Domestic Roles*) showed accepting normality indicators, and Factor 2 (*Inherent Inferiority of Women*) indicated high levels of skewness (> 3.00) and kurtosis (> 11.00). Yoon and colleagues (2015) offered a relevant explanation for similar findings, which relate to the items' explicitness. General patriarchal beliefs imply men's superiority and women's inferiority; however, F1-*Institutional Power of Men* and F3-*Gendered Domestic Roles* items assess the power imbalance between men and women more covertly and subtly (Yoon et al., 2015) than F2-*Inherent Inferiority of Women*. On the other hand, F2-*Inherent Inferiority of Women* items explicitly measure the imbalance of power between men and women, specifically focusing on beliefs linked to women's inferiority and subordination, restriction, or exclusion, thus involving more hostile and explicit patriarchal beliefs than the other two factors. Such explicitness might have contributed to the difference observed in normality assessment in F2, given that while individuals may somewhat agree with certain distinct gender roles to keep society functional, they might not agree as much with beliefs regarding women's explicit inferiority and/or exclusion (Yoon et al., 2015). It should also be noted that the characteristics of the sample may have played a role in this result since most of the sample in the current study is female (i.e., 66.8%), and male participants tend to show higher levels of endorsement or agreement with such items (Yoon et al., 2015; Yoon et al., 2019).

Measurement invariance across gender analysis showed scalar invariance, meaning that the intercepts (i.e., the origin of the scale) were comparable between groups. This means that the differences in a latent variable capture all differences in the mean of the items (Putnick & Bornstein, 2016), and we can compare men and women based on the scores obtained. Since we expected men to have higher levels of endorsement of patriarchal views, achieving scalar invariance is particularly important, as it allows us to compare the means between the two groups and not credit these differences to measurement errors or systematic differences in responses. The DIF analysis results indicated several items that could be potentially problematic, particularly in factor 2, Inherent Inferiority of Women, expected to draw more divisive answers from men and women, given the more explicit sexist content. However, we still achieved scalar invariance, and these items remained in the scale. The complementary DIF analysis could help in understanding the source of the extreme kurtosis values. Convergent validity and reliability of the Portuguese version of the PBS scale were also assessed. Evidence for convergent validity supported the trustworthiness of this scale, since positive and significant correlations between all subscales of patriarchal beliefs, social dominance orientation, and sexism were found. We observed gender differences in line with previous research, with men significantly outscoring women in all these subscales (Chim et al., 2020; Magalhães et al., 2022; Tripathi, 2020; Yoon et al., 2015; Yoon et al., 2018; Yoon et al., 2019). As previously stated, men's higher levels of endorsement of such views may stem from an attempt to preserve their higher social status, while women (lower-status group) may be more aware of such issues and therefore endorse these patriarchal beliefs less since it affects them directly and personally in various contexts (Crittenden & Wright, 2013; Yoon et al., 2018). The results regarding the positive and significant correlations between the PBS, SDO, and sexism further highlight convergent validity evidence. SDO and sexism reinforce the maintenance of a gender hierarchy where men assert their dominance over women, which is congruent with patriarchal beliefs (Batalha et al., 2011; Canto et al., 2020). These results are also consistent with previous findings where significant correlations between PBS and SDO (Janjua & Kamal, 2023) and PBS and sexism (Yoon et al., 2015) have been found.

Despite the contributions of this work and the evidence provided in favour of the validity and reliability of the scale, this study has some limitations. First, this study is based on an online convenience sample. Despite the benefits of this data collection procedure (i.e., lower costs and time), future research should include more diverse samples, such as participants who do not have online access. Second, sample diversity regarding participants' gender should also be improved, given that despite the great sample size (N=488), most of our participants (66.8%) were female. This limitation is similar to previous studies, including those focused on PBS development (Yoon et al., 2015), which calls for wider efforts to ensure more representative samples across countries to improve the generalizability of the results (He & van de Vijver, 2012; Henrich et al., 2010). Finally, recruitment was conducted through social networks of individuals based in Portugal as part of a broader study targeting Portuguese-speaking participants, but we could not verify that all respondents were Portuguese citizens or residents, as these data were not collected. Future studies should seek to replicate this factorial structure using samples with explicit residency criteria.

CONCLUSION

The current study provides validity and reliability evidence for the Patriarchal Beliefs Scale (PBS, Yoon et al., 2015) in the Portuguese context, confirming its three-factorial structure and its theoretically expected

associations with social dominance orientation and sexism. This validation contributes to cross-cultural research on how patriarchal beliefs vary across societies and how they relate to broader patterns of gender (in)equality.

DATA AVAILABILITY STATEMENT

The data will be made available upon request by email to eunice_magalhaes@iscte-iul.pt

REFERENCES

Abu-Ras, W. (2007). Cultural beliefs and service utilization by battered Arab immigrant women. *Violence Against Women, 13*(10), 1002-1028. https://doi.10.1177/1077801207306019

Batalha, L., Reynolds, K. J., & Newbigin, C. A. (2011). All else being equal: Are men always higher in social dominance orientation than women?. *European Journal of Social Psychology, 41*(6), 796-806. https://doi.org/10.1002/ejsp.829

Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process

Canto, J. M., Vallejo-Martín, M., Perles, F., & San Martín, J. (2020). The influence of ideological variables in the denial of violence against women: The role of sexism and social dominance orientation in the Spanish context. *International Journal of Environmental Research and Public Health, 17*(14), 4934. doi:10.3390/ijerph17144934

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling*, *14*, 464–504. https://doi.org/10.1080/10705510701301834

Chim, I., Magalhães, E., Graça, J., Antunes, C., & Ferreira, C. (2020). Child sexual abuse myth scale: validity and reliability evidence in the Portuguese context. *Journal of Child Sexual Abuse, 29*(7), 802-820. https://doi.10.1080/10538712.2020.1801934

Comissão para a Cidadania e a Igualdade de Género (2024). *Igualdade de Género em Portugal: Boletim Estatístico 2023* [PDF]. https://cld.pt/dl/download/e31838f9-aac0-4b19-ba8e-495e4fc452a1/BE2023.pdf

Crittenden, C. A., & Wright, E. M. (2013). Predicting patriarchy: Using individual and contextual factors to examine patriarchal endorsement in communities. *Journal of Interpersonal Violence, 28*(6), 1267-1288. https://doi.10.1177/0886260512468245

Espinoza, G., Hokoda, A., Ulloa, E. C., Ulibarri, M. D., & Castaneda, D. (2012). Gender differences in the relations among patriarchal beliefs, parenting, and teen relationship violence in Mexican adolescents. *Journal of Aggression, Maltreatment & Trauma, 21*(7), 721-738. https://doi.10.1080/10926771.2012.703289

Fowers, A. F., & Fowers, B. J. (2010). Social dominance and sexual self-schema as moderators of sexist reactions to female subtypes. *Sex Roles, 62*, 468-480. https://doi.10.1007/s11199-009-9607-7

Glick, P., Fiske, S. T., Mladinic, A., Saiz, J. L., Abrams, D., Masser, B., ... & López, W. L. (2000). Beyond prejudice as simple antipathy: hostile and benevolent sexism across cultures. *Journal of Personality and Social Psychology, 79*(5), 763-775. https://doi.org/10.1037/0022-3514.79.5.763

Graça, J., Calheiros, M. M., Oliveira, A., & Milfont, T. L., (2018). Why are women less likely to support animal exploitation than men? The mediating roles of social dominance orientation and empathy. *Personality and Individual Differences, 129*, 66–69. https://doi.org/10.1016/j.paid.2018.03.007

Haj-Yahia, M. M. (2003). Beliefs about wife beating among Arab men from Israel: The influence of their patriarchal ideology. *Journal of Family Violence, 18*(4), 193-206. https://doi.10.1023/A:1024012229984

Haj-Yahia, M. M. (2005). Can people's patriarchal ideology predict their beliefs about wife abuse? The case of Jordanian men. *Journal of Community Psychology, 33*(5), 545-567. https://doi.10.1002/jcop.20068

He, J., & van de Vijver, F. (2012). Bias and Equivalence in Cross-Cultural Research. *Online Readings in Psychology and Culture, 2*(2). https://doi.org/10.9707/2307-0919.1111

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world?. *Behavioral and Brain Sciences*, *33*(2-3), 61-83. https://doi.org/10.1017/S0140525X0999152X

Hunnicutt, G. (2009). Varieties of patriarchy and violence against women: Resurrecting "patriarchy" as a theoretical tool. *Violence Against Women, 15*(5), 553-573. https://doi.10.1177/1077801208331246

Jahan, S. (2022). Challenges to female college principals and vice principals: Patriarchal gender beliefs in Khyber Pakhtunkhwa Pakistan. *Educational Management Administration & Leadership*, 1-17. https://doi.10.1177/17411432221115521

Janjua, M. M., & Kamal, A. (2023). Development and validation of patriarchal beliefs scale in Pakistani culture. *Annals of Human and Social Sciences, 4*(2), 236-249. https://doi.org/10.35484/ahss.2023(4-II)22

Kline, R. B. (2005). Principles and practice of structural equation modeling, 2nd ed. In *Principles and practice of structural equation modeling, 2nd ed*. Guilford Press.

Kline, R. B. (2023). *Principles and practice of structural equation modeling*. Guilford publications.

Lishinsk, A. (2022). Package 'lavaan'.

Magalhães, E., Graça, J., Antunes, C., Ferreira, C., & Pinheiro, M. (2022). Why are men more likely to endorse myths about child sexual abuse than women? Evidence from disposition and situation-based approaches. *Child Maltreatment, 27*(3), 356-365. https://doi.10.1177/1077559520988353

Magalhães, E., Oliveira, G. K., Leitão, F., Chaves, S., Capela, S., Nogueira, C., & Martins, C. (2007). Adaptação do Inventário de sexismo ambivalente para uma população de estudantes universitários portugueses. *Psicologia: Teoria, Investigação e Prática, 12*, 41-53.

Matlin, M. W. (2012). *The psychology of women* (7ª ed.). Australia.

McKinley, C. E., Lilly, J. M., Knipp, H., & Liddell, J. L. (2021). "A Dad Can Get the Money and the Mom Stays at Home": Patriarchal Gender Role Attitudes, Intimate Partner Violence, Historical Oppression, and Resilience Among Indigenous Peoples. *Sex Roles, 85*(9), 499-514. https://doi.10.1007/s11199-021-01232-7

Mkhize, G., & Njawala, L. (2016). Rethinking hegemonic masculinity and patriarchal privilege within heterosexual interpersonal relationships. *The Oriental Anthropologist, 16*(2), 379-397.

of cross-cultural adaptation of self-report measures. *Spine*, *25*(24), 3186–3191. https://doi.org/10.1097/00007632-200012150-00014

Ogle, R. S., & Batton, C. (2009). Revisiting patriarchy: Its conceptualization and operationalization in criminology. *Critical Criminology, 17*(3), 159-182. https://doi.10.1007/s10612-009-9081-0

O'Neil, J. M. (2008). Summarizing 25 years of research on men's gender role conflict using the Gender Role Conflict Scale: New research paradigms and clinical implications. *The Counseling Psychologist, 36*(3), 358-445. https://doi.10.1177/0011000008317057

Ozaki, R., & Otis, M. D. (2017). Gender equality, patriarchal cultural norms, and perpetration of intimate partner violence: Comparison of male university students in Asian and European cultural contexts. *Violence Against Women, 23*(9), 1076-1099. https://doi.10.1177/1077801216654575

Perista, H., Cardoso, A., Brázia, A., Abrantes, M., Perista, P., & Quintal, E. (2016). Os usos do tempo de homens e de mulheres em Portugal. *Centro de Estudos para a Intervenção Social (CESIS)/Comissão para a Igualdade no Trabalho e no Emprego (CITE).* http://cidadaniaemportugal.pt/wp-content/uploads/recursos/cite_os_usos_do_tempo_de_homens_e_de_mulheres_em_portugal.pdf

Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: A personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology, 67*(4), 741-763. https://doi.org/10.1037/0022-3514.67.4.741

Putnick, D. L., & Bornstein, M. H. (2016). Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Developmental Review*, *41*, 71-90. https://doi.org/10.1016/j.dr.2016.06.004

R Development Core Team. (2005). *R: A language and environment for statistical computing.* R Foundation for Statistical Computing.

Revelle, W. R. (2017). psych: Procedures for Personality and Psychological Research. Software

Rosseel, Y. (2012). lavaan: An R package for structural equation models. Journal of

Sibley, C. G., Wilson, M. S., & Duckitt, J. (2007). Antecedents of men's hostile and benevolent sexism: The dual roles of social dominance orientation and right-wing authoritarianism. *Personality and Social Psychology Bulletin, 33*(2), 160–172. https://doi.org/10.1177/0146167206294745

Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression.* Cambridge University Press. https://doi.org/10.1017/CBO9781139175043

Statistical Software, 48(2), 1–36. https://doi.org/10.18637/jss.v048.i02

Tripathi, S. (2020). Patriarchal beliefs and perceptions towards women among Indian police officers: A study of Uttar Pradesh, India. *International Journal of Police Science & Management, 22*(3), 232-241. https://doi.10.1177/1461355720905612

Weston, R., & Gore Jr, P. A. (2006). A brief guide to structural equation modeling. *The Counseling Psychologist*, *34*(5), 719-751. https://doi.org/10.1177/0011000006286345

Ymamgulyyeva, A., Kafescioğlu, N., & Harma, M. (2024). Examining actor–partner effects between social dominance, relationship power, sexism, and marital quality. *Family Relations, 73*(2), 1311-1328. https://doi.org/10.1111/fare.12881

Yoon, E., Adams, K., Hogge, I., Bruner, J. P., Surya, S., & Bryant, F. B. (2015). Development and validation of the Patriarchal Beliefs Scale. *Journal of Counseling Psychology*, 62(2), 264-279. https://doi.10.1037/cou0000056

Yoon, E., Cabirou, L., Bhang, C., & Galvin, S. (2019). Acculturation and patriarchal beliefs among Asian American young adults: A preliminary investigation. *Asian American Journal of Psychology, 10*(2), 122-130. https://doi.10.1037/aap000013

Yoon, E., Chang, H., & Adams, K. (2018). Interrelations of patriarchal beliefs, gender, collectivism/individualism, and mental health. *Counselling Psychology Quarterly, 33*(2), 199-217. https://doi.10.1080/09515070.2018.1511520

CREDIT AUTHORSHIP CONTRIBUTION STATEMENT

Eunice Magalhães: Conceptualisation; Investigation; Methodology; Project administration; Writing - Original Draft; Writing - Review & Editing. **Inês Chim**: Investigation; Writing - Original Draft; **Patrício Costa**: Formal analysis; Writing - Review & Editing. **Beatriz David:** Formal analysis; Writing - Original Draft. **João Graça:** Conceptualisation; Methodology; Project administration; Writing - Review & Editing

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APPENDIX

European-Portuguese Version of the Patriarchal Beliefs Scale

Por favor, indique em que medida concorda com as seguintes afirmações utilizando a escala de 1-7 abaixo apresentada. Não há respostas certas ou erradas. Por favor, seja espontâneo e honesto na sua resposta.

1 Discordo fortemente	2 Discordo	3 Discordo ligeiramente	4 Nem concordo nem discordo	5 Concordo ligeiramente	6 Concordo	7 Concordo fortemente

1	No trabalho, eu teria mais confiança num chefe do sexo masculino do que num chefe do sexo feminino.
2	Sinto-me mais confortável que homens dirijam grandes empresas do que com mulheres.
3	Sentir-me-ia mais confortável se um homem estivesse a gerir as finanças do país.
4	Sentir-me-ia mais seguro com um presidente do sexo masculino a governar o país do que um do sexo feminino
5	Os homens devem liderar a política nacional.
6	É importante que os homens tomem as grandes decisões que afetarão o meu país.
7	Os homens, mais do que as mulheres, devem liderar serviços religiosos
8	As questões de governação local devem ser deixadas para os homens
9	Um homem deve ser o chefe de uma empresa
10	Os homens seriam gestores mais competentes de instituições financeiras.
11	Eu prefiro que sejam homens a conduzir as reuniões municipais
12	Os papéis preponderantes que os homens desempenham na TV/filmes refletem como a sociedade deve funcionar
13	As mulheres devem receber menos que um homem pelo mesmo trabalho.
14	Os bancos não devem conceder créditos às mulheres
15	As mulheres não pertencem ao mundo do trabalho
16	É aceitável que um homem castigue fisicamente a sua esposa
17	O lugar de uma mulher na comunidade deve ser principalmente no trabalho voluntário.
18	As mulheres são menos capazes que os homens na gestão do dinheiro
19	Colegas de trabalho homens devem ter mais voz no contexto de trabalho
20	As raparigas têm menos necessidade de ter formação académica que os rapazes
21	A carreira das mulheres deve ser limitada a empregos tradicionais femininos.
22	A polícia não deve intervir em conflitos domésticos entre marido e mulher.
23	Os homens são naturalmente mais inteligentes do que as mulheres
24	Um homem tem o direito a ter relações sexuais com a sua esposa, mesmo que ela possa não querer
25	Um homem deve ser quem sustenta a família
26	Limpar é uma tarefa, principalmente, das mulheres
27	Cozinhar é uma tarefa, principalmente, das mulheres
28	Um homem deve ser aquele que disciplina as crianças
29	Uma mulher deve ser quem, maioritariamente, cuida da criança
30	Um homem deve controlar as finanças domésticas
31	Uma mulher deve ser quem faz o trabalho doméstico
32	Um homem é o chefe de família
33	Um homem deve ditar as regras de casa
34	As mulheres devem ser mais responsáveis pelas tarefas domésticas do que os homens
35	Uma mulher deve ser a cuidadora principal das crianças

Note. Institutional Power of Men (items 1-12); Inherent Inferiority of Women (items 13-24); Gendered Domestic Roles (items 25-35).

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Improving Emotional Regulation and Mental Health: The Impact of an Online Intervention for University Students

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Abstract: Emotion regulation difficulties and mental health problems are common among university students, underscoring the need for scalable preventive interventions. This non-randomized clinical trial evaluated a synchronous online group intervention designed to improve emotion regulation and well-being. Two hundred and six students were assessed, and eligible participants were allocated to intervention or control groups according to availability. The intervention comprised six weekly 90-minute videoconference sessions focused on emotional psychoeducation, awareness, acceptance, impulse control, and cognitive reappraisal. Outcomes were assessed before, immediately after, and 30 days after the intervention using validated measures and analysed with Mann–Whitney and Friedman tests. Compared with controls, intervention participants showed improvements in emotion regulation, reduced anxiety, depression, and stress, and increased psychological and subjective well-being, with gains maintained at follow-up. Findings indicate that brief synchronous online group interventions may be a feasible and scalable strategy for promoting university students' mental health.

Keywords: *Emotional regulation; Mental health; Online psychological intervention; University students.*

Emotions play a fundamental role in human experience, yet there is no consensus on a unified concept that encompasses all their facets. In this study, we adopt John Gross's process model of emotion regulation (Gross, 2015), which highlights the significance of an individual's attention and appraisal of specific situations as key elements in emotional generation. This model suggests that emotions, being adaptable and flexible, can be regulated even in situations of high emotional intensity.

Emotional regulation (ER) refers to the processes that initiate, maintain, modify, intensify, or determine the duration of emotions, aiming to adapt the emotional response to the individual's needs (Gross, 1998; Gross & Thompson, 2007). The effectiveness of these processes is closely linked to the prevention of mental disorders and the promotion of well-being, underscoring that the mere absence of clinical symptoms is not enough to ensure a meaningful and happy life.

Recent studies have shown that emotional dysregulation (ED) is a common feature of various mental disorders, including depression and anxiety. Individuals with ED often struggle with emotional clarity, acceptance of emotional responses, and managing unpleasant emotions (Aldao et al., 2016; Colombo et al., 2020). These associations are supported by meta-analytic evidence indicating that emotion-regulation strategies are systematically linked to symptoms across multiple forms of psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Compas et al., 2017). These challenges highlight the importance of adaptive emotion-regulation skills, which are essential not only for treating disorders but also for enhancing overall well-being.

Interventions focused on emotional regulation are increasingly being used not only for treatment but also for the prevention of disorders and the promotion of health. According to the World Health Organization (World Health Organization, 1948), health is conceptualized as a state of complete physical, mental, and social well-being, and not simply the absence of disease. In line with this perspective, recent studies underscore the relevance of subjective evaluations of one's life and behaviour for understanding mental health and well-being (Heatherton et al., 2018; Kraiss et al., 2020; Santana & Gondim, 2016). This study aims to test an emotional regulation intervention protocol specifically designed for university students, evaluating its effectiveness in improving emotional regulation capacity and, consequently, enhancing well-being and preventing emotional disorders in this demographic group.

Traditional treatment protocols in mental health often target specific disorders. However, these protocols have limitations in the context of public health, such as the need for specialized professional training and difficulties in integrating these practices into routine clinical care (Bar-low, 2016). The

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frequent comorbidity of mental disorders has led to the adoption of transdiagnostic interventions, which have been highlighted by the former Institute of Medicine of the United States National Academies as a promising strategy to improve clinical efficacy through more flexible and comprehensive approaches (Barlow, 2016; Barlow et al., 2017). Traditional diagnosis-specific protocols, although effective, can be difficult to disseminate widely because they are time-intensive, require substantial training, and are often not easily integrated into routine care (Barlow, 2016). Consistent with calls from public health frameworks, including those of the former Institute of Medicine, to increase the population impact of evidence-based mental health interventions, transdiagnostic approaches have been proposed as a way to enhance scalability and address comorbid emotional disorders more efficiently (Barlow et al., 2017; Barlow et al., 2018).

These transdiagnostic protocols generally incorporate elements of Cognitive Behavioural Therapy, Process-Based Therapy, Acceptance and Commitment Therapy, and Mindfulness practices (Peixoto & Gondim, 2020). Such methods help patients align their thoughts, physio-logical sensations, and behaviours with their goals, values, and objectives. The protocols typically include sessions on psychoeducation, motivation, reassessment of situations and unpleasant emotions, emotional acceptance, and relapse prevention (Barlow et al., 2017).

With technological advancements, internet-based interventions have emerged as powerful tools in clinical psychology, providing access to evidence-based treatments through digital platforms (Andersson & Titov, 2014; Chibanda et al., 2016). Recent meta-analyses show that such interventions can produce significant improvements in depression, anxiety, stress, and quality of life among adolescents and university students, including through online mindful-ness-based programmes (Harrer et al., 2018; Wang & Zhang 2023; Gong et al 2023). In addition to their clinical benefits, digital formats reduce costs and overcome barriers related to geography, stigma, and time, thereby increasing the scalability of mental health care for students (Jiménez-Molina et al., 2019). Additionally, the accessible nature of these resources allows patients to revisit the intervention content as needed, enhancing learning and information retention (Andersson & Titov, 2014).

The contribution of this study lies not in proposing a new theory of emotion regulation, but in testing the integration of transdiagnostic emotion-regulation components in a brief, synchronous, online group format tailored to university students. By combining psychoeducation, emotional awareness, acceptance, impulse control, cognitive flexibility, and reappraisal within a preventive university-based intervention, the study extends existing emotion-regulation models to a feasible format for mental health promotion in higher education.

In the context of promoting Emotional Regulation as a preventive tool through virtual platforms, this study evaluates the efficacy of a group-based emotional regulation intervention programme conducted online. The goal is to determine whether this approach can effectively improve the emotion-regulation skills of university students, thereby contributing to the promotion of their overall well-being.

METHOD

Study Design

This study utilized a non-randomized clinical trial design. Participants were divided into two groups (control and intervention) based on their availability for weekly meetings. Those who were unable to attend the meetings were allocated to the control group.

Participants

A total of 206 university students participated in the pre-intervention assessment. The majority of participants were women (74.3%), residents of the State of Bahia (90.3%), single (87.9%), had a family monthly income exceeding five minimum wages (42.2%), and were enrolled in private institutions (73.3%). The mean age of participants was 24 years (SD = 6.5), as detailed in Table 1.

Inclusion and Exclusion Criteria

For the intervention group, inclusion criteria were operationalized using the baseline assessment data collected via the online survey platform. First, DASS-21 total and subscale scores were calculated, and students whose depression, anxiety, or stress levels were classified as mild, moderate, or severe according to Brazilian norms (Vignola & Tucci, 2014) were flagged as potentially eligible. Second, emotional dysregulation was evaluated using the emotion regulation scales (DERS, ERQ, and LESS-II), and participants whose scores indicated clinically relevant difficulties in emotion regulation were identified by the research team. Only students who met both criteria and confirmed their interest were invited to take part in the group intervention. They were asked to sign a new informed consent form (ICF) specifically for the intervention phase.

Exclusion criteria were assessed at the same stage. Students who reported not having stable internet access or adequate devices to participate in the videoconference sessions were excluded from the intervention. In addition, participants who did not complete all questionnaires at the three assessment time points (pre-intervention, post-intervention, and 30-day follow-up) were excluded from the longitudinal analyses. The control group comprised students who met the inclusion criteria but did not have sufficient time availability to attend the weekly group sessions, as well as those who began the intervention but attended no more than two sessions and subsequently withdrew for personal or scheduling reasons. Figures 1 and 2 illustrate the flow of participant selection, inclusion, exclusion, and allocation to the intervention and control groups.

Table 1. Sociodemographic Data of Study Participants

		n	**%**
Gender	Female	153	74.3
	Male	52	25.2
	Prefer not to declare	1	0.5
State of Residence	Bahia	186	90.3
	Ceará	1	0.5
	Minas Gerais	2	1
	Piauí	1	0.5
	Rio de Janeiro	1	0.5
	Santa Catarina	14	6.8
	São Paulo	1	0.5
Marital Status	Married	15	7.3
	Separated	2	1
	Single	181	87.9
	Other	8	3.9
	n	**%**	
Monthly Income	1–3 Minimum Wages	77	37.4
	4–5 Minimum Wages	42	20.4
	+ 5 Minimum Wages	87	42.2
Type of Institution	Public	55	26.7
	Private	151	73.3
Age	Mean *(SD)*	24.0 (6.48)	

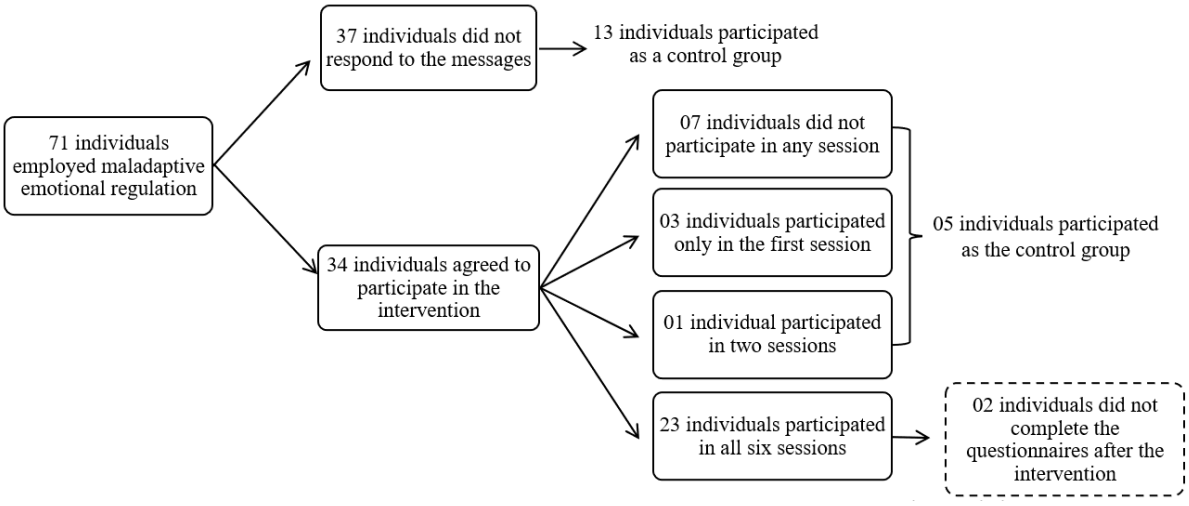

Figure 1. Flowchart of the selection, inclusion, and exclusion steps of participants in the intervention

Table 2. Sociodemographic Data of Participants in the Intervention Study

		n	%
Gender	Female	31	79.5
	Male	8	20.5
State of Residence	Bahia	36	92
	Minas Gerais	2	5
	Santa Catarina	1	3
	Married	4	10
	Separated	1	2.5
	Single	33	85
	Other	1	2.5
Monthly Income	1 – 3 Minimum Wages	18	46
	4– 5 Minimum Wages	9	23
	+ 5 Minimum Wages	12	31
Type of Institution	Public	16	41
	Private	23	59
Age	Mean *(SD)*	24.051 (5.515)	

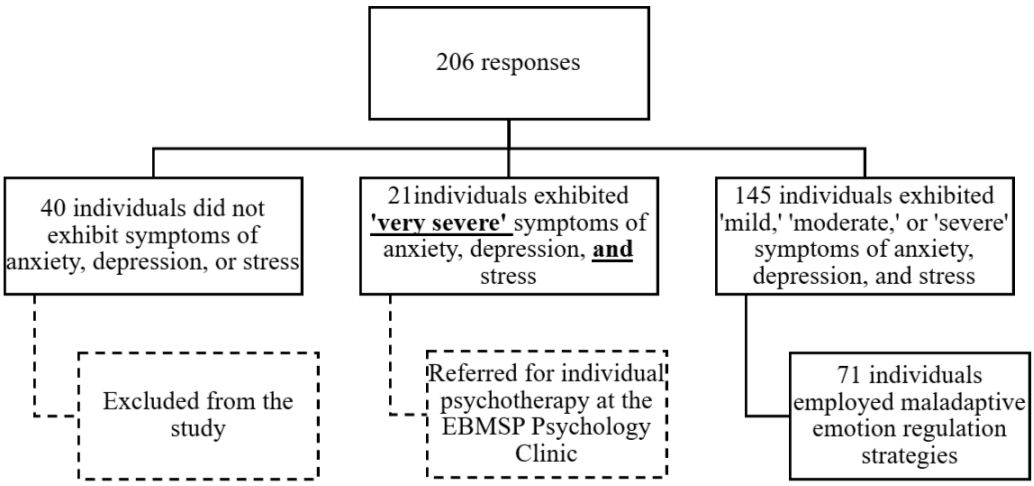

Figure 2. Flowchart of the steps for dividing the control and intervention groups

Procedures

Students who met the inclusion criteria were individually contacted via instant messaging apps to confirm their availability for weekly intervention sessions. They were also provided with a new link to the RedCap system to sign an updated informed consent form agreeing to participate in the intervention.

a) Psychotherapeutic Phase (Intervention Programme): The psychological intervention consisted of six weekly sessions, each lasting 90 minutes, conducted via the Zoom Cloud Meeting video conferencing app. Participants were grouped based on their availability, with each group containing up to six people. The interventions were carried out between May and November 2021.

b) Monitoring and Follow-up: Upon completing the six sessions, students received a new RedCap link to complete six scales assessing emotional regulation, mental health, and well-being. This procedure was repeated 30 days after the conclusion of the interventions (follow-up).

Assessment Instruments

Emotional regulation, mental health, and well-being were assessed using a battery of validated self-report instruments adapted for Brazilian populations. All scales were administered online at the three assessment points (pre-intervention, post-intervention, and 30-day follow-up).

Emotion regulation measures

Difficulties in Emotion Regulation Scale (DERS). The DERS, developed by Gratz and Roemer (2004) and adapted for Brazil by Cancian et al. (2016), assesses global difficulties in emotion regulation. It comprises 36 items rated on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always), grouped into six dimensions: difficulties engaging in goal-directed behaviour, impulse control difficulties, lack of emotional awareness, lack of emotional clarity, limited access to emotion regulation strategies, and non-acceptance of emotional responses. Higher scores indicate greater emotion dysregulation, and in the present study both total and subscale scores were used.

Emotion Regulation Questionnaire (ERQ). The ERQ, developed by Gross and John (2003) and adapted for Brazil by Boian, Soares, and Silva (2010), measures the frequency of two main emotion regulation strategies. It contains 10 items rated on a 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree), yielding two subscales: cognitive reappraisal and expressive suppression. Higher scores on each subscale reflect more frequent use of the corresponding strategy.

Leahy Emotional Schema Scale II (LESS-II). The LESS-II, developed by Leahy, Tirch, and Napolitano (2013) and adapted for Portugal by da Silva et al (2023), evaluates beliefs and attitudes about emotions. The scale consists of 28 items rated on a 6-point Likert scale from 1 (very false) to 6 (very true), covering multiple emotional schemas, such as accusation, duration, excessive rationality, guilt and shame, incomprehensibility, invalidation, lack of control, low consensus, low expression, non-acceptance of feelings, numbness, rumination, and a simplistic view of emotions. Higher scores indicate stronger endorsement of each emotional schema.

Mental health and well-being measures

Depression, Anxiety, and Stress Scale – 21 items (DASS-21). The DASS-21, developed by Lovibond and Lovibond (1995) and adapted for Brazil by Vignola and Tucci (2014), assesses symptoms of depression, anxiety, and stress over the previous week. It comprises 21 items rated on a 4-point scale from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time), forming three subscales. In the present study, subscale scores were used to classify symptom severity and as continuous outcomes.

Brief Psychological Well-Being Scale (BPWS). The BPWS, based on Ryff's model (Ryff & Singer, 2008) and adapted for Brazil by Novo (2005), assesses eudaimonic well-being. It includes 18 items (nine positively and nine negatively worded) rated on a 6-point Likert scale from 1 (very false) to 6 (very true), covering autonomy, environmental mastery, personal growth, positive relations, life goals, and self-acceptance. Higher scores indicate greater psycho-logical well-being.

Subjective Well-Being Scale (SWS). The SWS, developed by Albuquerque and Tróccoli (2004), measures hedonic well-being. It consists of 62 items divided into two subscales: 47 items assessing positive and negative affects (1 = not at all to 5 = extremely) and 15 items assessing life satisfaction (1 = strongly disagree to 5 = strongly agree). The scale yields three dimensions: negative affect, positive affect, and satisfaction–dissatisfaction with life, with higher scores reflecting greater intensity of each component.

Statistical Analyses

Statistical analyses were conducted by entering the questionnaire data into a digital data-base using SPSS, version 20. Descriptive analyses of the social and demographic data for the overall sample and for each group were performed.

To assess whether the Emotional Regulation (ER) and mental health indices were equivalent across the different groups (control and intervention) before and immediately after the intervention, the non-parametric Mann-Whitney U test was applied using Jeffrey's Amazing Statistics Program (JASP).

Friedman's ANOVA was conducted to explore whether ER and mental health factors in the control group remained consistent across the two assessment points, as well as in the intervention group before, immediately after the intervention, and at follow-up. For the intervention group, effect sizes were calculated using Kendall's W; differences between paired groups were assessed using the Conover post-hoc test; and variances among individuals at different time points were examined using Mauchly's test of sphericity, with the Greenhouse-Geisser correction applied where necessary. All tests used a significance threshold of $p < 0.05$.

Construction of the Emotional Regulation Intervention Programme

The intervention was developed by the research team based on Gross's process model of emotion regulation and on transdiagnostic cognitive-behavioural approaches for emotional disorders, incorporating elements, such as psychoeducation, monitoring of emotional episodes, acceptance-based exercises, and cognitive reappraisal training (Gross, 1998; Gross & Thompson, 2007; Barlow, 2016; Barlow et al., 2017).

Session 1 – Introduction and motivation for change. The first session aimed to introduce the programme's rationale and structure, establish group norms, and enhance participants' motivation to engage in change. After a brief explanation of how emotional regulation difficulties can maintain emotional distress, the psychologist facilitated exercises to identify personal goals for the group (e.g., "what would you like to be different in the way you deal with your emotions?") and to clarify expectations about confidentiality and participation.

Session 2 – Psychoeducation on emotions and emotional awareness. This session focused on basic psychoeducation about emotions, including their functions, components (physio-logical, cognitive, behavioural), and the difference between primary and secondary emotions, using examples drawn from students' daily lives. Emotional awareness was promoted through monitoring exercises in which participants were asked to describe recent emotional episodes in terms of triggers, bodily sensations, thoughts, action tendencies, and behaviours, and to practice labelling emotions with more precise vocabulary (e.g., distinguishing sadness, frustration, and disappointment).

Session 3 – Maladaptive and adaptive regulation strategies. The third session introduced maladaptive strategies (e.g., suppression, excessive rationality) and adaptive strategies (e.g., acceptance, cognitive reappraisal) within Gross's framework. Participants identified their typical coping styles using brief vignettes and were guided to practice cognitive reappraisal by generating alternative, more balanced interpretations for emotionally salient situations, as well as acceptance exercises focused on observing internal experiences without acting on them immediately.

Session 4 – Emotional acceptance, impulse control, and emotion duration. This session aimed to strengthen acceptance and impulse control skills and to challenge beliefs about the uncontrollability and endless duration of emotions. The psychologist conducted exercises in which students practiced delaying impulsive responses (e.g., pausing before sending a message when angry) and noticing how emotional intensity naturally rises and falls over time, using brief mindfulness-of-breath practices and exposure to mild emotional cues.

Session 5 – Cognitive flexibility and positive reappraisal. The fifth session focused on broadening participants' repertoires of flexible thinking and promoting positive reappraisal of stressful academic and interpersonal situations. Through guided group discussions and written exercises, students generated multiple alternative perspectives on recent stressors (e.g., exams, conflicts with peers) and identified personal values that could guide more adaptive responses.

Session 6 – Consolidation and relapse prevention. The final session aimed to review the main concepts and skills covered in the programme and to develop individualized maintenance plans. Participants summarized the strategies that had been most helpful for them, anticipated high-risk situations for emotional dysregulation (e.g., exam periods), and formulated concrete coping plans and self-monitoring strategies to support continued practice after the end of the intervention.

Ethical Aspects

The protocol and informed consent for this study were approved by the Research Ethics Committee of the *Escola Bahiana de Medicina e Saúde Pública* (Bahiana School of Medicine and Public Health) under CAAE number 40033120.9.0000.5544. All participants were fully informed about the study's purpose and content. Afterward, each participant read and signed the Informed Consent Form, confirming their willingness to participate. Participants who exhibited "very severe" levels of depression, anxiety, or stress were referred for individual psychotherapy at the Psychology Clinic of the Bahiana School of Medicine and Public Health.

RESULTS

Using the assessment instruments, the efficacy of the intervention programme on emotional regulation, mental health, and well-being of university students was assessed. Students completed the scales at three time points: before the intervention, immediately after the intervention, and 30 days post-intervention. Additionally, the effect of time was evaluated on students who did not participate in the intervention programme.

At the start of the study, similar socio-demographic data was shown in the two groups studied, as demonstrated in Table 3.

Table 3. Comparison of Sociodemographic Data by Group

		Control Group (*n* = 22)		Intervention Group (*n* = 17)	
		n	%	*n*	%
Gender	Female	19	86	12	70
	Male	3	14	5	30
State of Residence	Bahia	22	100	14	82
	Minas Gerais	0	0	2	12
	Santa Catarina	0	0	1	6
Marital Status	Married	3	14	1	6
	Separated	0	0	1	6
	Single	19	86	14	82
	Other	0	0	1	6
Monthly Income	1 – 3 Minimum Wages	12	54	6	35.3
	4– 5 Minimum Wages	3	14	6	35.3
	+ 5 Minimum Wages	7	32	5	29.4
Type of Institution	Public	10	45	6	35
	Private	12	55	11	65
Age	Mean *(SD)*	23.68 (5.286)		24.53 (5.928)	

When comparing the control and intervention groups in terms of Emotional Regulation (ER) measures before the intervention, only 3 out of the 25 factors from the scales showed significant differences (Table 4). These results suggest that the control and intervention groups exhibited few differences in emotional regulation prior to the intervention programme. Specifically, participants in the control group demonstrated greater emotional dysregulation (LESS-II), U = 258, mean *(SD)* = 4.9 (1.0), $p = 0.04$. On the other hand, participants in the intervention group showed higher levels of excessive rationality (LESS-II), U = 111.5, mean *(SD)* = 4.4 (1.1), $p = 0.03$ and greater rumination (LESS-II), U = 109.5, mean *(SD)* = 5.3 (0.7), $p = 0.02$.

Table 4. Comparison Between Control and Intervention Groups, Before the Intervention

BEFORE THE INTERVENTION								
Scale		Control Group (*n* = 22)		Intervention Group (*n* = 17)		***W***	***p***	**Rank-Biserial Correlation**
		M	*SD*	*M*	*SD*			
Difficulties in Emotion Regulation Scale (DERS)	Difficulties in engaging in goal-directed behaviours	19.2	4.9	20.5	3.1	166.0	0.55	-0.112
	Impulse control difficulties	17.6	6.8	16.3	6.8	207.0	0.58	0.107
	Lack of emotional awareness	16.6	5.8	17.2	4.4	177.0	0.78	-0.053
	Lack of emotional clarity	14.5	5.1	15.1	3.3	170.5	0.64	-0.088
	Limited Access to ER Strategies	23.7	5.4	25.2	6.9	165.5	0.55	-0.115
	Non-acceptance of emotional responses	17.5	6.8	19.9	4.6	148.0	0.27	-0.209
Emotional Regulation Questionnaire (ERQ)	Cognitive reappraisal	4.6	1.5	4.5	1.3	191.5	0.91	0.024
	Emotional suppression	3.8	1.2	4.1	1.6	163.5	0.51	-0.126

Table 4. Continued.

Scale		Control Group (*n* = 22)		Intervention Group (*n* = 17)		W	*p*	Rank-Biserial Correlation
		M	*SD*	*M*	*SD*			
Leahy Emotional Schemas Scale (LESS-II)	Accusation	4.3	1.1	4.4	0.8	173.5	0.70	-0.072
	Disconnection from values	4.4	1.1	4.4	1.0	189.5	0.95	0.013
	Duration	3.2	1.3	3.1	1.0	203.5	0.64	0.088
	Excessive Rationality	3.6	1.3	4.4	1.1	111.5	0.03*	-0.404
	Guilt and shame	3.0	1.4	3.2	1.3	174.0	0.72	-0.070
	Incomprehensibility	4.3	1.1	3.9	0.9	239.0	0.14	0.278
	Invalidation	3.0	0.8	3.0	0.9	197.0	0.78	0.053
	Lack of Control	4.9	1.0	4.1	1.2	258.0	0.04*	0.380
	Low Consensus	3.7	0.9	3.8	0.6	181.5	0.88	-0.029
	Low Expression	4.2	0.7	4.3	0.9	169.5	0.62	-0.094
	Non-Acceptance of Feelings	4.5	0.9	4.2	0.8	222.0	0.32	0.187
	Numbness	3.2	1.2	3.1	0.9	200.5	0.70	0.072
	Rumination	4.7	1.0	5.3	0.7	109.5	0.02*	-0.414
	Simplistic View of Emotion	4.9	1.2	4.8	1.1	199.5	0.72	0.067
Anxiety, Depression and Stress Scale (DASS-21)	Anxiety	17.0	9.9	18.1	9.3	173.5	0.71	-0.072
	Depression	17.1	9.2	21.1	12.0	154.0	0.35	-0.176
	Stress	25.8	8.6	26.2	8.2	177.0	0.78	-0.053

Note. For the Mann-Whitney test, effect size is given by the rank biserial correlation. Mann-Whitney U Test. $p > .05$

Table 5 presents the comparison of Emotional Regulation (ER) and mental health factors between the intervention and control groups after the intervention procedure. A significant difference in ER and mental health factors was observed in 10 out of the 25 compared factors.

Participants who did not undergo the intervention showed a greater belief that little can be done to effectively regulate emotions (limited access to ER strategies), U = 270, mean *(SD)* = 20.7 (6.1), $p = 0.01$. They also exhibited increased difficulty in controlling impulses, U = 258, mean *(SD)* = 14.5 (5.3), $p = 0.04$, delays in recognizing the emotion being experienced (lack of emotional clarity) (U = 273.5, mean *(SD)* = 12.8 (2.4), $p = 0.01$, and delays in perceiving and being aware of emotional responses (lack of emotional awareness), U = 267.5, mean *(SD)* = 18.0 (5.8), $p = 0.02$.

Additionally, those in the control group had poorer indices in accepting emotions (non-acceptance), U = 294, mean *(SD)* = 15.1 (5.8), $p < 0.01$, and more difficulty recognizing that their emotions were justified and not caused by another person's actions or their absence (accusation), U = 274, mean *(SD)* = 4.5 (0.9), $p = 0.01$. They also struggled with allowing themselves to feel emotions (lack of control), U = 286, mean *(SD)* = 4.0 (1.3), $p < 0.01$.

Furthermore, higher levels of anxiety, U = 291.5, mean *(SD)* = 13.1 (8.0), $p < 0.01$, depression, U = 263, mean *(SD)* = 13.0 (8.8), $p = 0.03$, and stress, U = 302.5, mean *(SD)* = 21.6 (9.9), $p < 0.01$ were observed in those who did not participate in the intervention.

Table 5. Comparison between the control group and intervention group after the intervention

AFTER THE INTERVENTION								
Scale		**Control Group (*n* = 22)**		**Intervention Group (*n* = 17)**		***W***	***p***	**Rank-Biserial Correlation**
		M	*SD*	*M*	*SD*			
Difficulties in Emotion Regulation Scale (DERS)	Difficulty engaging in goal-directed behaviour	15.4	4.6	14.6	4.3	210.0	0.523	0.123
	Impulse control difficulties	14.5	5.3	11.4	4.5	258.0	0.045*	0.380
	Lack of awareness	18.0	5.8	13.9	5.1	267.5	0.023*	0.430
	Lack of emotional clarity	12.8	2.4	10.8	3.0	273.5	0.014*	0.463
	Limited access to strategies	20.7	6.1	15.8	5.1	270.0	0.019*	0.444
	Non-acceptance of emotional response	15.1	5.8	10.1	5.1	294.0	0.002*	0.572
Emotion Regulation Questionnaire (ERQ)	Cognitive reappraisal	5.9	4.0	4.6	1.3	220.5	0.349	0.179
	Emotional suppression	3.6	1.5	2.8	1.2	250.0	0.076	0.337
Leahy Emotional Schemas Scale (LESS-II)	Accusation	4.5	0.9	3.5	1.2	274.0	0.014*	0.465
	Disconnection from values	4.9	0.9	4.6	1.1	212.0	0.477	0.134
	Duration	3.4	1.3	2.9	1.0	234.0	0.184	0.251
	Excessive Rationality	3.4	1.2	3.0	1.3	223.0	0.310	0.193
	Guilt and shame	2.6	1.4	2.0	1.0	233.0	0.191	0.246
	Incomprehensibility	3.3	1.2	2.9	1.1	219.5	0.360	0.174
	Invalidation	3.1	0.8	3.0	0.7	209.0	0.534	0.118
	Lack of Control	4.0	1.3	2.8	1.2	286.0	0.005*	0.529
	Low Consensus	3.7	0.6	3.7	0.5	174.0	0.713	-0.070
	Low Expression	4.7	0.7	5.0	0.7	148.5	0.269	-0.206
	Non-Acceptance of Feelings	4.1	0.8	3.7	0.5	234.5	0.170	0.254
	Numbness	2.9	1.3	2.7	1.3	202.0	0.678	0.080
	Rumination	4.0	1.2	3.5	1.0	242.0	0.117	0.294
	Simplistic View of Emotion	4.8	1.0	4.5	1.3	203.5	0.643	0.088
Depression Anxiety Stress Scale (DASS-21)	Anxiety	13.1	8.0	6.4	7.4	291.5	0.003*	0.559
	Depression	13.0	8.8	7.1	6.2	263.0	0.031*	0.406
	Stress	21.6	9.9	11.4	7.4	302.5	0.001*	0.618

Note. For the Mann-Whitney test, effect size is given by the rank biserial correlation. Mann-Whitney U Test

Table 6 presents the results of the comparison of the control group at two different time points, highlighting the effect of time passage. The findings indicate that 5 out of the 25 items analysed showed significant differences over time.

The Wilcoxon Signed Rank Tests revealed that difficulty in maintaining goal-directed behaviours increased over time (mean *(SD)* = 17.6 (6.8), $p < 0.01$; $r = 0.80$), as did low emotional expression (mean *(SD)* = 4.7 (0.7), $p = 0.02$; $r = -0.58$) at the second assessment. On the other hand, decreases were observed in lack of control (mean *(SD)* = 4.9 (1.0), $p = 0.01$; $r = 0.68$), incomprehensibility (mean *(SD)* = 3.3 (1.2), $p < 0.01$; $r = 0.68$), and rumination (mean *(SD)* = 4.0 (1.2), $p = 0.04$; $r = 0.55$) at the follow-up assessment.

Table 6. Comparison of the control group at two different times

Control group (n = 22)								
SCALE		**First Data Collection**		**Second Data Collection**		***W***	***p***	**Rank-Biserial Correlation**
		M	*SD*	*M*	*SD*			
Difficulties in Emotion Regulation Scale (DERS)	Difficulty engaging in goal-directed behaviour	17.6	6.8	14.5	5.3	167.5	0.07	0.450
	Impulse control difficulties	19.2	4.9	15.4	4.6	189.0	0.00*	0.800
	Lack of awareness	16.6	5.8	18.0	5.8	93.0	0.28	-0.265
	Lack of emotional clarity	14.5	5.1	12.8	2.4	159.0	0.13	0.377
	Limited access to strategies	23.7	5.4	20.7	6.1	181.0	0.07	0.431
	Non-acceptance of emotional response	17.0	6.8	15.1	5.8	163.5	0.09	0.416
Emotion Regulation Questionnaire (ERQ)	Cognitive reappraisal	4.6	1.5	5.9	4.0	75.0	0.16	-0.351
	Emotional suppression	3.8	1.2	3.6	1.5	145.5	0.54	0.150
Leahy Emotional Schemas Scale (LESS-II)	Accusation	4.3	1.1	4.5	0.9	70.0	0.50	-0.181
	Disconnection from values	4.4	1.1	4.9	0.9	30.5	0.09	-0.492
	Duration	3.2	1.3	3.4	1.3	77.5	0.49	-0.184
	Excessive Rationality	3.6	1.3	3.4	1.2	118.0	0.36	0.242
	Guilt and shame	3.0	1.4	2.6	1.4	117.0	0.17	0.368
	Incomprehensibility	4.3	1.1	3.3	1.2	160.5	0.00*	0.689
	Invalidation	3.0	0.8	3.1	0.8	52.0	0.66	-0.133
	Lack of Control	4.9	1.0	4.0	1.3	128.5	0.01*	0.680
	Low Consensus	3.7	0.9	3.7	0.6	85.0	0.69	0.111
	Low Expression	4.2	0.7	4.7	0.7	44.0	0.02*	-0.581
	Non-Acceptance of Feelings	4.5	0.9	4.1	0.8	101.0	0.25	0.320
	Numbness	3.2	1.2	2.9	1.3	145.5	0.30	0.260
	Rumination	4.7	1.0	4.0	1.2	132.5	0.04*	0.550
	Simplistic View of Emotion	4.9	1.2	4.8	1.0	84.0	0.73	0.098
Depression Anxiety Stress Scale (DASS-21)	Anxiety	17.0	9.9	13.1	8.0	142.0	0.17	0.352
	Depression	17.1	9.2	13.0	8.8	153.5	0.19	0.329
	Stress	25.8	8.6	21.6	9.9	174.5	0.12	0.379

Note. Wilcoxon signed-rank test. $p > 0.05$

In the analysis of the intervention group across three time points (before, immediately after the intervention, and at follow-up), six variables required the Greenhouse-Geisser sphericity correction: guilt and shame, lack of control (LESS-II); anxiety (DASS-21); life goals and self-acceptance (EBEP); and dissatisfaction with life (EBES).

After correcting for sphericity, a Friedman ANOVA was performed to examine the changes in factors related to Emotional Regulation (ER), mental health (MH), and well-being (BE) over time (see Table 7). The results indicated that all six factors on the Difficulties in Emotion Regulation Scale (DERS) were statistically significant.

Table 7. Comparison of the results of the intervention group before, immediately after the intervention, and at follow-up

Intervention group (n = 17)									
SCALE		**Before the intervention**		**After the intervention**		**Follow-up**		***p***	**Kendall's W**
		M	***SD***	***M***	***SD***	***M***	***SD***		
Difficulties in Emotion Regulation Scale (DERS)	Difficulty engaging in goal-directed behaviour	16.3	6.8	11.4	4.5	10.0	3.3	.00*	0.367
	Impulse control difficulties	20.5	3.1	14.6	4.3	13.7	4.4	< .001*	0.555
	Lack of awareness	17.2	4.5	13.9	5.1	10.5	3.5	< .001*	0.416
	Lack of emotional clarity	15.1	3.3	10.8	3.0	9.1	2.5	< .001*	0.696
	Limited access to strategies	25.2	6.9	15.8	5.1	14.1	4.7	< .001*	0.757
	Non-acceptance of emotional response	19.9	4.6	10.1	5.1	10.0	4.1	< .001*	0.718
Emotion Regulation Questionnaire (ERQ)	Cognitive reappraisal	4.5	1.3	4.6	1.3	4.7	1.6	0.36	0.059
	Emotional suppression	4.1	1.6	2.8	1.2	2.5	1.3	< .001*	0.407
Leahy Emotional Schemas Scale (LESS-II)	Accusation	4.5	0.8	3.5	1.2	3.5	0.9	0.02*	0.226
	Disconnection from values	4.5	1.0	4.6	1.1	5.1	0.8	.198	0.095
	Duration	3.1	1.0	2.9	1.1	2.1	0.9	.00*	0.276
	Excessive Rationality	4.5	1.1	3.0	1.3	2.6	1.1	< .001*	0.433
	Guilt and shame	3.2	1.3	1.9	0.9	1.2	0.5	< .001*	0.623
	Incomprehensibility	3.9	0.9	2.9	1.0	2.3	1.0	< .001*	0.568
	Invalidation	3.0	0.9	2.9	0.6	2.9	0.5	.78	0.014
	Lack of Control	4.1	1.2	2.8	1.2	2.0	1.1	< .001*	0.426
	Low Consensus	3.8	0.6	3.7	0.5	3.5	0.8	0.05*	0.171
	Low Expression	4.3	0.9	4.9	0.7	5.0	0.8	0.05*	0.174
	Non-Acceptance of Feelings	4.2	0.8	3.7	0.5	3.5	0.7	.00*	0.379
	Numbness	3.1	0.9	2.7	1.3	2.5	0.8	.14	0.113
	Rumination	5.3	0.7	3.5	1.0	3.5	1.2	< .001*	0.684
	Simplistic View of Emotion	4.8	1.0	4.5	1.3	4.7	1.2	.31	0.067
Depression Anxiety Stress Scale (DASS-21)	Anxiety	18.1	9.3	6.5	7.5	5.7	9.1	< .001*	0.608
	Depression	21.1	12.0	7.1	6.2	7.0	8.7	< .001*	0.651
	Stress	26.2	8.2	11.2	7.5	11.0	7.6	< .001*	0.706
Brief Psychological Well-Being Scale (BPWS)	Autonomy	9.0	3.6	10.5	3.6	10.9	4.0	.13	0.117
	Environmental Mastery	7.3	2.9	10.0	3.0	10.9	3.0	.00*	0.301
	Life Goals	12.2	2.9	14.3	2.5	15.0	2.6	< .001*	0.418
	Personal Growth	14.5	2.2	15.7	2.3	16.1	1.9	.07	0.153
	Positive Relationships with Others	10.5	3.7	11.9	3.6	12.1	3.5	.22	0.087
	Self-acceptance	10.7	3.7	14.1	3.3	14.7	3.0	< .001*	0.601
	Total Psychological Well-Being Psychological	64.5	12.0	76.7	11.9	79.8	10.9	< .001*	0.596
Subjective Well-Being Scale (SWS)	Dissatisfaction with life	22.9	6.6	18.1	6.5	16.7	6.8	< .001*	0.452
	Life satisfaction	25.1	5.7	28.8	6.2	29.8	5.6	.02*	0.224
	Negative affects	78.8	17.1	53.0	14.2	47.3	11.6	< .001*	0.540
	Positive affects	54.8	15.5	68.8	15.3	70.7	14.5	.00*	0.315

Note. *Friedmann Test*; $p > 0.05$.

Limited Access to ER Strategies: The Chi-square test, $\chi^2(2) = 25.754$, $p < 0.001$, W = 0.757, revealed significant differences, with the mean score being higher before the intervention (M *(SD)* = 25.2 (6.9)) compared to immediately after, M *(SD)* = 15.8 (5.1), $p < 0.001$, $r = 3.952$, and at follow-up, M *(SD)* = 14.1 (4.7), $p < 0.001$, $r = 4.743$). There was no significant change between post-intervention and follow-up.

Difficulty in Controlling Impulses: The mean score was significantly higher before the intervention (M *(SD)* = 16.3 (6.8)) than immediately after, M *(SD)* = 11.4 (4.3), $p = 0.038$, $r = 2.162$ and at follow-up, M *(SD)* = 10.0 (3.3), $p = 0.001$, $r = 3.513$. No significant change was observed between post-intervention and follow-up.

Difficulty in Maintaining Goal-Directed Behaviour: Significant differences were observed, $\chi^2(2) = 18.875$, $p < 0.001$, W = 0.555, with the mean score higher before the intervention, M *(SD)* = 20.5 (3.1), compared to immediately after, M *(SD)* = 14.6 (4.3), $p = 0.002$, $r = 3.365$, and at follow-up, M *(SD)* = 10.0 (4.1), $p < 0.001$, $r = 4.074$, with no significant change be-tween post-intervention and follow-up.

Lack of Emotional Clarity: The mean score significantly decreased from before the intervention, M *(SD)* = 15.1 (3.3), to immediately after, M *(SD)* = 10.8 (3.0), $p < 0.001$, $r = 3.716$, and at follow-up, M *(SD)* = 9.1 (2.5), $p < 0.001$, $r = 4.581$, with no significant change be-tween post-intervention and follow-up.

Lack of Emotional Awareness and Non-Acceptance of Emotional Response: Significant improvements were observed post-intervention, particularly in reducing non-acceptance of emotional responses from before the intervention to follow-up.

Emotion Regulation Questionnaire (ERQ) - Suppression Factor: Significant reductions were found, $\chi^2(2) = 13.841$, $p < 0.001$, W = 0.407, from before the intervention, M *(SD)* = 4.1 (1.6), to immediately after, M *(SD)* = 2.8 (1.2), $p = 0.005$, $r = 3.037$, and at follow-up, M *(SD)* = 2.5 (1.3), $p = 0.002$, $r = 3.394$.

Leahy Emotional Schema Scale II (LESS-II): Nine of the fourteen factors showed statistically significant changes, particularly in blame, low expression, and guilt and shame, indicating improvements in emotional regulation strategies post-intervention.

DASS-21 Scale for Anxiety, Depression, and Stress: All three factors showed statistically significant improvements, with a marked decrease in symptoms of anxiety and depression from before the intervention to follow-up.

Psychological Well-Being Scale (BPWS). In the intervention group, several dimensions of psychological well-being showed significant improvements over time (Table 7). Life goals increased from 12.2 ($SD = 2.9$) before the intervention to 14.3 ($SD = 2.5$) after the intervention and 15.0 ($SD = 2.6$) at follow-up, with a significant time effect ($p < .001$, Kendall's W = 0.418). Self-acceptance also increased substantially, from 10.7 ($SD = 3.7$) at baseline to 14.1 ($SD = 3.3$) post-intervention and 14.7 ($SD = 3.0$) at follow-up, again with a significant time effect ($p < .001$, Kendall's W = 0.601). Consistent with these findings, the total BPWS score rose from 64.4 ($SD = 12.0$) to 76.7 ($SD = 11.9$) and 79.8 ($SD = 10.9$), with a significant time effect ($p < .001$, Kendall's W = 0.596), indicating a broad enhancement in psychological well-being among participants in the intervention group.

Subjective Well-Being Scale (SWS). The intervention group also showed significant changes in subjective well-being over time (Table 7). Dissatisfaction with life decreased from 22.9 ($SD = 6.6$) before the intervention to 18.1 ($SD = 6.5$) after the intervention and 16.7 ($SD = 6.8$) at follow-up, with a significant time effect, $p < .001$, Kendall's W = 0.452. Negative affects scores decreased markedly from 78.8 ($SD = 17.1$) at baseline to 53.0 ($SD = 14.2$) post-intervention and 47.3 ($SD = 11.6$) at follow-up, $p < .001$, Kendall's W = 0.540, indicating reduced negative emotionality. Positive affects increased from 54.8 ($SD = 15.5$) to 68.8 ($SD = 15.3$) and 70.7 ($SD = 14.4$), with a significant time effect, $p = .001$, Kendall's W = 0.315, reflecting higher levels of positive emotions after the intervention and at follow-up.

These results highlight the effectiveness of the intervention in significantly improving various aspects of emotional regulation, mental health, and well-being over time.

DISCUSSION

This study examined the efficacy of an emotion regulation–based intervention delivered via a digital platform to improve university students' capacity to manage emotions. Before the intervention, the control and intervention groups differed significantly in only three of the 25 factors assessed, indicating that baseline disparities in emotion regulation were present but not widespread. After the intervention, significant between-group differences emerged in ten of the 25 factors, suggesting a robust impact of the programme on the targeted processes.

Students who did not receive the intervention tended to endorse stronger beliefs that emotions are difficult or impossible to regulate, reported greater difficulty responding to emotions without acting impulsively, and showed more delays in recognizing and becoming aware of their emotional experiences. This pattern is consistent with evidence that maladaptive regulation strategies, such as experiential

avoidance and poor emotional awareness, contribute to ineffective emotional management and increased vulnerability to psychopathology.

The control group also showed greater difficulty accepting their emotions as valid experiences, without attributing them primarily to the actions or omissions of others, and reported more problems allowing themselves to experience emotions, indicating marked resistance to emotional acceptance. In parallel, this group presented higher levels of anxiety, depression, and stress over time, illustrating how inadequate emotion-regulation skills can be associated with worsening psychological symptoms in the absence of targeted intervention.

In contrast, participants in the intervention group demonstrated significant improvements in all six dimensions of the Difficulties in Emotion Regulation Scale (DERS), including limited access to regulation strategies, impulse control difficulties, problems maintaining goal-directed behaviour, lack of emotional clarity, lack of emotional awareness, and non-acceptance of emotional responses. These changes reflect a broader increase in adaptive emotion regulation capacities and are consistent with models that conceptualize these processes as transdiagnostic mechanisms in emotional disorders.

The intervention group also showed reductions in expressive suppression and in several maladaptive emotional schemas, such as tendencies toward blame, low emotional expression, low perceived consensus, guilt and shame, lack of control, and rumination. Complementing these findings, scores on the DASS-21 indicated decreases in anxiety, depression, and stress in the intervention group, whereas the control group did not show similar improvements. Together, these results support the conclusion that the programme was effective in enhancing emotion-regulation skills and reducing adverse psychological symptoms, reinforcing the relevance of emotion regulation–based interventions for promoting mental health in university students.

The initial profile of participants indicated that many students believed little could be done to effectively regulate their emotions and tended to respond impulsively to emotional stimuli. Such patterns are consistent with evidence that emotion regulation is closely linked to academic functioning, with poorer regulation predicting worse academic performance, higher perceived stress, and more maladaptive coping strategies (Andrés et al., 2017; Usán Supervía & Quílez Robres, 2021). Difficulties in regulating emotions therefore appear to affect not only students' mental health, but also their engagement, motivation, and performance in the academic context.

Recent studies have also highlighted other factors associated with the mental health of university students, such as limited mental health literacy and reduced engagement in learning and leisure activities (Campbell et al., 2022). In line with this, research has shown that mindful-ness and emotion-regulation skills are associated with lower psychological distress in this population, with higher mindfulness scores predicting fewer symptoms (Ünlü Kaynakçı & Yerin Güneri, 2023). Taken together, these findings suggest that interventions that explicitly target emotion regulation and related competencies may play a central role in protecting university students' mental health.

In the present study, observations of the control group over time showed that, although some aspects of emotion regulation changed with the mere passage of time, the pattern was mixed and not uniformly positive. Difficulties in maintaining goal-directed behaviour and low emotional expression increased, whereas lack of control, incomprehensibility, and rumination decreased. This heterogeneous pattern reinforces the idea that spontaneous changes are insufficient and that structured, targeted interventions are needed to foster more adaptive emotion regulation profiles, with potential benefits for both academic and mental health outcomes.

By contrast, the intervention group showed improvements in all six DERS dimensions, as well as reductions in emotional suppression and in several maladaptive emotional schemas captured by the LESS-II (e.g., blame, low emotional expression and consensus, guilt and shame, lack of control, and rumination), alongside decreases in depression, anxiety, and stress on the DASS-21. These results converge with findings from online emotion-regulation programmes that have demonstrated reductions in depressive mood and perceived stress and sustained gains in self-compassion and regulation skills among young adults (Chen, 2024). They are also consistent with studies using video-based training that reported increases in cognitive reappraisal, reductions in suppression, and lower frustration and anxiety in university students (Engelmann & Bannert, 2019), supporting the potential of online interventions to enhance emotion regulation competencies.

The content of the present intervention was designed to target specific skills: psychoeducation about emotions, emotional awareness and clarity, impulse control, emotional acceptance, flexibility, and cognitive reappraisal. Psychoeducation can help students understand the functions and components of emotions and thereby regulate them more effectively (Lemes & Ondere Neto, 2017). Emotional awareness and clarity enable individuals to recognize and differentiate their emotional states in the moment, which facilitates more deliberate and balanced responses (Tasneem & Panwar, 2022; Wang et al., 2023).

Emotional acceptance—acknowledging emotions without avoidance or suppression—has been identified as an adaptive regulation strategy associated with better psychological outcomes (Lu et al., 2022), while flexibility and cognitive reappraisal, by promoting alternative perspectives on stressful situations, are key mechanisms for modifying emotional responses (Riepenhausen et al., 2022).

Overall, the pattern of results in this study and in the broader literature highlights the im-portance of educational and therapeutic strategies focused on emotion regulation for students' personal and academic development. Online emotion-regulation interventions have shown promising effects in improving regulatory skills and reducing distress among university students, although their impact may vary depending on adherence and engagement with the pro-gram. In the present intervention, participants not only improved across all dimensions of emotion regulation, but also showed reductions in anxiety, depression, and stress, as well as increases in psychological and subjective well-being, including self-acceptance, environmental mastery, life goals, positive affect, and life satisfaction, together with reduced negative affect and dissatisfaction with life. These findings align with evidence that emotion regulation is a central determinant of well-being (Kraiss et al., 2020; Santana & Gondim, 2016) and with studies showing that broader emotional repertoires and more adaptive regulation strategies are associated with better mental health (Colombo et al., 2020; Batista & Noronha, 2018; Nelis et al., 2011).

In contrast, students who did not receive the intervention did not exhibit meaningful improvements in emotion regulation or in levels of depression, anxiety, and stress across assessment points, which suggests that the changes observed in the intervention group are unlikely to be attributed to time effects alone. Together, these findings indicate that the programme effectively supported more adaptive emotion regulation, greater emotional awareness and clarity, increased openness to emotional experience, and better impulse control in the face of intense emotions, resulting in lower psychological distress and higher well-being in university students.

Several limitations of this study should be acknowledged when interpreting the findings. First, the non-randomized design and allocation of participants to groups based on time availability may have introduced selection bias and limit the strength of causal inferences. Although the intervention and control groups were largely comparable at baseline on most emotion regulation and mental health measures, unmeasured variables such as motivation for change or previous help-seeking may have differed between groups.

Second, some participants allocated to the control group attended up to two intervention sessions before discontinuing, which may have partially contaminated the comparison between conditions. Although these participants were kept in the control group to preserve sample size, brief exposure to the intervention content could have attenuated differences between groups and led to conservative estimates of the programme's effects.

Third, all outcomes were assessed using self-report instruments, which are subject to shared-method variance, social desirability, and recall bias, and do not capture behavioural or physiological indicators of emotion regulation. The relatively short follow-up period (30 days) also prevents conclusions about the long-term maintenance of gains.

Finally, the sample consisted predominantly of women, students from private institutions, and residents of a single Brazilian state, which may restrict the generalizability of the results to other regions, public universities, or more diverse student populations in terms of gender, socioeconomic status, and cultural background.

Another limitation concerns the analytical strategy. Because of the small final sample and the exploratory nature of the study, non-parametric tests were used. However, this approach required multiple univariate comparisons across several outcomes and time points, increasing the possibility of chance findings. Future studies with larger samples should use linear mixed-effects models to test group-by-time interactions, handle missing data more appropriately, and estimate intervention effects with confidence intervals and sensitivity analyses.

Future research should prioritize fully randomized controlled trials with larger and more heterogeneous samples of university students, including participants from different regions, public and private institutions, and diverse socioeconomic backgrounds. Such designs would allow stronger causal inferences about the effects of emotion regulation interventions and would help clarify for whom and under which conditions these programmes are most effective.

It would also be valuable to extend follow-up assessments beyond 30 days to examine the durability of changes in emotion regulation, symptoms, and well-being, and to test whether booster sessions or online maintenance modules are necessary to sustain gains over time. Future studies could incorporate behavioural tasks, ecological momentary assessment, or third-party reports (e.g., peers, teachers) to complement self-report measures and provide a more comprehensive picture of emotion regulation in daily life.

In addition, dismantling or component-based designs could be used to identify which elements of the programme—such as psychoeducation, monitoring of emotional episodes, acceptance-based exercises, or cognitive reappraisal training—contribute most strongly to change. Finally, it would be important to adapt and test the intervention in different formats (e.g., fully self-guided, blended with individual counselling, or integrated into curricular activities) and de-livery platforms, to evaluate feasibility, engagement, and cost-effectiveness in real-world university settings.

In conclusion, this study provides evidence that a brief, synchronous, online group intervention focused on emotion regulation can improve key regulatory processes, reduce symptoms of depression, anxiety, and stress, and enhance psychological and subjective well-being among university students. By targeting transdiagnostic mechanisms such as emotional aware-ness, acceptance, impulse control, and cognitive reappraisal, the programme appears to offer a feasible and scalable strategy for promoting mental health in higher education settings. Despite the methodological limitations noted, the findings highlight the potential value of incorporating emotion regulation–based interventions into university mental health services and underscore the need for further rigorous research to refine, expand, and implement such programmes on a larger scale.

REFERENCES

Albuquerque, A. S., & Tróccoli, B. T. (2004). Desenvolvimento de uma escala de bem-estar subjetivo. *Psicologia: Teoria e Pesquisa*, *20*(2), 153–164. https://doi.org/10.1590/S0102-37722004000200008

Aldao, A., Gee, D. G., de Los Reyes, A., & Seager, I. (2016). Emotion regulation as a transdiagnostic factor in the development of internalizing and externalizing psychopathology: Current and future directions. *Development and Psychopathology, 28*(4pt1), 927–946. https://doi.org/10.1017/s0954579416000638

Aldao, N., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic review. Clinical Psychology Review, 30(2), 217–237.

Andersson, G., & Titov, N. (2014). Advantages and limitations of Internet-based interventions for common mental disorders. *World Psychiatry.13*(1), 4–11. https://doi.org/10.1002/wps.20083

Andrés, M. L., Stelzer, F., Juric, L. C., Introzzi, I., Rodríguez-Carvajal, R., & Navarro Guzmán, J. I. (2017). Emotion regulation and academic performance: A systematic re view of empirical relationships. *Psicologia em Estudo, 22*(3), 299–311. https://doi.org/10.4025/psicolestud.v22i3.34360

Barlow, D. (2016). *Manual Clínico dos Transtornos Psicológicos: tratamento passo a passo* [Clinical Handbook of Psychological Disorder: A Step-by-Step Treatment Manual]. Artmed.

Barlow, D. H., Farchione, T. J., Bullis, J. R., Gallagher, M. W., Murray-Latin, H., Sauer-Zavala, S., Bentley, K. H., Thompson-Hollands, J., Conklin, L. R., Boswell, J. F., Ametaj, A., Carl, J. R., Boettcher, H. T., & Cassiello-Robbins, C. (2017). The Unified Protocol for Transdiagnostic Treatment of Emotional Disorders Compared With Diagnosis-Specific Protocols for Anxiety Disorders: A Randomized Clinical Trial. *JAMA psychiatry*, *74*(9), 875–884. https://doi.org/10.1001/jamapsychiatry.2017.2164

Batista, H. H. V., & Noronha, A. P. P. (2018). Instrumentos de autorregulação emocional: uma revisão de literatura. *Revista Avaliação Psicológica, 17*(3), 389–398. https://doi.org/10.15689/ap.2018.1703.15643.12

Boian, A. C., Soares, D. S. M., & Lima, J. (2010). *Questionário de Regulação Emocional adaptado para a população brasileira*. https://spl.stanford.edu/sites/g/files/sbiybj19321/files/media/file/portuguese_brazilian.pdf

Campbell, F., Blank, L., Cantrell, A., Baxter, S., Blackmore, C., Dixon, J., & Goyder, E. (2022). Factors that influence mental health of university and college students in the UK: a systematic review. *BMC Public Health, 22*(1), 1–22. https://doi.org/10.1186/s12889-022-13943-x

Cancian, A. C. M., Souza, L. A. S. D., Silva, V. H. P. E., Machado, W. D. L., & Oliveira, M. D. S. (2018). Psychometric properties of the Brazilian version of the Difficulties in Emotion Regulation Scale (DERS). Trends in psychiatry and psychotherapy, 41(01), 18-26. Chen, W. L. (2024). Online emotion regulation training for emerging adults: effects on psychological well-being. *Current Psychology*, *43*, 18344–18355. https://doi.org/10.1007/s12144-024-05649-7

Chibanda, D., Weiss, H. A., Verhey, R., Simms, V., Munjoma, R., Rusakaniko, S., Chingono, A., Munetsi, E., Bere, T., Manda, E., Abas, M., & Araya, R. (2016). Effect of a Primary Care-Based Psychological Intervention on Symptoms of Common Mental Disorders in Zimbabwe: A Randomized Clinical Trial. *JAMA*, *316*(24), 2618–2626. https://doi.org/10.1001/jama.2016.19102

Colombo, D., Fernández-Álvarez, J., Suso-Ribera, C., Cipresso, P., Valev, H., Leufkens, T., Sas, C., Garcia-Palacios, A., Riva, G., & Botella, C. (2020). The need for change: Understanding emotion

regulation antecedents and consequences using ecological momentary assessment. *Emotion (Washington, D.C.)*, *20*(1), 30–36. https://doi.org/10.1037/emo0000671

Compas, B. E., et al. (2017). Coping, emotion regulation, and psychopathology in childhood and adolescence: A meta-analysis and narrative review. Psychological Bulletin, 143(9), 939–991.

da Silva, A. N., Matos, M., Faustino, B., Neto, D. D., & Roberto, M. S. (2023). Rethinking Leahy's Emotional Schema Scale (LESS): Results from the Portuguese Adaptation of the LESS: AN da Silva et al. Journal of Rational-Emotive & Cognitive-Behavior Therapy, 41(1), 95-114.

Engelmann, P., & Bannert, M. (2019). Fostering students' emotion regulation during learning: Design and effects of a computer-based video training. *The International Journal of Emotional Education, 11*(2), 3–16.

Gong, X. G., Wang, L. P., Rong, G., Zhang, D. N., Zhang, A. Y., & Liu, C. (2023). Effects of online mindfulness-based interventions on the mental health of university students: A systematic review and meta-analysis. *Frontiers in psychology,* 14, 1073647.

Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*(3), 271–299. https://doi.org/10.1037/1089-2680.2.3.271

Gross, J. J., & Thompson, R. A. (2007). Emotion Regulation: Conceptual Foundations. In J. J. Gross, & B. Q. Ford (Eds.), *Handbook of Emotion Regulation* (pp. 3–24). Guilford Press.

Gross, J. J. (Ed.). (2013). *Handbook of emotion regulation*. Guilford Publications.

Gross, J. J. (2015). The extended process model of emotion regulation: Elaborations, applications, and future directions. Psychological inquiry, 26(1), 130-137.

Heatherton, T., Halpern, D., Ide, M. R., & Mallmann da Rosa, S. (2018). *Ciência Psicológica* [Psychological Science] (5ª ed.). Norton & Company.

JASP Team (2024). JASP (Version 0.19.0)[Computer software].

Jiménez-Molina, Á., Franco, P., Martínez, V., Martínez, P., Rojas, G., & Araya, R. (2019). Internet-Based Interventions for the Prevention and Treatment of Mental Disorders in Latin America: A Scoping Review. *Frontiers in psychiatry*, *10*, 664. https://doi.org/10.3389/fpsyt.2019.00664

Kraiss, J. T., Ten Klooster, P. M., Moskowitz, J. T., & Bohlmeijer, E. T. (2020). The relationship between emotion regulation and well-being in patients with mental disorders: A meta-analysis. *Comprehensive psychiatry*, *102*, 152189. https://doi.org/10.1016/j.Comppsych.2020.152189

Leahy, R. L., Tirch, D., & Napolitano, L. A. (2013). *Regulação Emocional em Psicoterapia – Um guia para o terapeuta cognitivo-comportamental* [Emotion Regulation in Psychotherapy A Practitioner's Guide]. Artmed.

Lemes, C. B., & Ondere Neto, J. (2017). Aplicações da psicoeducação no contexto da saúde [Applying psychoeducation in health]. *Temas Em Psicologia*, *25*(1), 17–28. https://doi.org/10.9788/tp2017.1-02

Lovibond, S. H., & Lovibond, P. F. (1996). *Manual for the Depression Anxiety Stress Scales*. Psychology Foundation of Australia.

Lu, Q., Wang, B., Zhang, R., Wang, J., Sun, F., & Zou, G. (2022). Relationship Between Emotional Intelligence, Self-Acceptance, and Positive Coping Styles Among Chinese Psychiatric Nurses in Shandong. *Frontiers in psychology*, *13*, 837917. https://doi.org/10.3389/fpsyg.2022.837917

Nelis, D., Kotsou, I., Quoidbach, J., Hansenne, M., Weytens, F., Dupuis, P., & Mikolajczak, M. (2011). Increasing emotional competence improves psychological and physical well-being, social relationships, and employability. *Emotion (Washington, D.C.)*, *11*(2), 354–366. https://doi.org/10.1037/a0021554

Novo, R. F. (2005). We need more than self-reports: contributo para a reflexão sobre as estratégias de avaliação do bem-estar [We need more than self-reports: contribution to the discussion about the well-being evaluation strategies]. *Revista de Psicologia, Educação e Cultura, 9,* 477-495.

Peixoto, L. S. A., & Gondim, S. M. G. (2020). Mindfulness e regulação emocional: uma revisão sistemática de literatura [Mindfulness and emotional regulation: a systematic review of literature]. *SMAD Revista Eletrônica Saúde Mental Álcool E Drogas (Edição Em Português)*, *16*(3), 88–104. https://doi.org/10.11606/issn.1806-6976.smad.2020.168328

Riepenhausen, A., Wackerhagen, C., Reppmann, Z. C., Deter, H., Kalisch, R., Veer, I. M., & Walter, H. (2022). Positive Cognitive Reappraisal in Stress Resilience, Mental Health, and Well-Being: A Comprehensive Systematic Review. *Emotion Review*, *14*(4), 310–331. https://doi.org/10.1177/17540739221114642

Santana, V. S., & Gondim, S. M. G. (2016). Regulação emocional, bem-estar psicológico e bem-estar subjetivo [Emotion regulation, psychological well-being and subjective well-being]. *Estudos De Psicologia (Natal)*, *21*(1). https://doi.org/10.5935/1678-4669.20160007

Tasneem, S. A., & Panwar, N. (2020). Emotion regulation and psychological well-being as contributors towards mindfulness among Under-Graduate students. *Human Arenas*, *5*(2), 279–297.

https://doi.org/10.1007/s42087-020-00144-4
Usán Supervía, P., & Quílez Robres, A. (2021). Emotional Regulation and Academic Performance in the Academic Context: The Mediating Role of Self-Efficacy in Secondary Education Students. *International journal of environmental research and public health*, *18*(11), 5715. https://doi.org/10.3390/ijerph18115715
Vignola, R. C., & Tucci, A. M. (2014). Adaptation and validation of the depression, anxiety and stress scale (DASS) to Brazilian Portuguese. *Journal of affective disorders*, *155*, 104–109. https://doi.org/10.1016/j.jad.2013.10.031
Wang, Y., Zhou, J., Gu, X., Zeng, X., & Wu, M. (2023). The Effect of Self-Compassion on Impulse Buying: a randomized controlled trial of an online Self-Help intervention. *Mindfulness*, *14*(6), 1542–1551. https://doi.org/10.1007/s12671-023-02139-y
Wang, Q., Zhang, W., & An, S. (2023). A systematic review and meta-analysis of Internet-based self-help interventions for mental health among adolescents and college students. *Internet interventions*, 34, 100690.
World Health Organization. (1948). Preamble to the Constitution of the World Health Organization.

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A brief and sound assessment of the Big Five Personality Factors at work: The Revised Portuguese Big Five Mini-Markers

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Abstract: The *Big Five Mini-Markers* is a short inventory of the five factors of personality that demonstrates a high degree of psychometric robustness compared to alternative short forms. This paper revises the previous Portuguese version by focusing on the organizational context, using two independent occupational samples (n = 265 and n = 212). Furthermore, it addresses the main shortcoming of the previous version, i.e. the inclusion of only 31 personality items instead of the original English form's 40 items. Current research efforts have extended the Portuguese version to match the length of the original form and have provided supporting evidence for its validity and reliability. Moreover, the results regarding criteria-related validity showed that the Big Five, as assessed by the revised version (*Mini-Markers-P,* see Appendix), account for a significant portion of the variance in thriving at work and of its subdimensions of learning and vitality. The main implications for assessing personality in the workplace are discussed.

Keywords: *Personality; Five-factor model; Work thriving; Validity; Reliability; Factor structure.*

Personality represents a critical psychological domain that shapes individuality and impacts multiple domains of life (i.e. academic, work, health and other social areas) across economies and cultural contexts (Stanek & Ones, 2023). It refers to a spectrum of dispositional attributes that translate into enduring individual differences in basic tendencies to think, feel and behave (Ones et al., 2005; Stanek & Ones, 2018), which play a significant role in driving human performance and well-being in achievement domains, including in the academic and organizational contexts (Anglim et al., 2020; Mammadov, 2022; Salgado et al., 2020). The five-factor model, or simply the Big Five, represents the most accepted and supported taxonomy across cultures (Bainbridge et al., 2022; Goldberg, 1992), for mapping and assessing the individual dispositions that form the meso level of the hierarchical structure of personality traits (see Stanek & Ones, 2018; 2023). It includes the factors of conscientiousness (i.e. achievement orientation, dependability, orderliness), emotional stability (i.e. calmness, self-confidence, psychological adjustment), extraversion (i.e. sociability, surgency, assertiveness), agreeableness (i.e. likeability, empathy, friendliness) and openness to experience (i.e. intellect, curiosity, unconventionality). Similarly, the Big Five represent the personality framework predominantly employed in the literature to theorize and empirically assess the role of individual basic tendencies in predicting distal individual outcomes that form one's life biography and personal growth (Bainbridge et al., 2022; McCrae & Suttin, 2018; Rodrigues et al., 2024).

In the workplace, which is the scope of this paper, substantial empirical evidence has mapped cognitive ability and personality, as operationalized by the five-factor model, among the most robust predictors of key work outcomes, such as job performance, satisfaction and well-being (Anglim et al., 2020; Salgado et al., 2020; Rodrigues & Rebelo, 2022, 2023; Wilmot & Ones, 2021). In addition to emerging as valid predictors of these criteria, meta-analytic research has shown that, depending on the focal job outcome, some of the Big Five generalize their validity across jobs and occupational groups. Specifically for performance criterion, conscientiousness is the personality factor that makes the stronger and non-redundant (with cognitive ability) contribution to predicting overall job performance across jobs and organizations (see Salgado et al., 2020; Wilmot & Ones, 2021). Findings regarding the validity of the other Big Five presented a more nuanced picture, as it depends on the type of occupation and the respective level of job complexity, indicating that conscientiousness should be paired with a measure of another Big Five, depending on the occupational group, to maximize validity (Wilmot & Ones, 2021). According to this logic, agreeableness should be considered alongside conscientiousness when selecting personnel for healthcare occupations because it has emerged as a relevant predictor of performance within this occupational group. Emotional stability holds that status for skilled, semi-skilled, and law enforcement occupations,

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extraversion for sales and management occupations, whereas openness predicts performance only in high complexity jobs, e.g. professionals' occupations. In addition to emerging as valid predictors of job performance, the big five represent important drivers of job satisfaction and well-being at work (Rodrigues & Rebelo, 2022; Salgado et al., 2020), with meta-analytic data supporting a prominent contribution of neuroticism, extraversion, and conscientiousness when global well-being (averaged psychological and subjective well-being measures) is taken as the focal criterion (see Anglim et al., 2020).

This body of research illustrates the recognized critically of the Big Five at work (Bainbridge et al., 2022; Rodrigues & Rebelo, 2023, Salgado et al., 2020) and justifies the efforts made in the development and validation of several Big Five instruments suitable for applied settings, including the *Big Five Mini-Markers,* or simply the *Mini-Markers* (Saucier, 1994). The current paper aims to contribute to the revision and improvement of the Portuguese version of this instrument, previously developed by Rodrigues and Rebelo (2024) in the context of higher education. The focus on this Big Five measure is the result of its acknowledged advantages in terms of brevity of administration and psychometric soundness (Saucier 1994; Thompson, 2008), as further developed in the next section.

To this end, two independent studies were conducted to fulfil the three main phases of validation of psychological measures, as recommended by the *Standards of Educational and Psychological Testing* (AERA, 2014). Thus, in the scope of the first phase (i.e. substantive validation phase) the content validity of this instrument for occupational settings was assessed, followed by the study of its psychometric properties in terms of its factorial structure and reliability (i.e. structural validation phase). Finally, empirical evidence was also gathered to examine its criteria-related validity (i.e. the external validation phase), using the construct of thriving at work as the focal criterion, which is defined as a psychological state that captures the joint experience of employee's learning and vitality at work (Spreitzer et al., 2005; Porath et al., 2012). Accordingly, to thrive and prosper workers must perceive an increase in their job knowledge acquisition and skill building to perform their job roles optimally, coupled with a sense of energy, enthusiasm and aliveness in the organization (Spreitzer et al., 2005; Porath et al., 2012). This work outcome has received a great deal of attention in recent literature due to the growing recognition of its role in sustaining optimal levels of employee performance and well-being (Goh et al., 2021; Rodrigues & Rodrigues, 2023). Accordingly, meta-analytic evidence shows that thriving employees achieve higher levels of task and creative performance, as well as of job satisfaction, commitment and subjective health, while tending to report lower levels of burnout and reduced intentions to leave the organization (see Kleine et al., 2019).

Recent research efforts have considered the personality traits, including the Big Five, as key personal antecedents of this construct (Goh et al., 2021; Liu et al., 2021), with preliminary evidence suggesting that conscientiousness represents a positive and meaningful predictor of this criterion (see Liu et al., 2021), yet the literature remains uninformative about the contributions of the remaining Big Five factors. Hence, in addition to revising the adequacy of the Portuguese version of the *Big Five* Mini-Markers (Saucier, 1994) for the occupational context, the current study intends to further contribute to literature by focusing on the contribution of the Big Five model for predicting thriving at work.

Psychometric strengths of the *Big Five Mini-Markers*

The original version of the *Mini-Markers* is a 40-item English's abbreviated form of Goldberg's (1992) 100-item *Trait Descriptive Adjectives* (TDA) measure of unipolar adjective markers, that assesses the phenotypic personality traits based on the five-factor model. This short version was developed under the premise that the Big Five factor structure can be consistently captured and reliably reproduced across samples, by a relatively small number of focal adjectives, carefully selected as trait markers, i.e. with the ability to describe and capture the prototypical trait characteristics of each personality factor within a given language lexicon (Goldberg, 1992; Saucier 1994; Thompson, 2008). By using adjectives instead of full item sentences, the *Big Five Mini-Markers* outperforms alternative and well-established Big Five instruments, like the *NEO Personality Inventory - Revised* (240-items, NEO-PI-R, Costa & McCrae, 1992, average approx. administration time of 45 minutes), the *NEO Five-Factor Inventory* (60-item NEO-FFI, Costa & McCrae, 1992, average administration time of 15 minutes), in maximizing the brevity of administration without losing psychometric adequacy (most subjects complete the *Mini-Markers* in 4-5 minutes). These advantages help to explain the widespread use of the *Mini-Markers* and other abbreviated measures of the Big Five, especially in occupational settings (see Ellen et al., 2022), where respondents' time and availability tend to be particularly limited.

However, as emphasized in the literature, these advantages may be coupled with relevant shortcomings, as brief personality instruments may suffer from reduced reliability and validity, due to content deficiency and attenuation effects, increasing Type I and Type II error rates, as happens with short measures for assessing other psychological constructs (Credé et al., 2012). Recently, a meta-analysis conducted by Ellen et al. (2022), focusing on the business research literature, assessed whether and to what

extent a set of five short versions of established measures of the Big Five, including the *Mini-Markers*, suffer from these limitations. The other four selected short forms included: a) the short 20-item version of the 50-item *International Personality Item Pool* (Goldberg et al., 2006), i.e. the *Mini-IPIP*, Donnellan et al. (2006); b) the short 10-item version of the 44-item of the *Big Five Inventory* (John et al., 1991), i.e. the *BFI-10*, Rammstedt and John (2007); c) the *Ten-Item Personality Inventory*, i.e. the *TIPI*, Gosling et al. (2003), based on the Goldberg (1992) and John et al. (1991) big five instruments; and d) the 30-item pairs *Brief Big-Five Bipolar Markers*, developed by Shafer (1999), based on the unipolar adjectives of Golberg (1992) and related work.

The results reported by these authors depicted a rather promising picture for the *Mini-Markers*. Specifically, it was used in a greater number of primary studies compared to the remaining four short scales, and the corrected average validity estimates for the Big Five (as assessed by this instrument) were approximately the same as those reported in previous meta-analyses for the associations of existing and larger Big Five measures with meaningful work criteria, such as the performance dimensions of task and citizenship performance. For example, considering the factor of conscientiousness, the best predictor of personality, the estimate obtained with studies using the *Mini-Markers* for predicting task performance was of ρ = .24 (k = 17, N = 3,132), which converges with the effect size of ρ = .20 (k = 45, N = 8,083) reported in the Hurtz and Donovan (2000) meta-analysis. For citizenship performance, the correspondent validity estimate for conscientiousness, as measured by the *Mini-Markers*, was the same (ρ = .18, k = 10, N = 1,543) as that in the Chiaburu et al. (2011) meta-analysis (ρ = .18, k = 71, N = 14,355). Furthermore, the *Mini-Makers* showed internal consistency estimates comparable to the respective longer version, meeting or exceeding the α = .80 standard for all the five factors, except for openness to experience with a point estimate of α = .77.

In summary, extant research suggests that, despite its brevity, the *Mini-Makers* preserves rather acceptable levels of psychometric soundness, in terms of sub-scale reliability, criterion-related validity (Ellen et al., 2022) and orthogonality (Saucier, 1994), justifying the efforts to further examining the appropriateness of its Portuguese version for other achievement contexts, such as organizational settings. As mentioned above, the initial Portuguese version of the *Big Five Mini-Markers* and the preliminary examination of its psychometric properties was carried out by Rodrigues e Rebelo (2024) in the academic context, with a sample of 673 university students. The results reported by the authors supported some of the aforementioned strengths for the Portuguese version, in terms of its factorial structure convergence, reliability and validity to predict academic performance. Specifically, the authors have provided evidence supporting its five-factor structure, the orthogonality of its five subscales and levels of internal consistency equivalent to those reported by Saucier (1994) with the original version, ranging from α = .72 for emotional stability to α = .81 for conscientiousness. In terms of criterion-related validity, the reported evidence was consistent with previous meta-analyses (Mammadov, 2022; Vedel, 2014) showing that conscientiousness and openness were valid predictors of the sampled students' performance, as measured by GPA.

Nevertheless, this first attempt to create a Portuguese version of the *Mini-Markers* has also revealed some limitations. First, it ended up composed by 31 adjectives from the initial set of 40, due to the exclusion of 9 translated adjectives that showed low component loadings or high cross-loadings, suggesting that they lack clarity in the Portuguese language or may have multiple meanings in the Portuguese cultural setting. Consequently, as acknowledged by Rodrigues e Rebelo (2024), there remains a need to identify alternative personality markers in the Portuguese language, to achieve the same length and equivalent content of the original *Mini-Markers* adjective set. Addressing these issues is paramount to avoid potential reduced reliability and threats to validity, due to attenuation effects and content deficiency resulting from a smaller number of items (Credé et al., 2012; Ellen et al., 2022). Second, the final set of 31 adjectives includes 2 items based on negations i.e. *Não intelectual*, and *Não criativo/a*, from the original items of *Unintellectual* and *Uncreative*. Despite their relatively typical use in English, these adjectives can create ambiguity and interpretation difficulties for speakers of other languages and contexts (Thompson, 2008), as in Portuguese, potentially leading to response errors. Third, despite the preliminary evidence supporting the psychometric viability of the Portuguese version of the *Mini-Markers* in academic settings (i.e. Rodrigues & Rebelo, 2024), parallel and complementary evidence regarding the assessment of its psychometric credentials in other relevant achievement domains (i.e. work, sports, health settings) is, according to our knowledge, virtually absent in the literature.

The current study aims to overcome these limitations by conducting two studies within the organizational domain with independent samples of Portuguese workers from various jobs and organizations. As noted, in order to adapt the Portuguese version of the *Mini-Markers* for occupational settings, the recommended practices of Standards of Educational and Psychological Testing (AERA, 2014) were followed. Since this instrument was not previously studied in the organizational context, the content validity of the Portuguese *Mini-Markers* was assessed for the occupational population (i.e. substantive

phase) and its psychometric properties, in terms of factor validity and reliability (i.e. structural phase), were also examined in both Study 1 and Study 2. Lastly, evidence respecting its criterion-related validity (i.e. external phase) was gathered in Study 2, using the construct of work thriving as the criterion variable, given the aforementioned relevance of this psychological state for individual performance and well-being (Goh et al., 2022; Rodrigues & Rodrigues, 2023; Spreitzer et al., 2005).

STUDY I

Method

As emphasized, the Portuguese *Big five Mini-Markers*, translated and adapted for the academic context by Rodrigues e Rebelo (2014), retained only 31 of the 40 adjectives (including 8 adjectives for each of the Big Five subscales) of the original English version. Consequently, this first study aims to extend the adjective set of the Portuguese version to reach the original measure length and to further adapt it for the organizational context. Thus, in a first phase, the content validity of the Portuguese *Mini-Markers* for the assessment of the employee population was evaluated through a focus group of four subject matter experts (SMEs), consisting of two personality researchers and two psychologists with experience in personality assessment. In addition to analysing the appropriateness of the 31-adjective set for this population, efforts were made to identify the missing nine personality markers and to maximize the degree to which each of the five subscales captures the conceptual content of the respective personality dimension.

As a result, for the extraversion subscale, the existing seven items of the Portuguese version were considered adequate and maintained, i.e. *Extrovertido/a* (*Extroverted*), *Calado/a* (*Quiet*), *Tímido/a* (*Shy*), *Reservado/a* (*Withdrawn*), *Falador/a* (*Talkative*), *Enérgico/a* (*Energetic*), *Desinibido/a* (*Bold*). For the missing marker of this subscale, the adjective *Sociável* (*Outgoing*) was proposed by the SMEs and included to reach the same size of the original subscale of 8 items. For neuroticism (or emotional stability, when operationalized from its positive pole), the five items of the Portuguese set were also kept i.e. *Nervoso/a* (*Fretful*), *Inseguro/a* (*Jealous*), *Instável* (*Moody*), *Ressentido/a* (*Touchy*), *Temperamental* (*Temperamental*). For the three missing adjectives, *Ansioso/a* (*Anxious*), *Tenso/a* (*Tense*) and *Stressado/a* (*Worried*) were suggested by the SMEs and included in the revised set. Regarding conscientiousness, the five pre-existing adjectives were considered appropriate, i.e. *Organizado/a* (*Organized*), *Desorganizado/a* (*Disorganized*), *Desleixado/a* (*Sloppy*), *Descuidado/a* (*Careless*), *Ineficiente* (*Inefficient*). For the set of three additional markers needed to complete this subscale, the SMEs proposed the inclusion of *Empenhado/a* (*Determined*) and *Esforçado/a* (*Hardworking*) with the purpose of tapping the dispositional elements of this factor regarding the individual tendency to show effort and persistence in achieving goals (Goldberg, 1992; Stanek & Ones, 2018, 2023). Furthermore, experts also recommended the inclusion of two additional adjectives in this subscale. i.e. *Responsável* (*Dependable*) and *Disciplinado/a* (*Disciplined*), in order to increase the subscale coverage of this factor theoretical domain, especially regarding the core elements of impulse control, responsibility and adherence to prescribed social norms, i.e. the tendency to be disciplined and responsible (Stanek & Ones, 2018, 2023). In order to add these four new items to the existing five without exceeding the subscale's limit of eight adjectives, the item *Desorganizado/a* (*Disorganized*) was supressed, given the predominance of items reflecting order and tidiness in the original conscientiousness sub-scale, as outlined by previous researchers (see Mammadov, 2022). Regarding the agreeableness subscale, all the seven items of the Portuguese set were retained, i.e. *Desagradável* (*Rude*), *Indelicado/a* (*Harsh*), *Gentil* (*Kind*), *Insensível* (*Unsympathetic*), *Frio/a* (*Cold*), *Afetuoso/a* (*Warm*), *Compreensivo/a* (*Sympathetic*). The item *Tolerante* (*Tolerant*) was proposed by the SMEs for this subscale where an adjective was missing. Finally, for the openness to experience subscale, a set of five adjectives from the Portuguese version were kept, consisting of the items *Creativo/a* (*Creative*), *Imaginativo/a* (*Imaginative*), *Intelectual* (*Intellectual*), *Filosófico/a* (*Philosophical*) and *Reflexivo/a* (*Deep*).

However, the experts strongly recommended the elimination of the remaining two items which are based on negations, i.e. *Não criativo/a* (*Uncreative*) and *Não intelectual* (*Unintellectual*), as they are more difficult to interpret and prone to originate rating errors, especially for workers with lower levels of education. Consequently, the items *Artístico/a* (*Artistic*) and *Original* (*Original*) were proposed as replacements, along with the adjective *Tradicional* (*Conventional*) to reach an 8-item a subscale and ensure an adequate coverage of the core characteristics of this factor, namely intellectance, aesthetic and unconventionality (see Stanek & Ones, 2018). In summary, after the qualitative assessment of SMEs, a total of nine new items were added and three items were replaced in the previous 31-item Portuguese *Mini-Markes* adjective set, reaching the intended revised set of 40 items, in line with the original version.

In a second step of the content validity assessment, an additional focus group composed by members of the focal population was conducted according to the adopted validation recommendations (AERA, 2014; Vogt et al., 2004). This focus group was composed of 6 workers from different occupations, including law

enforcement, management, sales, teaching, clerical and catering personnel, with an age range between 23 and 50 years. In terms of education and work experience, half of the participants had a high school (i.e. secondary) diploma, and the other half had a college degree, ranging from 3 to 26 years of work experience. The research team asked for their feedback on the ease of understanding of the *Mini-Markers* instructions, the response scale used, and the level of clarity and singularity of meaning of each adjective in the revised set. They began by assessing the ease of understanding of the instructions (which ask participants to indicate the extent to which each adjective describes themselves), as well as the suitability of the response scale, i.e. a seven-point Likert scale ranging from 1 = *Doesn't describe me at all* to 7 = *Totally describes me*. Overall, the instructions were considered clear and no major difficulties with the rating scale were reported. Participants were then instructed to indicate the meaning of each adjective, along with its level of clarity and familiarity. Consistent with the concerns of the SMEs, these workers reported that the adjectives based on negations, included in the first translation of the *Mini-Markers* (Rodrigues & Rebelo, 2024), i.e. *Não criativo/a* (*Uncreative*) and *Não intellectual* (*Unintellectual*) were confusing and difficult to rate, supporting the decision of eliminate them from the set. Moreover, some participants signalled the item *Frio/a* (*Cold*) as an adjective with a rather negative meaning, particularly in the work domain, for which the answers of the incumbents could potentially become evasive or significantly distorted. Faced with this observation, we decided to look for another item for the agreeableness subscale, finally replacing it with *Generoso/a* (*Generous*), after considering the conceptual domain of this personality factor. All the remaining adjectives were considered familiar, non-ambiguous and seemed to be uniformly understood by these incumbents, suggesting the face validity of the final set of adjectives.

Therefore, this evaluation of the revised set of adjectives of the *Revised Portuguese Big Five Mini-Markers* conducted by personality experts and through consultation with members of the target population suggests that it captures the conceptual elements of the Big Five and seems to be adequately understood by incumbents from different jobs and organizations, supporting its content validity. The revised set of personality markers is presented in Table 1. For clarity, a translation of each adjective into English is also provided and the new items or replacements are shown in bold.

Table 1. Revised set of the Portuguese Personality Markers of each Big Five scale, after content validity assessment.

Big Five sub-scale / Items Portuguese, *English*		
Extraversion	**Emotional Stability**	**Conscientiousness**
Extrovertido/a, *Extroverted*	Nervoso/a, *Fretful*	Organizado/a, *Organized*
Calado/a, *Quiet*	Inseguro/a, *Jealous*	Desleixado/a, *Sloppy*
Tímido/a, *Shy*	Instável, *Moody*	Descuidado/a, *Careless*
Falador/a, *Talkative*	Ressentido/a, *Touchy*	Ineficiente, *Inefficient*
Reservado/a, *Withdrawn*	Temperamental, *Temperamental*	Empenhado/a, *Determined*
Enérgico/a, *Energetic*	**Ansioso/a, *Anxious***	**Esforçado/a, *Hardworking***
Desinibido/a, *Bold*	**Tenso/a, *Tense***	**Responsável, *Dependable***
Sociável, ***Outgoing***	**Stressado/a, *Worried***	**Disciplinado/a, *Disciplined***
Openness	**Agreeableness**	
Criativo/a, *Creative*	Desagradável, *Rude*	
Imaginativo/a, *Imaginative*	Indelicado/a, *Harsh*	
Intelectual, *Intellectual*	Gentil, *Kind*	
Filosófico/a, *Philosophical*	Insensível, *Unsympathetic*	
Reflexivo/a, *Deep*	Afetuoso/a, *Warm*	
Artístico/a, *Artistic*	Compreensivo/a, *Sympathetic*	
Tradicional, *Conventional*	**Generoso/a, *Generous***	
Original, *Original*	**Tolerante, *Tolerant***	

Note. New items and item replacements are shown in bold.

After completing the required procedures of the substantive phase, an occupational sample was collected to examine the empirical fidelity of these Big Five operationalizations (i.e. the structural phase), by assessing the latent-structure (i.e. its five-factor structure) and subscale reliability of this instrument. The sample characteristics and data collection procedure used are described below.

Participants and procedure

A sample of 265 incumbents from different professional groups and organizations was collected through a cross-sectional design using a paper-and-pencil questionnaire to measure all variables under study (i.e. socio-demographic, relevant job-related data, and the Big Five). All incumbents agreed to participate in the survey under the conditions specified in the informed consent included in the first section of the questionnaire, after a brief explanation of the main research objectives. The anonymity and confidentiality of their answers and their exclusive use for research purposes were emphasized. It was also clarified that no incentives would be given for their participation, as well as their right to withdraw from the survey at any time without consequences. Prior to data collection, the research project, including this study and ongoing research developments, was reviewed and approved by the scientific committee of the psychology department of the university of Madeira, confirming its adherence to the ethical standards for research in psychology, the Helsinki Declaration of 1964 and its subsequent amendments, or comparable ethical standards.

Of the 265 incumbents sampled, 47.5% were female and 52.5% male, with an average age of 41.4 years (*SD* = 10.2), ranging from 18 to 66 years. The majority of participants have completed upper secondary education (40.4%), followed by 34.7% with higher education, while 24.9% have basic education, specifically at the level of third cycle (15.5%), second cycle (8.3%) and first cycle (1.1%). They belong to different organizations and occupational groups, including management and administration (6.4%); sales and customer service (18.1%); health care (8.7%); clerical workers (8.8%); professionals (26.4%); i.e. teachers, accountants, lawyers, engineers, consultants; law enforcement and military (4.1%), i.e. police officers and soldiers; as well as skilled and semiskilled workers (27.5%), such as mechanics and plant assistants. Overall, 30.6% of the participants were employed in the public sector, 55.1% in the private sector, and 14.3% were self-employed, with an average of 13.2 years of global work experience (*SD* = 9.7) and 11.2 years of organizational tenure (*SD* = 9.9).

Measures

Sociodemographic and work-related data. Incumbents were asked to provide sociodemographic and job-related data to characterize the sample. In addition to gender, age, and education, they also reported their current job, organizational tenure, total work experience and organizational sector.

Big Five. Personality factors were assessed using the Portuguese form of Saucier's (1994) 40-item *Mini-Markers* set, adapted by Rodrigues and Rebelo (2014). The revised 40-item set of *Mini-Markers* developed in the first phase of this study was used. Participants were instructed to rate the extent to which each adjective provided an accurate description of themselves, using a seven-point Likert scale ranging from 1 = *Doesn't describe me at all* to 7 = *Totally describes me*.

RESULTS AND DISCUSSION

Factor structure and reliability

Following the same analytical strategy used by Saucier (1994) in the development of the original *Mini-Markers* and by Rodrigues e Rebelo (2024) in its Portuguese adaptation, the factor structure of the revised *Mini-Markers* set was examined by principal component analysis with varimax rotation, using IBM SPSS (version 27) for Windows. As recommended by Tabachnik and Fidell (2019) and Pituch and Stevens (2015), the factorability of the data was first assessed by checking whether the Kaiser-Mayer-Olkin measure of sampling adequacy (KMO) was greater than 0.80 (Tabachnick et al., 2019) and whether Bartlett's spherical test reached statistical significance. Accordingly, the KMO value was 0.83 and Bartlett's sphericity test was significant [χ^2 (780) = 4965.87, $p < 0.001$], allowing the analysis to proceed. Next, the number of components to be extracted was determined by considering the theoretical framework of the *Mini-Markers*, which postulates the extraction of five components corresponding to the Big Five, along with the complementary empirical evidence of the scree test and a parallel analysis for the 95th percentile of 1000 random samples (Horn, 1965; O'Connor, 2000). Consistent with the conceptual criterion, empirical evidence suggested the retention of a five-component solution, explaining 50.40% of the total item variance, with the five components accounting for 21.13%, 9.78%, 7.31%, 6.92%, and 5.26% of the variance, respectively.

Still, contrary to our expectations, the results with the current sample indicate that a total of 13 items, two in the extraversion and openness subscales and three in the neuroticism, conscientiousness, and agreeableness subscales, did not show acceptable loadings on the expected component or showed cross-loadings of similar magnitude (Pituch & Stevens, 2015). Specifically, for the extraversion subscale, the item *Desinibido/a* (*Bold*) showed an equivalent cross-loading on the openness component, while the item

Enérgico/a (*Energetic*) showed a similar cross-loading on the conscientiousness component. With respect to emotional stability, the items *Ressentido/a* (*Touchy*) and *Instável* (*Moody*) showed equivalent negative cross-loadings on the agreeableness component, whereas the item *Temperamental* (*Temperamental*) loaded on its component, but with a magnitude below the acceptable standard (i.e. minimum of .40, Pituch & Stevens, 2015). For the openness subscale, the *Tradicional* (*Conventional*) and *Reflexivo/a* (*Deep*) items did not load adequately on any of the components. For the conscientiousness subscale, the items *Descuidado/a* (*Careless*) and *Desleixado/a* (*Sloppy*) showed high cross-loadings on openness and neuroticism, while the loading of the item *Ineficiente (Inefficient)* on the corresponding component did not reach at least .40 to be kept. Finally, for the agreeableness subscale, the items *Desagradável* (*Rude*), *Indelicado/a* (*Harsh*) e *Insensível* (*Unsympathetic*) loaded on the expected component, but with magnitudes below this standard. Therefore, all these items were dropped from the solution and the analysis was repeated with the remaining 27 items (as presented in Table 2). A value of KMO = .82 was obtained, and Bartlett's test of sphericity [χ^2 (780) = 3082.32, p < .001] was statistically significant, supporting the adequacy of the sample and the factorability of the data.

Table 2. Factor loadings from principal components analysis of the Portuguese *Mini-Markers* (with varimax rotation), with an organizational sample.

Item Portuguese, *English*	Openness	Agreeableness	Conscientiousness	E. Stability	Extraversion
Criativo/a, *Creative*	**.79**	.18	.15	.01	.10
Original, *Original*	**.74**	.17	.18	.09	.15
Imaginativo/a, *Imaginative*	**.73**	.09	.20	-.05	.16
Filosófico/a, *Philosophical*	**.66**	.02	-.07	-.14	.14
Artístico/a, *Artistic*	**.66**	.29	-.14	-.04	-.07
Intelectual, *Intellectual*	**.53**	.08	.28	.12	-.05
Tolerante, *Tolerant*	.14	**.72**	.13	.11	-.06
Afetuoso/a, *Warm*	.10	**.71**	.05	-.04	.22
Gentil, *Kind*	.17	**.70**	.20	.08	.17
Compreensivo/a, *Sympathetic*	.20	**.67**	.17	.13	-.11
Generoso/a, *Generous*	.11	**.66**	.11	-.13	.16
Responsável, *Dependable*	-.01	.18	**.80**	.08	.06
Organizado/a, *Organized*	.05	-.02	**.75**	-.02	-.07
Esforçado/a, *Diligent*	.15	.21	**.74**	.03	.20
Disciplinado/a, *Disciplined*	.18	.09	**.71**	.05	-.08
Empenhado/a, *Determined*	.11	.24	**.62**	-.03	.21
Stressado/a, *Worried*	-.09	.11	.01	**.85**	.04
Nervoso/a, *Fretful*	-.01	-.12	.02	**.83**	.14
Tenso/a, *Tense*	-.07	.20	-.01	**.79**	-.05
Ansioso/a, *Anxious*	.06	-.14	.01	**.78**	-.08
Inseguro/a, *Jealous*	.24	.34	.16	**.44**	-.06
Extrovertido/a, *Extroverted*	.20	.22	.02	-.12	**.74**
Falador/a, *Talkative*	.19	.20	.16	-.15	**.74**
Sociável, *Outgoing*	.18	.35	.17	.01	**.68**
Calado/a, *Quiet*	.20	.09	.27	-.07	**-.66**
Tímido/a, *Shy*	-.01	.25	-.06	-.16	**-.63**
Reservado/a, *Withdrawn*	-.39	-.21	-.31	-.04	**-.50**
Empirical eigenvalue	6.33	3.11	2.47	2.12	1.81
Random eigenvalue	1.64	1.54	1.47	1.40	1.35
% of variance explained	23.44	11.52	9.14	7.84	6.73
α Cronbach	.80	.79	.80	.82	.78

Notes. N = 265. E. Stability = Emotional Stability. Random eigenvalues were estimated by parallel analysis for the 95th percentile in 1000 random samples.

Using the same criteria for component retention, the results indicated that the items effectively reproduced the expected five-component solution, explaining 58.67% of the total variance, with the five components accounting for 23.44%, 11.52%, 9.14%, 7.84%, and 6.73%, respectively. Of these 27 items, with the exception of the item *Inseguro* (*Jealous*), all of them showed loadings equal to or greater than .50 on the respective component, with relatively low cross-loadings. As shown in Table 2, the openness and extraversion subscales ended up with six items each, while the agreeableness, conscientiousness, and neuroticism subscales ended up with five items each.

Despite these shortcomings of the subscales, the reliability estimation showed rather acceptable values of Cronbach's alphas, all equal or very close to .80, being of 78 for extraversion, .79 for agreeableness, .80 for conscientiousness and openness, and of .82 for emotional stability (see Table 2). Nevertheless, 13 out of the 40 adjectives, which were dropped from the analysis, seem to represent inadequate personality markers in the Portuguese lexicon, at least when the respondents are workers with different levels of education, jobs and occupational domains. It is possible that some of these items may have generated ambiguity or interpretation difficulties (e.g. *Reflexivo/a*, *Tradicional, Temperamental*, *Ressentido/a*, *Desinibido/a*). In spite of the positive feedback on the revised set collected in the focus group with the six incumbents, a significant portion (approximately 65%) of the sampled employees have a secondary or basic education and thus may have experienced difficulties in interpretation and understanding the meaning of adjectives that were not detected by the focus group due to their higher educational level. Moreover, it cannot be excluded that some adjectives may have generated evasive response patterns due to their potentially negative meaning in the workplace (e.g. *Descuidado/a*, *Ineficiente*, *Instável*, *Insensível*).

Regardless, our goal of strengthening the Portuguese form of *Mini-Markers* to achieve the same number of items as the original version and maintain equivalent coverage of the Big Five theoretical content, which is key to the criterion-related validity of this instrument (Credé et al., 2012, Ellen et al., 2022, Saucier, 1994), was not fully accomplished, requiring a further revision of the *Mini-Markers* Portuguese adjective set.

STUDY II

Method

Content validity reassessment

For the reason mentioned above, a second study was developed that attempted to identify appropriate personality markers for the 13-item dropout of the revised *Mini-Markers* set used in Study I. To this end, two additional focus groups were used in a further revision, expansion, and subsequent content validity assessment of the set.

In the first step, the same group of SMEs from the first study was invited to participate in the task of identifying new potential markers for the *Mini-Markers* subscales, while ensuring a level of theoretical coverage equivalent to the original version. In a second step, a new focus group with eight members of the target population was used. To avoid potential shortcomings due to the underrepresentation of workers with lower levels of education, four pairs of workers were used, each representing one of the educational levels of the Portuguese system, namely two with a university degree, two with secondary education, two with basic education (one with a third cycle and the other with a second cycle) and two with primary education. Based on the underlying theoretical framework of this instrument (Goldberg, 1992; Saucier, 1994) and recent developments in personality research (Stanek & Ones, 2018, 2023), a number of new adjectives were suggested by the SMEs to reach eight adjectives for each of the five major subscales. For the emotional stability subscale, the SMEs suggested the addition of the items *Inquieto/a* (*Uneasy*), *Impaciente* (*Impatient*), and *Pessimista* (*Pessimistic*), as a result of the dropping of the adjectives *Temperamental* (*Temperamental*), *Instável* (*Moody*) and *Ressentido/a* (*Touchy*). These indications were made under the premise that these adjectives capture the core attributes of worry, emotional dysregulation, and maladjustment of the negative pole of emotional stability. For the extraversion subscale, the items *Comunicativo/a* (*Communicative*) and *Expressivo/a* (*Vivid*) were considered appropriate proposals after dropping the items *Desinibido/a* (*Bold*) and *Enérgico/a* (*Energetic*), as they tap into core extraversion dispositional elements of interpersonal engagement and external stimulation seeking. With respect to the conscientiousness subscale, the dropped items *Descuidado/a* (*Careless*) and *Desleixado/a* (*Sloppy*) were replaced by *Desorganizado/a* (*Disorganized*) and *Prevenido/a* (*Cautious*) to preserve this factor's core elements of orderliness and planning, while *Ineficiente* (*Inefficient*) was replaced by *Cumpridor/a* (*Reliable*) to capture the core features of conscientiousness, i.e. the determination and goal attainment (Goldberg, 1992; Saucier, 1994; Stanek & Ones, 2018). In the openness subscale, SMEs proposed the replacement of the items *Reflexivo/a* (*Deep*) and *Tradicional* (*Conventional*), due to their empirical

inadequacy, by *Engenhoso/a* (*Ingenious*) and *Explorador/a* (*Adventurous*), which are close to the main openness traits of cognitive flexibility, curiosity and exploration. Finally, for agreeableness, SMEs proposed the replacement of the items *Desagradável* (*Rude*), *Indelicado/a* (*Harsh*) and *Insensível* (*Unsympathetic*) due to their strongly negative social connotations and the need to minimize potential evasive response patterns. Accordingly, the items *Amável* (*Affectionate*), *Acolhedor* (*Caring*) e *Bondoso* (*Compassionate*) were proposed and integrated, as they focus on the unique features of this personality factor, namely, the compassionate affiliation with others and empathetic concern for their well-being (Goldberg, 1992; Stanek & Ones, 2018).

In a second step of content validity assessment, this updated revised set of adjectives was presented and reviewed through a focus group with the eight members of the target population. These professionals confirmed the clarity of the *Mini-Markers* instructions and the usefulness of the correspondent rating scale. More importantly, most of the adjectives were well and consistently understood by all members, despite their different levels of education. Conversely, the items *Afetuoso/a* (*Warm*) and *Filosófico/a* (*Philosophical*) generated an unexpectedly high level of ambiguity from workers with lower levels of education and were therefore eliminated from the updated set. Since the items *Meigo/a (Gentle)* and *Inovador/a (Innovative)* were included in the list of alternative items suggested by the SMEs for these subscales, they were added as eligible replacements. After the described adjective additions and modifications, the updated and final 40-item Portuguese *Mini-Markers* set (*Mini-Markers-P*) is shown in Table 3 (item updates are in bold).

Table 3. Updated Revised set of Portuguese personality markers for each Big Five scale of the *Mini-Markers*, following content validity reassessment (i.e. the *Mini-Markers-P*).

Big Five sub-scale / Items Portuguese, *English*		
Extraversion	**Emotional Stability**	**Conscientiousness**
Extrovertido/a, *Extroverted*	Nervoso/a, *Fretful*	Organizado/a, *Organized*
Calado/a, *Quiet*	Inseguro/a, *Jealous*	Empenhado/a, *Determined*
Tímido/a, *Shy*	Ansioso/a, *Anxious*	Esforçado/a, *Hardworking*
Falador/a, *Talkative*	Tenso/a, *Tense*	Responsável, *Dependable*
Reservado/a, *Withdrawn*	Stressado/a, *Worried*	Disciplinado/a, *Disciplined*
Sociável, *Outgoing*	**Inquieto/a, *Uneasy***	**Desorganizado/a, *Disorganized***
Comunicativo/a, *Communicative*	**Impaciente, *Impatient***	**Cumpridor/a, *Reliable***
Expressivo/a, *Vivid*	**Pessimista, *Pessimistic***	**Prevenido/a, *Cautious***
Openness	**Agreeableness**	
Criativo/a, *Creative*	Gentil, *Kind*	
Imaginativo/a, *Imaginative*	Compreensivo/a, *Sympathetic*	
Intelectual, *Intellectual*	Generoso/a, *Generous*	
Artístico/a, *Artistic*	Tolerante, *Tolerant*	
Original, *Original*	**Acolhedor/a, *Caring***	
Engenhoso/a, *Ingenious*	**Bondoso/a, *Compassionate***	
Inovador/a, *Innovative*	**Meigo/a, *Gentle***	
Explorador/a, *Adventurous*	**Amável, *Affectionate***	

Note. New items and item replacements are shown in bold.

Participants and procedure

An additional independent sample of 212 incumbents from different jobs and organizations was collected to complete the remaining structural and external phases of the validation of this instrument (AERA, 2014). Data collection followed the same methodological approach as in Study I, i.e. a cross-sectional survey using paper and pencil questionnaires. All participants gave their informed consent, ensuring that their participation was voluntary and that they were not subject to any incentives. They were also informed of the possibility of withdrawing from the study at any time, and that all data provided would be collected and analysed under conditions of anonymity, confidentiality and exclusive use for research purposes. This second study, originally designed to cross-validate the *Mini-Markers*, was part of the same research project that included Study I and was previously approved by the Psychology Department of the respective university, in terms of its adherence to ethical standards of research in psychology.

Of the 212 incumbents, 40.1% were male and 59.9% were female, with an average age of 40.3 years (*SD* = 12.8), ranging from 18 to 65 years. In terms of education, 41.5% of the participants have completed secondary education, 30.2% have basic education, 17.0% have completed the third cycle, 9.0% the second cycle and 4.2% the first cycle, while the remaining 28.3% have a university degree. The sampled

incumbents belong to different organizations and occupational groups, including management and administration (10.4%); sales and customer service (14.2%); health care (6.6%), i.e. doctors, nurses, and health technicians; clerical workers (7.5%); professionals (28.8%), i.e. teachers, consultants, lawyers, and engineers; skilled and semiskilled workers (30.7%), such as electricians, mechanics, construction workers, and operating assistants; and law enforcement and security personnel (1.9%). The percentage of participants working in the private sector was 49.5%, while 45.3% worked in the public sector and 5.2% were self-employed. Their organizational tenure was approximately 12.0 years (*SD* = 11.2).

Measures

Big Five. Personality factors were assessed with the revised 40-item Portuguese version of the *Mini-Markers* (*Mini-Markers-P*, see the Appendix), using the same instructions and response scale as the original version (i.e. a seven-point Likert scale, from 1 = *Doesn't describe me at all* to 7 = *Totally describes me*).

Thriving at work. This variable was measured using the Portuguese version of Porath et al.'s 10-item scale of thriving at work, adapted by Rodrigues and Rodrigues (2023), which assesses each of its encompassing dimensions of learning and vitality at work with five items. A sample item of the learning dimension is "I see myself continually improving" and of the vitality dimension is "I feel alive and vital". Incumbents provided their responses using a 7-point Likert scale ranging from 1 = *Strongly disagree* to 7 = *Strongly agree*. A principal components analysis conducted on the present sample data revealed the expected two-component solution, accounting for 64.42% of the total variance. After oblimin rotation, all items loaded clearly and strongly on their respective dimensions, with loadings ranging from .63 to .86 for the learning subdimension and from .67 to .90 for the vitality subdimension. A second-order principal component analysis using both dimensions as indicators showed that both learning and vitality loaded at .89 on the expected higher-order component of workplace thriving, which accounted for 78.72% of the total variance. Taken together, this evidence supports the hierarchical structure of this construct and allows for the use of its first-order dimensions of learning and vitality scores, as well as the total scale score, as a representation of the higher-order construct of work thriving. Cronbach's alphas for the learning and vitality dimensions were of .80 and .87, respectively, and of .85 for the total scale.

RESULTS AND DISCUSSION

Factor structure and reliability

The dimensionality of this second revision of the *Mini-Markers* set was assessed using the same analytical strategy as the previous sample, by submitting the revised set of adjectives to a principal components analysis with varimax rotation. The KMO value of 0.85 and the statistical significance of Bartlett's test of sphericity [χ^2 (780) = 4662.78, $p < 0.001$] supported the appropriateness of the sample and the level of factorability of the data necessary to obtain reliable results (Tabachnik & Fidell, 2019; Pituch & Stevens, 2015). Regarding the number of components to retain, as expected, the scree test and a parallel analysis for the 95th percentile in 1000 samples (Horn, 1965; O'Connor, 2000) indicated that a five-component solution should be extracted, explaining 55.82% of the total variance. As can be seen in Table 4, all items clearly loaded in the expected component and low cross-loadings were obtained. In fact, all items of the subscales of neuroticism, openness and conscientiousness met the Saucier's (1994) strict criterion of item purity (p. 509), i.e. a personality factor pure adjective displays a loading in its subscale that, is at least, twice as high as the higher cross-loading. Even for the agreeableness and openness subscales, only two and three of the respective eight items did not meet this criterion, so that a total of 35 items/adjectives (88%) met Saucier's (1994) narrower definition of a personality marker.

Hence, the pattern of high item loadings, low cross-loadings, and relatively low mean inter-scale correlations, which reached .23 in this sample, supports the factor validity and orthogonality of this revised set. In addition, the replication of the principal component analyses using a random split of this sample into two smaller samples of N = 106, revealed a five-component solution in both, with all items loading adequately on the respective component, indicating cross-sample factor stability. Consistently, as shown in Table 4, all Big Five subscales had at least five items with component loadings greater than .60. These findings are consistent with previous research indicating that factors/components with four or more loadings above .60 in absolute value are stable across samples (Guadagnoli & Velicer, 1988; MacCallum et al., 1999) and can be effectively replicated with relatively small sample sizes ($N \leq 100$).

Table 4. Factor loadings from principal component analysis of the Portuguese Revised *Mini-Markers-P* (with varimax rotation), with a second occupational sample.

Item Portuguese, ***English***	E. Stability	Openness	Agreeableness	Conscientiousness	Extraversion
Stressado/a, *Worried*	**.84**	-.10	.02	.00	.00
Nervoso/a, *Fretful*	**.83**	-.16	.10	-.03	-.17
Ansioso/a, *Anxious*	**.80**	-.05	.07	. 07	-.08
Inseguro/a, *Jealous*	**.74**	-.16	.17	-.17	-.13
Inquieto/a, *Uneasy*	**.74**	.12	-.08	.05	.19
Tenso/a, *Tense*	**.74**	-.09	.08	.06	-.17
Impaciente, *Impatient*	**.71**	.05	-.10	.06	.08
Pessimista, *Pessimistic*	**.60**	.00	-.12	-.01	.02
Criativo/a, *Creative*	-.04	**.83**	.23	-.04	.00
Engenhoso/a, *Ingenious*	-.05	**.79**	.10	.16	.03
Inovador, *innovative*	-.10	**.72**	.13	.11	.21
Imaginativo/a, *Imaginative*	-.04	**.68**	.17	.12	.10
Explorador/a, *Adventurous*	-.02	**.64**	.10	.18	.02
Artístico/a, *Artistic*	.15	**.63**	.30	-.11	.05
Intelectual, *Intellectual*	-.11	**.62**	.07	.19	.02
Original, *Original*	-.11	**.59**	.19	.25	.13
Amável, *Affectionate*	.05	.10	**.75**	.29	.13
Gentil, *Kind*	.03	.22	**.74**	.20	.09
Meigo/a, *Gentle*	.13	.23	**.69**	.12	-.05
Compreensivo/a, *Sympathetic*	-.05	.20	**.68**	.05	-.07
Acolhedor/a, *Caring*	.00	.24	**.65**	.23	.25
Bondoso/a, *Compassionate*	.15	.06	**.64**	.37	.10
Generoso/a, *Generous*	.01	.08	**.58**	.43	.08
Tolerante, *Tolerant*	-.19	.20	**.57**	.10	-.03
Responsável, *Dependable*	-.01	.07	.21	**.71**	.06
Organizado/a, *Organized*	.05	.19	.03	**.68**	.13
Esforçado/a, *Diligent*	.02	.07	.21	**.67**	.07
Desorganizado/a, *Disorganized*	.28	.17	.00	**-.65**	-.09
Cumpridor/a, *Reliable*	-.06	.20	.18	**.64**	.02
Disciplinado/a, *Disciplined*	.09	.17	.26	**.64**	-.11
Empenhado/a, *Determined*	.05	.17	.22	**.64**	.21
Prevenido/a, Cautious	.21	.23	.21	**.50**	-.10
Calado/a, *Quiet*	.14	.17	.02	-.13	**-.77**
Falador/a, *Talkative*	.20	.21	.06	.05	**.69**
Tímido/a, *Shy*	.33	.03	.14	.00	**-.68**
Comunicativo/a, *Communicative*	.00	.40	.20	.24	**.62**
Reservado/a, *Withdrawn*	.26	.19	.11	.12	**-.60**
Sociável, *Outgoing*	-.07	.34	.28	.12	**.59**
Extrovertido/a, *Extroverted*	.29	.30	.21	-.07	**.56**
Expressivo/a, *Vivid*	.10	.22	.15	.25	**.52**
Empirical eigenvalue	9.03	5.35	3.10	2.92	1.91
Random eigenvalue	1.94	1.82	1.74	1.67	1.60
% of variance explained	22.59	13.39	7.76	7.84	4.78
α Cronbach	.89	.86	.87	.83	.81

Notes. *N* = 212. E. Stability = Emotional Stability. First component items were previously inverted to represent Emotional Stability. Random eigenvalues were estimated by parallel analysis for the 95th percentile in 1000 random samples.

In terms of reliability, the Cronbach alphas for all the subscales reach at least .80 and exceed the respective estimates obtained in Study I, being equivalent or even superior to those reported by Saucier (1994) for the respective subscales of the original version (i.e. .83 vs .83 for conscientiousness, .81 vs .83 for extraversion, .87 vs .81 for agreeableness, 89 vs .78 for emotional stability, .86 vs .78 for openness). Further results concerning final item statistics and scale reliability are summarized in Table 5.

Table 5. *Scale*/Item descriptive and reliability statistics of the Revised Portuguese *Big Five Mini-Markers.*

***Scale*/Item**	***M***	***DP***	r_t	**Alpha if item deleted**	**α**
Estabilidade Emocional (*Emotional Stability*)					.89
Stressado/a, *Worried*	4.18	1.83	.79	.87	
Nervoso/a, *Fretful*	4.05	1.82	.80	.87	
Ansioso/a, *Anxious*	4.45	1.69	.74	.88	
Inseguro/a, *Jealous*	3.60	1.62	.68	.88	
Inquieto/a, *Uneasy*	3.87	1.74	.62	.89	
Tenso/a, *Tense*	3.63	1.62	.66	.88	
Impaciente, *Impatient*	4.23	1.76	.59	.89	
Pessimista, *Pessimistic*	3.17	1.71	.52	.89	
Intelecto/Abertura à Experiência (*Intellect or Openness*)					.86
Criativo/a, *Creative*	4.91	1.37	.79	.82	
Engenhoso/a, *Ingenious*	4.58	1.50	.72	.83	
Inovador/a, *innovative*	4.79	1.39	.63	.84	
Imaginativo/a, *Imaginative*	5.17	1.30	.62	.84	
Explorador/a, *Adventurous*	4.52	1.46	.53	.85	
Artístico/a, *Artistic*	4.31	1.71	.58	.85	
Intelectual, *Intellectual*	4.78	1.28	.54	.85	
Amabilidade (*Agreeableness*)					.87
Amável, *Warm*	5.68	1.15	.73	.84	
Gentil, *Kind*	5.73	1.04	.71	.85	
Meigo/a, *Gentle*	5.38	1.23	.61	.86	
Compreensivo/a, *Sympathetic*	5.58	1.19	.58	.86	
Acolhedor/a, *Caring*	5.48	1.19	.66	.85	
Bondoso/a, *Compassionate*	5.70	1.14	.65	.85	
Generoso/a, *Generous*	5.77	1.10	.61	.86	
Tolerante, *Tolerant*	5.68	1.15	.47	.87	
Conscienciosidade (*Conscientiousness*)					.83
Responsável, *Dependable*	5.48	1.19	.60	.80	
Organizado/a, *Organized*	5.79	1.19	.60	.80	
Esforçado/a, *Diligent*	6.25	0.90	.64	.80	
Desorganizado/a, *Disorganized*	2.41	1.43	.57	.81	
Cumpridor/a, *Reliable*	5.70	1.09	.62	.80	
Disciplinado/a, *Disciplined*	5.94	1.04	.56	.81	
Empenhado/a, *Determined*	5.23	1.22	.45	.82	
Prevenido/a, Cautious	5.59	1.44	.47	.82	
Extroversão (*Extraversion*)					.81
Calado/a, *Quiet*	3.38	1.72	.61	.78	
Falador/a, *Talkative*	4.50	1,56	.51	.79	
Tímido/a, *Shy*	3.50	1.56	.46	.80	
Comunicativo/a, *Communicative*	5.39	1.26	.58	.78	
Reservado/a, *Withdrawn*	4.76	1.48	.39	.81	
Sociável, *Outgoing*	5.10	1.34	.46	.80	
Extrovertido/a, *Extroverted*	5.26	1.27	.64	.78	
Expressivo/a, *Vivid*	4.62	1.72	.59	.78	

Notes. r_t = item-total correlation. The minimum and maximum values of all items were 1 and 7, respectively.

Criterion-related validity

Tables 6 and 7 summarize the main findings regarding the validity of the Big Five, as assessed by the Revised *Mini-Markers*, for predicting thriving at work and its subdimensions. As shown in Table 6, the obtained zero-order correlations showed positive relationships between the personality factors extraversion, conscientiousness, agreeableness, and openness and the criterion under study, i.e. work thriving. However, according to the further results of a multiple regression analysis, when the other personality factors are also included in the model, only conscientiousness emerges as a significant predictor of this criterion, explaining approximately 17% of its variance (see Table 7). Indeed, the correlation between conscientiousness and thriving obtained with the current sample, i.e. $r = .40$ ($p < .001$), is fully aligned with the respective meta-analytic effect size ($\rho = .40$, $k = 5$, $N = 2{,}702$) for this relationship, as reported by Liu et al. (2021).

Table 6. Means, standard deviations and zero-order Pearson correlations

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12
1. Gender[a]			--											
2. Age	40.27	4.52	.09	--										
3. Education	4.00	2.00	.16*	-.27***	--									
4. Tenure	11.99	11.20	.08	-.71***	-.22**	--								
5. ES	4.10	1.31	-.17*	.11	.18*	.01	--							
6. EX	4.72	0.95	.09	.05	.05	.10	.10	--						
7. C	5.73	0.78	.06	.14*	.00	.06	.00	.23**	--					
8. A	5.58	0.84	.04	.10	-.05	.11	-.03	.25***	.53***	--				
9. OP	4.75	1.04	-	.02	.07	.08	.09	.30***	.34***	.47***	--			
10. Learning	5.74	1.09	.06	-.11	.14*	-.13	.00	.14*	.40***	.32**	.16*	--		
11. Vitality	4.71	1.32	-.08	-.12	.01	.05	.10	.17*	.28***	.19**	.23**	.38***	--	
11. Thriving	5.22	1.00	-.02	.02	.09	-.04	.07	.19*	.40***	.30***	.24**	.79**	.87***	--

Notes. $N = 212$. *M* = Mean, *SD* = Standard Deviation. [a]Male = 0, Female = 1, ES = Emotional stability, EX = Extraversion, C = Conscientiousness, A = Agreeableness, OP = Openness. $^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Similarly, all of the Big Five, with the exception of emotional stability, established positive and significant relationships with the learning and vitality subdimensions of thriving, as shown in Table 6. Of the demographic variables examined, only employee education level was significantly correlated with the learning subdimension. Yet, further results from hierarchical multiple regression analysis showed that, of this set, only conscientiousness and agreeableness yielded a significant contribution for predicting learning, in a model that explained 18% of its variance, when the effects of worker's education were also considered. For vitality, the results have shown that solely conscientiousness and openness significantly predict this criterion, in a model that explains 9% of its variance.

Table 7. Multiple regression analyses examining the contribution of the Big Five, as assessed by the *Mini-Markers-P* in predicting thriving at work and its subdimensions.

Predictors	*R*	R^2	R^2_{adj}	*F*	*β*	ΔR^2
			Thriving at work			
	.429***	.184	.168	11.69***		
Extraversion					.077	
Conscientiousness					.320***	
Agreeableness					.078	
Openness					.071	
			Learning			
Step 1	.144**	.021	.016	4.44*		.021*
Education					.14*	
Step 2	.450***	.202	.183	11.74***		.182**
Extraversion					.032	
Conscientiousness					.315***	
Agreeableness					.180*	
Openness					.052	

Table 7. Continued.

Predictors	R	R^2	R^2_{adj}	F	β	ΔR^2
				Vitality		
	.327***	.107	.090	6.19***		
Extraversion					.084	
Conscientiousness					.224**	
Agreeableness					.078	
Openness					.140*	

Notes. N = 212. *p < .05. **p < .01. ***p < .001.

GENERAL DISCUSSION

The current paper was developed with two main objectives, which were to strengthen the previous Portuguese version of the *Big Five Mini-Markers* (Rodrigues & Rebelo, 2014) and to contribute to its revision for implementation in the organizational domain, given the importance of the Big Five at work (Bainbridge et al., 2022; Salgado et al., 2020; Wilmot & Ones, 2021). To this end, two independent empirical studies have been conducted, providing some contributions to research and practice related to the brief, but effective, assessment of personality at work, as operationalized by the Big Five Factor Model (Stanek & Ones, 2028; 2023).

Contributions to research and assessment of the Big Five at work

Study I focused on extending the existing Portuguese *Mini-Markers* set of adjectives, from 31 to 40, and further validating it for the professional setting. Indeed, the development of the first Portuguese version by Rodrigues and Rebelo (2024) with a sample of university students, left unanswered the question of whether the respective adjective set personality markers will be equally suitable from less educated workers. The results showed that 13 adjectives of the full and revised set, developed through the applied content validity procedures, showed psychometric inadequacy in capturing the prototypical characteristics of the Big Five, when a sample of workers with different levels of education was used. Despite the rather acceptable levels of reliability obtained for all the revised *Mini-Markers* subscales (in terms of internal consistency), the failure to reach the original size leads to a potential subscale conceptual content deficiency, which is a threat to the validity of this instrument (Credé et al., 2012; Ellen et al., 2022).

Study II addressed these limitations by developing an updated and complete 40-item set with 15 new items and item substitutions (the *Mini-Markers-P*), which ultimately demonstrated the virtues of the original Big Five *Mini-Markers*, i.e. a rather acceptable trade-off between maximizing brevity of administration while maintaining robust psychological properties in terms of factor validity and reliability (Ellen et al., 2022; Saucier, 1994). Thus, through the results of these two cumulative empirical studies, the Portuguese version of the *Mini-Markers* was strengthened and validated by the assessment of the Big Five at work. Besides reaching the same length of the original form and excluding the negation items, it allowed the identification and inclusion of 35 adjectives, from the final set of 40 items, that preserve factor purity in the strict terms of Saucier (1994) to be considered effective markers of the Big Five. Moreover, they appear to retain uniqueness of meaning and to be adequately understood (i.e. without major ambiguities) by the members of the target occupational population.

Accordingly, this paper contributes for the research and assessment of personality at the organizations by providing an updated version of the *Big Five Mini-Markers*, with its recognized merits of being easy and quick to administer (approximately 4-5minutes), while keeping psychometric robustness even in small samples (i.e. N = 100, Saucier, 1994). As Saucier (1994) has pointed out, these advantages come at the cost of sacrificing a broad sample of the Big Five's full theoretical bandwidth and relevant specific subsumed traits. Nonetheless, this sacrifice may not be as extreme in terms of reliability and criterion-related validity potential loss, as might arguably occur with alternative and even shorter measures of the Big Five, such as the 20-item *Mini-IPIP* (Donnellan et al., 2006) or the 10-item *TIPI* (Gosling et al., 2003), to name a few. Thus, for research and application purposes, even in the case of the *Big Five Mini-Markers*, one should fully consider whether the theoretical coverage and bandwidth of the Big Five instrument chosen is sufficient to capture the specificity of the criterion to be predicted (Credé et al., 2012; Ellen et al., 2022). Accordingly, using the *Mini-Markers* instead of these very short Big Five scales may provide a reasonable balance in reducing administration time without largely compromising validity and reliability.

Moreover, our findings also help to examine the unexplored role of the Big Five, as assessed by the *Mini-Markers*, in promoting individual thriving at work (Goh et al., 2021; Spreitzer et al., 2005), converging with preliminary evidence supporting the central role of conscientiousness (see Liu et al., 2021). Still, they

also showed that agreeableness and openness may also contribute, albeit to a lesser extent, to fostering the core dimensions of this positive psychological state. Hence, screening job applicants, in the scope of personnel selection procedures, on the basis on their scores in conscientiousness, agreeableness and openness to experience, may contribute to build a workforce more predisposed to thrive at work and, consequently, capitalize on the benefits of this job outcome (see Goh et al., 2021; Kleine et al., 2019).

Limitations and suggestions for future research

Despite these contributions, the current findings should be interpreted within the context of their limitations. First, the cross-validation of the Portuguese final version of the *Big Five Mini-Markers* (*Mini-Markers-P*) in terms of factorial validity and reliability was conducted in a suboptimal manner by splitting the Study II sample into two smaller samples. Future research on the cross-validation of this instrument with other occupational samples is needed before more definitive conclusions can be drawn about the positive prospects of this revised set of adjectives. Second, five items (i.e. *Bondoso/a* and *Generoso/a* from the agreeableness subscale, and *Comunicativo/a* and*Sociável* and*Extrovertido/a* from the extraversion subscale), despite showing clear and relatively strong loadings on the respective factor, did not meet Saucier's (1994) narrow criterion of factor purity to be considered effective personality markers. Thus, further evidence with other samples is needed to diagnose whether they are effectively failing to fulfil this role and, ultimately, if a suitable replacement may be needed. Related to this aspect, the psychometric robustness of *Mini-Markers-P* should be tested using confirmatory evidence and estimates of measurement equivalence and stability, across occupational groups and job complexity levels. Specifically, empirical research should test whether and to what extent the effects of the Big Five, namely conscientiousness, agreeableness and openness to experience, are contingent to the nature and complexity of the job. More complex jobs encompass higher task variety, role impact, and autonomy, requiring an expanded job knowledge and the need to make decisions under ambiguity and uncertainty (Martínez et al., 2025; Salgado, 2017), which will, arguably place stronger learning and vitality demands on incumbents. As such, seems worthwhile to explore in future research whether the effects of personality in nurturing work thriving may be larger in more complex jobs. Third, despite the pertinence of selecting work thriving as the focal criterion to study the criteria-related of the *Mini-Markers-P*, due to personality meaningful impact on job performance, satisfaction and well-being at work (Anglim et al., 2020; Pires et al., 2025; Wilmot & Ones, 2021), our evidence is totally uninformative as to whether this instrument holds the validity of the original English form for predicting these critical job outcomes. Future studies using these criteria are needed to achieve such a more complete understanding of the predictive validity of the *Mini-Markers-P* and its potential for high-stakes decisions (e.g. staffing and development) in human resource management at work.

In conclusion, the current empirical efforts support the psychometric robustness of this revised Portuguese version of the *Big Five Mini-Markers-P*, as a short and sound measure of the big five with utility for the organizational context, where the available time for personality assessment is often constrained.

REFERENCES

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, & Joint Committee on Standards for Educational and Psychological Testing. (2014). *Standards for Educational and Psychological Testing. AERA.*

Anglim, J., Horwood, S., Smillie, L. D., Marrero, R. J., & Wood, J. K. (2020). Predicting psychological and subjective well-being from personality: A meta-analysis. *Psychological Bulletin, 146*(4), 279–323. https://doi.org/10.1037/bul0000226

Bainbridge, T. F., Ludeke, S. G., & Smillie, L. D. (2022). Evaluating the Big Five as an organizing framework for commonly used psychological trait scales. *Journal of Personality and Social Psychology, 122*(4), 749–777. https://doi.org/10.1037/pspp0000395

Chiaburu, D. S., Oh, I. S., Berry, C. M., Li, N., & Gardner, R. G. (2011). The five-factor model of personality traits and organizational citizenship behaviors: A meta-analysis. *Journal of Applied Psychology, 96*(6), 1140–1166. https://doi.org/10.1037/a0024004

Costa, P. T., & McRae, R. R. (1992). *Revised NEO personality inventory and NEO-five factor inventory: Professional manual*. Psychological Assessment Resources.

Credé, M., Harms, P., Niehorster, S., & Gaye-Valentine, A. (2012). An evaluation of the consequences of using short measures of the Big Five personality traits. *Journal of Personality and Social Psychology, 102*(4), 874–888. https://doi.org/10.1037/a0027403

Ellen, B. P., Mackey, J. D., McAllister, C. P., & Mercer, I. S. (2022). Are small measures big problems? A meta-analytic investigation of brief measures of the Big Five. *Journal of Business Research, 151*, 579-592. https://doi.org/10.1016/j.jbusres.2022.07.027

Goh, Z., Eva, N., Kiazad, K., Jack, G.A., De Cieri, H. and Spreitzer, G.M. (2022). An integrative multilevel review of thriving at work: Assessing progress and promise. *Journal of Organizational Behavior*, *43*(2), 197–213. https://doi.org/10.1002/job.2571

Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment, 4*(1), 26–42. https://doi.org/10.1037/1040-3590.4.1.26

Goldberg, L. R., Johnson, J. A., Eber, H. W., Hogan, R., Ashton, M. C., Cloninger, C. R., & Gough, H. C. (2006). The International Personality Item Pool and the future of public-domain personality measures. *Journal of Research in Personality, 40*, 84–96. https://doi.org/10.1016/j.jrp.2005.08.007

Gosling, S. D., Rentfrow, P. J., & Swann, W. B., Jr (2003). A very brief measure of the Big- Five personality domains. *Journal of Research in Personality, 37*(6), 504–528.

Guadagnoli, E., & Velicer, W. F. (1988). Relation of sample size to the stability of component patterns. *Psychological Bulletin, 103*(2), 265–275. https://doi.org/10.1037/0033-2909.103.2.265

Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika, 30*, 179–185. https://doi.org/10.1007/bf02289447

Hurtz, G. M., & Donovan, J. J. (2000). Personality and job performance: The Big Five revisited. *Journal of Applied Psychology, 85*(6), 869–879. https://doi.org/10.1037/0021-9010.85.6.869

John, O. P., Donahue, E. M., & Kentle, R. L. (1991). *The Big Five Inventory-Versions 4a and 54*. University of California, Berkeley, Institute of Personality and Social Research.

Kleine, A.-K., Rudolph, C. W., & Zacher, H. (2019). Thriving at work: A meta-analysis. *Journal of Organizational Behavior, 40*(9-10), 973–999. https://doi.org/10.1002/job.2375

Liu, D., Zhang, S., Wang, Y., & Yan, Y. (2021). The antecedents of thriving at work: A meta-analytic review. *Frontiers in Psychology*, *12*, Article 659072. https://doi.org/10.3389/fpsyg.2021.659072

MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods, 4*(1), 84–99. https://doi.org/10.1037/1082-989X.4.1.84

Mammadov, S. (2022). Big five personality traits and academic performance: A meta-analysis. *Journal of Personality,* 90(2), 222–255. https://doi.org/10.1111/jopy.12663

Martínez, A., Lado, M., Cuadrado, D., & Salgado, J. F. (2025). A meta-analysis of the relationship between cognitive intelligence and the big five assessed by quasi-ipsative forced-choice personality inventories: Implications for predicting job performance. *Journal of Work and Organizational Psychology, 41*(1), 19–26. https://doi.org/10.5093/jwop2025a3

McCrae, R. R., & Sutin, A. R. (2018). A five-factor theory perspective on causal analysis. *European Journal of Personality, 32*(3), 151–166. https://doi.org/10.1002/per.2134

Nunnally, J. C. (1978). *Psychometric Theory* (2nd ed.). McGraw-Hill.

O'Connor, B. P. (2000). SPSS and SAS programs for determining the number of components using parallel analysis and Velicer's MAP test. *Behavior Research Methods, Instruments, & Computers, 32*(3), 396–402. https://doi.org/10.3758/Bf03200807.

Ones, D. S., Viswesvaran, C., & Dilchert, S. (2005). Personality at work: Raising awareness and correcting misconceptions. *Human Performance*, *18*(4), 389–404.

Pituch, K.A., & Stevens, J. P. (2015). *Applied Multivariate Statistics for the Social Sciences: Analyses with SAS and IBM's SPSS*. Routledge. https://doi.org/10.4324/9781315814919

Pires, M., Rodrigues, N., & Rebelo, T. (2025). Core self-evaluations and job satisfaction during organizational entry: Examining the mediating role of newcomer proactivity. *Revista CES Psicología*, *18*(1), 1–17. https://doi.org/10.21615/cesp.7321

Porath, C.L., Spreitzer, G.M., Gibson, C. and Garnett, F.G. (2012), "Thriving at work: Toward its measurement, construct validation, and theoretical refinement", *Journal of Organizational Behavior,* Vol. 33 No. 2, pp. 250–275. https://doi.org/10.1002/job.756

Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10- item short version of the Big Five Inventory in English and German. *Journal of Research in Personality, 41*(1), 203–212. https://doi.org/10.1016/j.jrp.2006.02.001

Rodrigues, D., Rodrigues, N., Rebelo, T. (2024). Extending the understanding of the impact of conscientiousness on individual soccer performance: examining the mediating role of mental toughness. *Current Issues in Personality Psychology, 12*(2), 140-151. https://doi.org/10.5114/cipp/163181

Rodrigues, N. M., & Rebelo, T. M. (2023). A relevância da avaliação dos cinco grandes fatores de personalidade (Big Five) no contexto de seleção de pessoas: Dos aspetos relativos à sua conceptualização e medida às questões da validade preditiva. In T. Proença, & A. Veloso (Cords.), *Tendências no trabalho e na gestão de pessoas*. Editora RH.

Rodrigues, N., & Rebelo, T. (2022). The bandwidth dilemma applied to trait emotional intelligence: Comparing the contribution of emotional intelligence factor with its facets for predicting global job

satisfaction. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues, 41*(4), 2218–2226. https://doi.org/10.1007/s12144-020-00740-1

Rodrigues, N., & Rebelo, T. (2024). Mapping personality markers in a Portuguese sample: The factor structure, reliability and incremental validity of the Big Five Mini-Markers. *Psicologia: Revista da Associação Portuguesa Psicologia, 38*(1), 13–22. https://doi.org/10.17575/psicologia.1911

Rodrigues, P., & Rodrigues, N. (2023). Predicting well-being at work during Covid-19: Examining the incremental validity of core self-evaluations and the mediating effect of perceived strengths use. *Psicologia: Revista da Associação Portuguesa Psicologia, 37*(2), 51–61. https://doi.org/10.17575/psicologia.1868

Salgado, J. F. (2017). Moderator effects of job complexity on the validity of forced-choice personality inventories for predicting job performance. *Journal of Work and Organizational Psychology, 33*(3), 229–238. https://doi.org/10.1016/j.rpto.2017.07.001

Salgado, J. F., Anderson, N., & Moscoso, S. (2020). Personality at work. In P. J. Corr & G. Matthews (Eds.), *The Cambridge handbook of personality psychology* (2nd ed., pp. 427–438). Cambridge University Press. https://doi.org/10.1017/9781108264822.040

Saucier, G. (1994). Mini-Markers: A brief version of Goldberg's unipolar Big-Five markers. *Journal of Personality Assessment, 63*(3), 506–516.https://doi.org/10.1207/s15327752jpa6303_8

Shafer, A. B. (1999). Brief bipolar markers for the Five Factor Model of personality. *Psychological Reports, 84*(3), 1173–1179. https://doi.org/10.2466/PR0.84.3.1173-1179

Spreitzer, G.M., Sutcliffe, K., Dutton, J., Sonenshein, S. and Grant, A. M. (2005), "A socially embedded model of thriving at work". *Organization Science,* Vol. 16 No. 5, pp. 537–549. https://doi.org/10.1287/orsc.1050.0153

Stanek, K. C. & Ones, D. S. (2023). *Our constellations. A primer for "Of Anchors & Sails": Personality-ability trait constellations.* Pleiades Press. https://doi.org/10.17605/OSF.IO/9D8XK

Stanek, K. C., & Ones, D. S. (2018). Taxonomies and compendia of cognitive ability and personality constructs and measures relevant to industrial, work and organizational psychology. In D. S. Ones, N. Anderson, C. Viswesvaran, & H. K. Sinangil (Eds.), *The SAGE handbook of industrial, work & organizational psychology: Personnel psychology and employee performance (pp. 366–407). Sage Reference.*

Tabachnick, B. G., & Fidell (2019). *Using multivariate statistics* (7th ed.). Pearson.

Thompson, E. R. (2008). Development and validation of an International English Big-Five Mini-Markers. *Personality and Individual Differences, 45*(6), 542–548. https://doi.org/10.1016/j.paid.2008.06.013

Vedel, A. (2014). The Big Five and tertiary academic performance: A systematic review and meta-analysis. *Personality and Individual Differences, 71*, 66–76. https://doi.org/10.1016/j.paid.2014.07.011

Vogt, D. S., King, D. W., & King, L. A. (2004). Focus groups in psychological assessment: Enhancing content validity by consulting members of the target population. *Psychological Assessment, 16*(3), 231–243. https://doi.org/10.1037/1040-3590.16.3.231

Wilmot, M. P., & Ones, D. S. (2021). Occupational characteristics moderate personality performance relations in major occupational groups. *Journal of Vocational Behavior, 131*, Article 103655. https://doi.org/10.1016/j.jvb.2021.103655

CRediT AUTHORSHIP CONTRIBUTION STATEMENT

Nuno Rodrigues: Conceptualization; Data Curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Resources; Software; Supervision; Validation; Visualization; Writing - Original Draft; Writing - Review & Editing. **Teresa Silva**: Investigation; Methodology; Resources; Validation; Visualization; Writing - Review & Editing. **Ricardo Nóbrega**: Investigation; Methodology; Resources; Validation; Visualization; Writing - Review & Editing.

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APPENDIX
Versão Portuguesa Revista do *Big Five Mini-Markers* (*Mini-Markers-P*, Rodrigues, Silva & Nóbrega, 2026)

Instruções: Utilize os adjetivos seguintes para descrever-se a si próprio/a. Descreva-se como se vê no presente e não como gostaria de ser no futuro. Não existem respostas certas ou erradas, o importante é que indique o grau em que cada adjetivo descreve a sua forma de ser habitualmente. Por favor, responda de forma honesta e o mais precisa possível, usando a escala seguinte:

1	2	3	4	5	6	7
Não me descreve nada	Descreve-me muito pouco	Descreve-me pouco	Descreve-me moderadamente	Descreve-me muito	Descreve-me bastante	Descreve-me totalmente

1. Falador/a	1	2	3	4	5	6	7
2. Organizado/a	1	2	3	4	5	6	7
3. Imaginativo/a	1	2	3	4	5	6	7
4. Ansioso/a	1	2	3	4	5	6	7
5. Esforçado/a	1	2	3	4	5	6	7
6. Inseguro/a	1	2	3	4	5	6	7
7. Compreensivo/a	1	2	3	4	5	6	7
8. Responsável	1	2	3	4	5	6	7
9. Tolerante	1	2	3	4	5	6	7
10. Nervoso/a	1	2	3	4	5	6	7
11. Original	1	2	3	4	5	6	7
12. Tímido/a	1	2	3	4	5	6	7
13. Tenso/a	1	2	3	4	5	6	7
14. Extrovertido/a	1	2	3	4	5	6	7
15. Empenhado/a	1	2	3	4	5	6	7
16. Artístico/a	1	2	3	4	5	6	7
17. Sociável	1	2	3	4	5	6	7
18. Inovador/a	1	2	3	4	5	6	7
19. Stressado/a	1	2	3	4	5	6	7
20. Amável	1	2	3	4	5	6	7

21. Criativo/a	1	2	3	4	5	6	7
22. Gentil	1	2	3	4	5	6	7
23. Disciplinado/a	1	2	3	4	5	6	7
24. Meigo/a	1	2	3	4	5	6	7
25. Reservado/a	1	2	3	4	5	6	7
26. Cumpridor/a	1	2	3	4	5	6	7
27. Impaciente	1	2	3	4	5	6	7
28. Bondoso/a	1	2	3	4	5	6	7
29. Intelectual	1	2	3	4	5	6	7
30. Comunicativo/a	1	2	3	4	5	6	7
31. Inquieto/a	1	2	3	4	5	6	7
32. Acolhedor/a	1	2	3	4	5	6	7
33. Explorador/a	1	2	3	4	5	6	7
34. Desorganizado/a	1	2	3	4	5	6	7
35. Generoso/a	1	2	3	4	5	6	7
36. Engenhoso/a	1	2	3	4	5	6	7
37. Pessimista	1	2	3	4	5	6	7
38. Expressivo/a	1	2	3	4	5	6	7
39. Prevenido/a	1	2	3	4	5	6	7
40. Calado/a	1	2	3	4	5	6	7

Cotação:
Extroversão: 1, 12*, 14, 17, 25*, 30, 38, 40*
Estabilidade Emocional: 4*, 6*, 10*, 13*, 19*, 27*, 31*, 37*
Conscienciosidade: 2, 5, 8, 15, 23, 26, 34*, 39
Amabilidade: 7, 9, 20, 22, 24, 28, 32, 35
Abertura à Experiência: 3, 11, 16, 18, 21, 29, 33, 36

*Estes itens devem ser invertidos antes do cálculo da pontuação global do respetivo fator. Caso se pretenda que a escala de estabilidade emocional expresse, alternativamente, o fator de neuroticismo, os itens respetivos não necessitam de ser invertidos.

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Effects of Aided Augmented Input on Autism Spectrum Disorder: A Scoping Review

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Resumo: Pessoas diagnosticadas com transtorno do espectro do autismo (TEA) frequentemente apresentam necessidades complexas de comunicação e desafios no desenvolvimento. Como resposta, diversas estratégias de intervenção que incorporam recursos e suportes de Comunicação Aumentativa e Alternativa (CAA) são utilizadas. Uma abordagem de destaque é a entrada aumentada assistida, uma intervenção que utiliza símbolos visuais fornecidos por um parceiro de comunicação para apoiar tanto a comunicação expressiva quanto a compreensão. Esta scoping review tem como objetivo analisar a literatura existente sobre essa intervenção em crianças e adolescentes com TEA, seguindo as diretrizes do PRISMA-ScR. Foram analisados 17 estudos extraídos de bases de dados como Web of Science, Scopus e PubMed, com foco nos recursos de CAA utilizados, nos contextos de implementação e nos principais achados. Os resultados sugerem que a entrada aumentada assistida beneficia usuários com TEA ao melhorar a comunicação, as habilidades sociais e o comportamento. No entanto, são necessárias mais pesquisas para compreender melhor seus efeitos.

Palavras-chave: *Entrada Aumentada Assistida; Comunicação Aumentativa e Alternativa; Transtorno do Espectro do Autismo; Revisão sistemática da literatura.*

Abstract: People diagnosed with autism spectrum disorder (ASD) often experience complex communication needs and developmental challenges. As a result, various intervention strategies incorporating augmentative and alternative communication (AAC) resources and supports are utilised. One notable approach is aided augmented input, an intervention that involves using visual symbols provided by a communication partner to support both expressive communication and comprehension. This scoping review aims to examine the existing literature on this intervention in children and adolescents with ASD, following PRISMA-ScR guidelines. 17 studies from databases such as Web of Science, Scopus, and PubMed were analysed, focusing on AAC resources, implementation contexts, and key findings. Results suggest that aided augmented input benefits users with ASD by enhancing communication, social skills, and behaviour. However, further research is needed to better understand its effects.

Keywords*: Aided Augmented Input; Augmentative and Alternative Communication; Autism Spectrum Disorder; Systematic literature review.*

The need to improve the quality of life for people with complex communication needs has led to the use of augmentative and alternative communication (AAC) with or without assistance in numerous interventions (Cerpa Reyes, Jorquera Arellano & Toro Lisboa, 2023). Recent research has highlighted the effectiveness of AAC interventions for people with autism spectrum disorder (ASD) who have these needs, especially children, showing an increase in communicative opportunities (Landa, 2018; Lorah et al., 2024; Pereira et al., 2020; Therrien, Light & Pope, 2016). The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5; APA, 2013) serves as the leading reference for diagnosing mental health conditions. According to this manual, people with ASD experience significant difficulties in social communication and interaction, along with restricted and repetitive patterns of behaviour, interests, or activities.

Estimates indicate that ASD affects over 70 million people worldwide. Current research suggests a global prevalence of autism ranging from 65 to 72 cases per 10,000 individuals. Approximately 30% of people with ASD have complex communication needs that significantly limit their ability to express themselves through speech, sign language, or writing (Holyfield et al., 2017; WHO, 2023). These challenges often include difficulties in vocabulary development and responding appropriately in social interactions with one or multiple conversational partners. Such communication barriers not only hinder social

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engagement in daily life but may also influence behaviour and have long-term developmental consequences.

Due to its characteristics, aided augmented input emerges as an approach that can be beneficial for users with ASD who have complex communication needs (Biggs, Carter & Gilson, 2018; Drager, 2009). Also known as "natural aided language stimulation," this AAC approach is designed to support communication by fostering both expressive and receptive language skills. This strategy involves using visual symbols provided by a communication partner to support expressive communication and comprehension. Rather than relying solely on verbal expression, it encourages the integration of graphic symbols as a viable mode of communication (Goossens & Crain, 1986; Wandin et al., 2023). The primary focus of this approach is to enrich linguistic input during various communicative situations, including daily interactions, routine activities, and the delivery of instructions in therapeutic settings. For this intervention to be effective, communication partners play a crucial role in creating a supportive social environment by providing consistent verbal input. This ensures that the language experiences of people using AAC resemble those of individuals with typical language development. In practice, communication partners actively model AAC use in natural and dynamic interactions, incorporating graphic symbols to enhance communication with additional detail and context (Chazin, Ledford & Pak, 2021; Muttiah et al., 2022).

However, previous reviews of this strategy remain limited in scope (Chazin, Ledford & Pak, 2021), outdated in relation to recent technological developments (Sennott, Light & McNaughton, 2016), or primarily focused on broader language modelling methodologies rather than specifically on aided augmented input (Wandin et al., 2023). For example, training with large amounts of linguistic input can help users learn grammatical and semantic patterns and rules, thus producing coherent and relevant texts or speeches (Gibson, Pritchard & de Lemos, 2021; Jensen de López, Kraljević & Struntze, 2022; Shi et al., 2021). This differs from aided augmented input, where additional support is provided to promote receptive and expressive communication during natural interactions.

Consequently, the purpose of this scoping review was to deepen knowledge about aided augmented input interventions and their effects on participants with ASD, by systematising the available information. This study aims not only to consolidate understanding in this area of study in a simplified manner but also to facilitate the design of future interventions.

METHOD

A scoping review was conducted with the aim of identifying and analysing studies that examine the use of strategies based on aided augmented input, as well as the effectiveness of different types of AAC supports in users with ASD. Additionally, the factors influencing their implementation and the outcomes achieved were evaluated. For this purpose, the guidelines outlined in the PRISMA framework for scoping reviews (PRISMA-ScR; Tricco et al., 2018) were followed, adapting them to the objectives of the current research. Throughout this study, the term “aided augmented input” is used consistently to refer to partner-provided aided language modelling, including related terms, such as aided language stimulation and aided AAC modelling. Terminology was standardised during manuscript revision to reduce conceptual ambiguity across studies.

Inclusion and exclusion criteria

The studies included in the review had to meet the following criteria: a) original experimental studies with specified outcomes; b) intervention methodology based on aided augmented input; c) participants aged 3 or older, diagnosed with ASD, and in school age or adolescence; d) published in English, due to the widespread use of this language in the global scientific community, its predominant indexing in databases and journals, and its relevance in scientific communication; and e) studies published between 2010 and 2024, inclusive. This time frame was selected to capture contemporary AAC practices, particularly considering the rapid evolution of digital AAC systems, speech-generating devices, and visual scene display technologies over the last decade (Durán Cuartero, 2021). Earlier seminal studies (e.g., Drager et al., 2006; Goossens & Crain, 1986) were used for conceptual background but were not included in the empirical synthesis unless they met inclusion criteria.

Additionally, the exclusion criteria were: a) studies that used methodologies not aligned with the characteristics of aided augmented input; b) other systematic reviews, such as works not published in scientific journals, intervention protocols, press releases, conference presentations, abstracts, and letters to the editor; c) studies that included only participants with conditions other than ASD; and d) works that did not describe the effects, outcomes, or conclusions of the intervention.

Identifying relevant studies

The literature search was conducted on the Web of Science, Scopus, Semantic Scholar, PubMed, and PsycInfo databases from March 19, 2024, to April 26, 2024. To enhance transparency and replicability, the search strategy was developed in collaboration with an experienced university librarian. The search process followed an iterative approach, including pilot searches to refine keywords and Boolean combinations. Controlled vocabulary (e.g., MeSH terms in PubMed and Thesaurus terms in PsycInfo) was combined with free-text terms to maximise sensitivity and specificity. The main terms of interest for this review were: "autism spectrum disorder", "ASD", "augmentative and alternative communication", "AAC", "aided augmented input", "aided language stimulation", "aided language modelling", "aided AAC input", "communication", and "language".

The final search string was adapted to each database syntax but maintained the same conceptual structure: ("aided augmented input" OR "aided language stimulation" OR "aided language modelling" OR "aided AAC modelling" OR "augmented input") AND ("augmentative and alternative communication" OR "AAC") AND ("autism spectrum disorder" OR "ASD") AND ("communication" OR "language"). Boolean operators were applied systematically, with "OR" used to combine synonymous intervention terms and population descriptors, and "AND" used to intersect intervention, population, and outcome domains. Truncation and quotation marks were applied when permitted to ensure the retrieval of both exact phrases and relevant variations.

Although aided augmented input is conceptually situated within the broader field of AAC, the deliberate combination of intervention-specific terms (e.g., "aided language modelling") with broader AAC-related descriptors using the Boolean operator "AND" was intended to ensure alignment with the AAC theoretical framework. This approach helped exclude studies that employed visual supports or multimodal input without explicitly incorporating AAC systems or principles. This trade-off reflects a balance between specificity and sensitivity in the search strategy and is consistent with the aim of identifying studies that explicitly position aided augmented input within AAC-based interventions.

A total of 1141 papers were identified, which were reduced to 1019 after removing duplicates. Upon reviewing titles and abstracts based on the established eligibility criteria, 965 papers were excluded. Then, 54 papers were analysed in detail, of which 37 did not meet specific criteria and were excluded. 17 papers were finally included in the scoping review, as they met all criteria (Figure 1).

Interrater reliability

Following the methodology outlined in the scoping review by Wandin et al. (2023), the interrater reliability was assessed using the Percentage Agreement index (Figure 2).

$$\textbf{Percentage Agreement} = \frac{\textbf{Number of Agreements}}{\textbf{Total Number of Decisions}} \times \mathbf{100}$$

Figure 2. Percentage Agreement Index Equation

Interrater reliability between the primary author and the supervisor for the title and abstract screening was 96.3%. During the full-text review, the two evaluators each assessed 50% of the remaining 54 full texts (27 texts each). The initial inter-observer agreement for the full-text screening was 85% (83% and 87%) before consensus discussions. All discrepancies were resolved through discussion, ensuring unanimous agreement on the final selection.

RESULTS

This research study analysed a sample of 17 academic papers published between 2010 and 2024, from four different countries. These countries were: the United States (70.59 %), Canada (5.88 %), the United Kingdom (5.88 %) and South Africa (17.65 %). Specifically, the United States was represented by the papers published by Allen et al. (2021), Brady et al. (2015), Dorney and Erickson (2019), Finke et al. (2017), Harjusola-Webb and Robbins (2012), Kasari et al. (2014), Lorah, Karnes and Speight (2015), McFadden, Kamps and Heitzman-Powell (2014), Muttiah et al. (2022), Park, Moulton and Laugeson (2023), Remner et al. (2016), and Schlosser et al. (2013). Canadian literature consisted of the work published by Trottier, Kamp and Mirenda (2011). The United Kingdom was represented by Emerson and Dearden (2013); and South Africa contributed the papers by Hassim (2019), Laher and Dada (2023), and Ngwira (2019). Variability in the level of detail reported across studies reflects differences in study design, reporting quality, and relevance to the specific aims of this review. Studies with more rigorous designs (e.g., randomised controlled trials) or those directly addressing core mechanisms of aided augmented input are described in greater depth to support interpretability.

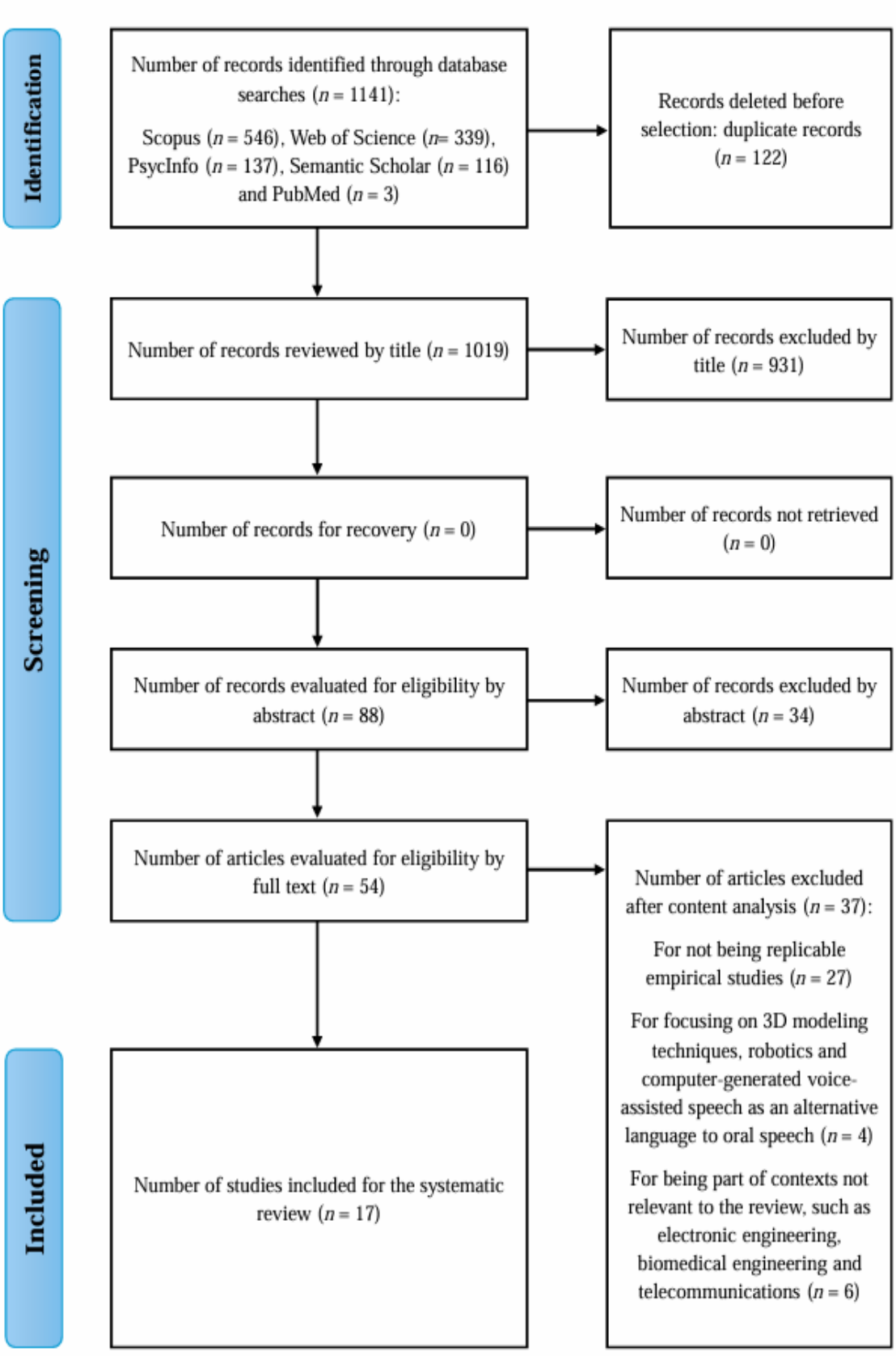

Figure 1. PRISMA flowchart of study selection process

The extracted characteristics from the studies included information about the authors, year of publication, study design, sample size, characteristics of the experimental group, intervention tools, and follow-up (Table 1). Among all the studies analysed, the total number of participants meeting the inclusion criteria proposed by the authors was *n* = 184, from whom *n* = 134 (72.83 %) were male participants and *n* = 33 (17.93 %) female participants. There were only two studies that did not specify the gender of participants in the analysed sample (Allen et al., 2021; Remner et al., 2016). However, none of the studies divided the groups by gender for analysis. Instead, analyses were conducted either globally or individually.

Table 1. Characteristics of the studies

	Design	Sample	Characteristics of the experimental group	Intervention tools	Follow-up
Allen et al. (2021)	Controlled within-subjects design	*n* = 11	Moderate to severe ASD, comorbidity with intellectual deficit	Images, real objects, and videos with iPad™	No tracking
Brady et al. (2015)	Controlled within-subjects design	*n* = 10	ASD with limited expressive vocabulary	Multimodal elements with iPad™ or computer	Between 2 and 40 sessions
Dorney & Erickson (2019)	Mixed methods experimental design	*n* = 13	ASD with limited expressive vocabulary	Communication matrix and AAC classroom elements (PCS and PECS)	No tracking
Emerson & Dearden (2013)	Controlled single-case design	*n* = 1	ASD with restricted receptive language and basic verb comprehension	Images and words paired	Several weeks (unspecified)
Finke et al. (2017)	Controlled within-subjects design	*n* = 6	ASD with experience using AAC	Multimodal communication strategies, including high-tech AAC, sign language, gestures, and speech	3 months
Harjusola-Webb & Robbins (2012)	Controlled within-subjects design	*n* = 3	ASD capable of communicating with gestures and vocalisations	Teacher training package on naturalistic intervention	No tracking
Hassim (2019)	Experimental crossover design between subjects	*n* = 21	ASD able to recognise objects and prepositions	ICT support for iPad™, real colour photographs, and assisted symbols	Several weeks (unspecified)
Kasari et al. (2014)	Randomised longitudinal regression models	*n* = 61	Minimally verbal ASD	Naturalistic speech and communication-generating device	3 months
Laher & Dada (2023)	Alternative treatment design (randomised)	*n* = 6	Children with complex communication needs, including ASD	Facilitating boards with 12 PCS symbols	3 weeks
Lorah, Karnes & Speight (2015)	Multiple baseline design	*n* = 2	ASD with an absent or weak verbal repertoire	ICT support with voice generator; experimenter vocally presented stimuli	21 sessions
McFadden, Kamps & Heitzman-Powell (2014)	Multiple baseline design	*n* = 4	ASD with severe social functioning deficits	Peer Networks and Fundamental Response Training	Several weeks (unspecified)
Muttiah et al. (2022)	Single-case multiple probe across participants	*n* = 3	ASD with a presymbolic level or lower on communication and developmental delay	Low-tech VSDs and aided modelling	No tracking
Ngwira (2019)	Quasi-experimental design	*n* = 17	ASD with deficits in receptive language skills	12 verbal instructions combined with pictograms presented on iPad™	No tracking

Table 1. Continued.

	Design	Sample	Characteristics of the experimental group	Intervention tools	Follow-up
Park, Moulton & Laugeson (2023)	Randomised controlled trial design	*n* = 5	ASD with moderate involvement and intellectual disability	Parent-Assisted Social Skills Training Program	Weekly tasks
Remner et al. (2016)	Controlled within-subjects design	*n* = 10	Moderate to severe ASD with object recognition skills	Wooden blocks, jewellery boxes, communication board, and iPad™	No tracking
Schlosser et al. (2013)	Randomised controlled within-subjects	*n* = 9	ASD with interests in electronic tools	Directives, figures, other accessories, and iPad™	No tracking
Trottier, Kamp & Mirenda (2011)	Multiple baseline design	*n* = 2	ASD capable of making requests with at least 10 pictograms	Games tailored to individual interests and abilities	No tracking

Note: PCS: Pictographic Communication System; PECS: Image Exchange Communication System; AAC: Augmentative and Alternative Communication; ICT: Information and Communications Technologies; VSDs: Visual Scene Displays.

All participants had an ASD diagnosis and did not present any visual or hearing challenges. Most studies (76.47%) established the ASD diagnosis based on previous reports by developmental pediatricians, neurologists, or clinicians, independently from the researchers. There were three studies (17.65%), namely Finke et al. (2017); Harjusola-Webb and Robbins (2012) and Brady et al. (2015), that confirmed the ASD diagnosis using the Diagnostic and Statistical Manual of Mental Disorders–Fourth Edition, DSM-IV (APA, 1994). One study (5.88%), conducted by Kasari et al. (2014), validated the diagnosis using the Autism Diagnostic Observation Schedule–Second Edition (ADOS-2; Lord et al., 1999).

Across the 17 included studies, participant ages ranged broadly from early childhood to adolescence. Most investigations focused on preschool and early school-aged children (approximately 3 to 8 years old; e.g., Kasari et al., 2014; Brady et al., 2015; Schlosser et al., 2013), while several studies included older elementary-aged children and preadolescents up to 12–13 years of age (e.g., Finke et al., 2017; Muttiah et al., 2022). A smaller number of studies extended into adolescence, with participants reaching approximately 15–16 years (e.g., Emerson & Dearden, 2013). Overall, the majority of the evidence base reflects interventions implemented during early and middle childhood, with comparatively limited representation of older adolescents.

Although being conducted in a school setting was not an inclusion criterion, the majority of the studies were conducted in educational environments. Specifically, ten studies were conducted in school settings, including preschools and classrooms (Dorney & Erickson, 2019; Finke et al., 2017; Harjusola-Webb & Robbins, 2012; Laher & Dada, 2023; Lorah, Karnes & Speight, 2015; McFadden, Kamps & Heitzman-Powell, 2014; Trottier, Kamp & Mirenda, 2011). Four studies were conducted in clinical or structured settings, including university research laboratories or controlled clinical environments (Brady et al., 2015; Hassim, 2019; Ngwira, 2019; Remner et al., 2016). Three studies were carried out in naturalistic settings such as the participants' homes or family-inclusive group settings (Allen et al., 2021; Muttiah et al., 2022; Park, Moulton & Laugeson, 2023). Additionally, Emerson and Dearden (2013) implemented their intervention in an individualised educational setting tailored to the participant's needs, while Schlosser et al. (2013) conducted their study in a controlled experimental laboratory environment.

These findings are consistent with the trend observed in previous research, where school and clinical settings are commonly chosen for interventions targeting communication, social and behavioural skills in children with ASD (Du, Guo & Xu, 2024; Sutton, Webster & Westerveld, 2019). This distribution highlights the importance of selecting contexts that provide consistent routines and opportunities for social interaction, essential for generalising learned skills.

In the majority of the studies, the interventions were implemented by a variety of professionals, reflecting a multidisciplinary approach to aided augmented input strategies: Teachers/Educators participated in 29% of the studies (Dorney & Erickson, 2019; Harjusola-Webb & Robbins, 2012; Laher & Dada, 2023; McFadden, Kamps & Heitzman-Powell, 2014; Trottier, Kamp & Mirenda, 2011), primarily in school settings, where they were trained to use aided augmented input strategies. Speech therapists were involved in 29% of the studies (Allen et al., 2021; Brady et al., 2015; Finke et al., 2017; Kasari et al., 2014; Remner et al., 2016), focusing on AAC interventions and providing visual models with speech-generating devices. Researchers/Specialists in AAC conducted 24% of the studies (Schlosser et al., 2013; Hassim, 2019;

Ngwira, 2019; Muttiah et al., 2022), designing and supervising interventions in clinical and experimental settings. Parents were involved in 6% of the studies (Park, Moulton & Laugeson, 2023), supporting generalisation of social skills in family-inclusive group settings. Other educational professionals, including paraprofessionals and teaching assistants, supported the implementation of AAC strategies in 12% of the studies (Dorney & Erickson, 2019; Laher & Dada, 2023).

The implementation of aided augmented input varied in flexibility across the studies. In school-based interventions, teachers and educational staff tailored the use of AAC resources to fit classroom routines, with some adapting the materials to the specific needs of their students (Dorney & Erickson, 2019; Laher & Dada, 2023). In clinical and experimental settings, the interventions were more structured, maintaining consistency to evaluate the effectiveness of different doses and modalities of aided input (Hassim, 2019; Ngwira, 2019; Remner et al., 2016). This flexibility reflects the adaptability of aided augmented input across different settings and populations with ASD, emphasising the importance of context-specific adjustments. These findings also highlight the significance of prior training, particularly when interventions are implemented by professionals who are naturally part of the educational or clinical environments.

Interventions and results were described in detail in terms of frequency, duration, and a summary of the results is shown (Table 2). The interventions conducted in these studies meet the criteria proposed by Goossens and Crain (1986). Most studies used autism behaviour checklists (Schlosser et al., 2013; Remner et al., 2016; Finke et al., 2017; Brady et al., 2015; McFadden, Kamps & Heitzman-Powell, 2014; Kasari et al., 2014; Trottier, Kamp & Mirenda, 2011; Lorah, Karnes & Speight, 2015), which are based on observable behaviours recorded by the authors during assessment moments in the study.

Table 2. Synthesis of interventions and results

	Intervention	**Frequency and duration**	**Summary of results**
Allen et al. (2021)	EG: Spoken directives, dynamic (video) and static (image) scene cues	Intervention sessions (unspecified)	Greater precision in following directives (comprehension
Brady et al. (2015)	EG: Interactive routines, physical prompts, and corrective feedback	17-76 sessions 45-60 minutes	Increased production of spoken words
Dorney & Erickson (2019)	EG: PCS CG: PECS system	5 days x 7 months 15-45 minutes	Abstract graphic symbols increased social engagement and information sharing
Emerson & Dearden (2013)	EG: Identification of elements and opportunities for social participation and responding by pointing	32 sessions 20 months 20-30 minutes	Improved understanding of complex language and literacy skills
Finke et al. (2017)	EG: Communication screens with multi-symbol messages based on favourite books	14 weeks	Improved language and communication to meet daily needs
Harjusola-Webb & Robbins (2012)	EG: Strategies to promote communication (commenting, labelling, modelling, and reinforcement)	Daily sessions 18 weeks 30 minutes	Increased functional skills without interrupting classroom activities
Hassim (2019)	EG: 60% aided augmented input level CG: 20% aided augmented input level	Intervention sessions (unspecified) 20 minutes	60% aided augmented input produced greater response accuracy and increased communication modes
Kasari et al. (2014)	EG: JASP+EMT+SGD CG: JASP+EMT	24 sessions 6 months 60 minutes	Significant advances in spontaneous communication through joint participation, play skills, and SGD use
Laher & Dada (2023)	EG: Aided augmented input with 70% dose CG: Aided augmented input with 40% dose	10 sessions 10 days 20 minutes	Using a low-tech AAC board at a 70% dose increased receptive vocabulary and language skills

Table 2. Continued.

	Intervention	Frequency and duration	Summary of results
Lorah, Karnes & Speight (2015)	EG: Instructions represented with three specific symbols and two distractor symbols	2 sessions 12 weeks 2 hours	Responded to three intraverbal statements and acquired skills rapidly
McFadden, Kamps & Heitzman-Powell (2014)	EG: Bringing participants and peers together for interactive games and activities	17-37 sessions 7 months 20-30 minutes	Significant increases in social communication with peers and generalisation of these skills
Muttiah et al. (2022)	EG: VSDs with interactive "hotspots" for people, objects, and events, combined with aided modelling in natural contexts	1-2 times per week 2-4 weeks 10-15 minutes	Significant increases in communication turns and unique semantic concepts; supported preliminary efficacy for communicative engagement
Ngwira (2019)	EG: 75% aided augmented input level CG: 25% aided augmented input level	Intervention sessions (unspecified) 15 minutes	Aided augmented input benefitted participants in both conditions
Park, Moulton & Laugeson (2023)	EG: Developmentally appropriate social skills with parent involvement and behavioural strategies integrated into play-based activities	5 days 16 weeks 15-20 minutes	Improvements in social responsiveness, cognition, motivation, and reductions in restricted, repetitive behaviours
Remner et al. (2016)	EG1: Verbal speech combined with static scene (image) EG2: Verbal speech with dynamic scene (video) CG: verbal discourse	Intervention sessions (unspecified) 30 minutes	Visual aids (static or dynamic) improved children's ability to follow verbal directives (comprehension)
Schlosser et al. (2013)	EG1: Dynamic scene (video) EG2: Static scene (image) CG: Spoken interaction	6 months	Combining static and dynamic scene cues with speech was more effective than using speech alone
Trottier, Kamp & Mirenda (2011)	EG: SGD devices to engage in peer interactions in school	13 sessions 86-130 minutes	Improvements in social interactions after AAC instruction

Note: EG: Experimental Group; CG: Control Group; EMT: Enhanced Milieu Teaching; JASP: Joint Attention Symbolic Play Engagement and Regulation; SGD: Speech-Generating Device; PCS: Pictographic Communication System; PECS: Picture Exchange Communication System; AAC: Augmentative and Alternative Communication; VSDs: Visual Scene Displays.

Checklists allow for participant profiling and tracking their progress in communication, social, or behavioural areas. In addition, the standardised Childhood Autism Rating Scale (CARS; Schopler, Reichler & Renner, 2010) and the Peabody Picture Vocabulary Test Fourth Edition (PPVT-4; Dunn & Dunn, 2007) were used in three studies (Allen et al., 2021; Hassim, 2019; Ngwira, 2029) for primary measures. Harjusola-Webb and Robbins (2012) and Brady et al. (2015) used the Vineland II Adaptive Behaviour Scales (Sparrow, Cicchetti & Balla, 2005). An observational survey test was used by Laher and Dada (2023) to measure participant progress. Additionally, Muttiah et al. (2022) assessed participants' communication skills using the Communication Matrix (Rowland, 2013). In this study, teachers, paraprofessionals, or caregivers provided information about the children and also completed the M-CDI (Fenson et al., 2007) to evaluate expressive vocabulary. Park, Moulton and Laugeson (2023) included the Program for the Education and Enrichment of Relational Skills (PEERS) and ADOS-2 among their assessment tools.

Implications for receptive and expressive communication

Across the included studies, several consistent patterns emerge regarding the effects of aided augmented input on receptive and expressive communication. First, the integration of visual supports with spoken language systematically improves directive-following accuracy, particularly for abstract linguistic structures such as prepositions (Schlosser et al., 2013; Remner et al., 2016; Allen et al., 2021). Second, higher dosages of aided augmented input tend to yield stronger outcomes in both receptive and expressive domains, as evidenced by studies manipulating modelling density (Hassim, 2019; Laher & Dada, 2023; Ngwira, 2019). Third, interventions that embed aided input within naturalistic and interactive contexts

appear to promote not only comprehension but also expressive outcomes such as vocabulary acquisition, multi-symbol message production, and increased communicative turns (Dorney & Erickson, 2019; Brady et al., 2015; Muttiah et al., 2022; Finke et al., 2017).

At the same time, some divergences are evident. For example, while several studies report comparable effectiveness between static and dynamic visual supports (Schlosser et al., 2013; Remner et al., 2016), the relative advantage of each modality may depend on individual learner characteristics and task demands (Allen et al., 2021). Similarly, responsiveness to intervention varies according to baseline language abilities, with some participants demonstrating more substantial gains than others in expressive outcomes (Brady et al., 2015), suggesting that aided augmented input may not benefit all profiles equally without appropriate individualisation.

To enhance clarity, studies in this section are organised thematically according to their primary outcome focus: (a) directive comprehension and receptive language (e.g., Schlosser et al., 2013; Remner et al., 2016; Allen et al., 2021), (b) effects of input dosage (e.g., Hassim, 2019; Laher & Dada, 2023; Ngwira, 2019), and (c) expressive communication and multi-symbol production within naturalistic contexts (e.g., Brady et al., 2015; Dorney & Erickson, 2019; Muttiah et al., 2022).

Schlosser et al. established the foundational experimental conditions that have since become the most frequently replicated in subsequent research. They provided a pivotal study on aided augmented input by comparing three instructional modalities: oral input alone, oral input paired with static scene cues (images), and oral input paired with dynamic scene cues (videos). Their research focused on children with ASD or pervasive developmental disorders-not otherwise specified (PDD-NOS) to evaluate their ability to follow directives involving prepositional phrases such as “Put the boy under the lamp”. The results demonstrated that static and dynamic scene cues significantly outperformed spoken input alone, with accuracy rates of 83% and 81%, respectively, compared to 19% for spoken input.

Dynamic scene cues displayed the complete motion of placing an object in its final spatial position relative to another, while static scene cues captured only the final position. Both modalities enhanced comprehension by providing additional visual context, allowing children to better interpret the relationships described in the directives. Interestingly, there was no statistically significant difference between the static and dynamic scene cues, suggesting that the choice of modality can be flexible depending on instructional preferences and resources available.

The study highlighted the limitations of spoken input alone for children with ASD, who often struggle with auditory processing and transient cues. By integrating visual modalities, educators and clinicians can provide more permanent and accessible instructional supports. The findings advocate for the inclusion of static or dynamic visual supports in both educational and therapeutic contexts to enhance directive-following and spatial understanding.

Remner et al. (2016) replicated and expanded upon the foundational work of Schlosser et al. (2013) by exploring the effects of static and dynamic scene cues combined with oral directives on comprehension in children with moderate to severe ASD. This study focused on improving understanding of prepositional phrases such as “put the block on the box” or “put the block behind the box” using aided augmented input strategies. The study utilised ten participants aged 9–20 years, all diagnosed with ASD and exhibiting profound deficits in receptive vocabulary skills, as measured by the Receptive One-Word Picture Vocabulary Test (ROWPVT-4). The intervention involved three conditions: a) verbal input alone (e.g., “Put the block on the box”); b) verbal input paired with static scene cues, which depicted the correct spatial relationships as a photograph; and c) verbal input paired with dynamic scene cues, which presented the spatial relationships as a video sequence.

Stimuli included a wooden block and two boxes, and directives targeted seven prepositions (e.g., “in”, “on”, “under”, “between”). Visual cues were displayed on an iPad™, chosen for its capacity to maintain participants' motivation and attention. Participants were tested in randomised sequences during two separate sessions to ensure response stability. The study revealed significant improvements in directive comprehension when visual cues were included. Interestingly, while both static and dynamic cues were effective, no statistically significant difference was observed between the two visual modalities. However, some participants demonstrated a clear preference for dynamic cues, suggesting individual variability in modality effectiveness.

The findings highlight the critical role of visual supports in enhancing language comprehension for people with ASD, particularly for abstract concepts like prepositions. The study emphasises that mere repetition of verbal instructions does not yield the same benefits as aided augmented input strategies, underscoring the importance of integrating multimodal supports into therapeutic and educational settings.

Hassim (2019) and Ngwira (2019) explored the effects of varying doses of aided augmented input. Both studies highlight the importance of visual supports in complementing oral directives for children with ASD, especially in tasks requiring comprehension of abstract concepts. They emphasise the need to

consider individual variability in response to input dosage, suggesting that single-input approaches may be insufficient.

Hassim (2019) investigated the effects of varied dosages of aided augmented input on following directives containing prepositions in children with ASD. This study used a within-subject crossover design to expose participants, aged 5 to 11 years, to two conditions of aided input dosage: 20% and 60%. Participants completed pre-tests assessing their noun and preposition knowledge and matching skills to ensure they met the inclusion criteria.

The intervention employed Go Talk Now™ software, presenting Picture Communication Symbols (PCS) alongside spoken directives. For example, participants were instructed to "Put the spoon under the bowl", with PCS symbols displayed in varying frequencies depending on the dosage condition. Results indicated that a higher dosage of aided input (60%) yielded greater accuracy in directive comprehension for most participants, with some exceptions. Nine participants showed better performance at the higher dosage, while four performed better at the lower dosage, highlighting the need for individualised approaches. Additionally, five participants responded equally across conditions, and three did not respond at all. These results underline the potential benefits of tailored input dosages in enhancing receptive language skills.

Ngwira (2019) conducted a similar study focusing on the use of aided augmented input to improve directive comprehension in children with ASD. This research employed real-colour photographs instead of PCS symbols, integrated into a naturalistic play-based intervention. The study emphasised varying the frequency of visual and verbal cues. The findings mirrored Hassim's results, confirming that a higher dosage of visual input generally led to improved accuracy in following directives, particularly for spatial relationships involving prepositions such as "on", "under", and "beside".

Allen et al. (2021) investigated the effects of different types of visual and oral cue combinations on directive-following accuracy in ASD children, aged 4 to 10 years, with moderate-to-severe communication challenges. The study employed three instructional modalities: a) spoken input alone (SPO), participants were given verbal directives without accompanying visual aids; b) dynamic scene cues combined with spoken input (SC), with short video clips demonstrated the spatial relationships depicted in the directives (e.g., placing a figurine "behind" an object); and c) element cues paired with spoken input (EC), with static sequences of graphic symbols representing nouns, prepositions, and objects were presented. This research focused on how integrating various visual supports with oral input could enhance the comprehension of spatial prepositions in directive-following tasks.

Participants were pre-screened for basic match-to-sample (MTS) skills and receptive vocabulary. The intervention was conducted in their homes in a controlled setting to minimise distractions. Visual and oral cues were presented using an iPad™. The study revealed significant differences in directive-following accuracy across conditions. The SC condition resulted in the highest accuracy and was significantly more effective than both SPO and EC conditions. Interestingly, the study found a positive correlation between participants' pre-existing spoken noun knowledge and their performance in the SC condition. This suggests that dynamic scene cues may activate and leverage semantic networks associated with known vocabulary.

This study supports the efficacy of dynamic scene cues as a tool for enhancing directive comprehension in children with ASD. Unlike static element cues, which require participants to interpret syntactic relationships, dynamic scene cues explicitly depict these relationships, making them more accessible for people with limited receptive language skills.

Laher and Dada (2023) conducted a study investigating the impact of an intervention based on aided augmented input on receptive vocabulary acquisition in children with complex communication needs and severe intellectual disabilities, including those with ASD. The intervention utilised communication boards measuring 50 x 70 cm, each displaying 10 x 10 cm coloured pictographic symbols created with Boardmaker Plus v6.1.6 software. During tailored activities, the researcher guided participants by pointing to these symbols while articulating the corresponding words, thereby providing augmented input to facilitate language learning. The intervention compared two dosages of aided augmented input: 40% and 70%. Receptive vocabulary acquisition was assessed to determine the effectiveness of each dosage level.

The results indicated that all participants demonstrated receptive vocabulary acquisition when aided augmented input was provided at a 70% dosage. In contrast, only two participants showed vocabulary gains at the 40% dosage level. These findings suggest that a higher dosage of augmented input may be more effective in facilitating receptive vocabulary acquisition for children with complex communication needs and severe intellectual disabilities, including those with ASD. Additionally, the acquired vocabulary was maintained following a six-day withdrawal period, indicating the intervention's potential for promoting lasting language gains.

This study underscores the importance of dosage in the application of aided augmented input interventions, as noted previously by Hassim (2019) and Ngwira (2019). Laher and Dada (2023)

demonstrated that utilising communication boards with pictographic symbols, combined with a higher dosage of aided augmented input, effectively improves receptive vocabulary in children with severe intellectual disabilities and complex communication needs, including those with ASD.

Finke et al. (2017) demonstrated the effectiveness of aided augmented input in combination with a least-to-most prompting (LTM) procedure to enhance multi-symbol message production in children with ASD who relied on AAC. The intervention focused on integrating aided augmented input during interactive book-reading activities to support language and communication development. The study involved six children aged 8 to 12 years who used AAC devices. During the intervention, the Proloquo2Go™ software was used to present multi-symbol messages alongside spoken language, aligning with the principles of the strategy intervention. The LTM procedure added a structured hierarchy of prompts—starting with minimal assistance and progressing to more explicit guidance—to encourage children to construct messages with two or more symbols. The intervention emphasised modelling, where the facilitator combined verbal input with the visual display of symbols to reinforce language learning.

The results indicated a consistent increase in the production of multi-symbol messages across all participants following the introduction of aided augmented input and LTM strategies. This approach also fostered greater attention and engagement during book-reading sessions. The study highlights the potential of the strategy to support multi-symbol communication and its role in promoting meaningful language interactions for children with ASD who use AAC.

Similarly, Harjusola-Webb and Robbins (2012) explored the impact of aided augmented input in naturalistic interventions implemented by teachers to enhance communication in preschoolers with ASD. Teachers received training on implementing aided augmented input strategies such as combining spoken language with gestures, pointing to visual supports (e.g., pictograms), and modelling communication during child-led activities. The intervention was tailored to the children's individual interests, with teachers using aided augmented input to respond to and expand on the children's communicative attempts.

The study found that aided augmented input strategies increased opportunities for communication and resulted in a significant improvement in expressive communication among the children. Teachers' consistent use of these techniques, such as pointing to symbols while speaking, created a supportive linguistic environment that allowed children to connect visual and verbal inputs. This approach facilitated natural communication exchanges without disrupting the flow of classroom routines, demonstrating the feasibility and effectiveness of aided augmented input in educational settings.

Emerson and Dearden (2013) conducted a case study focusing on a 10-year-old non-verbal boy with ASD to assess the impact of using "full" language within the framework of the "least dangerous assumption". This educational philosophy posits that, in the absence of conclusive data, educators should make assumptions that, if incorrect, will have the least harmful effect on the student. In this context, it involves presuming competence and providing rich language input, even when a child's receptive language abilities are uncertain.

The intervention employed aided augmented input strategies to enhance comprehension, literacy, and motivation. Engaging resources such as matching images with words, spelling exercises, and sentence formation tasks were utilised. The researchers (speech therapists) provided "full" language input by using complete sentences and a rich vocabulary, rather than simplifying language or relying solely on minimal speech approaches.

The study revealed that the child demonstrated improved comprehension and vocabulary acquisition following the intervention. These findings suggest that providing rich language input, even to non-verbal children with ASD, can facilitate language development and literacy skills. The results challenge the assumption that children with limited expressive abilities cannot benefit from complex language exposure. This case study underscores the importance of adopting the "least dangerous assumption" by presuming competence and providing enriched language input to children with ASD, regardless of their expressive language abilities. Educators and practitioners are encouraged to utilise aided augmented input strategies and avoid underestimating the potential of non-verbal children. By offering comprehensive language exposure, there is potential to enhance comprehension, literacy, and overall communication skills in this population.

Similarly, Dorney and Erickson (2019) explored the impact of a classroom-based AAC intervention on preschool students with ASD. The intervention incorporated three evidence-based, transactional approaches: a) attributing communicative meaning to student behaviours; b) providing aided augmented input; and c) focusing on graphic symbols representing core vocabulary. Data collection methods included observation field notes, Individualised Education Programs (IEPs), and direct communication assessments. The researchers aimed to explore interaction patterns between educators and students while analysing improvements in student communication, as measured by the Communication Matrix.

The results indicated a transactional relationship between educators' and students' communication across the classrooms. Specifically, the preschool students learned to use abstract graphic symbols representing core vocabulary to make requests, a development attributed to the educators' focus on this communicative function. Additionally, several students demonstrated growth in the use of non-verbal communication for social interaction and information sharing, which was associated with the educators' increased use of aided augmented input.

This study highlights the potential of using graphic symbols to teach requesting and basic vocabulary to children with ASD, thereby fostering functional communication for specific purposes. The findings suggest that educators' intentional focus on aided augmented input and the use of core vocabulary symbols can effectively enhance communication skills in preschool students with ASD.

Brady et al. (2015) conducted a pilot study to evaluate a multimodal intervention aimed at enhancing expressive word learning in school-age children with ASD, aged 6 to 10 years, who have limited expressive vocabularies. The intervention combined speech sound practice with AAC strategies to teach individualised vocabulary words. These words were selected based on each child's existing speech sound repertoire and principles of phonotactic probability.

The intervention utilised Proloquo2Go™ software to provide visual models and interactive routines, accompanied by physical prompts such as pointing and corrective feedback. The results indicated that five children, termed "High Responders", demonstrated significant gains in spoken-word learning across successive word sets. The remaining five children, labelled "Low Responders", did not meet the learning criteria. Comparative analyses revealed that High Responders had relatively higher skills in receptive language, imitation, and oral motor abilities prior to the intervention.

This study supports the efficacy of combining oral and visual input through multimodal interventions to promote effective communication in children with ASD across diverse contexts. The findings suggest that integrating speech sound practice with AAC resources can enhance the production of spoken words, particularly in children with certain pre-existing skills. However, further research is recommended to explore the factors influencing the varying responsiveness of children with ASD to such resources, using an intervention based on aided augmented input.

Muttiah et al. (2022) investigated the use of low-tech Visual Scene Displays (VSDs) combined with aided augmented input in naturalistic contexts. The intervention focused on three preschool-aged children with ASD at a presymbolic level of communication. The VSDs featured interactive "hotspots" representing people, objects, and events, which were paired with spoken input during interactive play sessions.

The results demonstrated significant increases in the number of communication turns and unique semantic concepts expressed by the participants. For example, one participant increased from 0-7 communication turns at baseline to 20-28 turns during intervention sessions. This study highlighted the effectiveness of combining oral input with visual elements in creating meaningful communicative opportunities, emphasising the potential of low-tech solutions for populations with complex communication needs. These findings align with previous research (e.g., Schlosser et al., 2013; Hassim, 2019) that supports the use of multimodal strategies to enhance receptive and expressive language skills, while also underscoring the feasibility of applying aided augmented input in naturalistic settings.

Implications for social and behavioural skills

This section synthesises studies in which aided augmented input was associated with changes in broader social participation, peer interaction, motivation, and behavioural outcomes. Although communication gains often co-occurred, the emphasis here is on socially mediated and behavioural dimensions beyond discrete language measures. In this context, Park, Moulton and Laugeson (2023) evaluated the impact of aided augmented input on social skills in children with ASD through structured didactic lessons, role-playing scenarios, and behavioural learning activities. They conducted a study evaluating the effectiveness of the Program for the Education and Enrichment of Relational Skills (PEERS®) for Preschoolers, a parent-assisted social skills training program tailored for young children with ASD. The intervention was designed to address the challenges children with ASD face in forming reciprocal friendships by enhancing their social functioning through developmentally appropriate strategies.

The study involved a two-part evaluation of the PEERS® for Preschoolers program. Modifications to the original PEERS® curriculum included the incorporation of developmentally appropriate social skills, increased parental involvement, and the integration of behavioural strategies within play-based activities. Parents were actively engaged in the intervention, facilitating the generalisation of skills to naturalistic settings.

The intervention led to significant improvements in several areas: a) social responsiveness: enhanced ability to engage in social interactions; b) social cognition: improved understanding of social cues and contexts; and c) social motivation: increased willingness to participate in social activities. Additionally,

there were notable reductions in: a) restricted and repetitive behaviours: decreased engagement in repetitive actions or adherence to rigid routines; and b) problem behaviours: reduction in behaviours that interfere with daily functioning and social interactions.

Previously, McFadden, Kamps and Heitzman-Powell (2014) highlighted the role of group play as a key strategy for fostering social and communication skills of children with ASD, aged 6 to 8 years. The intervention incorporated several evidence-based social skills-teaching procedures, including direct instruction, priming, prompting, peer mediation, contingent reinforcement, and token economies, directly in the recess setting to increase appropriate social behaviours. Elements of Peer Networks and Pivotal Response Training were included.

The intervention was implemented during recess, a naturalistic and less structured environment, to promote the generalisation of social skills. The program included class-wide social skills lessons, priming, adult prompting and feedback, peer prompting and praise, and a token economy. Peers were trained to model, initiate, prompt, and reinforce social behaviours and interactions with the target children.

The results demonstrated significant increases in social communication between focus children and their peers. Notably, the children with ASD were able to generalise their improved social skills to non-intervention recesses, indicating the effectiveness of the intervention in promoting lasting behavioural changes. The study also observed a reduction in behavioural challenges during recess, suggesting that enhanced social interactions contributed to better overall behaviour in less structured settings.

In summary, the evidence suggests that aided augmented input may contribute to improvements in social participation and behavioural regulation, particularly when embedded within interactive and peer-mediated contexts. Across studies, gains in social responsiveness, peer interaction, and reductions in problem behaviours appear to be closely linked to enhanced communicative competence. These findings support the view that communication and social behaviour are functionally interconnected, and that interventions targeting symbolic communication may have broader developmental effects beyond language itself. However, the limited number of studies explicitly addressing these outcomes highlights the need for more systematic investigation in this domain.

Aided augmented input combined with speech-generating devices

Several studies (Kasari et al. 2014; Lorah, Karnes & Speight, 2015; Trottier, Kamp & Mirenda¸2011) incorporated Speech-Generating Devices (SGDs) into aided augmented input interventions. Kasari et al. (2014) conducted a study to evaluate the effectiveness of communication interventions for minimally verbal children with ASD, aged 5 to 8 years. The research focused on the use of SGDs within naturalistic communication settings to enhance spontaneous language use, based on the aided augmented input strategy. Participants were randomised to receive a blended developmental and behavioural intervention, specifically Joint Attention, Symbolic Play, Engagement, and Regulation (JASP+EMT), either with or without the addition of an SGD. In the first stage, all children received two sessions per week for three months. In the second stage, the intervention was adapted based on the child's early response, either by increasing the number of sessions or by adding the SGD.

The results indicated that children who received the intervention with the SGD (JASP+EMT+SGD) demonstrated significant improvements in spontaneous communicative utterances, the use of novel words, and the frequency of comments, compared to those who received the intervention without the SGD. The study also found that starting the intervention with the SGD and intensifying it for children who were slow responders led to better post-treatment outcomes.

This study suggests that incorporating SGDs can effectively enhance language development in minimally verbal children with ASD. The use of SGDs, combined with strategies focusing on joint attention and symbolic play, can expand children's expressive capabilities and increase spontaneous communication within relatively short periods. These findings support the integration of aided augmented input in interventions aimed at improving communication skills in this population.

Trottier, Kamp and Mirenda (2011) demonstrated that SGD use enhanced social interactions and AAC instruction. Participants with limited verbal abilities initially struggled to produce more than 20 words, but by the end of the intervention, they increased their communicative acts and social skills. Lorah, Karnes and Speight (2015) extended this work by using iPads™ equipped with Proloquo2Go™. Their intervention, which included verbal prompts and pictograms, improved participants' ability to respond to specific social cues, highlighting the versatility of SGDs in teaching social communication skills.

DISCUSSION

This scoping review mapped the empirical evidence on aided augmented input interventions for children and adolescents with ASD who have complex communication needs—that is, significant difficulties engaging in functional communicative exchanges through spoken language, manual signs, or written

modalities (Calleja & Rodríguez, 2018; Moorcroft, Scarinci, & Meyer, 2018). Across a range of research designs and service delivery contexts, studies consistently documented improvements in directive-following accuracy, receptive vocabulary, multi-symbol message production, spontaneous communicative turns, and social engagement. Importantly, the convergence of findings across both low-tech and high-tech AAC systems reinforces the robustness of aided augmented input as a mediated modelling strategy.

In a variety of research designs and service delivery contexts, studies have consistently documented improvements in directive-following accuracy, receptive vocabulary, multi-symbol message production, spontaneous communicative turns, and social engagement. Evidence spans a continuum of AAC supports, ranging from paper-based pictographic systems (e.g., Schlosser et al., 2013; Remner et al., 2016; Allen et al., 2021; Laher & Dada, 2023; Harjusola-Webb & Robbins, 2012; Emerson & Dearden, 2013; Dorney & Erickson, 2019; Park, Moulton, & Laugeson, 2023; McFadden, Kamps, & Heitzman-Powell, 2014; Muttiah et al., 2022), to Information and Communications Technology (ICT) based software applications (Brady et al., 2015; Finke et al., 2017; Hassim, 2019; Ngwira, 2019), and SGDs devices (Kasari et al., 2014; Lorah, Karnes, & Speight, 2015; Trottier, Kamp, & Mirenda, 2011). Importantly, the convergence of findings across both low-tech and high-tech AAC modalities strengthens confidence in the robustness of aided augmented input as a mediated modelling strategy.

From a theoretical standpoint, the effectiveness of aided augmented input can be interpreted within multimodal processing frameworks and transactional models of communication (Sennott, Light, & McNaughton, 2016). By pairing spoken language with stable visual-symbolic representations, this approach may reduce the cognitive demands associated with transient auditory input while facilitating symbol–referent mapping. Such mechanisms may be particularly relevant for individuals with ASD, who often demonstrate relative strengths in visual processing alongside challenges in auditory-temporal integration (Ganz et al., 2012; Light & McNaughton, 2014).

The findings of this review further extend current knowledge in several ways. First, the evidence supports the effectiveness of aided augmented input for children and adolescents with ASD and complex communication needs, confirming its applicability across a heterogeneous population profile. Second, the analysed studies suggest that many participants with ASD rely on visual supports to enhance comprehension at both lexical and sentence levels, as well as to improve accuracy in following spoken directives (Laher & Dada, 2023; Schlosser et al., 2013). Additionally, intervention success appears closely linked to individualised customisation, consistent AAC support, and the use of systematic reinforcement strategies (Scarcella et al., 2023). Taken together, these findings align with earlier research indicating that aided augmented input constitutes a highly beneficial instructional approach for facilitating the association between symbolic representations and spoken input, thereby supporting meaning-making processes grounded in the interlocutor's verbal models (Drager et al., 2006).

Finally, the results of the review also highlight reductions in problem behaviours and improvements in social development. These outcomes may be explained by the functional relationship between communication and behaviour: when individuals with ASD gain more effective ways to express needs, preferences, and affect, they are less likely to rely on challenging behaviours that serve communicative functions (Alakhzami & Chitiyo, 2022; Blair, Park & Risse, 2025). At the same time, aided augmented input may enhance reciprocal interaction, joint attention, and peer engagement because modelling accessible symbolic language supports shared reference and participation in social routines, which are core components of socio-communicative competence (Edgar, Schlosser & Koul, 2024). Additionally, interventions based on aided augmented input can have positive effects on message production and new vocabulary acquisition, sometimes resulting in generalisation of these gains to natural contexts in which users operate (Brady et al., 2015).

Limitations

Several limitations should be considered when interpreting the findings of this scoping review. First, although the 17 studies analysed spanned four countries, their geographical distribution was limited. For instance, the review did not identify any studies from Spanish or Portuguese-speaking contexts. This gap may reflect a scarcity of published research in these regions and restricts the cross-cultural generalisability of the findings, despite the growing international recognition of aided augmented input as an intervention approach.

Second, the inherent heterogeneity of ASD (Mottron & Bzdok, 2020), combined with variability in educational and clinical service delivery systems across countries, complicates the formulation of definitive conclusions. Although positive outcomes were consistently reported, differences in participant characteristics—such as verbal status, intellectual functioning, and prior AAC experience (Brady et al., 2015; Finke et al., 2017)—as well as contextual variables and implementation practices (Dorney & Erickson, 2019; Harjusola-Webb & Robbins, 2012) limit the extent to which results can be generalised. In

addition, most studies included small samples, and several relied on single-case designs with one or very few participants (e.g., Emerson & Dearden, 2013; Lorah, Karnes, & Speight, 2015; Trottier, Kamp, & Mirenda, 2011). While this is common and methodologically appropriate in AAC research (Biggs, Carter & Gilson, 2018), small sample sizes inevitably constrain external validity. At the same time, recruitment challenges are understandable given the diversity of diagnoses, age ranges, communicative profiles, and levels of support needs required to meet inclusion criteria.

A further limitation concerns the heterogeneity of outcome measures. The reviewed studies employed a wide range of observational checklists (e.g., Schlosser et al., 2013; Remner et al., 2016), standardised assessments such as the CARS or PPVT-4 (Allen et al., 2021; Hassim, 2019; Ngwira, 2019), and researcher-developed probes tailored to specific intervention targets (Brady et al., 2015; Laher & Dada, 2023). This variability limited direct comparability across studies and precluded the possibility of conducting a quantitative meta-analytic synthesis. Intervention fidelity was also inconsistently reported. Although some studies described modelling procedures in detail (e.g., Schlosser et al., 2013; Muttiah et al., 2022), only a minority quantified the exact proportion of aided models delivered or systematically verified adherence to modelling protocols. The absence of detailed fidelity data makes it difficult to determine which specific components of the intervention are responsible for the reported gains and limits replication efforts.

Implications

Building on the reviewed evidence, the findings of this scoping review point toward a set of interrelated and testable research directions that can help advance the field beyond descriptive accounts of effectiveness. A central issue concerns the role of input dosage, as several studies suggest that more intensive exposure to aided augmented input may be associated with stronger gains in both receptive and expressive language. Future research would benefit from systematically manipulating modelling density to determine whether there are threshold effects or optimal dosage ranges, while also accounting for individual variability in responsiveness.

Closely related to this, the variability observed across AAC modalities highlights the need for more fine-grained comparative research. Although both static and dynamic visual supports appear to facilitate language development, their relative effectiveness may depend on the linguistic target, task demands, and learner characteristics. Investigating how different AAC formats support specific aspects of language (e.g., spatial relations or multi-symbol production) could provide more precise guidance for intervention design, particularly for children with lower baseline receptive abilities.

Another key direction involves the temporal dimension of intervention effects. The predominance of short- to medium-term studies limits our understanding of whether early improvements in symbolic communication are maintained over time and whether they generalise to broader domains such as social participation and behavioural regulation. Longitudinal approaches are therefore needed to examine developmental trajectories and to clarify the extent to which early communication gains translate into sustained functional outcomes.

These research priorities are particularly relevant in the context of ASD, where AAC plays a critical role across clinical, educational, and social settings (Holyfield et al., 2017; Llaneza et al., 2010). The diversity of AAC systems and their design features can substantially influence user performance and learning outcomes (Agius, Stansfield & Murray, 2024; Lorah et al., 2022), underscoring the importance of identifying not only whether aided augmented input is effective, but under which conditions and for whom. In this sense, the variability observed across studies reinforces the need to move away from a “one-size-fits-all” perspective and toward more individualised and context-sensitive intervention approaches.

In line with this, the evidence consistently suggests that aided augmented input is most effective when embedded within naturalistic and interactive contexts, where visual supports are integrated with spoken language to facilitate both comprehension and expression. These conditions appear to promote not only language development but also broader outcomes related to social interaction and behavioural adjustment, supporting the view that communication, social engagement, and behaviour are functionally interconnected domains (Salvadó et al., 2012). At the same time, the heterogeneity of participant responses indicates that intervention effects are mediated by individual characteristics, including baseline communicative abilities and access to appropriate supports.

The review also highlights several areas that remain insufficiently explored. In particular, more systematic comparisons across AAC tools are needed to determine their relative impact on learning efficiency, generalisation, and skill acquisition. Similarly, although some evidence points to positive effects on social and behavioural outcomes, these domains have not been examined as extensively or systematically as language outcomes, limiting the strength of current conclusions. Greater attention to

these dimensions would provide a more comprehensive understanding of the broader developmental impact of aided augmented input.

Finally, the rapid evolution of technology introduces an additional layer of complexity, as emerging digital tools and applications may alter both the accessibility and effectiveness of aided augmented input compared to more traditional resources, such as printed pictograms. Exploring how these technological developments interact with intervention variables represents a promising avenue for future research.

Overall, the implications of this review extend beyond identifying general trends, pointing instead to the need for hypothesis-driven research that systematically examines key variables such as input dosage, modality, intervention context, and individual differences. Advancing knowledge in these areas will be essential for moving from evidence of effectiveness toward the identification of optimal and personalised implementation strategies for aided augmented input in individuals with ASD.

CONCLUSION

In conclusion, aided augmented input represents a clinically actionable and theoretically grounded intervention approach for supporting communication development in children with ASD who have complex communication needs. Across the studies reviewed, consistent positive effects were documented in receptive language accuracy, expressive vocabulary growth, multi-symbol message production, and, in several cases, reductions in challenging behaviours and improvements in social participation. These findings support the systematic incorporation of aided modelling practices across educational, clinical, and home settings, with particular emphasis on training communication partners to deliver high-density, contextually embedded modelling with documented fidelity. At the same time, the field would benefit from adequately powered randomised controlled trials, standardised reporting of dosage and fidelity variables, and longitudinal studies examining maintenance and generalisation beyond structured intervention contexts. Future research should also prioritise culturally and linguistically diverse populations, particularly in Spanish- and Portuguese-speaking countries, where empirical evidence on aided augmented input remains scarce despite widespread clinical need. By advancing methodological rigor and expanding cross-cultural representation, future investigations can better define best-practice parameters and optimise implementation guidelines for diverse service systems.

REFERENCES

Agius, M. M., Stansfield, J., & Murray, J. (2024). A comparison of differing organizational formats for teaching requesting skills to children with autism. *Augmentative and Alternative Communication*, 1–12. https://doi.org/10.1080/07434618.2024.2370825

Alakhzami, M., & Chitiyo, M. (2022). Using functional communication training to reduce self-injurious behavior for individuals with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *52*(8), 3586–3597. https://doi.org/10.1007/s10803-021-05246-8

Allen, A. A., Shane, H. C., Schlosser, R. W., & Haynes, C. W. (2021). The effect of cue type on directive-following in children with moderate to severe autism spectrum disorder. *Augmentative and Alternative Communication*, *37*(3), 168–179. https://doi.org/10.1080/07434618.2021.1930154

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.).

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Biggs, E. E., Carter, E. W., & Gilson, C. B. (2018). Systematic review of interventions involving aided AAC modeling for children with complex communication needs. *American Journal on Intellectual and Developmental Disabilities*, *123*(5), 443–473. https://doi.org/10.1352/1944-7558-123.5.443

Blair, K. S. C., Park, E. Y., & Risse, M. R. (2025). A meta-analysis of functional communication training for young children with ASD and challenging behavior in natural settings. *Behavioral Sciences*, *15*(12), Article 1688. https://doi.org/10.3390/bs15121688

Brady, N. C., Storkel, H. L., Bushnell, P., Barker, R. M., Saunders, K., Daniels, D., & Fleming, K. (2015). Investigating a multimodal intervention for children with limited expressive vocabularies associated with autism. *American Journal of Speech-Language Pathology*, *24*(3), 438–459. https://doi.org/10.1044/2015_AJSLP-14-0093

Calleja Reina, M., & Rodríguez, J. M. (2018). La comunicación aumentativa y alternativa para hacer frente a las necesidades complejas de comunicación en usuarios de bajo perfil cognitivo. In E. Postigo Pinazo, M. Calleja Reina, & E. Gabau Vila (Eds.), *Disability and communication. Scientific analysis, total communication and ICT tools and case studies* (pp. 163–174). McGraw-Hill Education.

Cerpa Reyes, C., Jorquera Arellano, L., & Toro Lisboa, J. (2023). Comunicación aumentativa alternativa para una educación inclusiva: Experiencias y desafíos. *Revista Latinoamericana de Educación Inclusiva*, *17*(1), 95–110. https://doi.org/10.4067/s0718-73782023000100095

Chazin, K. T., Ledford, J. R., & Pak, N. S. (2021). A systematic review of augmented input interventions and exploratory analysis of moderators. *American Journal of Speech-Language Pathology*, *30*(3), 1210–1223. https://doi.org/10.1044/2020_AJSLP-20-00102

Dorney, K. E., & Erickson, K. (2019). Transactions within a classroom-based AAC intervention with preschool students with autism spectrum disorders: A mixed-methods investigation. *Exceptionality Education International*, *29*(2). https://doi.org/10.5206/eei.v29i2.9401

Drager, K. D. (2009). Aided modeling interventions for children with autism spectrum disorders who require AAC. *Perspectives on Augmentative and Alternative Communication*, *18*(4), 114–120. https://doi.org/10.1044/aac18.4.114

Drager, K. D., Postal, V. J., Carrolus, L., Castellano, M., Gagliano, C., & Glynn, J. (2006). The effect of aided language modeling on symbol comprehension and production in 2 preschoolers with autism. *American Journal of Speech-Language Pathology*, *15*(2), 112–125. https://doi.org/10.1044/1058-0360(2006/012

Du, G., Guo, Y., & Xu, W. (2024). The effectiveness of applied behavior analysis program training on enhancing autistic children's emotional-social skills. *BMC Psychology*, *12*(1), Article 568. https://doi.org/10.1186/s40359-024-02045-5

Dunn, L. M., & Dunn, D. M. (2007). *PPVT-4: Peabody picture vocabulary test*. Pearson Assessments.

Durán Cuartero, S. (2021). Technologies for teaching and learning of students with autism spectrum disorder: A systematic review. *Innoeduca. International Journal of Technology and Educational Innovation*, *7*(1), 107–121. https://doi.org/10.24310/innoeduca.2021.v7i1.9771

Edgar, T. C., Schlosser, R., & Koul, R. (2024). Effects of an augmentative and alternative communication intervention package on socio-communicative behaviors between minimally speaking autistic children and their peers. *American Journal of Speech-Language Pathology*, *33*(4), 1619–1638. https://doi.org/10.1044/2024_AJSLP-23-00313

Emerson, A., & Dearden, J. (2013). The effect of using 'full' language when working with a child with autism: Adopting the 'least dangerous assumption'. *Child Language Teaching and Therapy*, *29*(2), 233–244. https://doi.org/10.1177/0265659012463370

Fenson, L., Marchman, V. A., Thal, D. J., Dale, P. S., Reznick, J. S., & Bates, E. (2007). *MacArthur-Bates communicative development inventories: User's guide and technical manual* (2nd ed.). Paul H. Brookes.

Finke, E. H., Davis, J. M., Benedict, M., Goga, L., Kelly, J., Palumbo, L., ... & Waters, S. (2017). Effects of a least-to-most prompting procedure on multi-symbol message production in children with autism spectrum disorder who use augmentative and alternative communication. *American Journal of Speech-Language Pathology*, *26*(1), 81–98. https://doi.org/10.1044/2016_AJSLP-14-0187

Ganz, J. B., Earles-Vollrath, T. L., Mason, R. A., Rispoli, M. J., Heath, A. K., & Parker, R. I. (2011). An aggregate study of single-case research involving aided AAC: Participant characteristics of individuals with autism spectrum disorders. *Research in Autism Spectrum Disorders*, *5*(4), 1500–1509. https://doi.org/10.1016/j.rasd.2011.02.011

Gibson, J. L., Pritchard, E., & de Lemos, C. (2021). Play-based interventions to support social and communication development in autistic children aged 2–8 years: A scoping review. *Autism & Developmental Language Impairments*, *6*. https://doi.org/10.1177/23969415211015840

Goossens, C., & Crain, S. (1986). Establishing multiple communication displays. *Augmentative Communication: An Introduction*, 337–344.

Harjusola-Webb, S. M., & Robbins, S. H. (2012). The effects of teacher-implemented naturalistic intervention on the communication of preschoolers with autism. *Topics in Early Childhood Special Education*, *32*(2), 99–110. https://doi.org/10.1177/0271121410397060

Hassim, R. (2019). *Effects of varied dosage of aided input on following directives that contain prepositions for children with Autism Spectrum Disorder (ASD)* [Doctoral dissertation, University of Pretoria]. DSpace. https://repository.up.ac.za/handle/2263/76855

Holyfield, C., Drager, K. D., Kremkow, J. M., & Light, J. (2017). Systematic review of AAC intervention research for adolescents and adults with autism spectrum disorder. *Augmentative and Alternative Communication*, *33*(4), 201–212. https://doi.org/10.1080/07434618.2017.1370495

Jensen de López, K. M., Kraljević, J. K., & Struntze, E. L. B. (2022). Efficacy, model of delivery, intensity and targets of pragmatic interventions for children with developmental language disorder: A systematic review. *International Journal of Language & Communication Disorders*, *57*(4), 764–781. https://doi.org/10.1111/1460-6984.12716

Kasari, C., Kaiser, A., Goods, K., Nietfeld, J., Mathy, P., Landa, R., ... & Almirall, D. (2014). Communication interventions for minimally verbal children with autism: A sequential multiple assignment

randomized trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, *53*(6), 635–646. https://doi.org/10.1016/j.jaac.2014.01.019

Laher, Z., & Dada, S. (2023). The effect of aided language stimulation on the acquisition of receptive vocabulary in children with complex communication needs and severe intellectual disability: A comparison of two dosages. *Augmentative and Alternative Communication*, 1–14. https://doi.org/10.1080/07434618.2022.2155566

Landa, R. J. (2018). Efficacy of early interventions for infants and young children with, and at risk for, autism spectrum disorders. *International Review of Psychiatry*, *30*(1), 25–39. https://doi.org/10.1080/09540261.2018.1432574

Light, J., & McNaughton, D. (2014). Communicative competence for individuals who require augmentative and alternative communication: A new definition for a new era of communication?. *Augmentative and Alternative Communication*, *30*(1), 1–18. https://doi.org/10.3109/07434618.2014.885080

Llaneza, D. C., DeLuke, S. V., Batista, M., Crawley, J. N., Christodulu, K. V., & Frye, C. A. (2010). Communication, interventions, and scientific advances in autism: A commentary. *Physiology & Behavior ℵ*, *100*(3), 268–276. https://doi.org/10.1016/j.physbeh.2010.01.003

Lorah, E. R., Holyfield, C., Griffen, B., & Caldwell, N. (2024). A systematic review of evidence-based instruction for individuals with autism using mobile augmentative and alternative communication technology. *Review Journal of Autism and Developmental Disorders*, *11*(1), 210–224. https://doi.org/10.1007/s40489-022-00334-6

Lorah, E. R., Holyfield, C., Miller, J., Griffen, B., & Lindbloom, C. (2022). A systematic review of research comparing mobile technology speech-generating devices to other AAC modes with individuals with autism spectrum disorder. *Journal of Developmental and Physical Disabilities*, *34*(2), 187–210. https://doi.org/10.1007/s10882-021-09803-y

Lorah, E. R., Karnes, A., & Speight, D. R. (2015). The acquisition of intraverbal responding using a speech generating device in school aged children with autism. *Journal of Developmental and Physical Disabilities*, *27*, 557–568. https://doi.org/10.1007/s10882-015-9436-2

Lord, C., Rutter, M., DiLavore, P. C., Risi, S., Gotham, K., & Bishop, S. L. (1999). *ADOS: Autism diagnostic observation schedule. Manual*. Western Psychological Services.

McFadden, B., Kamps, D., & Heitzman-Powell, L. (2014). Social communication effects of peer-mediated recess intervention for children with autism. *Research in Autism Spectrum Disorders*, *8*(12), 1699–1712. https://doi.org/10.1016/j.rasd.2014.08.015

Moorcroft, A., Scarinci, N., & Meyer, C. (2018). A systematic review of the barriers and facilitators to the provision and use of low-tech and unaided AAC systems for people with complex communication needs and their families. *Disability and Rehabilitation: Assistive Technology*, *14*(7), 710–731. https://doi.org/10.1080/17483107.2018.1499135

Mottron, L., & Bzdok, D. (2020). Autism spectrum heterogeneity: Fact or artifact? *Molecular Psychiatry*, *25*(12), 3178–3185. https://doi.org/10.1038/s41380-020-0748-y

Muttiah, N., Drager, K. D., Beale, B., Bongo, H., & Riley, L. (2022). The effects of an intervention using low-tech visual scene displays and aided modeling with young children with complex communication needs. *Topics in Early Childhood Special Education*, *42*(1), 91–104. https://doi.org/10.1177/0271121419844825

Ngwira, S. P. T. (2019). *The effects of quantity of aided input on the accuracy of instruction following in children with Autism Spectrum Disorder* [Doctoral dissertation, University of Pretoria]. DSpace. https://repository.up.ac.za/handle/2263/76747

Park, M. N., Moulton, E. E., & Laugeson, E. A. (2023). Parent-assisted social skills training for children with autism spectrum disorder: PEERS for preschoolers. *Focus on Autism and Other Developmental Disabilities*, *38*(2), 80–89. https://doi.org/10.1177/10883576221110158

Pereira, E. T., Montenegro, A., Rosal, A., & Walter, C. (2020). Augmentative and Alternative Communication on Autism Spectrum Disorder: Impacts on communication. *CoDAS*, *32*(6), Article e20190167. https://doi.org/10.1590/2317-1782/20202019167

Remner, R., Baker, M., Karter, C., Kearns, K., & Shane, H. (2016). Use of augmented input to improve understanding of spoken directives by children with moderate to severe autism spectrum disorder. *eHEARSAY: Journal of the Ohio Speech Language Hearing Association*, *6*(3), 4–10.

Rowland, C. (2013). *Communication Matrix for parents and professionals: Handbook: Online Communication Matrix*. Oregon Health and Science University. https://www.communicationmatrix.org/Uploads/Pdfs/Handbook.pdf

Salvadó, B., Palau Baduell, M., Clofent Torrentó, M., Montero Camacho, M., & Hernández Latorre, M. A. (2012). Modelos de intervención global en personas con trastorno del espectro autista. *Revista de Neurología*, *54*(Supl. 1), S63–S71. https://doi.org/10.33588/rn.54S01.2011710

Scarcella, I., Marino, F., Failla, C., Doria, G., Chilà, P., Minutoli, R., ... & Pioggia, G. (2023). Information and communication technologies-based interventions for children with autism spectrum conditions: A systematic review of randomized control trials from a positive technology perspective. *Frontiers in Psychiatry*, *14*, Article 1212522. https://doi.org/10.3389/fpsyt.2023.1212522

Schlosser, R. W., Laubscher, E., Sorce, J., Koul, R., Flynn, S., Hotz, L., ... & Shane, H. (2013). Implementing directives that involve prepositions with children with autism: A comparison of spoken cues with two types of augmented input. *Augmentative and Alternative Communication*, *29*(2), 132–145. https://doi.org/10.3109/07434618.2013.784928

Schopler, E., Reichler, R. J., & Renner, B. R. (2010). *The Childhood Autism Rating Scale (CARS)*. Western Psychological Services.

Sennott, S. C., Light, J. C., & McNaughton, D. (2016). AAC modeling intervention research review. *Research and Practice for Persons with Severe Disabilities*, *41*(2), 101–115. https://doi.org/10.1177/1540796916638822

Shi, B., Wu, W., Dai, M., Zeng, J., Luo, J., Cai, L., ... & Jing, J. (2021). Cognitive, language, and behavioral outcomes in children with autism spectrum disorders exposed to early comprehensive treatment models: A meta-analysis and meta-regression. *Frontiers in Psychiatry*, *12*, Article 691148. https://doi.org/10.3389/fpsyt.2021.691148

Sparrow, S. S., Cicchetti, D. V., & Balla, D. A. (2005). *Vineland-II adaptive behavior scales, second edition, survey forms manual*. PsychCorp.

Sutton, B. M., Webster, A. A., & Westerveld, M. F. (2019). A systematic review of school-based interventions targeting social communication behaviors for students with autism. *Autism*, *23*(2), 274–286. https://doi.org/10.1177/1362361317753564

Therrien, M. C., Light, J., & Pope, L. (2016). Systematic review of the effects of interventions to promote peer interactions for children who use aided AAC. *Augmentative and Alternative Communication*, *32*(2), 81–93. https://doi.org/10.3109/07434618.2016.1146331

Tricco, A. C., Lillie, E., Zarin, W., O'Brien, K. K., Colquhoun, H., Levac, D., ... & Straus, S. E. (2018). PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation. *Annals of Internal Medicine*, *169*(7), 467–473. https://doi.org/10.7326/M18-0850

Trottier, N., Kamp, L., & Mirenda, P. A. T. (2011). Effects of peer-mediated instruction to teach use of speech-generating devices to students with autism in social game routines. *Augmentative and Alternative Communication*, *27*(1), 26–39. https://doi.org/10.3109/07434618.2010.546810

Wandin, H., Tegler, H., Svedberg, L., & Johnels, L. (2023). A scoping review of aided AAC modeling for individuals with developmental disabilities and emergent communication. *Current Developmental Disorders Reports*, *10*(2), 123–131. https://doi.org/10.1007/s40474-023-00275-7

World Health Organization. (2023). *Autism*. https://bit.ly/4dvUOwU

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Translation, Adaptation, and Validation of the Emotion Beliefs Questionnaire for the Portuguese Population (EBQ-P)

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Abstract: Beliefs about emotions, particularly their controllability and usefulness, shape emotion-regulation strategies and psychological well-being. This study aimed to translate, adapt, and validate the Emotion Beliefs Questionnaire (EBQ) for European Portuguese (EBQ-P), following the International Test Commission guidelines. Data from 373 adults (81.5% female; M = 43.87 years) were analysed. Exploratory (n = 183) and confirmatory (n = 190) factor analyses supported a four-factor structure (Negative Controllability, Positive Controllability, Negative Usefulness, and Positive Usefulness), consistent with recent international validations. The four-factor model showed acceptable fit (CFI = .91, TLI = .90, SRMR = .06, RMSEA = .09). Internal consistency ranged from modest to excellent (Cronbach's α = .57–.92; McDonald's ω = .59–.91). Negative emotions were perceived as more controllable than positive emotions, whereas positive emotions were perceived as more useful. Overall, the EBQ-P shows sound psychometric properties and provides a reliable, valid instrument for assessing emotion beliefs in the Portuguese population.

Keywords: *emotion beliefs questionnaire, beliefs about emotions, validation, psychometrics*

Individuals' beliefs about emotions play a fundamental role in how people interpret, respond to, and regulate emotional experiences, both their own and those of others. These beliefs influence whether individuals view emotions as meaningful, manageable, or disruptive and, as a result, shape the strategies they use to regulate emotions in daily life. For example, individuals who see emotions as controllable are more likely to engage in adaptive strategies such as cognitive reappraisal, whereas those who view emotions as uncontrollable may rely more on suppression or avoidance (Deplancke et al., 2022; Vuillier et al., 2021).

While a wide range of beliefs about emotions can be identified, two dimensions have received particular attention in recent research and are considered conceptually distinct and foundational: (a) beliefs about the controllability of emotions and (b) beliefs about the usefulness of emotions (Ford & Gross, 2018, 2019). Controllability beliefs refer to whether individuals perceive emotions as modifiable through intentional effort, whereas usefulness beliefs concern whether emotions, positive or negative, are viewed as beneficial or detrimental in achieving goals or navigating social situations. These two dimensions can be meaningfully crossed with emotional valence, yielding beliefs about the controllability or usefulness of positive and negative emotions separately, a structure that has been increasingly supported across cultures (e.g., Johnston et al., 2024; Ranjbar et al., 2023).

Emotion beliefs have important implications for psychological functioning. For instance, Ford and colleagues (2018) found that individuals who believed their emotions were uncontrollable reported higher levels of depressive symptoms, potentially because these beliefs undermine motivation to regulate emotions effectively. Similarly, evaluations of emotional usefulness predict emotional well-being: individuals who see positive emotions as valuable report higher psychological health, whereas those who view negative emotions as harmful tend to report worse outcomes (Willroth et al., 2023).

According to Ford and Gross (2019), these beliefs are shaped by early life experiences, parenting practices, and cultural norms through socialisation processes. Parents influence children's emotion beliefs through emotion-related conversations, modelling of emotional behaviour, and responses to children's emotions. For example, emotion-coaching parenting predicts greater emotional understanding and a belief that emotions are manageable, whereas dismissing or punitive responses can foster beliefs that emotions are overwhelming or unhelpful (Gottman et al., 1996; Dunsmore et al., 2009).

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At a broader level, cultural contexts play a central role in shaping emotion beliefs (Mesquita, 2001; Uchida et al., 2004). Some cultural frameworks encourage the expression of negative emotions as a signal of authenticity or relational attunement, whereas others interpret these same emotions as socially inappropriate or personally undesirable. These sociocultural norms not only shape how emotions are interpreted but also influence how individuals respond to the emotions of others, contributing to shared emotional climates and societal patterns of emotional behaviour (Barrett, 2017).

Emotion beliefs influence not only intrapersonal regulation but also social interaction. People who believe emotions are controllable tend to offer greater emotional support, respond more constructively to the emotions of others, and show higher empathy and prosocial behaviour (e.g., Smith et al., 2023). Conversely, fixed or negative beliefs about emotions are associated with avoidance, interpersonal withdrawal, and suppression in social encounters (Tamir et al., 2007; Ford et al., 2018). In applied settings such as education, teachers' and parents' beliefs about emotions shape how they respond to children's emotional expressions, influencing emotional climates in classrooms and families (Hagan et al., 2020). Thus, emotion beliefs are central mechanisms not only in emotional functioning but also in interpersonal and social processes.

As emotion-related beliefs are not a unitary domain, several instruments have been created to capture different facets of these beliefs. Some of these instruments are: the Implicit Theories of Emotion Scale (ITES; Tamir et al., 2007), that measures beliefs about the malleability of emotions; the Emotion and Regulation Beliefs Scale (Veilleux et al., 2015), that assesses beliefs that emotions can hijack self-control, beliefs that emotion regulation is a worthwhile pursuit, and beliefs that emotions can constrain behaviour; the Evaluations of Emotions Scale (EVE; Netzer et al., 2018), that assesses the cognitive components of attitudes toward emotions; the Lay Theories of Emotion (Ben-Artzi & Mikulincer, 1996), that examine the attributes lay persons attach to emotional experiences; and the Perceived Utility of Emotion (Chow & Berenbaum, 2012), that measures the degree to which emotions are perceived to be useful in achieving goals.

Considering that we intended to assess beliefs about the controllability and usefulness of both positive and negative emotions, part of Ford & Gross (2018, 2019) framework, the Emotion Beliefs Questionnaire (EBQ; Becerra et al., 2020) was chosen, as it is the only measure available, at the best of our knowledge, designed to assess these two theoretically central belief dimensions, crossing with emotional valence.

The present study

The present study aimed to translate, culturally adapt, and validate the Emotion Beliefs Questionnaire (EBQ; Becerra et al., 2020) for the Portuguese adult population. The EBQ is a 16-item self-report instrument designed to assess individuals' beliefs about the controllability and usefulness of emotions, across both positive and negative valences.

To date, the EBQ has been adapted for several cultural contexts, including Italian (Rogier et al., 2023), Norwegian (Raanes et al., 2024), Iranian/American (Ranjbar et al., 2023), English-speaking community samples (Johnston et al., 2024), German (Gutzweiler & Grüning, 2025), Polish (Larionow et al., 2024), and Japanese (Kashimura et al., 2023).

These studies consistently followed a confirmatory approach, relying only on CFA to test the suitability of the original factor structure in each new context. In contrast, the present study adopted a two-stage analytic strategy, incorporating both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to examine the EBQ's latent structure that naturally emerged in the Portuguese population, before imposing any specific model. This distinction is especially relevant for cross-cultural adaptation, where linguistic nuance, cultural norms, and emotion socialisation practices may influence how constructs are represented (Mesquita, 2001; Ford & Gross, 2019). Accordingly, the EFA was used as an initial diagnostic tool to evaluate whether the conceptual dimensions proposed by the original authors would replicate or require adjustment in the Portuguese context, followed by CFA to formally test the resulting structure

While some earlier adaptations also included additional psychological measures to investigate convergent or predictive validity, the present study intentionally focused on establishing linguistic, conceptual, and structural equivalence, following the International Test Commission's guidelines for test translation and adaptation (ITC, 2017). Establishing a robust internal structure is an essential first step before extending validation to related constructs such as emotion regulation, well-being, or psychopathology.

By combining a culturally grounded translation process with both exploratory and confirmatory analyses, this study provides a comprehensive foundation for the use of the EBQ in Portuguese-speaking

contexts and supports future work exploring more differentiated belief systems, including beliefs tied to discrete emotions rather than broad valence categories.

METHOD

Participants

A total of 476 adults were recruited through online social platforms and academic networks. Only participants who indicated they were of Portuguese nationality were included in the analyses. Of these, 70 were excluded due to incomplete responses, 29 for failing an attention check (where participants had to select a specific Likert-scale point, as in the original study), and 3 for being identified as statistical outliers.

The final sample consisted of 373 participants. This sample size exceeds recommended guidelines for factor analysis of instruments with 16 items and meets the 10:1 participant-to-item ratio typically required for confirmatory factor analysis (Costello & Osborne, 2005; Kline, 2016). The sample included 304 women (81.5%) and 69 men (18.5%), reflecting a gender imbalance which is acknowledged as a limitation for potential invariance analyses. The mean age was 43.87 years (SD = 10.30). Regarding educational background, 76.60% held a university degree (50.1% bachelor's, 27.1% master's, and 2.4% doctoral), while 19% had completed secondary education and 1.3% basic education.

Translation and Adaptation Procedure

The translation process followed the guidelines of the International Test Commission (ITC, 2017), recognised as the international gold standard for instrument translation and cultural adaptation. A double-translation and reconciliation procedure was employed involving five translators. Two translators conducted independent forward translations, followed by a backward translation by a third translator. Finally, a panel of two experts in psychological assessment and emotion theory resolved discrepancies, ensuring both linguistic and conceptual equivalence. All were fluent in both languages (English and Portuguese) and with a background in psychology. No major cultural adaptations were required during this process.

Procedure

Data were collected online in two independent waves using Qualtrics. The first data collection occurred between December 2 and 12, 2024, and the second between October 22 and 27, 2025. Participants first accessed an information page describing the study's purpose, voluntary nature, confidentiality procedures, and estimated completion time, after which informed consent was obtained electronically.

Following consent, participants completed demographic questions and the 16-item EBQ-P in the same fixed order as the original instrument (Becerra et al., 2020), using a 7-point Likert scale (1 = Strongly disagree; 7 = Strongly agree). The average participation duration across both waves was approximately 5 minutes.

At the end of the questionnaire, participants were invited to comment on item clarity, with the following question: "Finally, we would like to know your opinion about the scale. Please indicate whether you experienced any difficulty in understanding any of the statements, or if you felt they were clear and well-formulated. Your opinion is very important to help us assess the clarity, comprehensibility, and adaptability of the scale."

Of the 373 participants, 46% did not provide comments and 47% indicated that the items were clear or easy to understand. The remaining noted the expected repetition arising from parallel items with opposite valences, and a few mentioned minor difficulties with negatively worded statements. Only four participants expressed uncertainty regarding distinctions between "controlling" and "managing" emotions. No single item was consistently flagged as problematic. These responses were reviewed prior to analysis and supported the linguistic adequacy and conceptual clarity of the adapted items.

The study adhered to the APA Ethical Principles of Psychologists and Code of Conduct (2017, Sec. 8.05a). Because the study involved anonymous, minimal-risk self-report questionnaires with no deception or sensitive content, formal ethics review was not required. All procedures complied with the General Data Protection Regulation (GDPR; EU 2016/679). Participation was voluntary, and no financial compensation was provided.

Statistical Analysis

Psychometric evaluation of the EBQ-P followed the methodological framework typically used in scale adaptation studies and in the original validation (Becerra et al., 2020), combining EFA, CFA, and reliability assessment.

To ensure robust structural validation, the full sample was randomly split in half. This approach reduces potential bias and enhances the generalisability of the factor structure across independent subsamples (Worthington & Whittaker, 2006). EFA was conducted on one subsample *(n* = 183) with IBM SPSS Statistics (version 30.0.0.0 for Mac), using principal axis factoring with direct oblimin rotation, given non-normal item distributions and the expectation of correlated factors. Sampling adequacy was assessed using the Kaiser-Meyer-Olkin (KMO) index and Bartlett's test of sphericity. Retention decisions were based on eigenvalues >1, scree plot inspection, item communalities, and factor loadings. We adopted conventional a priori thresholds: loadings ≥ .30 were considered salient, ≥ .40 strong; cross-loadings were flagged when an item loaded ≥ .30 on more than one factor with < .20 difference between loadings; communalities < .30 were examined for potential concern (Costello & Osborne, 2005; Field, 2018).

The resulting structure was then validated via CFA on the second subsample *(n* = 190) using JASP (version 0.19.2 for Mac). Maximum likelihood estimation assessed model fit via multiple indices: χ^2, CFI, TLI, RMSEA with 90% CI, and SRMR. Model fit was considered acceptable when CFI and TLI ≥ .90, RMSEA < .08, and SRMR < .08 (Hu & Bentler, 1999). In addition to the EBQ-P four-factor model supported by the EFA, we tested the three-factor model described in the original EBQ development (Becerra et al., 2020) to evaluate structural equivalence in the Portuguese context.

Internal consistency was evaluated using Cronbach's alpha (α) and McDonald's omega (*ω*), as recommended for scales with few items per factor. Average inter-item correlations (AIC), corrected item–total correlations**,** and part-whole corrected internal consistency were also computed. Criteria for interpretation followed Clark and Watson (1995) and Hajjar (2018): $\alpha \geq .70$ and AIC between .15 and .50 were considered acceptable.

To explore mean-level differences in emotion beliefs by valence, paired-samples t-tests were conducted comparing Negative vs. Positive Controllability and Negative vs. Positive Usefulness. Effect sizes were interpreted using Cohen's d (Cohen, 1988). All EBQ-P subscale scores were computed as the sum of their four constituent items (range 4–28), following the scoring procedure of the original EBQ validation (Becerra et al., 2020) and subsequent adaptations. All items were mandatory, preventing item-level missing data.

RESULTS

Exploratory Factor Analysis

Sampling adequacy was supported by a KMO value of .86, and Bartlett's test of sphericity was significant, $\chi^2(120) = 1391.60$, $p < .001$, indicating that the data were suitable for factor analysis.

Initial eigenvalue inspection suggested a three or four-factor solution, with eigenvalues of 1.48 and .98 respectively. After testing both solutions, we realised that the four-factor structure showed clearer and more interpretable patterns, with higher communalities and reduced cross-loading severity relative to the three-factor model.

The four extracted factors corresponded to: Negative Controllability (NC), Positive Controllability (PC), Negative Usefulness (NU), and Positive Usefulness (PU). These factors align with the multidimensional structure observed in the majority of international EBQ adaptations, including the American (Johnston et al., 2024), Italian (Rogier et al., 2023), Iranian/American (Ranjbar et al., 2023), Japanese (Kashimura et al., 2023), Polish (Larionow et al., 2024), and German (Gutzweiler & Grüning, 2025) validations.

Communalities were generally strong, except for two items that were < .30 (EBQ4 and EBQ16). All items loaded primarily on their intended factors, except for items EBQ6 and EBQ13 that displayed cross-loadings ≥ .30 on both factors. This pattern is not unique to the Portuguese version, as in the original validation (Becerra et al., 2020), EBQ6 also displayed a small secondary loading (> .20) on a different factor, suggesting that this wording can be slightly complex across samples. Moreover, no subsequent adaptation conducted an EFA, so the absence of reported cross-loadings in other versions reflects a lack of exploratory analyses rather than evidence that these items behave perfectly. From a psychometric standpoint, having a very small number of modest cross-loadings is expected in applied factor analysis with oblique rotation (Beauducel & Hilger, 2023; Costello & Osborne, 2005). Because recommendations emphasise prioritising overall simple structure and theoretical interpretability, rather than demanding perfectly "pure" items (e.g., Costello & Osborne, 2005). In addition, removing EBQ6 and EBQ13 would break the conceptual and linguistic symmetry between positive and negative controllability (the items are parallel, differing only in emotional valence), would reduce the coverage of a central aspect of the construct, namely beliefs about controllability, and undermine comparability with the original EBQ and all published adaptations, which retained all 16 items, we opted to retain EBQ6 and EBQ13, while explicitly acknowledging this minor deviation from ideal simple structure as a limitation of the measure.

Overall, the four-factor model accounted for 64.84% of the total variance. Given its superior interpretability, higher communalities, and theoretical alignment with current cross-cultural findings, this solution was retained for subsequent CFA testing.

Full, unsuppressed pattern matrices and communalities for all items (including low-magnitude loadings) are presented in the Supplementary Material, in accordance with best practices for EFA reporting.

Table 1. Factor Loadings from an Exploratory Factor Analysis of the Items of the EBQ-P

Item	Factor 1(Negative-usefulness)	Factor 2(Positive-usefulness)	Factor 3(Negative-controllability)	Factor 4(Positive-controllability)
Item 15	.858			
Item 7	.844			
Item 11	.810			
Item 3	.760			
Item 13	.425		-.408	
Item 6	.392			-.365
Item 8		.806		
Item 12		.535		
Item 4		.463		
Item 16		.463		
Item 5			-.729	
Item 1			-.723	
Item 9			-.512	
Item 10				-.742
Item 14				-.615
Item 2				-.412

Note. Factor loadings < .30 are suppressed for clarity in this table. The full, unsuppressed pattern matrix is provided in the Supplementary Material. Extraction Method: Principal Axis Factoring. Rotation Method: Oblimin with Kaiser Normalisation. Four factors were extracted (fixed number of factors) accounting for 64.84% of the variance in item scores.

Confirmatory Factor Analysis

Confirmatory factor analysis was conducted in JASP on the second subsample *(n* = 190), examining two models. The original three-factor model proposed by Becerra et al. (2020) (Model 1) and the four-factor structure suggested by our EFA results and subsequent international adaptations (Model 2). This analytic strategy is consistent with prior EBQ validation studies, which have relied on CFA to examine the instrument's structure within different cultural and linguistic contexts. Figure 1 provides a visual representation of both models, and Table 2 presents the corresponding fit indices.

In the original development study of EBQ (Becerra et al., 2020), the three-factor model (General Controllability, Negative Usefulness, Positive Usefulness) demonstrated acceptable fit, and its adoption over the four-factor alternative was justified on the basis of (a) statistically similar fit, (b) very high correlations between Negative and Positive Controllability, and (c) the parsimony principle, which recommends selecting the simpler structure when models are equivalent.

In contrast, when tested in the Portuguese sample, the same three-factor model (Model 1) did not reach acceptable fit levels (CFI = .866; TLI = .840; RMSEA = .105; SRMR = .069). This pattern indicates that, unlike in the original study, collapsing positive and negative controllability into a single factor does not adequately represent the structure of emotion beliefs in Portuguese adults.

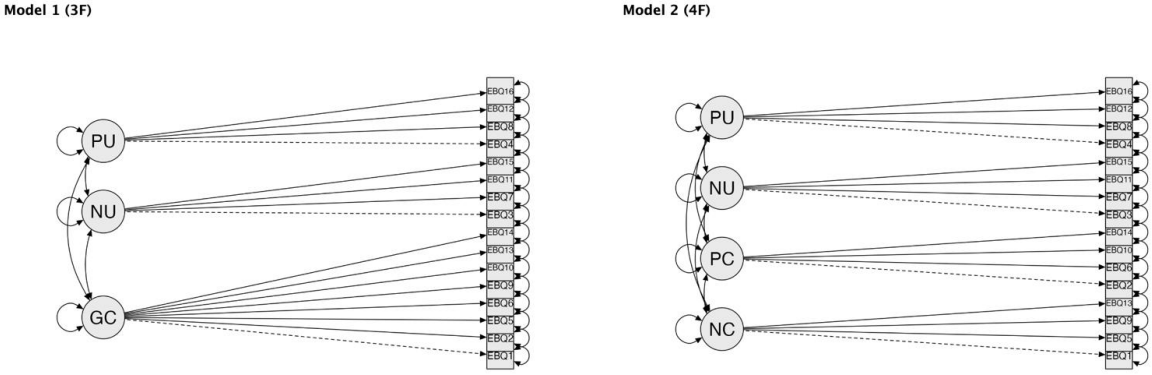
When examining the fully valence-specific four-factor model (Negative Controllability, Positive Controllability, Negative Usefulness, and Positive Usefulness), here as Model 2, it showed a substantial improvement over Model 1, meeting the recommended thresholds for acceptable model fit (CFI = .912; TLI = .892; RMSEA = .086; SRMR = .059). Additionally, the latent correlations demonstrated that although the two controllability dimensions were moderately related (*r* = .71), they were not collinear. Convergent and discriminant validity analyses reinforced this interpretation, as HTMT values between factors were well below conservative cut-offs (.18–.68), and no latent correlation approached problematic levels. These

results support the view that Positive and Negative Controllability reflect related yet empirically distinct belief domains.

Importantly, the superiority of the four-factor model in the Portuguese context aligns with patterns observed in more recent EBQ adaptations (e.g., German, Polish, Japanese), which have also reported evidence favouring valence-specific controllability factors. Thus, the present findings both replicate and extend the cross-cultural consistency of the EBQ structure.

Given its stronger empirical performance, conceptual clarity, and alignment with contemporary adaptations, the four-factor first-order model (Model 2) was retained as the final measurement model for the EBQ-P.

Figure 1 Visual Representation of the Various Confirmatory Factor Analysis Models Tested for the EBQ-P.



Note. Circles represent latent factors and squares represent items. GC = General-Controllability; NC = Negative-Controllability; PC = Positive-Controllability; NU = Negative-Usefulness; PU = Positive-Usefulness.

Table 2. Goodness-of-Fit Index Values For EBQ-P Models

Model	Factors	$\chi 2$ (df)	CFI	TLI	RMSEA (90% CI)	SRMR
1	3-factor	310.595 (190)	.866	.840	.105 [.091, .118]	.069
2	4-factor	235.177 (190)	.912	.892	.086 [.072, .100]	.059

Note. For all models, $\chi 2$ $p < .001$. $\chi 2$ = chi-square; *df* = degrees of freedom; CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; CI = confidence interval; SRMR = standardised root-mean-square residual; *n* = 190.

Reliability

Internal consistency of the EBQ-P was examined for each of the four subscales identified in the final measurement model. To provide a robust assessment of reliability for brief subscales, both Cronbach's alpha (α) and McDonald's omega (ω) were computed. Across the four dimensions, internal consistency coefficients ranged from acceptable to excellent. Negative Controllability, Positive Controllability, and Negative Usefulness displayed strong reliability (α range = .78–.92; ω range = .78–.91). Positive Usefulness showed the lowest internal consistency (α = .57; ω = .59). Inspection of item distributions revealed pronounced floor effects, as all four items in this dimension are reverse-keyed and strongly negatively phrased, producing extremely skewed response patterns. Most participants strongly disagreed with these statements, reflecting a broad cultural endorsement that positive emotions are useful. This compression of variance naturally attenuates inter-item correlations and leads to lower α and ω values, even when the items remain semantically coherent and theoretically aligned.

Similar patterns have emerged in multiple international adaptations, such as the Norwegian version that reported α = .64 (Raanes et al., 2024), and cross-cultural validation work comparing Iranian and U.S. adults (Ranjbar et al., 2023) found substantial variability in this subscale's reliability (α = .74 in Iran vs. .92 in the United States). In contrast, the original Australian validation (Becerra et al., 2020) and a subsequent psychometric study in U.S. samples (Johnston et al., 2024) reported higher internal consistency values (.83 and .84, respectively). Together, these findings suggest that reliability estimates for Positive Usefulness may be sensitive to linguistic and cultural nuances in how respondents interpret strongly worded statements about the usefulness of positive emotions or it may reflect some item-level functioning issues, and some items may require further refinement in the Portuguese context.

Within subscales, inter-item correlations ranged from -.03 to .82, with most values falling between .20 and .50, which indicates that, although the items are related, they also capture distinct aspects of the construct. The strongest correlation was observed between items 3 and 7 (r = .82), both belonging to the Negative Usefulness subscale, reflecting the internal coherence of that dimension.

Corrected item–total correlations exceeded the recommended threshold of .30 for all items, demonstrating that each item contributed meaningfully to its respective subscale (range = .32 –.85). Part–whole corrected internal consistency analyses further showed that removing any single item did not improve reliability for any subscale, supporting the adequacy of all items within the validated four-factor structure.

Descriptive statistics and internal consistency estimate for the EBQ-P subscales (α and ω) are presented in Table 3. Item-level descriptive statistics (means, standard deviations, skewness, and kurtosis) for all EBQ-P items as well as detailed part–whole corrected internal consistency coefficients (α and ω if item dropped) and item–rest correlations for each subscale are reported in the Supplementary Material.

Table 3. Descriptive Statistics and Internal Consistency Estimates for the EBQ-P

EBQ-P Subscale	1	2	3	4
1. Negative Controllability	—			
2. Positive Controllability	.59	—		
3. Negative Usefulness	.52	.60	—	
4. Positive Usefulness	.18	.19	.14	—
M	8.34	9.36	9.20	6.42
SD	3.46	4.01	5.23	2.68
N.º of items	4	4	4	4
α	.78	.80	.92	.57
ω	.78	.80	.91	.59
AIC	.48	.52	.73	.33

Note. All correlations were significant at $p < .01$. α = Cronbach's alpha; ω = McDonald's omega; AIC = Average Inter-Item Correlation. All subscale scores reflect summed items (range 4–28).

To assess differences in beliefs about the controllability and usefulness of negative versus positive emotions, two paired-samples t-tests were conducted. Given that all items are negatively phrased (e.g., "People cannot control their positive emotions"), higher scores indicate stronger beliefs that emotions are less controllable or less useful, whereas lower scores indicate stronger beliefs that emotions are more controllable or more useful.

A significant difference emerged between Negative Controllability and Positive Controllability, $t(372) = -5.73$, $p < .001$, $d = -.30$, 95% CI [–.40, –.19]. Participants endorsed significantly lower scores for Negative Controllability relative to Positive Controllability, indicating that they viewed negative emotions as more controllable than positive emotions. This pattern is consistent with findings from the original validation by Becerra et al. (2020) and aligns with theoretical accounts suggesting that individuals may perceive negative emotions as more amenable to regulation because they more frequently deploy regulatory strategies in response to these states (Ford & Gross, 2019).

A second paired-samples test showed a significant difference between Negative Usefulness and Positive Usefulness, $t(372) = 9.70$, $p < .001$, $d = .50$, 95% CI [.39, .61]. As expected, participants rated positive emotions as substantially more useful than negative emotions. The effect size observed in this Portuguese sample (d = .50) was larger than the value reported in the original validation by Becerra et al. (2020; d = .21), suggesting that Portuguese participants differentiate more strongly between the usefulness of positive and negative emotions.

Overall, the mean-level differences for both controllability and usefulness dimensions are consistent with prior EBQ literature and reinforce the construct validity of the four-factor structure. These findings further highlight that beliefs about emotions are valence-sensitive, with positive and negative emotions being evaluated differently in terms of how controllable and useful they are perceived to be.

DISCUSSION

The present study aimed to translate, adapt, and validate the Emotion Beliefs Questionnaire for the Portuguese population (EBQ-P). The findings support a four-factor structure that distinguishes beliefs about the controllability and usefulness of positive and negative emotions. This model demonstrated good

psychometric performance, with acceptable to excellent internal consistency across subscales, and good fit indices in confirmatory analyses. These results provide robust evidence that, in the Portuguese population, beliefs about emotions are valence-sensitive, and that separating controllability and usefulness across positive and negative emotions offers a more precise representation of the underlying construct.

A central contribution of this study lies in the systematic use of both exploratory and confirmatory factor analyses. In the original development of the EBQ, Becerra et al. (2020) tested both a three-factor and a fully valence-specific four-factor model and reported that the four-factor solution provided the best overall fit, although the two controllability factors were highly correlated. For reasons of parsimony, they retained a three-factor structure. Subsequent validations, however, have moved directly to CFA, with the Norwegian version supporting three factors (Raanes et al., 2024) and most other adaptations - Italian (Rogier et al., 2023), Japanese (Kashimura et al., 2023), German (Gutzweiler & Grüning, 2025), Polish (Larionow et al., 2024), and Iranian–U.S. (Ranjbar et al., 2023) - supporting a four-factor solution. This mixed pattern suggests that the underlying structure of the EBQ is not yet unequivocally established and may vary across cultural and methodological contexts.

Psychometric guidelines recommend that when no single clearly justified a priori model exists, researchers should allow the structure to emerge from the data rather than imposing it beforehand (Fabrigar et al., 1999; ITC, 2017). EFA is especially valuable in cross-cultural adaptation because it can detect translation nuances, cultural shifts in item functioning, and country-specific covariance patterns that may be obscured by a confirmatory-only approach. Once a plausible structure has been identified, CFA can be used to test that structure, ensuring that the final model is both theoretically grounded and empirically supported. In the present study, this sequential EFA and CFA strategy yielded a clear and interpretable four-factor solution that showed good fit without requiring correlated residuals, reinforcing the construct validity and cross-cultural robustness of the EBQ-P.

From a cross-cultural perspective, the Portuguese results align closely with most recent validations that favours a four-factor model. Italian, Japanese, German, and Polish studies all reported that distinguishing controllability and usefulness for positive and negative emotions improves fit and produces clearer factor loadings compared to more parsimonious structures (Rogier et al., 2023; Kashimura et al., 2023; Gutzweiler & Grüning, 2025; Larionow et al., 2024). Similarly, the Iranian–U.S. comparison supported a four-factor structure and demonstrated partial measurement invariance across cultures, suggesting a shared conceptual architecture of emotion beliefs that still allows meaningful cultural variability (Ranjbar et al., 2023). The present findings add Portugal to this growing set of countries in which a valence-specific representation of emotion beliefs is empirically justified. At the same time, the persistence of a three-factor solution in Norway (Raanes et al., 2024) reinforces the importance of allowing structural models to emerge empirically, as cultural and linguistic factors may influence whether positive and negative controllability are strongly differentiated.

The reliability pattern observed in the EBQ-P also mirrors international findings. Negative Controllability, Positive Controllability, and Negative Usefulness showed good to excellent internal consistency, in line with previous adaptations (e.g., Johnston et al., 2024; Kashimura et al., 2023; Rogier et al., 2023). By contrast, Positive Usefulness displayed more modest reliability, an effect also reported in Norway (Raanes et al., 2024) and in some non-Western samples (Ranjbar et al., 2023). This attenuation aligns with pronounced floor effects across cultures. All items are reverse-keyed and strongly worded, leading most participants to strongly reject statements implying that positive emotions have little usefulness (Kashimura et al., 2023; Johnston et al., 2024). This compression of variance reduces internal consistency despite adequate item–rest correlations. These converging observations suggest that cross-cultural differences in Positive Usefulness reflect meaningful variation in how strongly different societies endorse the inherent value of positive emotions.

The pattern of mean differences between subscales further situates the Portuguese data within the international literature. Consistent with the original validation (Becerra et al., 2020) and with subsequent work in Japanese, Italian, German, Iranian and U.S. samples (Kashimura et al., 2023; Rogier et al., 2023; Gutzweiler & Grüning, 2025; Johnston et al., 2024), Portuguese participants perceived negative emotions as more controllable and positive emotions as more useful. These differences align with emotion-regulation research suggesting that negative emotions more reliably trigger active regulatory efforts, whereas positive emotions are seen as inherently beneficial and less in need of regulation (Ford & Gross, 2019). The particularly strong distinction observed between positive and negative usefulness in the present study may indicate a salient cultural tendency among Portuguese adults to value the adaptive role of positive emotional experiences.

These empirical results can be interpreted through Ford and Gross's (2018, 2019) theoretical framework. Ford and Gross propose two superordinate emotion beliefs: the usefulness and controllability. Each can also operate at a more specific subordinate level, including distinctions across emotional valence.

In this framework, the four EBQ-P subscales represent valence-specific subordinate beliefs nested within broader superordinate beliefs. Emotion beliefs are theorised to guide each stage of Gross's extended process model of emotion regulation, namely identification, selection, implementation, and monitoring, by shaping whether people view emotions as meaningful, manageable, and worth regulating (Ford & Gross, 2019; Ford et al., 2023). Believing that negative emotions are controllable may promote adaptive regulation strategies such as reappraisal, whereas believing emotions to be uncontrollable is linked to increased avoidance and suppression and to poorer mental health outcomes (Ford & Gross, 2019; Kneeland et al., 2016). Similarly, believing emotions, especially negative ones, to be useless can heighten the desire to eliminate or avoid emotion, with potential long-term costs for psychological functioning (Ford & Gross, 2019; Ford et al., 2023).

Taken together, the findings demonstrate that the EBQ-P is a reliable and valid instrument for assessing emotion beliefs in the Portuguese context. The emergence of a valence-specific four-factor structure converges with most recent international validations and supports a differentiated representation of emotion beliefs across cultures. By integrating a rigorous EFA and CFA strategy with a theoretically grounded model, this study clarifies the latent structure of the EBQ and underscores the relevance of examining beliefs about the controllability and usefulness of different types of emotions.

Limitations and Future Directions

Although this study provides initial evidence for the structural validity and internal consistency of the Portuguese adaptation of the EBQ, there are some limitations that should be considered when interpreting the findings.

First, the sample consisted of Portuguese adults recruited through online convenience procedures and was strongly skewed toward women (81.5% female). Similar sampling constraints are reported in other EBQ validations, which frequently rely on student or community convenience samples and often overrepresent younger and female participants (e.g., Kashimura et al., 2023; Larionow et al., 2024; Raanes et al., 2024). This limits the generalisability of the results to the wider Portuguese population and restricts the capacity to test measurement invariance across demographic groups. Future research should aim to replicate these findings using more diverse and gender-balanced samples, ideally with probability-based or stratified recruitment strategies, and formally examine invariance across gender, age, education, and region.

Second, although the study targeted adults from the general population, no diagnostic or treatment information was collected. Consequently, it is not possible to determine how many participants might meet criteria for a mental disorder, and the applicability of the EBQ-P to clinical populations remains uncertain. Other adaptations likewise emphasise the need to extend validation to clinical groups and to test invariance across clinical and non-clinical samples (e.g., Larionow et al., 2024; Rogier et al., 2023). Future studies in the Portuguese context should therefore examine the EBQ-P in clinical settings (e.g., mood, anxiety, or eating disorders) to clarify whether mean levels and the factor structure of emotion beliefs differ across diagnostic categories and whether EBQ-P scores predict treatment response or relapse.

Third, as in most existing research, the present study employed a cross-sectional, self-report design. This precludes conclusions about the temporal stability or causal pathways between emotion beliefs, emotion regulation, and mental health outcomes. Longitudinal designs and test–retest assessments should be used in future work, to determine whether emotion beliefs function as stable traits or are subject to contextual or developmental changes.

Fourth, emotion beliefs were assessed only with self-report, and those beliefs may not always be fully explicit or consciously accessible. Theoretical accounts of emotion beliefs and the extended process model of emotion regulation suggest that some beliefs may be automatic or only partially accessible to conscious reflection (Ford & Gross, 2019). Combining the EBQ-P with behavioural tasks, experimental manipulations, or implicit measures may capture non-conscious aspects of these beliefs and provide a more complete picture of how they function as antecedents of regulation processes. This limitation is one that we intend to address in our next studies, trying to assess emotion beliefs creating implicit measures, as no measure still exists, for the best of our knowledge.

Finally, although the EBQ-P provides a theoretically grounded measure of emotion beliefs, it only assesses beliefs at the level of emotional valence (i.e., beliefs about positive vs. negative emotions in general). However, more recent research suggests that individuals may have different beliefs depending on the specific emotion (e.g., sadness), rather than valence category alone (e.g., negative). For instance, regarding beliefs about the usefulness of emotions, Gutentag et al. (2022) found that, in general, people consider some negative emotions (e.g., sadness) to be more useful than others (e.g., fear). Our results, like those of Becerra et al. (2020), show that participants viewed negative emotions as more controllable and positive emotions as more useful. However, these broad contrasts may conceal important nuances at the

level of discrete emotions. Future work in Portugal could therefore extend the EBQ-P by developing emotion-specific subscales (e.g., for sadness, anger, fear, enthusiasm) and examining whether such beliefs provide incremental prediction of regulation strategies and clinical outcomes beyond valence-based beliefs.

In summary, the present study lays a foundation for the use of the EBQ-P in the Portuguese context by establishing its factorial validity and internal reliability. Nonetheless, further work is required. As interest grows in understanding how emotions contribute to adaptive and maladaptive functioning, the EBQ-P, and future refinements that incorporate clinical samples, longitudinal designs, indirect measures, and emotion-specific scales, promises to be a valuable tool for both research and applied psychological practice in Portuguese populations.

Conclusion

The present study translated, adapted, and psychometrically validated the Emotion Beliefs Questionnaire for the Portuguese population, providing evidence for a valence-specific, four-factor structure that differentiates beliefs about the controllability and usefulness of positive and negative emotions. Using a sequential EFA–CFA strategy and following ITC guidelines for test adaptation, we showed that this structure offers good fit, satisfactory internal consistency for three subscales and acceptable reliability for Positive Usefulness, and coherent associations between factors and mean-level comparisons. In doing so, the EBQ-P joins the growing set of international adaptations that support a differentiated representation of emotion beliefs, while also clarifying the latent structure of the measure in a new linguistic and cultural context.

Beyond its psychometric contribution, the EBQ-P provides a theoretically grounded tool for examining how emotion beliefs function within Ford and Gross's broader framework, in which beliefs about the controllability and value of emotions guide downstream emotion-regulation choices and, ultimately, psychological adjustment. By enabling the assessment of beliefs about positive and negative emotions separately, the EBQ-P can help clarify why some individuals are more willing or motivated to regulate certain emotions, how these beliefs relate to adaptive and maladaptive regulation strategies, and how they contribute to mental health and well-being in Portuguese populations. As future research extends this work to clinical samples, longitudinal designs, indirect measures, and emotion-specific belief scales, the EBQ-P and its refinements are well-positioned to inform both basic research on emotion and applied efforts to design interventions that explicitly target dysfunctional beliefs about emotions.

SUPPLEMENTARY MATERIAL

The anonymised dataset, EBQ-P items, and analysis scripts are available at: https://osf.io/dw7ch/overview?view_only=351cbb5ed3b043079a3b2a11f1c979b2

REFERENCES

Barrett L. F. (2017). The theory of constructed emotion: an active inference account of interoception and categorization. *Social Cognitive and Affective Neuroscience*, *12*(1), 1–23. https://doi.org/10.1093/scan/nsw154

Beauducel, A., & Hilger, N. (2023). Robust oblique Target-rotation for small samples. *Frontiers in psychology*, *14*, 1285212. https://doi.org/10.3389/fpsyg.2023.1285212

Becerra, R., Preece, D. A., & Gross, J. J. (2020). Assessing beliefs about emotions: Development and validation of the Emotion Beliefs Questionnaire. *PloS one*, *15*(4), e0231395. https://doi.org/10.1371/journal.pone.0231395

Ben-Artzi, E., & Mikulincer, M. (1996). Lay Theories of Emotion: 1. Conceptualization and Measurement. *Imagination, Cognition and Personality, 15*(3), 249-271. https://doi.org/10.2190/K8HB-D3PB-L5K7-MHE6 (Original work published 1996)

Brown, T. A. (2015). Confirmatory factor analysis for applied research (2nd ed.). The Guilford Press.

Byrne, B. M. (2016). *Structural Equation Modelling with AMOS: Basic Concepts, Applications, and Programming (3rd ed.).* New York: Routledge.

Chen, F., Bollen, K. A., Paxton, P., Curran, P. J., & Kirby, J. B. (2001). Improper solutions in structural equation models: Causes, consequences, and strategies. *Sociological Methods & Research, 29(4)*, 468–508. https://doi.org/10.1177/0049124101029004003

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. Structural Equation Modeling, 9(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Chow, P. I., & Berenbaum, H. (2012). Perceived utility of emotion: The structure and construct validity of the Perceived Affect Utility Scale in a cross-ethnic sample. *Cultural Diversity & Ethnic Minority Psychology, 18*(1), 55–63. https://doi.org/10.1037/a0026711

Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7*(3), 309–319. https://doi.org/10.1037/1040-3590.7.3.309

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2 ed.)*. Lawrence Erlbaum Associates.

Costello, A. B., & Osborne, J. (2005). Best Practices in Exploratory Factor Analysis: Four Recommendations for Getting the Most from Your Analysis. *Practical Assessment Research & Evaluation, 10*, 1-9.

Deplancke, C., Somerville, M. P., Harrison, A., & Vuillier, L. (2022). It's all about beliefs: Believing emotions are uncontrollable is linked to symptoms of anxiety and depression through cognitive reappraisal and expressive suppression. *Current Psychology*. https://doi.org/10.1007/s12144-022-03252-2

Dunsmore, J. C., Her, P., Halberstadt, A. G., & Perez-Rivera, M. B. (2009). Parents' beliefs about emotions and children's recognition of parents' emotions. *Journal of Nonverbal Behavior, 33*(2), 121–140. https://doi.org/10.1007/s10919-008-0066-6

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods, 4*(3), 272–299. https://doi.org/10.1037/1082-989X.4.3.272

Farooq, R. (2022). Heywood cases: possible causes and solutions. *International Journal of Data Analysis Techniques and Strategies. 14*. 79-88. 10.1504/IJDATS.2022.10045654

Field, A.P. (2018). *Discovering Statistics Using IBM SPSS Statistics. 5th Edition*, Sage, Newbury Park.

Ford, B. Q., & Gross, J. J. (2018). Emotion regulation: Why beliefs matter. *Canadian Psychology / Psychologie canadienne, 59*(1), 1–14. https://doi.org/10.1037/cap0000142

Ford, B. Q., & Gross, J. J. (2019). Why Beliefs About Emotion Matter: An Emotion-Regulation Perspective. *Current Directions in Psychological Science, 28*(1), 74–81. https://doi.org/10.1177/0963721418806697

Gottman, J. M., Katz, L. F., & Hooven, C. (1996). Parental meta-emotion philosophy and the emotional life of families: Theoretical models and preliminary data. *Journal of Family Psychology, 10*(3), 243–268. https://doi.org/10.1037/0893-3200.10.3.243

Gutentag, T., Kalokerinos, E. K., & Tamir, M. (2022). Beliefs about the ability to control
specific emotions. Motivation and Emotion, 47(3), 448–460. https://doi.org/10.1007/s11031-022-09991-w

Gutzweiler, R., & Grüning, D. J. (2025). Measuring four facets of emotion beliefs in Germany: A German-language adaptation of the EBQ and its comparability across gender and different emotion abilities. *PLoS ONE, 20*(1), Article e0316007. https://doi.org/10.1371/journal.pone.0316007

Hagan, C. A., Halberstadt, A. G., Cooke, A. N., & Garner, P. W. (2020). Teachers' Beliefs About Children's Anger and Skill in Recognising Children's Anger Expressions. *Frontiers in psychology, 11*, 474. https://doi.org/10.3389/fpsyg.2020.00474

Hajjar, S. (2018) Statistical Analysis: Internal Consistency Reliability and Construct Validity. *International Journal of Quantitative and Qualitative Research Methods, 6*, 27-38.

Hu, L.-t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118

International Test Commission. (2017). *International guidelines on test use: Guidelines for the development and use of tests and testing practices* (2nd ed.). International Test Commission

Johnston, T. E., McEvoy, P. M., Gross, J. J., Becerra, R., & Preece, D. A. (2024). The Emotion Beliefs Questionnaire: Psychometric properties, norms, and links to affective outcomes. *Journal of affective disorders, 356*, 577–585. https://doi.org/10.1016/j.jad.2024.04.002

Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika, 39*, 31–36

Kashimura, M., Ishizu, K., & Becerra, R. (2023). Psychometric examination of the Japanese version of the emotion beliefs questionnaire. *Japanese Psychological Research*. Advance online publication. https://doi.org/10.1111/jpr.12491

Kline, R. B. (2016). Principles and practice of structural equation modeling (4th ed.). Guilford Press.

Kneeland, E. T., Dovidio, J. F., Joormann, J., & Clark, M. S. (2016). Emotion malleability beliefs, emotion regulation, and psychopathology: Integrating affective and clinical science. *Clinical Psychology Review*, *45*, 81–88. https://doi.org/10.1016/j.cpr.2016.03.008

Larionow, P., Preece, D. A., & Mudło-Głagolska, K. (2024). Assessing emotion beliefs with the Polish version of the Emotion Beliefs Questionnaire (EBQ): Psychometric properties, norms, and links with emotional reactivity and psychopathology. Current Psychology: *A Journal for Diverse Perspectives on Diverse Psychological Issues, 43*(17), 15939–15951. https://doi.org/10.1007/s12144-023-05544-7

Mesquita, B. (2001). Emotions in collectivist and individualist contexts. *Journal of Personality and Social Psychology, 80*(1), 68–74. https://doi.org/10.1037/0022-3514.80.1.68

Netzer, L., Gutentag, T., Kim, M. Y., Solak, N., and Tamir, M. (2018). Evaluations of emotions: distinguishing between affective, behavioral and cognitive components. *Personal Individual Differences 135*, 13–24. doi: 10.1016/j.paid.2018.06.038

Raanes, E. F. W., Ryum, T., & Stiles, T. C. (2024). Psychometric Evaluation of the Emotion Beliefs Questionnaire – Norwegian Version (EBQ-N): Measuring Beliefs About the Controllability and Usefulness of Emotions. *Psychological Test Adaptation and Development, 5*, 283–292. https://doi.org/10.1027/2698-1866/a000086

Ranjbar, S., Mazidi, M., Gross, J. J., Preece, D., Zarei, M., Azizi, A., Mirshafiei, M., & Becerra, R. (2023). Examining the cross cultural validity and measurement invariance of the Emotion Beliefs Questionnaire (EBQ) in Iran and the USA. *Journal of Psychopathology and Behavioral Assessment, 45*(3), 755–766. https://doi.org/10.1007/s10862-023-10068-2

Rogier, G., Cavalli, R. G., Maggiolo, C., & Velotti, P. (2023). Factorial structure of the Emotional Beliefs Questionnaire: Testing measurement invariance and competitive models. Journal of Psychopathology and Behavioral Assessment, 45(2), 558–571. https://doi.org/10.1007/s10862-023-10038-8

Smith, A. M., Young, G., & Ford, B. Q. (2023). The interpersonal correlates of believing emotions are controllable. *Motivation and Emotion, 47*(3), 323–332. https://doi.org/10.1007/s11031-023-10016-3

Tamir, M., John, O. P., Srivastava, S., & Gross, J. J. (2007). Implicit theories of emotion: affective and social outcomes across a major life transition. *Journal of personality and social psychology, 92*(4), 731–744. https://doi.org/10.1037/0022-3514.92.4.731

Uchida, Y., Norasakkunkit, V., & Kitayama, S. (2004). Cultural constructions of happiness: Theory and empirical evidence. *Journal of Happiness Studies: An Interdisciplinary Forum on Subjective Well-Being, 5*(3), 223–239. https://doi.org/10.1007/s10902-004-8785-9

Van de Vijver, F. & Hambleton, R. (1996). Translating Tests: Some Practical Guidelines. *European Psychologist. 1*. 89-99. 10.1027/1016-9040.1.2.89

Veilleux, J. C., Salomaa, A. C., Shaver, J. A., Zielinski, M. J., & Pollert, G. A. (2015). Multidimensional assessment of beliefs about emotion: development and validation of the emotion and regulation beliefs scale. *Assessment, 22*(1), 86–100. https://doi.org/10.1177/1073191114534883

Vuillier, L., Joseph, J., Somerville, M. P., & Harrison, A. (2021). Believing emotions are uncontrollable is linked to eating dis- order psychopathology via suppression and reappraisal. *Journal of Eating Disorders, 9*(1), 43. https://doi.org/10.1186/ s40337-021-00395-8

Willroth, E. C., Young, G., Tamir, M., & Mauss, I. B. (2023). Judging emotions as good or bad: Individual differences and associations with psychological health. *Emotion (Washington, D.C.)*, *23*(7), 1876–1890. https://doi.org/10.1037/emo0001220

Worthington, R. L., & Whittaker, T. A. (2006). Scale Development Research: A Content Analysis and Recommendations for Best Practices. *The Counseling Psychologist, 34*(6), 806-838. https://doi.org/10.1177/0011000006288127

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Paulo Jorge Gonçalves Moreira: Conceptualisation; Data Curation; Formal analysis; Investigation; Methodology; Project administration; Resources; Software; Validation; Visualisation; Writing - Original Draft; Writing - Review & Editing. **Francisco Gomes Esteves**: Conceptualisation; Formal analysis; Methodology; Supervision; Validation; Writing - Review & Editing. **Sandra Elisabete Henriques de Oliveira**: Conceptualisation; Formal analysis; Methodology; Supervision; Validation; Writing - Review & Editing.

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Perceções de Prontidão para Liderança e Rendimento: Estudo em Contexto Organizacional

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Resumo: Este estudo foi realizado no setor da indústria, analisando a relação entre a perceção dos colaboradores sobre a prontidão para a liderança das respetivas chefias e a perceção de rendimento profissional que os colaboradores assumem face ao trabalho. A amostra foi composta por 236 colaboradores (51% do sexo feminino), tendo-lhes sido solicitada a resposta a instrumentos de avaliação da liderança (ciclos de liderança, estilos de liderança e fatores antecedentes da liderança) e do rendimento profissional. A análise de clusters permitiu identificar três perfis de prontidão para a liderança percebidos pelos colaboradores. Com base nestes perfis, destacam-se: (a) perfis mais positivos de liderança correspondem a maior perceção de rendimento profissional; (b) os perfis de liderança percebidos pelos colaboradores não variaram em função das suas características sociodemográficas. Em síntese, este estudo demonstra uma relação entre a perceção de prontidão para a liderança e a perceção de rendimento profissional nos colaboradores.

Palavras-chave: *Liderança; Prontidão; Estilos de Liderança; Perfis de liderança; Rendimento; Organizações.*

Abstract: This study was conducted within the industrial sector, examining the relationship between employees' perceptions of their supervisors' leadership readiness and employees' perceptions of their own professional performance at work. The sample comprised 236 employees (51% female), who were asked to respond to instruments assessing leadership (leadership cycles, leadership styles, and antecedent factors of leadership) and professional performance. Cluster analysis enabled the identification of three profiles of leadership readiness as perceived by employees. Based on these profiles, the following findings stand out: (a) more positive leadership profiles correspond to a higher perception of professional performance; (b) the leadership profiles perceived by employees did not vary according to their sociodemographic characteristics. In summary, this study demonstrates a relationship between the perception of leadership readiness and the perception of professional performance among employees.

Keywords: *Leadership; Readiness; Leadership Styles; Leadership Profiles; Performance; Organizations.*

O fenómeno da liderança tem sido amplamente estudado cientificamente, tendo evoluído, ao longo do tempo, na forma como é compreendido e analisado (Antonakis, 2012; Bass & Riggio, 2006; Fiedler, 1967; Northouse, 2025; Yukl, 2013). De um modo geral, a liderança tem sido entendida como um processo de influência, orientada para o alcance de objetivos partilhados, envolvendo a mobilização de pessoas em torno de uma finalidade comum (Avolio & Bass, 2004).

Um dos aspetos que tem suscitado a atenção dos autores refere-se aos fatores que podem potenciar os efeitos da liderança, isto é, que dimensões da liderança podem contribuir para a eficácia da liderança (DeRue et al., 2011; Stiliadi, 2024; Zaccaro, 2007). A este nível, a investigação tem realçado a importância das características pessoais do líder, tais como a integridade, a autoconsciência, a empatia e a coragem no exercício da liderança (Harvard Business Publishing, 2023; Yukl, 2013). No entanto, outros referem que os comportamentos assumidos pelo líder são o fator mais importante, nomeadamente as ações de transmitir energia positiva e inspiração, bem como a importância das lideranças servidora, altruísta e carismática (House & Howell, 1992; Lemoine et al., 2019; McClean et al., 2019). Numa outra linha de análise dos fatores de eficácia da liderança, encontramos perspetivas que destacam as circunstâncias/contexto onde ocorre a

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liderança, englobando as características dos colaboradores, da organização e do ambiente externo onde ocorre a liderança (Aslam et al., 2022; Oc, 2018).

Uma das maiores dificuldades que se pode colocar a todas estas perspetivas prende-se com o facto de a análise parcelar de cada um dos fatores da eficácia da liderança condicionar o entendimento deste fenómeno. Porém, uma das alternativas a este entendimento parcelar radica no surgimento de perspetivas integradoras, que conjuguem vários fatores de liderança, procurando um entendimento mais abrangente dos impactos decorrentes da mesma (Fiedler, 1967; Figueiredo et al., 2023; Hersey & Blanchard, 1996; Meirovich & Gu, 2015; Parkkinen, 2025; Shaikh, 2018; Uysal, 2022). Estudos recentes atestam a análise, de forma integrada, dos fatores da liderança como estratégia de credibilização ampliada do desempenho, envolvimento, desenvolvimento das competências dos colaboradores e da eficácia das equipas (Fransen et al., 2020).

Eficácia da Liderança: Uma Proposta Integrativa. Uma destas perspetivas integradoras é o Modelo da Eficácia da Liderança (MEL; Gomes, 2020) que propõe três fatores que, quando conjugados entre si, ajudam a compreender os impactos produzidos pela liderança. O primeiro fator designa-se por ciclos de liderança, que congrega a filosofia (e.g., ideias, valores, atitudes, princípios e objetivos acerca do que é a liderança e ser líder), a prática de liderança (e.g., ações assumidas pelo líder no sentido de concretizar a filosofia de liderança) e os indicadores de liderança (e.g., critérios, preferencialmente objetivos e mensuráveis que o líder utiliza para monitorizar a implementação da filosofia e prática de liderança). Neste modelo, salienta-se que os ciclos de liderança podem ocorrer ao nível conceptual (modo como o líder pensa exercer a liderança) e ao nível prático (modo efetivo como o líder implementa a sua liderança), sugerindo-se que quanto mais próximos são estes dois ciclos, maior é a eficácia da liderança (esta aproximação entre os dois ciclos designa-se por Índice de Congruência dos Ciclos de Liderança - ICCL) (Gomes, 2020).

O segundo fator do MEL são os estilos de liderança (Burns, 1978), divididos em liderança transformacional (e.g., estilo em que os líderes inspiram e desenvolvem os seus colaboradores, procurando estimular a criatividade, permitindo que estes excedam as suas próprias expectativas), incluindo cinco comportamentos de liderança: visão (entusiasmo e otimismo relativamente ao futuro); inspiração (promoção do esforço contínuo e sucesso); instrução (transmissão positiva das indicações técnicas); individualização (atenção às expectativas e desejos individuais dos colaboradores) e apoio (desenvolvimento de relações positivas, tendo em consideração o bem-estar dos colaboradores). Por outro lado, a liderança transacional (e.g., um estilo baseado em trocas e recompensas, estabelecendo acordos para que os objetivos sejam cumpridos) inclui dois comportamentos de liderança: feedback positivo (reforço do desempenho e esforço dos colaboradores) e feedback negativo (punição de comportamentos inadequados e resultados negativos). Propõe-se, assim, uma congregação entre os comportamentos de liderança, para gerar o Índice do Perfil Ótimo de Liderança (IPOL), que engloba a maior utilização dos comportamentos transformacionais, a maior utilização do feedback positivo e menor utilização do feedback negativo da liderança transacional e uma maior utilização da gestão ativa e menor utilização da gestão passiva da tomada de decisão. Assim sendo, segundo o MEL, sempre que os líderes utilizam o perfil ótimo de liderança, alargam ainda mais a eficácia da liderança (Gomes, 2020).

O terceiro, e último fator do MEL são os fatores antecedentes da liderança, circunscritos às características específicas do líder (e.g., personalidade, experiência, competências técnicas); dos colaboradores (e.g., motivação, expectativas, maturidade) e da situação (e.g., contexto organizacional, recursos disponíveis, cultura) que podem potenciar (aumentar a favorabilidade da liderança) ou fragilizar (diminuir a favorabilidade da liderança) os efeitos produzidos pelos ciclos de liderança na eficácia da liderança (Gomes, 2020). Daqui resulta o Índice de Favorabilidade da Liderança (IFL) que congrega os três fatores antecedentes (líder, liderados e situação), sugerindo-se que se os líderes tiverem valores elevados neste índice podem aumentar ainda mais a sua eficácia da liderança. Em síntese, preconiza-se no MEL que a congruência dos ciclos de liderança aumenta a eficácia nesta área, principalmente quando a congruência entre os ciclos é obtida segundo o perfil ótimo de liderança e considerando os fatores antecedentes da liderança (Gomes, 2020; ver Figura 1).

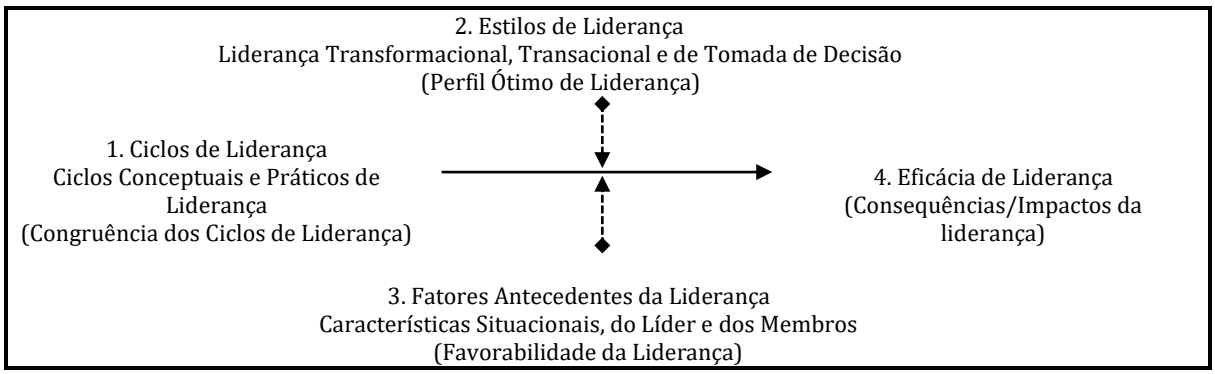

Figura 1. Modelo da Eficácia da Liderança (Gomes, 2020)

Modelo da Eficácia da Liderança: Investigação. Em termos de investigação, o Modelo da Eficácia da Liderança tem sido testado sobretudo em contexto desportivos, onde se verificou que os fatores que compõe o modelo estão associados a maiores níveis de eficácia da liderança, motivação, desempenho e perceção de rendimento individual dos atletas e das respetivas equipas (Gomes et al., 2020; Lisá et al., 2023; Ribeiro et al., 2016). Já em contexto organizacional, Ribeiro et al. (2024), embora sem utilizar os três fatores do modelo, observaram que a congruência dos ciclos de liderança relacionou-se positivamente com o compromisso organizacional e a satisfação profissional, sendo que a relação entre os ciclos de liderança e o compromisso organizacional foi mais forte para os colaboradores com mais tempo de permanência nos respetivos locais de trabalho. Nesse estudo, foi utilizada uma das componentes do MEL para analisar as relações entre estilos de liderança e três dimensões da atividade profissional (trabalho em equipa, rendimento profissional e compromisso organizacional), numa empresa multinacional que utilizava o método Scrum, tendo-se verificado que os comportamentos de feedback positivo e de gestão ativa foram as principais dimensões explicativas da forma como os membros da equipa se sentiam face à sua atividade profissional.

Oportunidade de Investigação. Apesar do interesse destes dados, não existem ainda registos com o MEL que tenham testado se os três fatores de liderança (i.e., ciclos de liderança, estilos de liderança e fatores antecedentes de liderança) ajudam a compreender a perceção de rendimento dos trabalhadores. Ou seja, será que quando os trabalhadores percecionam de modo diferente a liderança das suas chefias nos três fatores de liderança (i.e., ciclos de liderança, estilos de liderança e fatores antecedentes de liderança) assumem, também, perceções distintas do seu rendimento profissional?

Este estudo procura responder a esta questão da relação entre liderança e perceção de rendimento profissional, sendo um tópico relevante no contexto da psicologia das organizações (Dzikriana et al., 2024; Kaiser et al., 2008; Wang, 2023). De facto, a avaliação da eficácia da liderança depende da escolha de indicadores que traduzam não apenas o desempenho objetivo, mas também a experiência subjetiva dos colaboradores, como é o caso da sua perceção de rendimento profissional (Aguinis & Burgi-Tian, 2021). A perceção de rendimento profissional pode ser entendida como a avaliação subjetiva que o indivíduo possui acerca da qualidade do seu próprio desempenho laboral, sendo influenciada por fatores como a satisfação no trabalho, o ambiente organizacional e a perceção da liderança (Acheampong et al., 2016; Dias & Borges, 2017). De facto, a literatura tem procurado estudar as relações entre liderança e rendimento dos colaboradores (Judge & Piccolo, 2004; Wang et al., 2011), mas existe uma escassez de conhecimento sobre até que ponto a conjugação de três aspetos estruturantes da liderança (i.e., ciclos de liderança, estilos de liderança e fatores antecedentes da liderança) podem estar relacionados com a perceção de rendimento profissional dos trabalhadores. Neste sentido, importa explorar a relação entre liderança das chefias e a perceção de rendimento dos colaboradores, sendo este um dos tópicos mais significativos na literatura (Deci & Ryan, 2000; Spreitzer & Cameron, 2011; Wang, 2023). O nosso estudo segue esta linha de análise, procurando compreender até que ponto a liderança, entendida de um modo integrador com as três dimensões do MEL, pode estar relacionada com a perceção de rendimento profissional dos colaboradores. O mesmo é dizer, será que o modo como os colaboradores concebem a liderança das respetivas chefias pode relacionar-se com menor ou maior perceção de rendimento profissional dos colaboradores? Deste modo, espera-se que este trabalho possa contribuir para a compreensão de como diferentes fatores interagem e contribuem para organizações eficazes (Figueiredo et al., 2023; Parkkinen, 2025).

Mais especificamente, no nosso estudo efetuamos um cálculo de um valor agregador das três áreas da liderança incluídas no MEL (e.g., ciclos de liderança considerando os resultados do ICCL, estilos de liderança considerando os resultados do IPOL e fatores antecedentes da liderança considerando os resultados do IFL), cruzando-o com a perceção de rendimento profissional dos colaboradores de empresas da área da indústria. Este valor agregador de liderança pode ser entendido como uma medida de perceção para a prontidão para a liderança, indicando até que ponto uma determinada chefia assume a competência de liderança. No nosso caso, esta perceção de prontidão para a liderança foi obtida através da avaliação que os colaboradores efetuaram da liderança das respetivas chefias (valores do ICCL, IPOL e IFL), podendo, assim, ser concebida como as representações mentais que os colaboradores possuem sobre a capacitação das respetivas chefias (i.e., prontidão) para o exercício da liderança. Repare-se que, neste estudo, o conceito de prontidão para a liderança é uma medida da perceção dos colaboradores sobre o modo como a liderança é exercida pelas respetivas chefias (em termos de ciclos, estilos e fatores antecedentes da liderança), não devendo ser confundido com a capacidade efetiva e real dos líderes exercerem a sua atividade. Neste sentido, a perceção de prontidão para a liderança é compreendida de um modo integrativo, dado que as representações mentais dos colaboradores sobre a liderança das respetivas chefias inclui a opinião que os colaboradores possuem sobre a capacidade das chefias formularem a filosofia, prática e indicadores de um modo congruente (do ponto de vista conceptual e prático), usarem adequadamente os estilos e comportamentos de liderança e conseguirem adequar corretamente a liderança às características de todos os envolvidos e ao contexto em causa. Que seja do nosso conhecimento, é a primeira vez, no âmbito do MEL, que é utilizada uma medida global de perceção de prontidão para a liderança para se efetuar a relação com a perceção de rendimento de colaboradores de empresas da área da indústria.

Hipóteses de Investigação. O propósito central deste estudo consistiu em explorar as eventuais relações entre a liderança percebida pelos colaboradores nas suas chefias (i.e., perceção de prontidão para a liderança) e a perceção de rendimento profissional que os colaboradores assumem na sua atividade laboral, considerando o contexto real de trabalho.

Assim sendo, tendo por base o MEL, foram formuladas duas hipóteses para este estudo, a saber:

- H1 – Perfis de entendimento mais favoráveis de perceção de prontidão para a liderança por parte dos participantes (i.e., maior prontidão para a liderança atribuída às chefias) correspondem a perceções mais elevadas de rendimento profissional. Explicitando, espera-se que os colaboradores com perfis de avaliação mais positivos acerca da prontidão para a liderança das respetivas chefias apresentem perceções mais elevadas do seu rendimento profissional do que os colaboradores com perfis de avaliação mais baixos acerca da prontidão para a liderança das respetivas chefias.

- H2 – Os perfis de perceção de prontidão para a liderança não variam em função de variáveis pessoais e profissionais dos participantes. Assim, espera-se que os perfis de prontidão para a liderança (i.e., a prontidão para a liderança atribuída às chefias) não variem em função das características pessoais e profissionais dos colaboradores.

MÉTODO

Participantes

A amostra deste estudo foi selecionada por conveniência, incluindo 236 colaboradores de empresas do setor secundário, localizadas no norte de Portugal, 121 (51%) do sexo feminino e 111 (47%) do sexo masculino (4 participantes preferiram não responder; 1%). O nível de escolaridade foi o seguinte: ensino básico (n = 73; 31%), ensino secundário (n = 108; 46%), licenciatura (n = 22; 9%), bacharelato, (n = 25; 11%), mestrado, (n = 7; 3%) e doutoramento (n = 1; 0.4%). Na situação profissional, verificou-se a seguinte distribuição: contrato de trabalho sem termo (n = 176; 75%), contrato a termo (n = 24; 10%) e outras situações (n = 36; 15%). A média de anos de experiência foi 7.36 (min. = 1, máx. = 40; DP = 7.34).

Instrumentos

Questionário sociodemográfico, composto por 15 itens, permitiu recolher a seguinte informação: sexo dos participantes, estado civil, grau académico, profissão, setor de atividade atual, departamento onde exerce as funções, trabalho em equipa ou individualmente, horário de trabalho, situação contratual, número médio de horas de trabalho por semana, anos de experiência profissional na função desempenhada e indicação do email, caso pretendesse ter acesso aos seus resultados.

Liderança

Questionário dos Ciclos de Liderança (QCL - Versão breve de 9 itens – Gomes et al., 2022). O QCL tem por base o Modelo da Eficácia da Liderança (Gomes, 2020) e avalia os ciclos de liderança em três dimensões: (a) filosofia de liderança (α = .90, para este estudo): valores, crenças, pressupostos, atitudes,

princípios e prioridades assumidos pelos lideres que influenciam tanto a prática como a ideia acerca do que é a liderança ("O meu chefe/responsável diz-nos as ideias que mais valoriza"); (b) prática de liderança (α = .92, para este estudo): comportamentos específicos assumidos pelos líderes para concretizar a sua filosofia de liderança ("O meu chefe/responsável age de acordo com as ideias que valoriza"); e (c) indicadores de liderança (α = .92, para este estudo): critérios pessoais e profissionais que ajudam os líderes a monitorizar se estão a cumprir os princípios da sua filosofia e prática de liderança ("O meu chefe/responsável avalia se as suas ideias foram executadas"). Os itens são respondidos numa escala Likert de cinco pontos (1 = Nunca; 5 = Sempre). Os participantes neste estudo responderam aos itens duas vezes, uma vez, pensando nas ações ideais das chefias em termos de filosofia, prática e indicadores de liderança (ciclo conceptual de liderança) e nas ações atuais das chefias nas mesmas três dimensões (ciclo prático de liderança). Neste sentido, foi possível calcular o Índice de Congruência do Ciclos de Liderança (ICCL), que resulta da diferença entre as médias dos ciclos de liderança (conceptual e prático), sendo os valores negativos convertidos em valores positivos (valores modulares), significando que valores mais próximos de zero indicam uma congruência nas ações de liderança das chefias. A análise fatorial confirmatória indicou um bom ajustamento do instrumento à estrutura original trifatorial, $\chi2(22) = 42.161$, $p < .006$; $\chi2/df = 1.916$; TLI = .984; CFI = .990; PCFI = .605; RMSEA = .062, (90% C.I. [.033; .091], pclose = .005); SRMR = .0247.

Escala Multidimensional de Liderança (EMLO - Versão breve de 27 itens – Gomes et al., 2021). O EMLO tem por base o Modelo da Eficácia da Liderança (Gomes, 2020) e avalia os comportamentos de liderança em nove dimensões, distribuídos por três estilos de liderança: (1) transformacional, circunscrita à influência exercida pelo líder nos membros da equipa, com o objetivo que estes incorporem a visão estabelecida para que resultados acima do esperado possam ser alcançados; (2) transacional, referente à influência exercida pelo líder mediante um sistema de trocas, onde o membro da equipa aceita a autoridade do líder na expetativa de obter algo em troca (e.g., salário, prémios, prestígio, etc.); e (3) tomada de decisão, relacionada com modo como o líder gere o seu poder e influencia junto dos membros da equipa, podendo fazê-lo de uma forma mais ou menos ativa, ou com mais passividade. Estes três estilos são avaliados por nove dimensões: (a) visão (α = .93, para este estudo) - tendência de o líder estabelecer um futuro positivo e desafiador para os membros da equipa ("Promove uma visão positiva de futuro para mim"); (b) inspiração (α = .85, para este estudo) - comportamentos do líder no sentido de promover o desejo de sucesso e esforço contínuo dos membros da equipa na concretização das tarefas ("Promove em mim o desejo de sucesso e de melhorar"); (c) instrução (α = .88, para este estudo) - indicações positivas dadas pelo líder acerca do que os membros da equipa devem fazer ou como podem corrigir e melhorar as suas capacidades desportivas ("Quando me chama a atenção, dá-me exemplos sobre como corrigir a situação para eu progredir"); (d) individualização (α = .84, para este estudo), reportada à tendência de o líder considerar nas suas decisões as necessidades, desejos e expectativas dos membros da equipa ("Respeita as necessidades pessoais que eu possa ter neste trabalho"); (e) apoio (α = .79, para este estudo) - comportamentos do líder orientados para o bem-estar dos colaboradores, evidenciando um interesse em estabelecer relações pessoais francas e informais com os membros da equipa ("Ajuda-me quando tenho um problema pessoal"); (f) feedback positivo (α = .89, para este estudo) - comportamentos de reforço e reconhecimento do líder face ao bom rendimento dos membros da equipa ("Felicita-me quando trabalho bem ou tenho um bom rendimento"); (g) feedback negativo (α = .85, para este estudo) - comportamentos de desagrado e irritação do líder após comportamentos inadequados dos membros da equipa ("Zanga-se quando trabalho mal ou tenho um rendimento abaixo do esperado"); (h) gestão ativa (α = .89, para este estudo) - envolvimento do líder e dos membros da equipa no processo de tomada de decisão ("Pede a minha opinião sobre assuntos importantes relacionados com o trabalho"); e (i) gestão passiva (α = .72, para este estudo) - evitamento ou adiamento na tomada de decisão e distanciamento do líder face às suas responsabilidades quando é necessário resolver problemas importantes ("Espera que as coisas fiquem erradas antes de fazer algo"). Os itens são respondidos numa escala Likert de cinco pontos (1 = Nunca; 5 = Sempre). Os itens do instrumento foram respondidos uma única vez pelos colaboradores, tendo estes de pensar sobre os comportamentos assumidos pelas suas chefias no dia a dia. O Índice de Perfil Ótimo de Liderança (IPOL) é calculado com base na média dos itens das nove dimensões, nomeadamente, Visão, Inspiração, Instrução, Individualização, Apoio, Feedback positivo, Feedback negativo invertido, Gestão ativa e Gestão passiva invertida. Valores mais elevados nesta variável são indicadores de melhor perfil de liderança. A análise fatorial confirmatória indicou um bom ajustamento do instrumento à estrutura original de nove fatores, $\chi2(288) = 542.874$, $p < .001$; $\chi2/df = 1.885$; TLI = .941; CFI = .952; PCFI = .781; RMSEA = .061, (90% C.I. [.053; .069], pclose = .000); SRMR = .0421.

Questionário dos Fatores Antecedentes da Liderança (QFAL - Versão completa de 15 itens - Membros da equipa – Gomes et al., 2022). O QFAL tem por base o Modelo da Eficácia da Liderança (Gomes,

2020) e avalia os fatores antecedentes da liderança em cinco dimensões: (a) Líder – orientação para a tarefa (α = .93, para este estudo): refere-se a líderes que tem maior interesse por aspetos técnicos do trabalho, com preocupação centrada na realização das tarefas e alcance dos objetivos definidos ("O meu chefe/responsável valoriza que os membros da nossa equipa atinjam os objetivos definidos"); (b) Líder – orientação para as pessoas (α = .92, para este estudo): refere-se a líderes que tem maior interesse e preocupação com os aspetos pessoais e humanos do trabalho ("O meu chefe/responsável valoriza as necessidades pessoais dos membros da nossa equipa"); (c) Membros da equipa – maturidade técnica (α = .88, para este estudo): nível de conhecimento técnico que os colaboradores possuem para desempenhar as tarefas ("Como membro desta equipa sou muito bom a realizar as minhas tarefas"); (d) Membros da equipa – maturidade psicológica (α = .79, para este estudo): sentimentos de autoconfiança e abertura que os colaboradores possuem para aceitar as funções atribuídas, ou seja, o quanto estão confiantes sobre as competências necessárias para desempenhar com sucesso as tarefas ("Como membro desta equipa sou muito motivado/empenhado na realização das tarefas"); e (e) situação (α = .78, para este estudo): fatores contextuais que o líder enfrenta e que influenciam a realização das tarefas ("O meu chefe/responsável tem boas condições para realizar a sua atividade"). Os itens são respondidos numa escala Likert de cinco pontos (1 = Nunca; 5 = Sempre). O Índice de Favorabilidade da Liderança (IFL) é obtido com base na média de todas as dimensões da escala. A análise fatorial confirmatória indicou um bom ajustamento do instrumento ao modelo original, $\chi2(80) = 129.901$, $p < .000$; $\chi2/df = 1.624$; TLI = .974; CFI = .980; PCFI = .747; RMSEA = .052, (90% C.I. [.035; .067], pclose = .005); SRMR = .0380.

Rendimento

Questionário de Perceção de Rendimento Profissional (QPRP versão laboral; Gomes et al., 2020). O QPRP avalia a perceção de rendimento profissional individual e coletivo, tendo neste estudo sido usada apenas esta dimensão: (a) perceção de rendimento profissional individual (α = .89, para este estudo): refere-se à perceção das pessoas acerca do rendimento laboral que alcançam a nível individual ("Até ao momento tive o rendimento profissional/ocupacional"). Os itens são respondidos numa escala Likert de cinco pontos (1 = Nunca; 5 = Sempre). Esta é a variável dependente do estudo, sendo que quanto maior o valor registado, maior o rendimento individual percecionado, sendo que para efeitos de testes é utilizada a média. A análise fatorial confirmatória indicou um bom ajustamento do instrumento ao modelo original de um fator, $\chi2(4) = 8.381$, $p < .079$; $\chi2/df = 2.095$; TLI = .984; CFI = .994; PCFI = .397; RMSEA = .068, (90% C.I. [.000; .134], pclose = .005); SRMR = .0209.

Procedimento

Após a aprovação do estudo pelo Comité de Ética da Universidade do Minho (CEICSH 128/2020), a equipa de investigação iniciou o contacto com a organização selecionada. Para o efeito, contactou a direção do departamento de recursos humanos (DRH), a fim de obter autorização para a recolha dos dados. Adquirida a anuência da organização, foi elaborado o protocolo de recolha de dados com recurso à ferramenta eletrónica Qualtrics, composto pelo consentimento informado, descrição dos objetivos do estudo e os questionários de avaliação psicológica. Os participantes conheceram previamente o teor voluntário da participação no estudo, a que se seguiu o consentimento para a respetiva avaliação. A divulgação do link de acesso à plataforma, foi efetuada através de computadores disponibilizados pela organização. A taxa de retorno de respostas foi de 29%.

RESULTADOS

Análise Preliminar dos Dados

As análises foram realizadas utilizando o IBM SPSS Statistics (v. 29) e o AMOS (v. 29; SPSS Inc., Chicago, IL, EUA). A assimetria e a curtose das variáveis foram analisadas e concluiu-se que estas apresentam uma distribuição normal: (-1.970 < assimetria > 1.370; -1.121 < curtose > 4.430). Também não foram encontrados problemas de multicolinieridade (VIF < 5.00). As análises realizadas consideraram um valor de $p < .05$ como estatisticamente significativo.

Ciclos de Liderança

Numa primeira análise, procurou-se compreender se os participantes percecionavam que os seus líderes deveriam diminuir (valores inferiores a zero), aumentar (valores superiores a zero) ou manter (valores iguais a zero) os ciclos de liderança nas três dimensões avaliadas (filosofia, prática e indicadores), utilizando-se a média das dimensões dos ciclos de liderança (QCL). A maioria dos participantes considerou que os respetivos líderes deveriam manter os níveis de explicitação da filosofia, prática e indicadores (valores a rondar os 51 a 56%), logo seguidos dos participantes, a apostar mais na filosofia, prática e

indicadores (valores a rondar os 43 a 48%). Apenas uma minoria bastante reduzida indicou que os ciclos de liderança deveriam diminuir, com percentagens residuais inferiores a 2% em todas as dimensões (ver Tabela 1).

Tabela 1. Ciclos de liderança: Avaliação da Filosofia, Prática e Indicadores de Liderança

ICCL	Aumentar *n* (%)	Diminuir *n* (%)	Manter *n* (%)
Filosofia de liderança	102 (43%)	2 (1%)	132 (56%)
Prática de liderança	113 (48%)	3 (1%)	120 (51%)
Indicadores de liderança	109 (46%)	4 (2%)	123 (52%)

Correlações entre as Variáveis

A Tabela 2 apresenta as correlações entre as variáveis do estudo. Como se pode verificar, quanto maior é a perceção dos colaboradores na aproximação entre os ciclos de liderança das chefias (valores mais próximos de zero), maior é a perceção de utilização dos perfis ótimos de liderança pelas chefias, maior é a perceção de favorabilidade no exercício da liderança pelas chefias e maior é a perceção de rendimento profissional nos colaboradores. De igual modo, quanto mais os funcionários percecionam a utilização dos perfis ótimos de liderança pelas chefias, maior é a perceção de favorabilidade no exercício da liderança pelas chefias e maior é a perceção de rendimento profissional nos colaboradores. Finalmente, à medida que os colaboradores percecionam favorabilidade no exercício da liderança pelas chefias, aumenta a sua perceção de rendimento profissional.

Tabela 2. Correlações entre Variáveis em Estudo

Dimensões	1	2	3
1. QCL-ICCL – Ciclos de liderança	--	--	--
2. EMLO-IPOL: Perfil ótimo de liderança	-.611**	--	--
3. QFAL-IFL – Favorabilidade da liderança	-.499**	.797**	--
4. QPRP- Perceção de rendimento profissional	-.285**	.534**	.637**

Nota. ** $p < .01$; * $p < .05$.

Constituição dos Perfis de Liderança

Nesta parte do trabalho, iniciámos a preparação dos dados para poder testar as hipóteses previamente formuladas para este estudo, suportadas pelo MEL, principalmente a Hipótese 1 que referia que a perceção mais favorável por parte dos colaboradores (i.e., maior perceção de prontidão para a liderança atribuída às respetivas chefias) está associada a níveis mais elevados de rendimento profissional. Por conseguinte, começamos por efetuar uma análise de clusters, utilizando o método K-means, com o objetivo de identificar perfis liderança, agrupando os participantes consoante padrões semelhantes de resposta. Esta análise serviu para definir perfis mais e menos positivos na perceção que os participantes tinham da liderança das respetivas chefias.

As variáveis consideradas para a criação dos perfis incluíram os resultados dos ciclos de liderança (calculados através do ICCL), dos estilos de liderança (calculados através do IPOL) e dos fatores antecedentes da liderança (calculados através do IFL). A determinação do número ideal de clusters fundamentou-se na análise descritiva dos grupos resultantes, tendo em conta o número de participantes em cada cluster e as médias obtidas nas variáveis ICCL, IPOL e IFL. Este critério permitiu assegurar que os clusters representavam perfis de perceção de liderança distintos estatisticamente [ICCL: $F(2,233) = 243.51$, $p < .001$, $\eta 2 = .68$; IPOL: $F(2,233) = 308\text{-}26$, $p < .001$, $\eta 2 = .673$; IFL: $F(2,233) = 139.00$, $p < .001$, $\eta 2 = .54$]. A validade dos clusters foi avaliada com recurso ao Coeficiente de Silhueta. O coeficiente global foi de .40 (Cluster 1 = .36; Cluster 2 = .46, Cluster 3 = .35), indicando um nível moderado de separação entre clusters. Com base nesta análise, optou-se por um modelo composto por três perfis: Não Otimizado, Otimizado Inferior e Otimizado Superior.

A Tabela 3 apresenta os resultados descritivos de cada cluster (perfil de liderança) identificado. Como se pode verificar, é o grupo de participantes integrado no Perfil de Liderança Otimizado Superior (i.e., que possui maior perceção de prontidão para a liderança) que apresenta uma visão mais positiva da liderança das respetivas chefias (em todas as dimensões relativas ao ICCL, IPOL e IFL), seguido do grupo do Perfil de Liderança Otimizado Inferior, com resultados já bastante mais baixos que o grupo Otimizado superior, e do grupo de Liderança Não Otimizado, que demonstrou as avaliações ainda mais desfavoráveis nas diferentes dimensões da liderança do ICCL, IPOL e IFL.

Tabela 3. Constituição e Caracterização dos Perfis de Liderança

Perfis de prontidão para a liderança	N	ICCL (*M; DP*)	IPOL (*M; DP*)	IFL (*M; DP*)
Perfil liderança Não Otimizado	39	2.47; 0.68	2.28; 0.53	3.08; 0.63
Perfil liderança Otimizado Inferior	97	0.84; 0.47	2.99; 0.46	3.55; 0.56
Perfil liderança Otimizado Superior	100	0.36; 0.46	4.20; 0.41	4.46; 0.37

Diferenças na Perceção de Rendimento em Função dos Perfis de Liderança

Na segunda etapa, efetuamos o teste propriamente dito da hipótese principal formulada para este estudo que afirmava a relação entre a perceção mais favorável da liderança por parte dos colaboradores (i.e., maior perceção de prontidão para a liderança atribuída às respetivas chefias) e níveis mais elevados de rendimento profissional percecionado. Para tal, foi efetuada uma ANOVA Univariada, para testar se o agrupamento dos participantes pelos três perfis de liderança (i.e., Não Otimizado, Otimizado Inferior e Otimizado Superior) correspondia a diferenças na conceção de rendimento profissional (QPRP). Simplificando, será que percecionar mais e menos positivamente a prontidão para a liderança das chefias é relacionável com a perceção de rendimento que as pessoas têm face ao seu trabalho?

A análise ANOVA efetuada mostrou que os perfis apresentaram uma relação estatisticamente significativa com a perceção de rendimento, $F(2, 233) = 31.36$; $p < .001$; $\eta p^2 = .21$; Potência (π) = 1.000, tendo os perfis de liderança explicado cerca de 21% da oscilação nos valores obtidos na estimativa de rendimento. Mais concretamente, (e confirmando a hipótese formulada para este estudo), o Perfil de Liderança Otimizado Superior apresentou a média mais elevada de perceção de rendimento ($M = 4.03$, $DP = 0.68$), quando equiparado com o Perfil de Liderança Otimizado Inferior ($M = 3.29$, $DP = 0.75$) e com o Perfil de Liderança Não Otimizado que registou a média mais baixa ($M = 3.10$, $DP = 0.98$).

As comparações post-hoc de Bonferroni revelaram que existiam diferenças estatisticamente significativas entre o Perfil Otimizado Superior e os Perfis Otimizado Inferior e Não Otimizado (ambos $p < .001$). É ainda de registar que não foram observadas diferenças estatisticamente significativas entre o Perfil de Liderança Otimizado Inferior e o Perfil de Liderança Não Otimizado ($p = .876$[2]) .

Diferenças nos Perfis de Liderança em Função de Variáveis Sociodemográficas

Na última etapa deste estudo, procurou-se verificar se os diferentes perfis de liderança delimitados na análise de clusters, se diferenciavam em função de variáveis sociodemográficas, nomeadamente sexo, idade, experiência profissional e grau académico. Ou seja, importava perceber se os grupos de perfis de liderança diferiam entre si nestas variáveis, uma vez que tal poderia, de algum modo, explicar as diferenças encontradas na perceção de rendimento profissional, tendo em conta os perfis de liderança (etapa anterior da análise de dados). Por outras palavras, importava perceber se os grupos de perfis de liderança eram diferentes em variáveis sociodemográficas o que, se fosse o caso, verificar se isso poderia contribuir para as diferentes perceções de rendimento, sendo de questionar, então, os resultados da etapa anterior (teste da primeira hipótese deste estudo).

Para o efeito, foram realizados testes do Qui-quadrado (no caso da variável sexo e grau académico) e a ANOVA (para a idade e a experiência profissional). De referir que as variáveis sexo e grau académico foram recodificadas, equivalendo, no caso do sexo, a contabilizar o sexo feminino e masculino, não tendo sido consideradas os participantes que preferiram não responder a esta questão ($n = 4$; 1%). No grau académico, foram criadas duas categorias: 12.º ano ou inferior ($n = 181$; 77%) e licenciatura ou superior ($n = 47$; 20%).

As análises de Qui-Quadrado revelaram que os grupos estavam proporcionalmente compostos, não se verificando diferenças estatisticamente significativas na variável sexo, $\chi 2(2) = 0.63$, $p = .731$, nem na relativa ao grau académico, $\chi 2(2) = 2.610$, $p = .271$. Na variável idade, os resultados da ANOVA também não foram estatisticamente relevantes, $F(2, 233) = .411$; $p = .663$ nem na experiência profissional, $F(2, 199) = 1.178$; $p = .310$[3]. Estes resultados indicam que as diferenças observadas na variável de perceção de rendimento não podem ser atribuídas a variações na composição ou não proporcionalidade dos grupos

[2] O teste desta hipótese foi também repetido com uma ANCOVA, incluindo as variáveis Idade e Experiência Profissional como covariáveis. Foram obtidos os mesmos resultados [$F(4,197) = 28.97$, $p < .001$, $\eta p^2 = .23$; Potência (π) = 1.00. O mesmo padrão de comparações entre perfis foi encontrado: maior perceção de rendimento reportada no perfil otimizado superior por comparação com o otimizado inferior ($p < .001$) e não otimizado ($p < .001$); sem diferenças estatisticamente significativas entre os dois últimos perfis ($p = .642$).

[3] 34 participantes não incluíram informação sobre a sua experiência profissional e, por esse motivo, não foram considerados nesta análise.

relativamente à idade, sexo, experiência profissional e grau académico dos participantes, reforçando-se assim os resultados encontrado na primeira hipótese deste estudo.

DISCUSSÃO

O objetivo geral deste estudo foi analisar a relação entre a prontidão para a liderança percebida por colaboradores do setor da indústria acerca das chefias e a perceção de rendimento profissional dos colaboradores face ao trabalho. Considerando o Modelo da Eficácia da Liderança, os dados permitiram verificar que, quando os colaboradores percecionam de modo diferente a prontidão para a liderança das suas chefias, assumem perceções distintas do seu rendimento profissional. Mas vejamos em maior detalhe os dados do nosso estudo.

Em primeiro lugar, os resultados mais descritivos permitiram verificar que a maioria dos participantes entende que os seus líderes devem manter a sua filosofia, prática e indicadores de liderança (valores a rondar os 51 a 56%). No entanto, uma percentagem bastante significativa (valores a rondar os 43 a 48%) consideraram que os respetivos líderes deveriam explicitar mais a filosofia, prática e indicadores. Somente um número residual de participantes (abaixo dos 2%) sugere diminuição desta explicitação. Resultados semelhantes foram observados no estudo de Sousa et al. (2025), o que aponta para a pertinência de aumentar a congruência nos ciclos de liderança, de modo a intensificar os potenciais efeitos dos ciclos de liderança na eficácia da liderança.

Em segundo lugar, e mais importante, verificou-se que os dados obtidos permitiram corroborar a Hipótese 1 deste estudo, preconizador da tese de que colaboradores com perfis de avaliação mais positivos acerca da prontidão para a liderança das respetivas chefias apresentariam perceções mais elevadas do seu rendimento profissional do que colaboradores com perfis de avaliação mais baixos, no atinente à prontidão para a liderança das respetivas chefias. De facto, os perfis de liderança considerados mais positivos, relacionaram-se com uma perceção mais elevada de rendimento profissional relatada pelos colaboradores, reforçando a ideia de que a liderança é um fator determinante do desempenho organizacional (Hannah et al., 2008), sendo igualmente importante considerar os múltiplos fatores que podem caracterizar uma "boa" liderança (Fiedler, 1967; Figueiredo et al., 2023; Fransen et al., 2020; Meirovich, & Gu, 2015; Parkkinen, 2025; Shaikh, 2018; Uysal, 2022). Efetivamente, no nosso estudo, ao verificarmos que o perfil de liderança otimizado superior está associado a uma maior perceção de rendimento, pudemos inferir o papel contributivo da prontidão para a liderança no funcionamento e desempenho percebido pelos colaboradores (Dzikriana et al., 2024; Kaiser et al.,2008; Wang, 2023). Por outro lado, a variância explicada na variável dependente de 21% é particularmente relevante. Este resultado vai ao encontro do sugerido por Burke et al. (2006), que indica que os comportamentos de liderança justificam entre 4 e 31% na variação do desempenho organizacional.

Em terceiro lugar, a hipótese H2 foi igualmente confirmada, tendo em conta que os testes de Qui-Quadrado e ANOVA sustentam a hipótese definida previamente, reforçando a noção de que a relação encontrada na Hipótese 1 (i.e., perfis mais positivos de perceção de prontidão para a liderança podem potenciar mais a perceção de rendimento dos colaboradores) não se deveu a eventuais diferenças nas variáveis sociodemográficas sexo, idade, experiência profissional e grau académico. Os dados da investigação tendem a apontar poucas (ou até nenhumas) diferenças na eficácia dos líderes em função do sexo (ver Paustian-Underdahl et al., 2014), alguma relação entre formas de liderança mais negativas e o aumento da idade dos líderes (ver Tomova Shakur et al., 2024), sendo ainda vagas as conclusões sobre a importância da experiência profissional e grau académico do líder (ver Budur & Demir, 2019). Neste mesmo sentido, os dados do nosso estudo parecem reforçar aquilo que é mais evidente na literatura (ver, por exemplo, Osmani & Ndoka, 2025), nomeadamente o facto de formas mais positivas de liderança (medidas no nosso estudo através da perceção de prontidão para a liderança) estarem relacionadas com experiências mais positivas nos colaboradores (medidas no nosso estudo através da perceção de rendimento profissional). Complementarmente, os dados do nosso estudo mostram que estas diferenças são transversais em função das variáveis sociodemográficas dos colaboradores (e.g., sexo, idade, experiência profissional e grau académico), potenciando assim a conclusão que se pode retirar da Hipótese 1 deste estudo.

Implicações Práticas

No caso do nosso estudo, os dados contribuem para clarificar melhor a relação entre os três fatores estruturantes do MEL e a perceção de rendimento profissional, algo pouco explorado até ao momento. Na prática, os resultados obtidos permitem às organizações desenvolverem programas de intervenção, fomentadores de uma liderança que premeia a linearidade dos ciclos de liderança (com explicitação clara da filosofia, prática e indicadores de liderança), as vantagens dos líderes utilizarem perfis de liderança positivos (ao nível transformacional, transacional e da tomada de decisão) e de terem em consideração os

fatores antecedentes da liderança (ponderando as características do próprio líder, dos colaboradores e da situação onde a liderança ocorre). Assim sendo, as abordagens integradoras dos vários fatores da liderança podem potenciar práticas organizacionais mais eficazes, impactando positivamente no bem-estar e motivação dos colaboradores. Tal como referem Gomes e Morais (2025), implementar intervenções integrativas da liderança leva a uma maior capacitação das chefias para promoverem a eficácia da sua liderança e ampliarem a eficiência e crescimento das próprias organizações, tal como tem vindo a ser frequentemente apontado na literatura (Eniola, 2022; Figueiredo et al., 2023; Meiryani et al., 2022; Parkkinen, 2025; Stoker et al., 2021). No caso da indústria, as implicações práticas são neste mesmo sentido, alertando-se para a necessidade das chefias (nos seus diferentes níveis hierárquicos) serem sensibilizadas (e treinadas) para formas positivas de liderança, marcadas pela capacidade de explicitar aos colaboradores o que se pretende no trabalho (i.e., a filosofia de liderança) bem como aplicar, no dia a dia, estratégias de trabalho congruentes com essa filosofia. Fica claro que comportamentos de liderança transformacionais, transacionais (baseados no feedback positivo), e de tomada de decisão participativa, em conjugação com uma "boa" leitura dos recursos existentes, podem aumentar a perceção que os colaborares têm de estarem perante um líder "pronto" para o exercício pleno das suas funções. Obviamente, esta complexidade de fatores implica repensar processos de trabalho e, eventualmente, incluir nas equipas de trabalho profissionais da área das ciências humanas, no sentido de auxiliar quem lidera a enfrentar a complexidade de fatores que podem condicionar a sua eficácia.

Limitações do Estudo

Em termos de limitações, enfatiza-se o facto de os dados terem sido recolhidos num único momento, o que limita a possibilidade de estabelecer relações causais entre variáveis (Podsakoff et al., 1996). Este tipo de metodologia não permite observar a evolução que os resultados teriam se fossem recolhidos em momentos temporais distintos. Neste sentido, estudos longitudinais permitiriam inferir, com maior segurança, qual a relação entre os fatores de liderança e a perceção de rendimento. Outra limitação prende-se com a amostra, pois refere-se apenas a empresas do setor secundário, diminuindo a possibilidade de generalização dos resultados, não obstante permitir uma análise profunda de um setor com grande relevância económica e social no tecido económico do país. Importa, por isso, que a investigação futura alargue a análise da prontidão para a liderança noutros setores laborais e, eventualmente, noutros contextos culturais. Por outro lado, a utilização de instrumentos de autorrelato baseia os resultados unicamente em perceções dos colaboradores, não obstante serem significativamente relevantes para compreender atitudes e experiências no local de trabalho (Pradhan & Jena, 2017). Neste sentido, recomenda-se utilização de outros indicadores ou fontes de informação que possam permitir a triangulação dos resultados (Donaldson & Grant-Vallone, 2002).

Em suma, sugere-se que, em estudos futuros, a recolha seja longitudinal, pois isso reforçará a robustez e interpretação dos dados. Por outro lado, ganham relevo a consecução de estudos com amostras provenientes de setores de atividade e áreas geográficas distintas, assim como a inclusão ou controlo de mais variáveis (e.g., função, contexto, motivação, comprometimento, satisfação laboral, cultura organizacional, perceção de justiça, segurança, burnout...) (Bakker & Demerouti, 2007; Walumbwa et al., 2007).

Por fim, seria relevante que estudos futuros explorassem igualmente a classificação de grupos (clusters) para robustecer os resultados obtidos neste estudo. A solução de três grupos adotada, ainda que com coeficientes de silhueta dentro de valores aceitáveis/moderados, sugere que possa existir alguma sobreposição entre os grupos e que a sua generalização para outras amostras deva ser interpretada de forma cautelosa. Neste sentido, replicar esta estrutura com novas e maiores amostras será um passo importante para robustecer a confiança nos resultados.

Conclusão

Em suma, os resultados obtidos neste estudo sugerem que a perceção de prontidão para a liderança, que resulta da congruência entre os ciclos de liderança, um perfil ótimo de liderança e maior favorabilidade dos fatores antecedentes da liderança, contribui para explicar os resultados na variável de perceção de rendimento, confirmando-se, assim, as asserções fundamentais do MEL proposto por Gomes (2020). Estes dados demonstram a importância de os líderes dominarem competências específicas de liderança, de modo a potenciarem os efeitos das suas ações naqueles a quem se dirigem (Lemoine et al., 2019; McClean et al., 2019). A explicação destes resultados vai, igualmente, ao encontro do referido por Yulk, 2013, teorizador do lema de que os líderes, quando são consistentes entre o que dizem e o que fazem, promovem um ambiente organizacional de transparência e confiança, o que permite aumentar o envolvimento e motivação dos trabalhadores. Aliás, Walumbwa et al., (2007) defendem que esta coerência permite que o

comportamento dos colaboradores se alinhe com os objetivos da organização, potenciando uma perceção mais positiva do próprio desempenho.

REFERÊNCIAS

Acheampong, A., Muhammed, M. A., & Agyapong, K. (2016). Perceived quality of work life and work performance among university academic staff. *International Journal of Current Research and Academic Review, 4*(4), 1–13. https://doi.org/10.20546/ijcrar.2016.404.001

Aguinis, H., & Burgi-Tian, J. (2021). Talent management challenges during COVID-19 and beyond: Performance management to the rescue. *BRQ Business Research Quarterly, 24*(3), 233–240. https://doi.org/10.1177/23409444211009528

Aslam, S, Saleem, A, Kumar, T., & Parveen, K. (2022). New normal: Emergence of situational leadership during COVID-19 and its impact on work motivation and job satisfaction. *Frontiers in Psychology, 13*, 919941. https://doi.org/10.3389/fpsyg.2022.919941

Antonakis, J. (2012). Transformational and charismatic leadership. In D. V. Day & J. Antonakis (Eds.), *The nature of leadership* (pp. 256–288). Sage.

Avolio, B. J., & Bass, B. M. (2004). *Multifactor leadership questionnaire. Manual and Sampler Set* (3rd ed.). Mindgarden.

Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: State of the art. *Journal of Managerial Psychology, 22*(3), 309–328. https://doi.org/10.1108/02683940710733115

Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership* (2.ª ed.). Psychology Press.

Budur, T., & Demir, A. (2019). Leadership perceptions based on gender, experience, and education. *International Journal of Social Sciences & Educational Studies, 6*(1), 142-154. https://doi.org/10.23918/ijsses.v6i1p142

Burke, C. S., Stagl, K. C., Klein, C., Goodwin, G. F., Salas, E., & Halpin, S. M. (2006). What type of leadership behaviors are functional in teams? A meta-analysis. *The Leadership Quarterly, 17*(3), 288–307. https://doi.org/10.1016/j.leaqua.2006.02.007

Burns, J. M. (1978). *Leadership*. Harper & Row.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

DeRue, D. S., Nahrgang, J. D., Wellman, N., & Humphrey, S. E. (2011). Trait and behavioral theories of leadership: An integration and meta-analytic test of their relative validity. *Personnel Psychology, 64*(1), 7–52. https://doi.org/10.1111/j.1744-6570.2010.01201.x

Dias, M. A. M. J., & Borges, R. S. G. E. (2017). Performance and leadership style: When do leaders and followers disagree? RAM. *Revista de Administração Mackenzie, 18*(2), 104–129. https://doi.org/10.1590/1678-69712016/administracao.v18n2p104-129

Donaldson, S. I., & Grant-Vallone, E. J. (2002). Understanding self-report bias in organizational behavior research. *Journal of Business and Psychology, 17*(2), 245–260. https://doi.org/10.1023/A:1019637632584

Dzikriana, S., Samtiarico, R., Nahriyah, L., & Haryadi, D. (2024). Leadership effectiveness in improving employee performance. *International Journal of Accounting, Finance and Islamic Banking System*, *11*(4). https://doi.org/10.35335/ijafibs.v11i4.240

Eniola, O. E. (2022). Employee engagement outlooks in the era of COVID-19: Implications for human resource management. *International Journal of Human Resource Studies, 12*(1), 71–87. https://doi.org/10.5296/ijhrs.v12i1.19462

Fiedler, F. E. (1967). *A theory of leadership effectiveness*. McGraw-Hill.

Figueiredo, P. C. N., Sousa, M. J., & Tomé, E. (2023). Integrative model of the leader competences. *European Journal of Training and Development, 47*(5/6), 533–564. https://doi.org/10.1108/EJTD-08-2021-0121

Fransen, K., McEwan, D., & Sarkar, M. (2020). The impact of identity leadership on team functioning and well-being in team sport: Is psychological safety the missing link? *Psychology of Sport and Exercise, 51*, 101763. https://doi.org/10.1016/j.psychsport.2020.101763

Gomes, A. R. (2020). Coaching efficacy: The Leadership Efficacy Model. In R. Resende & A. R. Gomes (Eds.), *Coaching for human development and performance in sports* (pp. 43-72). Springer.

Gomes, A. R., Almeida, A., & Resende, R. (2020). Athletes' perception of leadership according to their perceptions of goal achievement and sport results. *Perceptual and Motor Skills, 127*(2), 415–431. https://doi.org/10.1177/0031512519892384

Gomes, A. R., Gonçalves, A., Morais, C., Simães, C., & Resende, R. (2022). Leadership efficacy in youth football: Athletes and coaches perspective. *International Sport Coaching Journal, 9*(2), 170–178. https://doi.org/10.1123/iscj.2020-0128

Gomes, A. R., & Morais, C. (2025). Developing Leadership: The integrative approach of Pro●Leader intervention program. *Behavioral Sciences, 15*(5), 601. https://doi.org/10.3390/bs15050601

Gomes, A. R., Simães, C., Morais, C., & Resende, R. (2021). Psychometric properties of the Multidimensional Sport Leadership Scale: Comparison to Multifactorial Leadership Questionnaire. *International Journal of Sport Psychology, 52*(3), 189-212. https://doi.org/10.7352/IJSP.2021.52.189

Hannah, S. T., Avolio, B. J., Luthans, F., & Harms, P. D. (2008). Leadership efficacy: Review and future directions. *The Leadership Quarterly, 19*(6), 669–692. https://doi.org/10.1016/j.leaqua.2008.09.007

Harvard Business Publishing (2023). The case for leadership character. *Harvard Business Publishing*. https://www.harvardbusiness.org/the-case-for-leadership-character/

Hersey, P., & Blanchard, K. (1996). *Management of organizational behaviour: Utilizing human resources* (7th ed.). Prentice-Hall.

House, R. J., & Howell, J. M. (1992). Personality and charismatic leadership. *The Leadership Quarterly, 3*(2), 81–108. https://doi.org/10.1016/1048-9843(92)90028-E

Judge, T. A., & Piccolo, R. F. (2004). Transformational and transactional leadership: A meta-analytic test of their relative validity. *Journal of Applied Psychology, 89*(5), 755–768. https://doi.org/10.1037/0021-9010.89.5.755

Kaiser, R. B., Hogan, R., & Craig, S. B. (2008). Leadership and the fate of organizations. *American Psychologist, 63*(2), 96–110. https://doi.org/10.1037/0003-066X.63.2.96

Lemoine, G. J., Hartnell, C. A., & Leroy, H. (2019). Taking stock of moral approaches to leadership: An integrative review of ethical, authentic, and servant leadership. *Academy of Management Annals, 13*(1), 148–187. https://doi.org/10.5465/annals.2016.0121

Lisá, E., Sousa, J., Morais, C., & Gomes, A. R. (2023). Leadership cycles, styles, and antecedent factors: The perspective of coaches and young soccer athletes from national Slovak leagues. *Frontiers in Psychology, 14*, 1218290. https://doi.org/10.3389/fpsyg.2023.1218290

McClean, S. T., Barnes, C. M., Courtright, S. H., & Johnson, R. E. (2019). Resetting the clock on dynamic leader behaviors: A conceptual integration and agenda for future research. *Academy of Management Annals, 13*(2), 479–508. https://doi.org/10.5465/annals.2017.0081

Meirovich, G., & Gu, J. (2015). Empirical and theoretical validity of Hersey-Blanchard's contingency model: A critical analysis. *Journal of Management Development, 34*(6), 679–692. https://doi.org/10.5465/ambpp.2014.10416abstract

Meiryani, N., Nelviana, N., Koh, Y., Soepriyanto, G., Aljuaid, M., & Hasan, F. (2022). The effect of transformational leadership and remote working on employee performance during COVID-19 pandemic. *Frontiers in Psychology, 13*, 919631. https://doi.org/10.3389/fpsyg.2022.919631

Northouse, P. G. (2025). *Leadership: Theory and practice* (9th ed.). Sage Publications.

Oc, B. (2018). Contextual leadership: A systematic review of how contextual factors shape leadership and its outcomes. *Leadership Quarterly, 29*(1), 218–235. https://doi.org/10.1016/j.leaqua.2017.12.004

Osmani, A., & Ndoka, E. (2025). From sustainable leadership to well-being: A systematic literature review on the function of collaborative learning in organizations. *Sustainability, 17*(22), 10345. https://doi.org/10.3390/su172210345

Parkkinen, J. (2025). Integrative public leadership: A systematic review. *International Journal of Public Sector Management, 38*(4), 426–447. https://doi.org/10.1108/IJPSM-03-2024-0093

Paustian-Underdahl, S. C., Walker, L. S., & Woehr, D. J. (2014). Gender and perceptions of leadership effectiveness: A meta-analysis of contextual moderators. *Journal of Applied Psychology, 99(*6), 1129–1145. https://doi.org/10.1037/a0036751

Podsakoff, P. M., MacKenzie, S. B., & Bommer, W. H. (1996). Transformational leader behaviors and substitutes for leadership as determinants of employee satisfaction, commitment, trust, and organizational citizenship behaviors. *Journal of Management, 22*(2), 259–298. https://doi.org/10.1177/014920639602200204

Pradhan, R. K., & Jena, L. K. (2017). Employee performance at workplace: Conceptual model and empirical validation. *Business Perspectives and Research, 5*(1), 69–85. https://doi.org/10.1177/2278533716671630

Ribeiro, A. R., Gomes, A.R., Morais, C., Sousa, J., & Fontes, L. (2024). Liderança, equipas, rendimento e comprometimento organizacional: Um estudo sobre método scrum. *Revista de Psicologia Aplicada, 2*(1), 116-135. https://hdl.handle.net/1822/95056

Ribeiro, C., Gomes, A. R., Simães, C., Resende, R., & Moreira, D. (2016). Liderança, satisfação e perceção de rendimento desportivo: Estudo com atletas seniores. *Journal of Sport Pedagogy & Research, 2*(1), 72–86. https://hdl.handle.net/1822/42226

Shaikh, S. S. (2018). Integrative leadership measure: Construct development and content validity. *International Business Research, 11*(9), 51–66. https://doi.org/10.5539/ibr.v11n9p51

Sousa, J., Morais, C., Gomes, A. R., Simães, C., Abreu, A., & Resende, R. (2025). Leadership efficacy, perceived sport performance, and satisfaction with leadership of competitive athletes. *International Journal of Sport Psychology, 56*(5), 447-471. https://doi.org/10.7352/IJSP.2025.56.447

Spreitzer, G. M., & Cameron, K. S. (Eds) (2011). *The Oxford handbook of positive organizational scholarship*. Oxford Library of Psychology. https://doi.org/10.1093/oxfordhb/9780199734610.001.0001

Stiliadi, S. (2024). Personality and individual differences in leadership behavior: A review. *Technium Business and Management, 7*(1), 49–61. https://doi.org/10.47577/business.v7i.10329

Stoker, J. I., Garretsen, H., & Lammers, J. (2021). Leading in times of crisis: How perceived COVID-19 crisis leadership influences employee outcomes. *The Leadership Quarterly, 33*(6), 101645. https://doi.org/10.1177/15480518211007452

Tomova Shakur, T. K., North, M. S., Berson, Y., & Oreg, S. (2024). The age of leadership: Meta-analytic findings on the relationship between leader age and perceived leadership style and the moderating role of culture and industry type. *Personnel Psychology, 77*(4), 1403–1440. https://doi.org/10.1111/peps.12644

Uysal, M. S. (2022). An integrative social identity model of populist leadership. *Social and Personality Psychology Compass, 16*(2), e12713. https://doi.org/10.1111/spc3.12713

Walumbwa, F. O., Avolio, B. J., Gardner, W. L., Wernsing, T. S., & Peterson, S. J. (2007). Authentic leadership: Development and validation of a theory-based measure. *Journal of Management, 34*(1), 89–126. https://doi.org/10.1177/0149206307308913

Wang, G., Oh, I.-S., Courtright, S. H., & Colbert, A. E. (2011). Transformational leadership and performance across criteria and levels: A meta-analytic review of 25 years of research. *Group & Organization Management, 36*(2), 223–270. https://doi.org/10.1177/1059601111401017

Wang, Y. (2023). The role of leadership style in influencing employees' perceptions of their individual performance. In S. Yacob et al. (Eds.), *Proceedings of the 2023 7th International Seminar on Education, Management and Social Sciences (ISEMSS 2023)* (pp. 946–952). Atlantis Press. https://doi.org/10.2991/978-2-38476-126-5_104

Yukl, G. (2013). *Leadership in organizations* (8th ed.). Prentice Hall.

Zaccaro, S. J. (2007). Trait-based perspectives of leadership. *American Psychologist, 62*(1), 6–16. https://doi.org/10.1037/0003-066X.62.1.6

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Emanuel Penada da Cunha: Curadoria dos dados; Análise formal; Metodologia; Administração do projeto; Redação do rascunho original. **Catarina Morais**: Concetualização; Análise formal; Aquisição de financiamento; Investigação; Metodologia; Supervisão; Redação – revisão e edição. **A. Rui Gomes**: Concetualização; Curadoria dos dados; Análise formal; Aquisição de financiamento; Investigação; Metodologia; Administração do projeto; Recursos; Software; Supervisão; Validação; Visualização; Redação – revisão e edição.

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Dark Future Scale adaptation and factor structure in Uruguay

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Abstract: Future Anxiety refers to a state of apprehension, insecurity, fear and worries about possible and unfavourable changes in the personal future, is measured with the Dark Future Scale. This study explores its factor structure and psychometric characteristics with 1850 participants, with ages between 13 and 82 years old (M = 28.99, SD = 10.91). Using Exploratory and Confirmatory Factor Analysis, a one-dimension structure was found, explaining 64% of total variance, high factor loadings and reliability ($\lambda \geq .60$, $\alpha = .86$, $\omega = .86$). Evidence of convergent-divergent validity was found: responsibility (r = -.28), emotional stability (r = -.32), openness to new experiences (r = -.23), satisfaction with life (r = -.38), past negative (r = .56) and future negative (r = .40). Measurement invariance across sex was supported, allowing for meaningful group comparisons. In general, results support a clear factor structure with adequate reliability and validity within general population.

Keywords: *Future anxiety; Subjective temporality; Psychological assessment; Psychometrics; Factor analysis.*

Anxiety represents an anticipatory response to a stimulus that presents itself as a future threat, which may occur after an event, as anticipation of a future event, or when approaching or confronting a representation or stimulus that provokes fear (American Psychiatric Association, 2013). According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013), anxiety is a characteristic that may present in excessive form, accompanied by associated behavioural alterations in what are termed anxiety disorders. Although anxiety and fear are clinically overlapping constructs, anxiety is more commonly associated with muscle tension, vigilance in relation to potential future threats, and cautious or avoidant behaviour.

According to Sarason and Sarason (1996), anxiety is defined as a confused, vague, and very unpleasant feeling of fear and apprehension. An anxious person excessively worries, especially about unknown dangers, experiencing uncertainty, helplessness, and physiological arousal, possibly exhibiting symptoms such as accelerated heart rate, shortness of breath, diarrhoea, loss of appetite, fainting, dizziness, sweating, insomnia, frequent urination, and trembling.

Subjective temporality and Future Anxiety

Anxiety, being directly associated with an evaluative process related to potential future situations or outcomes, is inextricably linked to temporality at an individual and therefore subjective level. Subjective temporality, as discussed by Ortuño, Paixão et al. (2017), brings together various aspects related to one's own time, including individual conceptions of time, as well as different temporally-based cognitive processes, among which we find: Time Perspective (Zimbardo & Boyd, 1999), Consideration of Future Consequences (Vásquez-Echeverría et al., 2017), and Hope for the Future (Snyder et al., 2002), to name a few.

From a theoretical perspective, subjective temporality provides a relevant framework for understanding future-oriented psychological processes. Lewin (1965) proposed that representations of the past and the future remain psychologically active in the present, shaping cognition and behaviour. Similarly, Nuttin and Lens (1985) conceptualised the future as the primary motivational space in which goals, plans, and expectations are organised. Within this framework, individuals may approach the future with either positive or negative orientations, giving rise to constructs such as Future Anxiety (Zaleski, 1996). Future Anxiety (FA) is defined as a state of apprehension, uncertainty, fear, and concern about unfavourable changes in a distant future (Zaleski, 1996). It refers to those attitudes towards the future in

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which an individual's negative cognitive and emotional processes outweigh the positive ones (Zaleski et al., 2019). In this sense, the individual experiences fear toward future events, interpreting them as dangerous or adverse rather than hopeful or motivating. This fear is conscious but not due to a specific event but to the individual's representation of it (Zaleski, 1996). It can be triggered by either a general theme or a specific stimulus (Zaleski, 1994).

Importantly, Future Anxiety should be distinguished from related constructs. While general anxiety is typically associated with immediate or proximal threats and involves strong physiological activation (American Psychiatric Association, 2013), Future Anxiety is oriented toward temporally distant scenarios and is predominantly cognitive in nature. Unlike fear, which involves rapid, adaptive responses to identifiable threats often rooted in evolutionarily prepared mechanisms (Öhman & Mineka, 2001), Future Anxiety is based on representations of potential future events. Similarly, although it shares features with worry, conceptualised as a relatively uncontrollable chain of negative thoughts and images oriented toward uncertain future outcomes (Borkovec et al., 1983), it is not limited to such repetitive cognitive processes but reflects broader negatively valenced expectations about the future. It also differs from intolerance of uncertainty, defined as a predisposition to react negatively to uncertain situations regardless of their probability or consequences (Ladouceur et al., 2000), whereas Future Anxiety specifically involves the anticipation of unfavourable future outcomes. Future Anxiety is not only a cognitive representation of the future but also a construct with clear motivational and behavioural implications. A negatively biased anticipation of future events may influence how individuals approach goals, cope with uncertainty, and regulate their behaviour, often favouring avoidance strategies or reduced engagement with future-oriented actions (Zaleski, 1996; Zaleski et al., 2019). Within the theoretical framework proposed by Nuttin and Lens (1985), we can assert that FA is framed in a future temporal orientation and is closely related to temporal content and temporal affective valence. In this sense, it can be understood as a negatively valenced future-oriented disposition, conceptually linked to broader dimensions of temporal perspective, particularly those involving negatively biased representations of the past and the future (Zaleski et al., 2019).

From a motivational standpoint, Future Anxiety is closely related to personal goals, for Zaleski (1994), those with defined goals may experience a certain level of Future Anxiety, while those without clear goals or who do not plan for the future may not experience the same levels of Future Anxiety. For this author, its development is linked to three central aspects: i) the value attributions we make regarding a certain object or situation that may be blocked, ii) the likelihood of that same blockage occurring, and iii) the sense of controllability or self-efficacy concerning the situation.

Future Anxiety is better understood as a distant rather than a near perspective. While the general definition of anxiety refers to a negative feeling mostly linked to short-term physiological changes, Future Anxiety refers to anxiety about the future, in which cognitive elements prevail over emotional ones (Ortuño, 2020). Although it can have relative short-term effects, it is primarily characterised as a long-term state. In this sense, the perceived temporal proximity of the aversive situation determines whether we are referring to General Anxiety or to Future Anxiety (Zaleski, 1996).

Empirical evidence on FA

Previous studies support the relevance of FA across multiple domains, Hammad (2016) found positive associations between Future Anxiety and career-related anxiety, psychosomatic manifestations of anxiety, and life stress. Zaleski and Janson (2000) studied the relationship between supervisors in civilian and military institutions and their subordinates and found a positive association between Future Anxiety and aggressive behaviour toward subordinates, while those who scored low on Future Anxiety tended to use cooperative rather than aggressive strategies. Díaz (2019) reported positive associations between Future Anxiety and Instagram addiction, Machiavellianism, and subclinical psychopathy. In the field of intervention, Kaya and Acvi (2016) examined the effectiveness of Cognitive Behavioural Therapy in reducing FA among university students. After the intervention, anxiety related to making mistakes decreased, while students' expectations increased. More recently, Duplaga and Grysztar (2021) found that FA was negatively and moderately associated with health literacy, and positively and moderately associated with perceived threat during the COVID-19 pandemic. Additionally, female participants showed higher levels of FA compared to males. Dodd et al. (2021) also reported that students with high levels of FA were more likely to experience lower well-being.

Furthermore, Apud et al. (2025) found that Zen Buddhist practitioners showed lower impulsivity and improved management of anxiety and emotions through meditation practices, suggesting that cultural and spiritual frameworks may modulate FA. Similar results were also observed among Soka Gakkai and Vajrayāna practitioners (Apud et al., 2022, 2024).

Scale development

The Future Anxiety Scale was initially developed by Zaleski (1996) to measure this construct. It consists of 29 items rated on a 7-point Likert scale ranging from 0 ("Decidedly false") to 6 ("Decidedly true"), structured as a single factor. Higher scores indicate greater levels of Future Anxiety. Zaleski (1996) also noted that the scale was originally translated into English, Polish, Dutch, and French. On the other hand, the Dark Future Scale (Zaleski et al., 2019) is a short version of the previously mentioned scale. The authors realised that the original scale did not produce acceptable results in relation to model fit indices when using Structural Equation Modelling. Therefore, they removed items with low factor loadings, subjectively evaluated the content of the items to preserve the representativeness of the concept under study and aimed to maintain a Cronbach's Alpha level of at least .80.

The final version has 5 items in a 7-point Likert format, like its predecessor. It appeared as a reliable method to measure Future Anxiety, presenting good psychometric properties despite the item reduction. At the reliability level, in their 2019 study, Zaleski and collaborators reported internal consistency values of α = .90 and test-retest reliability of r = .62. At the validity level, it showed significant convergent correlations with different dimensions, such as negative past temporal perspectives (r = .43, p < .05), fatalistic present (r = .32, p < .05), and negative future (r = .54, p < .05). At the structural level, it also presented a unifactorial structure with high factor loadings and high levels of global fit within the Structural Equation Modelling framework (CFI = .99, SRMR = .015). This new version of the scale has been used in several countries, including Australia, Canada, China, the Philippines, Singapore, Italy (Jannini et al., 2022), Turkey (Yıldırım et al., 2023) and Poland.

Studies on subjective temporality have mainly focused on the positive elements of the future dimension, ignoring the implications of the negative aspects of this framework (Ortuño, 2020), which makes it necessary to develop instruments capable of measuring constructs associated with negative future temporality whilst presenting good psychometric properties.

Although scales have been developed with concepts or underlying dimensions similar to Future Anxiety, there are no other instruments capable of specifically measuring this construct. The assessment of FA also requires consideration of cultural and contextual factors. Previous research has shown that FA is sensitive to macro-level stressors such as economic uncertainty, unemployment, and large-scale crises (e.g., pandemics), which shape individuals' expectations about their personal future. In this sense, the expression and intensity of FA may vary across sociocultural contexts, particularly in regions characterised by economic instability or transitional labour markets. Despite this, there is a scarcity of validated instruments for assessing FA in Latin American populations, including Uruguay. This gap limits both research development and the implementation of contextually appropriate assessment and intervention strategies. Taken together, FA clinical relevance, and the lack of validated instruments in specific cultural contexts highlight the need for rigorous psychometric evaluation of brief measures such as the Dark Future Scale.

The present study

Thus, the central objective of the current study is to i) present the cultural and linguistic adaptation of the Dark Future Scale (DFS) to Spanish, particularly in a sample of participants from the Oriental Republic of Uruguay; ii) present its factor structure and psychometric characteristics; iii) explore the network of associations of this construct with other psychological dimensions; and iv) study possible differences in FA between male and female participants. The hypotheses to be tested are as follows:

Hypothesis 1 (H1): The Dark Future Scale presents a unidimensional internal structure.

Hypothesis 2 (H2): The global FA score presents a negative association with adaptive dimensions of psychological functioning, such as life satisfaction, future temporal perspective, and extraversion.

Hypothesis 3 (H3): The global FA score presents a positive association with maladaptive dimensions of subjective temporality, such as negative past, fatalistic present, and negative future.

Hypothesis 4 (H4): Female participants present higher levels of FA than male participants.

METHOD

Participants

To conduct this study, two independent samples were collected through convenience sampling. The main descriptive statistics of these samples are presented below in Table 1. The study samples were collected at

different times, with one being dedicated to Exploratory Factor Analysis (EFA) and the other to Confirmatory Factor Analysis (CFA). This practice allows for testing the stability of the factorial solutions found (Izquierdo et al., 2014) and replicates the procedure carried out by Zaleski et al. (2019) in presenting the instrument. Comparatively, statistically significant differences were found between the two samples in terms of the participants' age and gender.

Table 1. Sample descriptive statistics

		Age			Sex			
	N_{Sample}	M	SD	Range	$n_{Male.}$	%	n_{Fem}	%
Sample 1	854	25.66	8.53	13-66	208	24.2	651	75.8
Sample 2	996	32.31	13.28	14-82	283	28.6	707	71.4
p			.001[1]			.035[2]		

Note. Result obtained with an Independent Sample T-Test. [2]Result obtained with a Chi-Square Test of Independence.

Instruments

The instruments used in this research are described below.

Dark Future Scale (DFS, Zaleski et al., 2019). The Dark Future Scale is a tool composed of five questions (7-point Likert scale, where 0 = Completely false and 6 = Completely true) used to assess Future Anxiety. It is a reduced version of Zaleski's (1996) Future Anxiety Scale. As previously mentioned, the DFS presented good psychometric indicators in its original version, as well as a clear factorial structure.

Brief Sensation Seeking Scale (BSSS, Hoyle et al., 2002). The Brief Sensation Seeking Scale consists of 8 items in a 5-point Likert format, where 1 = Completely false and 5 = Completely true. It aims to assess the individual tendency for seeking intense and/or novel sensations. The scale shows high levels of internal consistency both in the original study (α = .77) and in the version adapted to the Uruguayan context used in this study (α = .81, α 95% CI = .78, .83).

Zimbardo Time Perspective Inventory (ZTPI, Zimbardo & Boyd, 1999). The Uruguayan adaptation (Alvarez-Nuñez, 2018) of the Zimbardo Time Perspective Inventory was used. The IPTZ-UY configuration corresponds to the proposed abbreviated version consisting of 15 items (Košťál et al., 2016) grouped into five temporal dimensions: Positive Past, Negative Past, Hedonistic Present, Fatalistic Present, and Future. These are presented in a 5-point Likert format, with 1 = Does not characterise me at all and 5 = Totally characteristic. The IPTZ shows adequate internal consistency on average in its original version (α = .78), although the values obtained with the Uruguayan version in this study are more modest (α = .63), mainly due to it being a reduced version.

Temporal Perspective Inventory (TPI, Janeiro, 2012). The original version in Portugal of the TPI consists of 32 items that assess Temporal Orientations of Past, Present, Future, and Negative Future. The items are presented in a 7-point Likert format (1 = Does not correspond to my way of being at all, and 7 = Corresponds very closely to my way of being). For this study, the four items corresponding to the Negative Future dimension were used, following the recommendations of Ortuño, Janeiro et al. (2017) for a multidimensional assessment of Temporal Perspective. This scale shows high internal consistency in its original version (α = .70) as well as in this study (α = .80, α 95% CI = .78, .82) with the version adapted to Uruguay by Alvarez-Nuñez (2018).

Big Five Inventory 2S (BFI2-S, Soto & John, 2017). The Big Five Inventory 2 in its S version consists of 30 items in a 5-point Likert format (1 = Strongly disagree and 5 = Strongly agree), which are grouped into five personality dimensions: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism. This instrument showed good indicators of internal consistency in its original version (average α = .78) and acceptable in the version adapted to Uruguay (Oliveri, 2018) used in this study (average α = .68).

Satisfaction With Life Scale (SWLS, Diener et al., 1985). The Satisfaction with Life Scale consists of five items in a 5-point Likert format (1 = Strongly disagree and 5 = Strongly agree). The SWLS exhibits high internal consistency values in its original version (α = .87), as well as in the version used in this study (α = .85, α 95% CI = .84, .87), corresponding to the official Spanish translation by Reyes Torres.

Instrument adaptation

The translation and adaptation of the DFS to Rioplatense Spanish, which is the predominant variant in Uruguay, was carried out following the recommendations proposed by Widenfelt et al. (2005) for the adaptation of psychological assessment instruments. The DFS items were translated by three of the authors of this paper. Subsequently, a back-translation was performed by an independent translator, and the equivalence between the content of the back-translated version and the English version of the instrument was qualitatively compared.

The translation was subject to evaluation by a panel of five psychologists who are experts in psychological assessment, motivation, and subjective temporality to establish the representativeness of the construct under study, the ease of understanding of the instrument's instructions, as well as its items using a five-point Likert scale developed for this purpose. The evaluators' responses on the three evaluated criteria were satisfactory to continue the process ($M > 4$). Subsequently, the instrument was presented to a group of participants without specific training in the evaluated topics ($n = 10$), who evaluated the instrument based on a Likert scale for the criteria of grammatical structure ($M = 4.4$), difficulty ($M = 1.6$), ambiguity ($M = 1.4$), and accessibility of language ($M = 4.1$), and they also had the opportunity to provide specific comments on each item. Of this group, eight participants reported being completely in agreement with the formulation of the items. The qualitative comments received from the remaining two participants were discussed by the authors and introduced where deemed appropriate.

Procedures and Statistical Analysis

All participants were informed prior to participation about the anonymous and voluntary nature of their participation, the objectives of the study were briefly explained, and guidelines were given on how to answer the various questions in the questionnaires. Data were collected both in person in a classroom before the start of the class and online through an online questionnaire platform.

For the preparation of the database and the different statistical analyses, the following statistical packages were used: IBM SPSS 22, FACTOR 10.10.01 (Ferrando & Lorenzo-Seva, 2017), and Mplus 7.3 (Muthén & Muthén, 2017). The Shapiro-Wilk test was used to test the normality of the distribution of the study variables.

The Exploratory Factor Analysis (EFA) was carried out using the Robust Diagonally Weighted Least Squares (RDWLS) method, utilising the polychoric correlation matrix with the Factor statistical package, following the recommendations of Ledesma et al. (2019) for analysing ordinal-level categorical variables, as Pearson correlation matrices are not an ideal solution for data that do not present a normal distribution. The Scree Plot, the Kaiser Criterion, and parallel analysis were considered for the retention of the number of factors.

The Confirmatory Factor Analysis (CFA) was conducted with the Mplus statistical package using the maximum likelihood estimator, which allows for working with ordinal indicators and non-normal distributions. To analyse the global fit of the tested model, the following statistics were used: Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Standardised Root Mean Squared Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA), considering acceptable values above .95 (CFI and TLI), below .08 (SRMR), and below .06 (RMSEA) in line with the recommendations of Hu and Bentler (1999). Concerning the internal consistency of the DFS, Cronbach's Alpha and McDonald's Omega were used. The interpretation of these was made based on the recommendations of Nunnally (1978), who mentions that acceptable values are above .7 for new instruments, above .8 for research and group comparison, and .9 for instruments whose results will be used as decision criteria at an individual level.

RESULTS

Preliminary Analyses

The normality of the distribution of responses obtained in the five indicators that make up the DFS was tested. In Sample 1, the five items showed statistically significant results in the Shapiro-Wilk test ($p < .001$). The same procedure was applied to Sample 2, and the results were identical, with a statistically significant value of $p < .001$ in the same test. Therefore, we can infer that neither sample has a distribution similar to the normal distribution concerning the items that make up the DFS. For this reason, the remaining statistical analyses are performed with their non-parametric versions or adapted to categorical variables.

Exploratory Factor Analysis

The following analysis was conducted with Sample 1 ($n = 854$). Regarding the adequacy of the sample used, the Kaiser-Meyer-Olkin (KMO) test presented a value of .83, and the Bartlett's test of sphericity reported a

statistically significant value of $p < .001$. These reasons allow us to assert that the sample used is adequate for the statistical procedures presented below.

Regarding the number of factors to retain, the three criteria used point to a unifactorial solution. The eigenvalue of the first factor is 3.21, while the subsequent factors have values below 0.61. This option is also supported by analysing the scree plot. Parallel analysis further supported the retention of a single factor, as the first empirical factor exceeded the corresponding value obtained from 500 random correlation matrices.

Table 2 presents the detailed results of the Exploratory Factor Analysis (EFA), showing that the five items have high factor loadings ($\lambda > .60$) and communalities ($h^2 > .30$) in a single-factor structure, explaining 64% of the variance (Eigenvalue for factor 1 = 3.21). The reliability value is also presented in the case of item removal. It is not observed that the elimination of any of the items would improve reliability measured by Cronbach's Alpha ($\alpha = .84$).

Table 2. Dark Future Scale Exploratory Factor Analysis (DFS, *n* = 854)

Item Nº	Item content (Spanish adaptation)	h^2	λ	α w/ item
1	I am afraid that the problems which trouble me now will continue for a long time (Me temo que mis preocupaciones irán a continuar por un largo período de tiempo)	.39	.63	.83
2	I am terrified by the thought that I might sometimes face life´s crises or difficulties (Me da terror pensar en enfrentar una crisis de vida u otra dificultad)	.56	.75	.80
3	I am afraid that in the future my life will change for the worse (Me asusta que en el futuro mi vida pueda cambiar para peor)	.82	.91	.77
4	I am afraid that changes in the economic and political situation Will threaten my future (Me temo que posibles cambios en la economía o en la política amenacen mi future)	.43	.65	.82
5	I am disturbed by the thought that in the future I won´t be able to realise my goals (Me preocupa que en el futuro no sea capaz de alcanzar mis metas)	.62	.79	.79
Explained variance			64%	

Note. Results from Sample 1.

Confirmatory Factor Analysis

The following analysis was conducted with Sample 2 ($n = 996$). The unifactorial model composed of five indicators showed good overall fit, with acceptable values across most indices, $\chi^2(5) = 44.65$, $p < .001$; CFI = .977, TLI = .955, SRMR = .022, although RMSEA was slightly elevated (RMSEA = .089, 90% CI [.066, .114]). High factor loadings (λ) and variance explained values (R^2) were also found in each of the items used (see Figure 1).

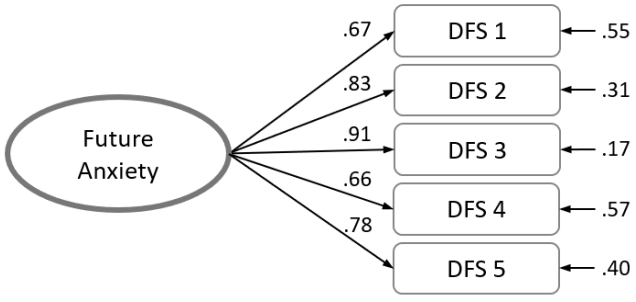

Figure 1. Standardised estimates of DFS confirmatory structural model (λ, R^2, n = 996, Sample 2). Source: Own elaboration.

Multi-group comparison

Measurement invariance across sex was tested using multi-group confirmatory factor analysis. The results supported configural, metric, scalar, and strict invariance (see Table 3), as the imposition of equality constraints did not result in any deterioration of model fit (ΔCFI = .000). Model fit indices remained stable

across increasingly constrained models (CFI = .968 in all cases), while RMSEA slightly improved in the strict model (from .079 to .069). These findings indicate that the Dark Future Scale operates equivalently across male and female participants, supporting the comparability of both observed and latent scores across groups.

Additionally, a significant difference in latent means was observed, with male participants showing lower levels of Future Anxiety (standardised estimate ≈ −0.20, p < .01).

Table 3. Measurement invariance across sex for the Dark Future Scale

Model	X^2 (df)	CFI	TLI	RMSEA	SRMR
Configural	73.04 (18)	.968	.964	.079	.036
Metric	73.04 (18)	.968	.964	.079	.036
Scalar	73.04 (18)	.968	.964	.079	.036
Strict	73.04 (23)	.968	.972	.069	.040

Reliability

At the reliability level (see Table 4), Cronbach's Alpha and McDonald's Omega were calculated for both samples. The results show high values in both indices for both samples. As can be seen in Table 2, the elimination of any of the items does not improve the Cronbach's Alpha value.

Table 4. Dark Future Scale (DFS) reliability indexes

	α	α I.C. 95%	ω
Sample 1	.84	.82, .85	.84
Sample 2	.88	.87, .89	.88

Validity

To examine potential sex differences in Future Anxiety (DFS, see Figure 2) a Mann–Whitney U test was used. Results indicated a statistically significant difference between males (n = 480, Mdn = 790.62, M = 14.35, SD = 7.85) and females (n = 1331, Mdn = 947.61, M = 16.72, SD = 7.67) in Future Anxiety, U = 264,055.50, Z = –5.64, p < .001. Female participants showed higher levels of Future Anxiety compared to male participants, as reflected in the mean ranks.

To complement this analysis, we also computed the standardised mean difference (Cohen's d), obtaining d = 0.31, 95% CI [0.20, 0.41]. This corresponds to a small effect size, suggesting that, although statistically significant, the difference between sexes is of modest magnitude.

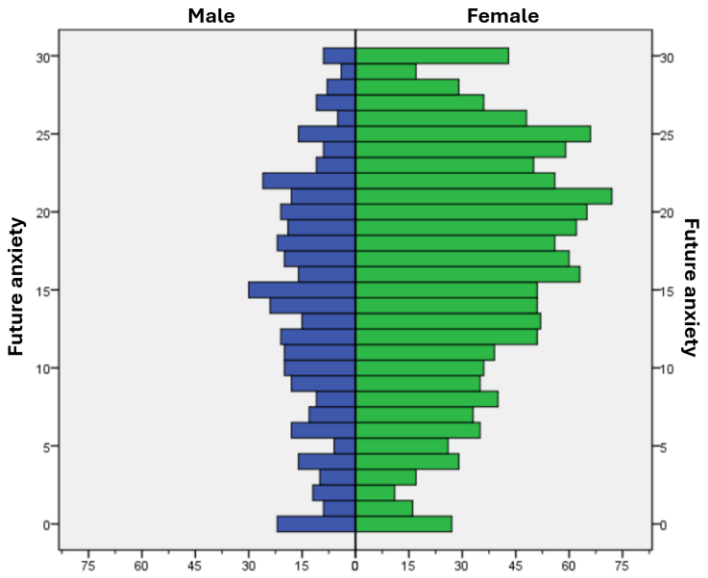

Figure 2. Comparative histogram of the distribution of Future Anxiety by sex (N = 1861).
Source: Own elaboration.

Finally, Table 5 presents the correlations between Future Anxiety scores and various psychological constructs, which we consider provide evidence of convergent-divergent validity. Concerning the dimensions considered negative for psychological functioning, there are weak positive correlations with Sensation Seeking (r = .16) and Fatalistic Present (r = .08). There are also moderate positive correlations with Negative Past (r = .56), Negative Future (r = .40), and Neuroticism (r = .46). Regarding the dimensions considered adaptive for psychological functioning, weak negative correlations were found with Future (r = -.20), Agreeableness (r = -.10), Conscientiousness (r = -.28), and Openness to Experience (r = -.23). Moderate negative correlations were also found with Life Satisfaction (r = -.38) and Extraversion (r = -.30). All these correlations are in the expected direction and provide empirical evidence concerning Hypotheses 2 and 3. Only the correlations with Positive Past and Hedonistic Present do not present a theoretically expected association.

Table 5. Correlations (Pearson r) between Future Anxiety and other psychological constructs

	Future Anxiety
Sensation Seeking (BSSS)	.16**
Satisfaction with Life (SWLS)	-.38**
Positive Past (ZTPI)	.21**
Negative Past (ZTPI)	.56**
Hedonist Present (ZTPI)	.12**
Fatalist Present (ZTPI)	.08*
Future (ZTPI)	-.20**
Negative Future (IPT)	.40**
Extraversion (BFI2-S)	-.30**
Agreeableness (BFI2-S)	-.10*
Conscientiousness (BFI2-S)	-.28**
Neuroticism (BFI2-S)	.46**
Openness (BFI2-S)	-.23*

** p < .01, * p < .05

DISCUSSION

The main objective of this study was to present the translation and cultural adaptation of the Dark Future Scale (DFS), developed by Zaleski and collaborators (2019), into Spanish and, more specifically, into the Uruguayan context. To achieve this, various procedures considered standard for this type of work were carried out.

The present study provides evidence regarding the construct validity of the DFS, specifically in terms of its structural, convergent-divergent validity, and its reliability, explored through Cronbach's Alpha and McDonald's Omega. These results not only validate the DFS but also allow us to affirm that the DFS in its version adapted for Uruguay is an instrument that presents a factorial structure and reliability levels similar to those of the original instrument presented by Zaleski et al. (2019).

From the theoretical review conducted to develop this study, no other adaptation of the DFS has been found in the Ibero-American space to date, so we can assert that this constitutes the first work to present results in this regard. This is particularly relevant due to the lack of instruments developed or adapted to our linguistic-cultural space concerning constructs of subjective temporality, which are highly relevant in understanding different aspects of human thought and behaviour (Ortuño, 2020).

Factor structure and measurement invariance

Regarding the hypotheses under study, evidence was found in favour of H1, in the sense that both the Exploratory Factor Analysis and the Confirmatory Factor Analysis results point to a grouping of items into a single factor. This is in line with the three criteria used for factor retention (Kaiser criterion, scree plot analysis, and parallel analysis), as well as with the factor loadings and communalities of each item, with the results presented in line with the recommendations of various authors on this subject (Kline, 2015). The total variance explained by the DFS showed a high value of 64%, exceeding the 48% reported in the original version (Zaleski et al., 2019). Finally, the global fit of the model, tested through structural equation modelling, presented acceptable results in the different fit indices used (CFI, TLI and SRMR, with the exception of RMSEA), considering the existing recommendations in this area (Hu & Bentler, 1999; Kline, 2015). Although the RMSEA was slightly above conventional cutoffs, this finding should be interpreted with

caution. Previous research has shown that RMSEA may overestimate model misfit in models with very small degrees of freedom, even when the model is correctly specified (Kenny et al., 2014; Kline, 2015), and that its statistical performance may deteriorate under certain conditions, particularly as model complexity increases, leading to an increased likelihood of rejecting adequately fitting models (Maydeu-Olivares et al., 2018). The results of the multi-group analysis provide strong evidence for the structural stability of the Dark Future Scale across sex. The support for configural, metric, scalar, and strict invariance indicates that the factorial structure, factor loadings, item intercepts, and residual variances are equivalent between male and female participants. This level of invariance is rarely achieved and suggests that the instrument operates with a high degree of psychometric consistency across groups. Consequently, observed differences can be interpreted as reflecting true differences in the latent construct rather than measurement artifacts. The finding that female participants reported higher levels of Future Anxiety here gains substantive meaning, as it is not confounded by differential item functioning or measurement bias. More broadly, these results reinforce the robustness of the DFS as a tool for comparative research and support its use in studies examining group differences in future-oriented anxiety.

Reliability and convergent-divergent validity

In reference to the instrument's reliability, high internal consistency values were found both in Cronbach's Alpha and McDonald's Omega. The latter has been widely suggested as a better solution for measuring the reliability of psychological assessment instruments conceptualised through congeneric models (Hayes & Coutts, 2020). We consider it very positive that both statistics, α and ω, exceeded the recommended value of .80 by Nunnally (1978) for conducting scientific research. In the case of Sample 2, the obtained values are very close to .90, which can be considered adequate for applied contexts.

In terms of validity, the results are also encouraging (see Table 5). As expected, Future Anxiety appeared negatively associated with positive dimensions of psychological functioning, such as life satisfaction (SWLS), future temporal perspective (ZTPI), and personality traits of extraversion, conscientiousness, and openness to new experiences (BFI). These results support H2. It is common to find results from different negative dimensions of future temporality, such as Future Anxiety, negatively associated with dimensions considered adaptive, such as vocational identity (Almeida, 2016), the use of cooperative strategies in organisational contexts (Zaleski & Janson, 2000), and self-esteem (Ortuño & Vásquez, 2013).

Also related to validity, we found a trend of positive associations between Future Anxiety and constructs related with maladaptive psychological functioning. This is the case with sensation seeking (BSSS), negative past and future temporal perspectives, and finally, the level of neuroticism (BFI), results that validate H3. The only exception was the Fatalistic Present dimension, which, although it presents a positive and statistically significant correlation, is of very low intensity (r = .08), so it is not possible to defend the existence of a relevant association pattern between these two dimensions.

The positive link between Future Anxiety and maladaptive dimensions is a trend reflected in other studies, with variables such as Instagram addiction, Machiavellianism, and non-clinical psychopathy (Diaz, 2019), Negative Past and Fatalistic Present Temporal Perspectives (Sobol et al., 2020). In our view, high levels of Future Anxiety may favour the development of a negative perspective concerning personal past and future. In the case of the former, through a process of selective memory due to the influence of a state with a strong affective charge. And in the latter, due to the difficulty in developing problem-solving strategies, due to an external and unstable attributional style and a low sense of self-efficacy. This is supported by the negative association between Future Anxiety and the age of the participants. In other words, the greater the life experience—and, tendentially, the greater the resources to deal with difficulties—the lower the individual's Future Anxiety. It remains to be seen whether these influences could also be bidirectional, with Temporal Perspective, acting as a personality trait, influencing the development or mitigation of Future Anxiety as a cognitive-affective trait.

Sex differences in Future Anxiety

Regarding gender differences (H4), female participants showed higher levels of Future Anxiety than male participants, replicating a pattern previously reported in the literature (e.g., Hammad, 2016; Ledezma et al., 2010; Zaleski, 1994). Importantly, the demonstration of configural, metric, scalar, and strict invariance across sex indicates that the Dark Future Scale measures the construct equivalently in male and female participants. Consequently, the observed differences can be interpreted as reflecting genuine differences in Future Anxiety rather than artefacts of measurement. Nevertheless, the magnitude of the effect was small (d = .31), suggesting that, although statistically reliable, the practical significance of these differences may be limited. Future studies should investigate the factors that contribute to these sex differences and assess their generalisability across cultures and developmental stages.

Limitations and future directions

This study presents several limitations that should be acknowledged. First, the use of convenience sampling limits the generalisability of the findings, as the sample may not be fully representative of the broader population. Second, the gender distribution was unbalanced, with a higher proportion of female participants, which may have influenced the observed associations and group comparisons. Third, the cross-sectional design precludes any causal inferences regarding the relationships between Future Anxiety and the psychological variables examined. Additionally, all measures were based on self-report instruments, which may be affected by response biases such as social desirability or common method variance.

Despite its growing use, the conceptual boundaries of Future Anxiety remain not fully established, particularly in relation to closely related constructs such as worry, general anxiety, and hopelessness. As observed throughout this study, Future Anxiety presents an important network of associations with different types of cognitions. It remains to explore in future studies the predictive potential of this dimension of subjective temporality and its contributions to specific populations, such as in clinical contexts where it may be particularly useful in understanding different psychopathological processes. Other dimensions to be addressed in the future may include income level, educational level, and religion, as there is evidence of how these impact other dimensions of subjective temporality, such as Temporal Perspective (Zimbardo & Boyd, 1999).

REFERENCES

Almeida, T. (2016). *Identidade vocacional e a sua relação com a perspetiva temporal: um estudo com jovens adultos portugueses a frequentar a universidade* (Unpublished master's thesis). Universidade de Lisboa, Portugal.

Alvarez-Nuñez, L. (2018). *Confiabilidad y validez de la escala consideración de las consecuencias futuras en español*. (Unpublished master's thesis). Universidad de la República, Uruguay.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Publishing. https://doi.org/10.1176/appi.books.9780890425596

Apud, I., Ortuño, V., Azambuya, M. N., Pérez, E., Reimondo, M.R., González, V., Paolillo, S., & Pedraja, N. V. (2022). Budismo y Personalidad. Estudio mixto cualitativo-cuantitativo en la Soka Gakkai Internacional del Uruguay. *Persona, 25*(2), 39-64. https://doi.org/10.26439/persona2022.n25(2).6140

Apud, I., Ortuño, V., Vallverdú, J., Millet, D., Barreto, D., Mota, G., Aquino, F., & Gulisano, M. (2024). The Vajrayāna personality. A mixed quantitative-qualitative study on Tibetan Buddhism in Spain. *Studies in Psychology, 45*(2-3), 338-368. https://doi.org/10.1177/02109395241290790

Apud, I., Ortuño, V., Vallverdú, J., Millet, D., Nuñez, B., Roth Kelland, M., Maciel Suárez, T., & Vega, J. (2025). La Personalidad Zen: Estudio mixto cuantitativo-cualitativo en practicantes budistas de Cataluña. *Revista Iberoamericana de Psicología*, *18*(1), 63–76. https://doi.org/10.33881/2027-1786.rip.18106

Borkovec, T. D., Robinson, E., Pruzinsky, T., & DePree, J. A. (1983). Preliminary exploration of worry: Some characteristics and processes. *Behaviour Research and Therapy, 21*(1), 9–16.

Diaz, J. (2019). *La oscuridad humana detrás de Instagram* (Unpublished graduate thesis). Universidad de la República, Uruguay.

Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of personality assessment, 49*(1), 71-75.

Dodd, R. H., Dadaczynski, K., Okan, O., McCaffery, K. J., & Pickles, K. (2021). Psychological wellbeing and academic experience of university students in Australia during COVID-19. *International Journal of Environmental Research and Public Health, 18*(3), 866. https://doi.org/10.3390/ijerph18030866

Duplaga, M. & Grysztar, M. (2021). The Association between Future Anxiety, Health Literacy and the Perception of the COVID-19 Pandemic: A Cross-Sectional Study. *Healthcare, 9*(43). https://doi.org/10.3390/healthcare9010043

Ferrando, P. J., & Lorenzo-Seva, U. (2017). Program FACTOR at 10: origins, development and future directions. *Psicothema, 29*(2), 236-241. https://doi.org/10.7334/psicothema2016.304

Hammad, M. A. (2016). Future Anxiety and Its Relationship to Students' Attitude toward Academic Specialization. *Journal of Education and Practice, 7*(15), 54-65.

Hayes, A. F., & Coutts, J. J. (2020). Use omega rather than Cronbach's alpha for estimating reliability. But…. *Communication Methods and Measures, 14*(1), 1-24. https://doi.org/10.1080/19312458.2020.1718629

Hoyle, R. H., Stephenson, M. T., Palmgreen, P., Lorch, E. P., & Donohew, R. L. (2002). Reliability and validity of a brief measure of sensation seeking. *Personality and individual differences, 32*(3), 401-414. https://doi.org/10.1016/S0191-8869(01)00032-0

Izquierdo, I., Olea, J., & Abad, F. J. (2014). Exploratory factor analysis in validation studies: Uses and recommendations. *Psicothema, 26*(3), 395–400.

Janeiro, I. N. (2012). O Inventário de Perspectiva Temporal: estudo de validação. *Revista Iberoamericana de Diagnóstico y Evaluación Psicológica, 2*(34), 117-132.

Jannini, T. B., Rossi, R., Socci, V., & Di Lorenzo, G. (2022). Validation of the Dark Future Scale (DFS) for future anxiety on an Italian sample. *Journal of Psychopathology*, *28*(2), 86-93. https://doi.org/10.36148/2284-0249-45

Kaya, S., & Avci, R. (2016). Effects of Cognitive-Behavioral-Theory-Based Skill-Training on University Students' Future Anxiety and Trait Anxiety. *Eurasian Journal of Educational Research, 66*, 281-298. https://doi.org/14689/ejer.2016.66.16

Kenny, D. A., Kaniskan, B., & McCoach, D. B. (2015). The performance of RMSEA in models with small degrees of freedom. *Sociological Methods & Research, 44*(3), 486–507. https://doi.org/10.1177/0049124114543236

Kline, R. B. (2015). *Principles and practice of structural equation modeling*. New York: Guilford publications.

Košťál, J., Klicperová-Baker, M., Lukavská, K., & Lukavský, J. (2016). Short version of the Zimbardo Time Perspective Inventory (ZTPI–short) with and without the Future-Negative scale, verified on nationally representative samples. *Time & Society, 25*(2), 169-192. https://doi.org/10.1177/0961463X15577254

Hu, L. & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives, *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Ladouceur, R., Gosselin, P., & Dugas, M. J. (2000). Experimental manipulation of intolerance of uncertainty: A study of a theoretical model of worry. *Behaviour Research and Therapy, 38*(9), 933–941.

Ledesma, R. D., Ferrando, P. J., & Tosi, J. D. (2019). Uso del Análisis Factorial Exploratorio en RIDEP. Recomendaciones para autores y revisores. *Revista Iberoamericana de Diagnóstico y Evaluación–e Avaliação Psicológica, 52*(3), 173-180. https://doi.org/10.21865/RIDEP52.3.13

Ledezma, C. L., Rodriguez, M., De Los Rios, F., & De Bortoli, M. A. (2010). Espiritualidad y ansiedad a futuro en una muestra de adolescentes. *II Congreso Internacional de Investigación y Práctica Profesional en Psicología XVII Jornadas de Investigación Sexto Encuentro de Investigadores en Psicología del MERCOSUR*. Facultad de Psicología - Universidad de Buenos Aires, Buenos Aires.

Maydeu-Olivares, A., Shi, D., & Rosseel, Y. (2018). Assessing fit in structural equation models: A Monte Carlo evaluation of RMSEA versus SRMR confidence intervals and tests of close fit. *Structural Equation Modeling: A Multidisciplinary Journal, 25*(3), 389–402. https://doi.org/10.1080/10705511.2017.1389611

Muthén, L. K. & Muthén, B. O. (2017). *Mplus User's Guide (8th edition)*. Los Angeles, CA: Muthén & Muthén.

Nunnally, J. C. (1978). *Psychometric theory*. New York: McGraw Hill.

Nuttin, J., & Lens, W. (1985). *Future Time Perspective and Motivation: theory and research method*. Belgium: Leuven University Press.

Öhman, A., & Mineka, S. (2001). Fears, phobias, and preparedness: Toward an evolved module of fear and fear learning. *Psychological Review, 108*(3), 483–522.

Oliveri, A. (2018). *Assessment of personality through Five Factor Model: reliability and convergent validity of the BFI-2 and TIPI* (Unpublished graduate thesis). Universidad de la República, Uruguay.

Ortuño, V. E. (2020). Aproximaciones a la Temporalidad Subjetiva: La Perspectiva Temporal en foco. En V. E. Ortuño & A. Vásquez (Eds.), *Psicología del Tiempo: Una introducción a la temporalidad en las ciencias del comportamiento* (pp. 85-138). Montevideo: Comisión Sectorial de Investigación Científica – CSIC.

Ortuño, V. E., Janeiro, I. N., Paixão, M. P., Esteves, C., & Cordeiro, P. (2017). Um novo modelo multidimensional da Perspetiva Temporal. *Revista Iberoamericana de Diagnóstico y Evaluación Psicológica, 45*(3), 71-84. https://doi.org/10.21865/RIDEP45.3.06

Ortuño, V. E., Paixão, M. P., & Janeiro, I. N. (2017). Qualitative and Quantitative Trends in the Assessment of Subjective Temporality. En A. Kostić & D. Chadee (Eds.), *Time Perspective: Theory and Practice* (pp. 167-194). Palgrave Macmillan, London. https://doi.org/10.1057/978-1-137-60191-9_8

Ortuño, V. E., & Vásquez, A. E. (2013). Time perspective and self-esteem: Negative temporality affects the way we judge ourselves. *Annales Universitatis Paedagogicae Cracoviensis. Studia Psychologica, 6*, 109-125.

Sarason, I. G., & Sarason, B. R. (1996). *Psicología anormal* (7ª edición). México: Prentice Hall.

Snyder, C. R., Feldman, D. B., Shorey, H. S., & Rand, K. L. (2002). Hopeful choices: A school counselor´s guide to hope theory. *Professional School Counseling, 5*(5), 298-307.

Sobol, M., Blachnio, A., & Przepiórka, A. (2020). Time of pandemic: Temporal perspectives related to compliance with public health regulations concerning the COVID-19 pandemic. *Social Science & Medicine, 265*, 113408. https://doi.org/10.1016/j.socscimed.2020.113408

Soto, C. J., & John, O. P. (2017). The next Big Five Inventory (BFI-2): Developing and assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and predictive power. *Journal of personality and social psychology, 113*(1), 117-143. https://doi.org/10.1037/pspp0000096

Vásquez-Echeverría, A., Martín, A., Esteves, C., Ortuño, V. E., & Joireman, J. (2017). Adaptación y Validación Inicial al Castellano de la Escala de Consideración de las Consecuencias Futuras. *Revista Iberoamericana de Diagnóstico y Evaluación Psicológica, 44*(2), 5-15. https://doi.org/10.21865/RIDEP44.2.01

Widenfelt, B. M., Treffers, P. D., de Beurs, E., Siebelink, B. M., & Koudijs, E. (2005). Translation and cross-cultural adaptation of assessment instruments used in psychological research with children and families. *Clinical Child and Family Psychology Review, 8*(2), 135-147. https://doi.org/10.1007/s10567-005-4752-1

Yıldırım, M., Kaynar, Ö., Arslan, G., & Chirico, F. (2023). Fear of COVID-19, resilience, and future anxiety: psychometric properties of the Turkish version of the dark future scale. *Journal of Personalized Medicine*, *13*(4), 597. https://doi.org/10.3390/jpm13040597

Zaleski, Z. (1994). *Psychology of future orientation*. Lublin, Poland: Towarzystwo Naukowe KUL.

Zaleski, Z. (1996). Future anxiety: Concept, measurement, and preliminary research. *Personality and individual differences, 21*(2), 165-174. https://doi.org/10.1016/0191-8869(96)00070-0

Zaleski, Z., & Janson, M. (2000). Effect of future anxiety and locus of control on power strategies used by military and civilian supervisors. *Studia Psychologica, 42*(1/2), 87-96.

Zaleski, Z., Sobol-Kwapinska, M., Przepiorka, A., & Meisner, M. (2019). Development and validation of the Dark Future scale. *Time & Society, 28*(1), 107-123. https://doi.org/10.1177/0961463X16678257

Zimbardo, P. G., & Boyd, J. N. (1999). Putting time in perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology, 77*(6), 1271-1288. https://doi.org/10.1037/0022-3514.77.6.1271

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Development and Validation of the Durand Emotional Comprehension Inventory (DECI): A Measure of Trait Emotional Intelligence

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Abstract: Although numerous instruments measuring trait emotional intelligence (EI) have been developed, none has been established as a gold standard. Across three studies (*N*s = 231, 202, and 377), this article describes the development and validation of a self-report trait EI questionnaire designed to capture the constructs common to widely used EI measures. A series of exploratory factor analyses (maximum likelihood, direct oblimin rotation) yielded a 44-item, 11-factor solution with good internal consistency (subscale αs = .65–.84; total α = .86). The instrument showed convergent validity with established EI measures, the expected relationships with self-esteem, alexithymia, happiness, personal growth, and the Big Five, and adequate separation among its subscales. In incremental-validity analyses, it performed comparably to the TEIQue and outperformed the SEIS in predicting EI-related constructs. Together, these findings provide initial support for the questionnaire as a broad and efficient measure of trait EI.

Keywords: *Test development; Psychometric testing; General population; Emotional intelligence.*

Emotional intelligence (EI) refers to the skillset associated with accurately reasoning about emotions and using knowledge of emotions to enhance one's thinking (Mayer, Roberts, & Barsade, 2008; Miners, Côté, & Lievens, 2018). Although the concept of EI is relatively new, there has been a plethora of scientific and popular literature published in the last three decades (Petrides, 2001). While the EI concept became widely popular due to laypeople's expectations of its importance in success, empirical research failed to provide consistent conclusive evidence regarding the relationship between EI and markers of success (Miners et al., 2018). Indeed, while many studies support the association between emotional intelligence and positive characteristics such as satisfaction in life (Ruiz-Aranda, Extremera, & Pineda-Galán, 2014), happiness (Furnham & Petrides, 2003), and both physical and psychological health (Tsaousis & Nikolaou, 2005); findings related to success, such as leadership and salary, are more mixed (Føllesdal & Hagtvet, 2013; George, 2000; Howe, Falkenbach, & Massey, 2014). Discrepancies in the EI field could potentially be due to how the concept is measured.

These conflicting findings may principally stem from the duality of approaches used to measure the construct: typical and maximal performance (Hofstee, 2001). Indeed, many researchers developed self-reported questionnaires focusing on the typical expression of traits related to EI, while others designed ability tests focusing on the maximum performance at a specific time point. Despite measuring EI using two widely different approaches, researchers believed they were operationalizing the same construct, leading to confusion regarding the conceptual definition of EI, as well as numerous divergent findings (Pérez, Petrides, & Furnham, 2005). The distinction between typical and maximal performance was further developed by Petrides and Furnham (2000) who classified EI as *trait* (or emotional self-efficacy) and *ability* (or cognitive-emotional ability). Trait EI refers to one's beliefs surrounding their emotional intelligence and is thus captured by self-report measures. On the other hand, ability EI refers to one's cognitive ability to understand their emotions and the emotions of others; and the ability to use that information in social settings and is best captured by maximal performance measures (Pérez et al., 2005). Although trait EI and ability EI shouldn't be considered as competing (since they are measuring two independent constructs), previous findings support a weak correlation between trait and ability EI (Brackett & Mayer, 2003).

Psychometric testing being a lucrative business, there has been a surge of instruments developed by academics and private organizations to measure emotional intelligence (Pérez et al., 2005). While reliable information regarding the psychometric properties of privately developed EI tests is scarce, the scientific literature has been particularly critical of the most common EI measures. For instance, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, & Caruso, 2002) has been criticized extensively, primarily due to the test's score being highly predicted by personality, general intelligence,

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and demographics, as well as due to suboptimal discriminant, construct, and incremental validity (Fiori & Antonakis, 2011). Another commonly used instrument, the Schutte Emotional Intelligence Scale (SEIS; Schutte et al., 1998), also faces a lot of criticism, particularly due to its lack of reverse-keyed items and its factor structure (Austin, Saklofske, Huang, & McKenney, 2004). Among the multiple other tests, common criticisms are that tests do not focus on the complete testing EI universe, are lengthy, have a questionable factor structure, and have not been used in the scientific literature, limiting the availability of psychometric data (for an extensive review of multiple measures, see Pérez et al., 2005).

In addition to the numerous limitations of many popular EI tests, EI measures should display significant relationships with multiple constructs commonly associated with EI, such as life outcomes, personality traits, and alexithymia (Saklofske, Austin, & Minski, 2003). Emotional intelligence has been associated with life satisfaction (Palmer, Donaldson, & Stough, 2002), happiness (Furnham & Christoforou, 2007), positive mood (Schutte, Malouff, Simunek, McKenley, & Hollander, 2002), self-esteem (Kong, Zhao, & You, 2012), and personal growth (Landa, Martos, & López-Zafra, 2010). EI was also reported to have positive relationships with all components of the Big Five factor of personality, apart from a negative relationship with neuroticism (Saklofske et al., 2003). A similar negative relationship is commonly observed between EI and alexithymia (Saklofske et al., 2003).

It is possible that the discrepancies observed in the EI field, particularly across trait EI, may be due to how each author operationalized the EI construct. Examining how each of the most common EI instruments define the construct and mapping the common and uncommon aspects within each definition may be beneficial to develop an instrument focusing on the entire testing EI universe. Hence, the purpose of this article is to describe the development and initial validation of a new trait EI self-reported questionnaire focusing on the constructs commonly observed within popular EI instruments.

METHOD OF STUDY 1: TEST DEVELOPMENT

Participants

Two hundred and thirty-one (N = 231, 42% males, M = 27.85 years old, SD = 11.08) participants were recruited online. All participants received informed consent at the beginning of the questionnaire. Inclusion criteria were to be over 18 years old and be fluent in English. Almost half (45%) of the participants reported being a university student. The majority of participants were located in North America (45%) and Europe (45%).

Procedure

In order to identify the constructs of interest to emotional comprehension, I first examined the factors included in six of the most well-researched EI instruments: the Mayer-Salovey-Caruso Emotional Intelligence Test battery (MSCEIT; Mayer, Salovey, Caruso, & Sitarenios, 2001), Emotional and Social Competence Inventory (ESCI; Goleman, 1998), Work Profile Questionnaire – Emotional Intelligence (WPQei; Cameron, 2004), BarOn Emotional Quotient Inventory (EQI; Bar-On, 1997), Trait emotional intelligence questionnaire (TEIQue; Petrides, 2001), and the Test of Emotional Intelligence (TIE; Śmieja, Orzechowski, & Stolarski, 2014). Upon examination of all factors and subscales reported by the aforementioned instruments, I regrouped identical factors, and in consultation with three independent psychologists, I excluded a set of constructs considered unrelated to EI, and included two constructs not observed in the aforementioned instruments, namely Integrity and Service Orientation. The final list of constructs included in the study is as follows: 1. Assertiveness, 2. Behavioural inhibition, 3. Cognitive empathy, 4. Cooperation, 5. Coping skills, 6. Emotional control, 7. Emotional empathy, 8. General mood, 9. Integrity, 10. Self-awareness, 11. Judgment, 12. Self-expression, 13. Service orientation, and 14. Stress management. Subsequently, 10 items were written for each construct, with half of these items being written in the negative form for reverse coding. Items were answered using a 5-point scale (*Strongly Disagree, Disagree, Neither Agree or Disagree, Agree, Strongly Agree*).

Prior to performing the factor analysis on all items of the Durand Emotional Comprehension Inventory (DECI), multiple statistical assumptions were verified. First, all response choices on all 140 items were utilized. Second, examination of skewness and kurtosis identified four problematic items exceeding a -2/+2 range, which were removed from the pool of items. Cronbach's alpha was then examined within each proposed construct. Items within each construct were removed until the deletion of the item with the lowest alpha would not further increase the alpha of the construct. These analyses removed an additional 45 items from the original pool of items. A bivariate Pearson correlation between all constructs and the total score of these constructs showed positive correlations between the constructs and the total.

An exploratory factor analysis using Maximum Likelihood with a direct oblimin rotation was then performed on the pool of items. Items were deleted if they did not load on a factor or load on two factors or more with a loading of 0.30. The remaining items were processed through a factor analysis once again

using the specifications mentioned previously. A factor analysis was computed after every round of items deletion. On the 7th factor analysis, a stable solution emerged, dividing 44 items into 11 factors. Table 1 shows the loading of the DECI's scales on the factors.

Table 1. DECI Subscales, sample items, Cronbach's alpha, eigenvalues, and variance

Scales	Alpha	Eigenvalues	Cumulative % of Variance
Optimism (3 items) I am happy most of the time (True)	.81	5.62	12.79
Emotional Composure (4 items) Sometimes, I feel like crying when I am sad (False)	.80	5.25	24.72
Nonjudgmental (5 items) I am judgmental sometimes (True)	.83	3.60	32.91
Self-awareness (3 items) Sometimes, I feel I do not fully know myself (False)	.76	2.26	38.03
Accepting Support (4 items) Very few people are aware of my fears (False)	.69	2.23	43.11
Assertiveness (4 items) I am not afraid to say 'no' to someone (True)	.72	1.61	46.79
Cognitive Empathy (4 items) Some people's arguments do not deserve to be listened to (False)	.67	1.49	50.17
Self-expression (3 items) My face does not display a lot of emotions (False)	.74	1.44	53.46
Behavioural Inhibition (4 items) I keep my cool in situations where others do not (True)	.72	1.39	56.61
Professionalism (4 items) As an employee, it is sometimes okay to ignore angry customers (False)	.68	1.18	59.29
Empathy & Integrity (6 items) Other people's problems are their problems, not mine (False)	.71	1.08	61.74

Results

The 11-factor EFA solution accounted for 61.74% of the variance. The eigenvalues of these 11 factors ranged between 5.62 and 1.08. The internal reliability of the scales ranged between α = .67 to .83. The internal consistency of the total score was α = .81. All subscales correlated at $p < .001$ with the total score. The correlations were as follows: Nonjudgmental (r = .56), Emotional Composure (r = .30), Optimism (r = .60), Assertiveness (r = .40), Professionalism (r = .43), Self-awareness (r = .45), Empathy & Integrity (r = .49), Cognitive Empathy (r = .53), Self-expression (r = .37), Behavioural Inhibition (r = .42), and Accepting Support (r = .42).

METHOD OF STUDY 2: INCREMENTAL VALIDITY OF THE DECI

Participants

All participants received informed consent and were given a debriefing at the end of the study. Two hundred and two (N = 202) participants were recruited online via social media and websites dedicated to psychological research. There was no missing data for any of the responses. Inclusion criteria for the study were to be over 18 years old and be fluent in English. The sample consisted of 97 males and 105 females. Participants were predominantly located in North America (64%), Europe (22%), Oceania (6%), or other (8%). Most participants reported being Caucasian (80%) or Asian (8%). English was the primary language of 78% of the participants. Almost half of the participants (46%) reported being enrolled as a university student. The mean age of the sample was 24.70 years old (SD = 7.42).

Measures

Trait emotional intelligence questionnaire – short form (TEIQue - SF; Petrides & Furnham, 2006). The TEIQue-SF is a 30-item self-report instrument providing a global measure of trait emotional intelligence and emotional self-efficacy (e.g., the ability to identify and manage one's own emotions, as well as the emotions of others). The short form is based on the original 153-item TEIQue (Petrides, 2001).

Participants provide their agreement to each statement on a 7-point scale. The TEIQue-SF has shown reliable internal consistency in previous studies (Ali, Amorim, & Chamorro-Premuzic, 2009).

Schutte Emotional Intelligence Scale (SEIS; Schutte et al., 1998). The SEIS is a 33-item self-report questionnaire answered on a 5-point Likert scale. Although it has been widely used in research, its psychometric properties, and especially its factor structure, have been extensively debated (Austin et al., 2004; Saklofske et al., 2003). A recurrently discussed shortcoming of the SEIS is that it solely assesses EI through the 3 dimensions postulated in the early Salovey & Mayer's (1990) model (Pérez et al., 2005).

Personal Growth Initiative Scale (PGIS; Robitschek, 1998). The PGIS is a 9-item self-report instrument measuring one's motivation to change and develop as a person. Each item is rated on a 6-point scale, ranging from Definitely Disagree to Definitely Agree. The PGIS has shown adequate internal reliability, as well as convergent and discriminant validity (Durand, 2018; Shorey et al., 2007).

Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). The RSES is a 10-item global measure of self-esteem. Each item is rated on a scale ranging from 1 = Disagree strongly to 4 = Agree strongly. The RSES possesses adequate psychometric properties (Crowe, LoPilato, Campbell, & Miller, 2015).

20-item-Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994). The TAS-20 is a 20-item self-report instrument of alexithymia. Items are rated on a 5-point scale from strongly disagree to strongly agree. The TAS-20 has three factors: 1) difficulty describing one's feelings towards others, 2) difficulty identifying and modulating feelings, and 3) externally oriented thinking (attention). The TAS-20 has shown adequate validity and reliability and is considered a valid measure of alexithymia (Bagby, Taylor, & Parker, 1994; Gori et al., 2014).

Subjective Fluctuating Happiness Scale and Subjective Authentic-Durable Happiness Scale (SFHS and SA-DHS; Dambrun et al., 2012). The 10-item SFHS and the 13-item SA-DHS examine two components of happiness: the fluctuation of happiness over time, and one's stable happiness state. Items are rated on a 7-point scale. Psychometric properties of both questionnaires are considered adequate and reliable (Dambrun et al., 2012; Durand, 2018).

Short Affect Intensity Measure (AIM; Geuens & De Pelsmacker, 2002). The short AIM is a shortened version of the original 40-item measure by Larsen, Diener, and Emmons (1986). The current AIM includes 20 items rated on a 6-point scale. The instrument measures the intensity with which an individual will experience positive and negative emotions. The AIM has demonstrated adequate psychometric properties (Geuens & De Pelsmacker, 2002).

Results

The mean, standard deviation, internal consistency, and inter-correlations of the DECI and its subscales are shown in Table 2. Overall, the internal consistency of the DECI (α = .86) as well as its subscales (α = .65 to .84) is acceptable. All the subscales of the DECI correlated moderately to strongly with the DECI total score, with the exception of Emotional Composure, which correlated weakly with the total (r = .26).

As shown in Table 3, examination of the DECI and its subscales against other measures of emotional intelligence and correlates related to EI yielded several significant results. First, the DECI total score showed strong positive correlations with the TEIQue and all its subscales, as well as with the SEIS, the PGIS, the RSES, and the SADHS, and weakly with Expressing Positive emotions from the AIM. It also showed strong negative associations with the TAS, and moderately with the SFHS. Additionally, all scales of the DECI correlated with three or four subscales of the TEIQue. All scales but Emotional Composure correlated with the SEIS.

In addition to examining the correlations of the DECI with other EI measures, I also examined the incremental validity of the DECI over the TEIQue and the SEIS in predicting EI correlates. All analyses were computed twice, once with the DECI in Block 1 and the TEIQue or the SEIS in Block 2, and a second time with the TEIQue or the SEIS in Block 1 and the DECI in Block 2. Tables 4 and 5 report the value in Block 1 and its related p value when the TEIQue or the SEIS was in Block 1, when the DECI was in Block 1, the outcome of the second variable in Block 2, and the adjusted R^2 change and its significance from DECI to TEIQue/SEIS and from TEIQue/SEIS to DECI.

Regarding the incremental validity over the TEIQue, the DECI added incrementally to the prediction of expressing positive and negative emotions from the AIM, identifying feelings from the TAS, as well as both measures of happiness. Alternatively, the TEIQue showed better predictive abilities than the DECI to measure personal growth, self-esteem, and describing feelings and attention scales from the TAS.

Table 2. Inter-correlations between the DECI subscales (*N* = 202)

Scales	1	2	3	4	5	6	7	8	9	10	11
1. Nonjudgmental											
2. Emotional comp.	-.05										
3. Optimism	.13	**.31**									
4. Assertiveness	.18	**.22**	**.43**								
5. Professionalism	**.25**	**.23**	**.27**	**.32**							
6. Self-awareness	.09	**.33**	**.55**	**.42**	**.24**						
7. Empathy & integ.	**.33**	**-.23**	**.24**	.16	.13	**.18**					
8. Cognitive empathy	**.41**	-.08	**.24**	**.25**	**.42**	**.24**	**.36**				
9. Self-expression	.10	**-.37**	**.22**	.09	.13	.15	**.28**	**.23**			
10. Behavioural inhib.	**.25**	**.40**	**.27**	**.18**	**.30**	**.22**	-.01	**.19**	-.17		
11. Accepting support	.12	**-.34**	**.31**	**.19**	.09	.16	**.35**	**.21**	**.40**	-.05	
12. DECI total	**.52**	**.26**	**.70**	**.61**	**.59**	**.63**	**.52**	**.60**	**.34**	**.45**	**.42**

Note. Bold indicates $p < .01$, two-tailed. 1 = Nonjudgmental (*M* = 15.43; *SD* = 4.03; α = .82); 2 = Emotional Composure (*M* = 12.54; *SD* = 3.82; α = .76); 3 = Optimism (*M* = 8.50; *SD* = 3.34; α = .84); 4 = Assertiveness (*M* = 12.32; *SD* = 3.32; α = .71); 5 = Professionalism (*M* = 12.26; *SD* = 3.35; α = .74); 6 = Self-awareness (*M* = 9.50; *SD* = 3.27; α = .80); 7 = Empathy & Integrity (*M* = 22.46; *SD* = 4.01; α = .68); 8 = Cognitive Empathy (*M* = 14.45; *SD* = 2.86; α = .65); 9 = Self-expression (*M* = 9.78; *SD* = 2.94; α = .74); 10 = Behavioural Inhibition (*M* = 14.41; *SD* = 2.85; α = .69); 11 = Accepting Support (*M* = 10.28; *SD* = 3.34; α = .69); 12 = DECI Total (*M* = 141.96; *SD* = 18.97; α = .86).

Table 3. Correlations between the DECI subscales and the TEIQue, the SEIS, the AIM, the PGIS, the RSES, the TAS, the SFHS, and the SADHS (*N* = 202)

Scales	1	2	3	4	5	6	7	8	9	10	11	12
TEIQue												
Well Being	.17	**.29**	**.86**	**.47**	**.35**	**.59**	**.28**	**.28**	**.33**	**.29**	**.26**	**.74**
Self-control	**.24**	**.56**	**.57**	**.52**	**.39**	**.57**	.04	.20	-.05	**.59**	.00	**.64**
Emotionality	**.37**	-.07	**.53**	**.37**	**.31**	**.54**	**.46**	**.49**	**.45**	.18	**.51**	**.73**
Sociability	**.20**	**.19**	**.53**	**.61**	**.36**	**.36**	**.22**	**.41**	**.23**	**.30**	**.25**	**.64**
Total	**.29**	**.31**	**.80**	**.59**	**.44**	**.65**	**.31**	**.42**	**.31**	**.41**	**.31**	**.85**
SEIS												
Total	**.33**	.00	**.63**	**.42**	**.31**	**.55**	**.42**	**.48**	**.48**	**.28**	**.45**	**.76**
AIM												
Exp.-Positive	.09	**-.38**	**.27**	.10	.17	.07	**.33**	**.23**	**.62**	**-.24**	**.45**	**.29**
Exp.-Negative	.06	**-.59**	**-.29**	**-.26**	-.13	**-.26**	**.32**	-.02	**.30**	**-.38**	**.25**	-.17
PGIS												
Total	.15	**.25**	**.73**	**.46**	**.31**	**.53**	**.26**	**.26**	**.28**	**.34**	**.31**	**.68**
RSES												
Total	.08	**.35**	**.79**	**.49**	**.31**	**.63**	.16	**.25**	**.20**	**.31**	.14	**.65**
TAS												
Descr. Feelings	**-.18**	.00	**-.49**	**-.38**	**-.26**	**-.57**	**-.32**	**-.36**	**-.40**	-.11	**-.44**	**-.61**
Ident. Feelings	-.16	**-.39**	**-.48**	**-.33**	**-.24**	**-.72**	-.16	**-.21**	-.15	**-.27**	-.11	**-.57**
Attention	**-.28**	**.24**	**-.27**	**-.25**	**-.18**	**-.28**	**-.44**	**-.39**	**-.36**	-.06	**-.41**	**-.47**
Total	**-.25**	-.09	**-.51**	**-.39**	**-.28**	**-.66**	**-.36**	**-.38**	**-.36**	**-.19**	**-.37**	**-.67**
SFHS												
Total	.01	**-.54**	**-.46**	**-.28**	-.14	**-.51**	.00	-.04	**.19**	**-.31**	.04	**-.37**
SADHS												
Total	.12	**.33**	**.87**	**.40**	**.31**	**.58**	.17	**.22**	**.21**	**.32**	**.25**	**.66**

Note. Bold indicates $p < .01$, two-tailed. 1 = Nonjudgmental; 2 = Emotional Composure; 3 = Optimism; 4 = Assertiveness; 5 = Professionalism; 6 = Self-awareness; 7 = Empathy & Integrity; 8 = Cognitive Empathy; 9 = Self-expression; 10 = Behavioural Inhibition; 11 = Accepting Support; 12 = DECI Total. Criterion measures: TEIQue Well Being (*M* = 27.04; *SD* = 9.68; α = .92); TEIQue Self-control (*M* = 26.15; *SD* = 7.37; α = .79); TEIQue Emotionality (*M* = 37.70; *SD* = 8.81; α = .77); TEIQue Sociability (*M* = 27.04; *SD* = 7.54; α = .82); TEIQue Total (*M* = 134.33; *SD* = 31.79; α = .94); SEIS Total (*M* = 113.64; *SD* = 21.08; α = .94); AIM Expressing Positive (*M* = 46.30; *SD* = 10.14; α = .84); AIM Expressing Negative (*M* = 22.27; *SD* = 4.89; α = .62); PGIS Total (*M* = 33.52; *SD* = 9.92; α = .91); RSES Total (*M* = 25.51; *SD* = 7.44; α = .93); TAS Describing Feelings (*M* = 14.55; *SD* = 5.06; α = .84); TAS Identifying Feelings (*M* = 16.52; *SD* = 6.26; α = .87); TAS Attention (*M* = 18.24; *SD* = 5.17; α = .71); TAS Total (*M* = 49.32; *SD* = 13.51; α = .89); SFHS Total (*M* = 41.28; *SD* = 12.15; α = .90); SADHS Total (*M* = 47.66; *SD* = 17.84; α = .96).

Table 4. Incremental validity of the DECI over the TEIQue and vice versa.

Criterion	Block 1: TEIQue R^2	p value in	Block 1 : DECI R^2	p value in	TEIQue /DECI Block 2	R^2 Change TEIQue to DECI	p	R^2 Change DECI to TEIQue	p
AIM									
Express Positive	.38	<.001	.49	<.001	.51	.13	<.001	.02	=.008
Express Negative	.28	<.001	.45	<.001	.45	.17	<.001	.00	=.641
PGIS									
Total	.62	<.001	.59	<.001	.63	.01	=.093	.04	<.001
RSES									
Total	.78	<.001	.70	<.001	.80	.02	=.001	.10	<.001
TAS									
Describe Feelings	.67	<.001	.50	<.001	.69	.02	=.010	.19	<.001
Identify Feelings	.52	<.001	.56	<.001	.66	.14	<.001	.10	<.001
Attent.	.40	<.001	.35	<.001	.43	.03	=.038	.08	<.001
Total	.72	<.001	.56	<.001	.75	.03	=.001	.19	<.001
SFHS									
Total	.35	<.001	.44	<.001	.46	.11	<.001	.02	=.039
SADHS									
Total	.76	<.001	.77	<.001	.83	.07	<.001	.06	<.001

Note. All analyses were run twice. Once with TEIQue subscales in the first block and DECI subscales in the second block, and once with the DECI subscales in the first block and the TEIQue subscales in the second block. TEIQue /DECI Block 2 refers to the value of block 2 when the other scale was in block 1. R^2 Change TEIQue to DECI refers to the adjusted R^2 difference when TEIQue was analysed as block 1 and DECI was analysed as block 2. R^2 Change DECI to TEIQue refers to the opposite, when DECI is block 1 and TEIQue is block 2.

Table 5. Incremental validity of the DECI over the SEIS and vice versa.

Criterion	Block 1: SEIS R^2	p value in	Block 1 : DECI R^2	p value in	SEIS /DECI Block 2	R^2 Change SEIS to DECI	p	R^2 Change DECI to SEIS	p
AIM									
Express Positive	.19	<.001	.49	<.001	.50	.31	<.001	.01	=.008
Express Negative	.00	=.604	.45	<.001	.45	.45	<.001	.00	=.716
PGIS									
Total	.51	<.001	.59	<.001	.65	.14	<.001	.06	<.001
RSES									
Total	.36	<.001	.70	<.001	.70	.34	<.001	.00	=.048
TAS									
Describe Feelings	.48	<.001	.50	<.001	.55	.07	<.001	.05	<.001
Identify Feelings	.32	<.001	.56	<.001	.59	.28	<.001	.04	<.001
Attent.	.39	<.001	.35	<.001	.46	.07	<.001	.11	<.001
Total	.58	<.001	.56	<.001	.65	.07	<.001	.09	<.001
SFHS									
Total	.03	=.005	.44	<.001	.44	.41	<.001	.00	=.154
SADHS									
Total	.39	<.001	.77	<.001	.79	.40	<.001	.02	=.034

Note. All analyses were run twice. Once with SEIS total in the first block and DECI subscales in the second block, and once with the DECI subscales in the first block and the SEIS total in the second block. SEIS /DECI Block 2 refers to the value of block 2 when the other scale was in block 1. R^2 Change SEIS to DECI refers to the adjusted R^2 difference when SEIS was analysed as block 1 and DECI was analysed as block 2. R^2 Change DECI to SEIS refers to the opposite, when DECI is block 1 and SEIS is block 2.

While the TEIQue and the DECI appear to predict multiple variables related to EI with similar predictive power, the DECI showed clear incremental validity over the SEIS. Indeed, the DECI showed major improvements in adjusted R^2 over the SEIS on expressing positive (.31) and negative (.45) emotions, personal growth (.14), self-esteem (.34), describing feelings (.07), identifying feelings (.28), fluctuating happiness (.41) and stable happiness (.40). Alternatively, the SEIS provided incremental validity over the DECI on attention from the TAS (.11) and total from the TAS (.09).

METHOD OF STUDY 3: CONSTRUCT VALIDITY OF THE DECI

Participants

Three hundred and seventy-seven (N = 377) participants were recruited online for Study 3. The sample consisted of 140 males and 237 females. Participants were predominantly located in North America (63%), Europe (24%), Oceania (8%), or other (5%). Most participants reported being Caucasian (79%) or Asian (10%). English was the primary language of 83% of the participants. A third of the participants (36%) reported being enrolled as a university student. The mean age of the sample was 27.94 years old (*SD* = 8.87).

Measures

Big Five Inventory (BFI; John, Donahue, & Kentle, 1991). The BFI is a 44-item instrument assessing the Big Five components of personality (Goldberg, 1992). The questionnaire is rated on a 5-point Likert scale and provides five subscale scores: Openness, Conscientiousness, Extroversion, Agreeableness, and Neuroticism. The BFI has been used in multiple studies and is considered psychometrically valid (Miller, Gaughan, Maples, & Price, 2011).

Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). The SWLS is a brief 5-item measure of life satisfaction. The statements are rated on a 7-point scale. The SWLS has shown high reliability and validity (Egan, Chan, & Shorter, 2014).

Results

The descriptive data, as well as the correlations between the DECI subscales and the SWLS and BFI are shown in Table 6. Overall, the DECI Total is strongly associated with satisfaction with life, and positively moderately to strongly associated with all components of the Big Five, with the exception of neuroticism (r = -.58). At the subscale level, all DECI subscales, apart from Nonjudgmental attitudes, were significantly associated with SWLS. Furthermore, all subscales were significantly correlated with at least two components of the BFI.

To determine which of the DECI's subscales were predictive of the SWLS and the BFI, a series of regression analyses was performed. For SWLS, a significant model was computed ($F(11, 365) = 84.95$, $p < .001$, *adjusted* $R^2 = .71$). Examination of coefficients showed that only Optimism was significant (β = .845, $t = 24.579$, $p < .001$). For Extroversion, a significant model was computed ($F(11, 365) = 28.08$, $p < .001$, *adjusted* $R^2 = .44$). Examination of coefficients showed that Nonjudgmental (β = -.097, $t = -2.226$, $p = .027$), Optimism (β = .164, $t = 3.435$, $p = .001$), Assertiveness (β = .376, $t = 8.878$, $p < .001$), Professionalism (β = .128, $t = 2.884$, $p = .004$), Self-expression (β = .247, $t = 5.129$, $p < .001$), Behavioural Inhibition (β = -.136, $t = -2.819$, $p = .005$), and Accepting Support (β = .161, $t = 3.384$, $p = .001$) were significant predictors. A significant model was also computed for Agreeableness ($F(11, 365) = 40.61$, $p < .001$, *adjusted* $R^2 = .54$). Significant predictors included Nonjudgmental (β = .134, $t = 3.370$, $p = .001$), Optimism (β = .156, $t = 3.581$, $p < .001$), Assertiveness (β = -.229, $t = -5.928$, $p < .001$), Professionalism (β = .168, $t = 4.153$, $p < .001$), Empathy and Integrity (β = .231, $t = 5.519$, $p < .001$), Cognitive Empathy (β = .209, $t = 4.983$, $p < .001$), Self-expression (β = .166, $t = 3.785$, $p < .001$), Behavioural Inhibition (β = .254, $t = 5.781$, $p < .001$), and Accepting Support (β = .098, $t = 2.251$, $p = .025$). A significant model was also computed for Conscientiousness ($F(11, 365) = 10.74$, $p < .001$, *adjusted* $R^2 = .22$). Significant predictors included Optimism (β = .169, $t = 3.003$, $p = .003$), Assertiveness (β = .196, $t = 3.911$, $p < .001$), Self-awareness (β = .147, $t = 2.651$, $p = .008$), and Behavioural Inhibition (β = .121, $t = 2.132$, $p = .034$). A significant model was also computed for Neuroticism ($F(11, 365) = 56.04$, $p < .001$, *adjusted* $R^2 = .62$). Significant predictors included Emotional Composure (β = -.284, $t = -7.094$, $p < .001$), Optimism (β = -.251, $t = -6.339$, $p < .001$), Assertiveness (β = -.237, $t = -6.747$, $p < .001$), Self-awareness (β = -.137, $t = -3.534$, $p < .001$), and Behavioural Inhibition (β = -.278, $t = -6.964$, $p < .001$). A final regression model was computed for Openness ($F(11, 365) = 7.67$, $p < .001$, *adjusted* $R^2 = .16$). The significant predictors included Assertiveness (β = .233, $t = 4.486$, $p < .001$), Empathy and Integrity (β = .180, $t = 3.202$, $p = .001$), and Behavioural Inhibition (β = .134, $t = 2.276$, $p = .023$).

Table 6. Correlations between the DECI, the SWLS, and the BFI (*N* = 377)

Scales	1	2	3	4	5	6	7	8	9	10	11	12
SWLS												
Total	.11	**.15**	**.85**	**.26**	**.19**	**.38**	**.22**	**.20**	**.18**	**.22**	**.30**	**.55**
BFI												
Extroversion	-.01	-.04	**.39**	**.46**	**.16**	**.33**	**.21**	.09	**.40**	-.06	**.40**	**.42**
Agreeableness	**.36**	-.05	**.36**	-.01	**.41**	**.24**	**.49**	**.48**	**.23**	**.37**	**.32**	**.58**
Conscientiousness	**.20**	**.15**	**.36**	**.34**	**.21**	**.36**	**.13**	**.18**	.06	**.26**	**.19**	**.45**
Neuroticism	**-.16**	**-.55**	**-.50**	**-.45**	**-.32**	**-.46**	-.02	**-.25**	**.14**	**-.56**	.01	**-.58**
Openness	**.20**	.00	.10	**.30**	**.15**	**.19**	**.27**	**.26**	.04	**.19**	**.18**	**.35**

Note. Bold indicates $p < .01$, two-tailed. 1 = Nonjudgmental (α = .81); 2 = Emotional Composure (α = .76); 3 = Optimism (α = .84); 4 = Assertiveness (α = .73); 5 = Professionalism (α = .62); 6 = Self-awareness (α = .76); 7 = Empathy & Integrity (α = .65); 8 = Cognitive Empathy (α = .67); 9 = Self-expression (α = .71); 10 = Behavioural Inhibition (α = .69); 11 = Accepting Support (α = .64); 12 = DECI Total (α = .85). Criterion measures: SWLS Total (*M* = 20.45; *SD* = 8.18; α = .90); BFI Extroversion (*M* = 22.80; *SD* = 8.17; α = .89); BFI Agreeableness (*M* = 33.58; *SD* = 6.31; α = .79); BFI Conscientiousness (*M* = 30.98; *SD* = 7.29; α = .86); BFI Neuroticism (*M* = 25.17; *SD* = 7.46; α = .87); BFI Openness (*M* = 38.39; *SD* = 6.63; α = .79).

DISCUSSION

The purpose of the present studies was to develop a new instrument focusing on the constructs commonly observed in popular EI measures. The reported findings support the reliability, as well as the convergent and incremental validity of the DECI. The 11 factors of the DECI showed a positive relationship with the total score, and most factors showed moderately low intercorrelations.

As expected, the DECI showed a strong positive association with both measures of trait EI. While correlations between trait-based and ability-based EI tests are generally low (Pérez et al., 2005; Petrides & Furnham, 2000), many trait EI tests share moderate to high correlations (Brackett & Mayer, 2003; Di Fabio & Saklofske, 2014; Hoerger, Chapman, Epstein, & Duberstein, 2012). Interestingly, the DECI's factors Optimism and Self-awareness showed the strongest correlations with the TEIQue and the SEIS. From these findings, it is not possible to determine if these two concepts are central to these two instruments, or if the two factors measure additional concepts. While there was no measure of convergent validity for Self-awareness, the factor Optimism showed the strongest correlation among all DECI's factors on self-esteem, personal growth, and stable happiness, suggesting a link with the concept of hope in one's well-being. In concordance with previous studies on alexithymia, the DECI showed a strong negative correlation with the TAS (Saklofske et al., 2003).

An examination of the DECI's incremental validity yielded interesting results. Overall, the DECI was vastly superior to the SEIS in measuring constructs typically connected to EI. However, when compared to the TEIQue, the DECI showed slightly better and worse incremental validity, depending on the concepts measured. Indeed, the findings suggest that the DECI is slightly superior to the TEIQue in predicting traits related to identifying feelings, expressing positive and negative emotions, and displaying fluctuating happiness. Alternatively, the TEIQue showed slightly superior incremental validity at predicting well-being-related traits, as well as signs of alexithymia. Despite these small differences in incremental validity, the findings suggest that both measures are, overall, similar in terms of predictive abilities in relation to the measured constructs.

Despite the lack of a clear superiority over the TEIQue, the DECI possesses several strengths. First, the DECI appears to cover 11 seemingly different constructs with only 44 items, providing an excellent ratio between the measured constructs and total number of items. This variety of constructs may provide useful information in understanding the relative contribution of different aspects of trait EI to personality traits. This strength is highlighted by the present findings regarding the predictive value of the DECI in measuring satisfaction with life and the Big Five. For example, despite the strong correlation between EI and satisfaction with life, results from the regression analysis suggest that the Optimism factor is the only significant predictor of satisfaction with life. Future studies should target the constructs measured by the significant factors to verify their contribution to the Big Five factors of personality.

Second, although similar to the TEIQue, the DECI showed clear incremental validity over a widely used EI measure, the SEIS. Apart from self-esteem and alexithymia, the DECI showed significant incremental validity on all measured constructs. It is possible that this incremental validity is the direct result of the numerous factors included in the DECI, allowing the instrument to cover a wider range of constructs related to EI than the single factor present in the SEIS.

Although these findings are encouraging, additional validation studies are needed to provide support for the use of the DECI as a valid measure of trait EI. Future studies should examine the incremental

validity of the DECI on similar and different constructs with other popular measures of trait EI. Test-retest reliability at different time points should be closely examined, and a thorough analysis of the DECI's factor structure through confirmatory factor analysis should be performed. Future studies should also aim for larger sample sizes, as the samples recruited in the present studies are relatively modest.

REFERENCES

Ali, F., Amorim, I. S., & Chamorro-Premuzic, T. (2009). Empathy deficits and trait emotional intelligence in psychopathy and Machiavellianism. *Personality and Individual Differences*, *47*(7), 758–762. https://doi.org/10.1016/j.paid.2009.06.016

Austin, E. J., Saklofske, D. H., Huang, S. H. S., & McKenney, D. (2004). Measurement of trait emotional intelligence: Testing and cross-validating a modified version of Schutte et al.'s (1998) measure. *Personality and Individual Differences*, *36*(3), 555–562. https://doi.org/10.1016/S0191-8869(03)00114-4

Bagby, R. M., Parker, J. D. A., & Taylor, G. J. (1994). The twenty-item Toronto Alexithymia scale—I. Item selection and cross-validation of the factor structure. *Journal of Psychosomatic Research*, *38*(1), 23–32. https://doi.org/10.1016/0022-3999(94)90005-1

Bagby, R. M., Taylor, G. J., & Parker, J. D. A. (1994). The twenty-item Toronto Alexithymia scale-II. Convergent, discriminant, and concurrent validity. *Journal of Psychosomatic Research*, *38*(1), 33–40. https://doi.org/10.1016/0022-3999(94)90006-X

Bar-On, R. (1997). BarOn Emotional Quotient Inventory (EQ-I): Technical manual. Toronto, Canada: Multi-Health Systems.

Brackett, M. A., & Mayer, J. D. (2003). Convergent, Discriminant, and Incremental Validity of Competing Measures of Emotional Intelligence. *Personality and Social Psychology Bulletin*, *29*(9), 1147–1158. https://doi.org/10.1177/0146167203254596

Cameron, A. (2004). Work Profile Questionnaire - Emotional Intelligence (WPQei) User's Guide. Emotional Intelligence Personality Team Roles. Oxford: The Test Agency Limited.

Crowe, M. L., LoPilato, A. C., Campbell, W. K., & Miller, J. D. (2015). Identifying Two Groups of Entitled Individuals: Cluster Analysis Reveals Emotional Stability and Self-Esteem Distinction. *Journal of Personality Disorders*, *30*(6), 762–775. https://doi.org/10.1521/pedi_2015_29_229

Dambrun, M., Ricard, M., Després, G., Drelon, E., Gibelin, E., Gibelin, M., … Michaux, O. (2012). Measuring happiness: From fluctuating happiness to authentic-durable happiness. *Frontiers in Psychology*, *3*(FEB), 1–11. https://doi.org/10.3389/fpsyg.2012.00016

Di Fabio, A., & Saklofske, D. H. (2014). Promoting individual resources: The challenge of trait emotional intelligence. *Personality and Individual Differences*, *65*, 19–23. https://doi.org/10.1016/j.paid.2014.01.026

Diener, E., Emmons, R., Larsen, J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, *49*(1), 71–75.

Durand, G. (2018). Demystification of the Relationship Between Psychopathy and Happiness. *Journal of Happiness Studies*, *19*(2), 381–395. https://doi.org/10.1007/s10902-016-9823-0

Egan, V., Chan, S., & Shorter, G. W. (2014). The Dark Triad, happiness and subjective well-being. *Personality and Individual Differences*, *67*, 17–22. https://doi.org/10.1016/j.paid.2014.01.004

Fiori, M., & Antonakis, J. (2011). The ability model of emotional intelligence: Searching for valid measures. *Personality and Individual Differences*, *50*(3), 329–334. https://doi.org/10.1016/j.paid.2010.10.010

Føllesdal, H., & Hagtvet, K. (2013). Does emotional intelligence as ability predict transformational leadership? A multilevel approach. *Leadership Quarterly*, *24*(5), 747–762. https://doi.org/10.1016/j.leaqua.2013.07.004

Furnham, A., & Christoforou, I. (2007). Personality traits, emotional intelligence, and multiple happiness. *North American Journal of Psychology*, *9*(3), 439–462.

Furnham, A., & Petrides, K. V. (2003). Trait emotional intelligence and happiness. *Social Behavior and Personality*, *31*(8), 815–824. https://doi.org/10.2224/sbp.2003.31.8.815

George, J. M. (2000). Human Relations emotional intelligence. *Human Relations*, *53*(8), 1027–1055. https://doi.org/10.1177/0018726700538001

Geuens, M., & De Pelsmacker, P. (2002). Developing a short affect intensity scale. *Psychological reports*, *91*(2), 657-670. https://doi.org/10.2466/pr0.2002.91.2.657

Goldberg, L. R. (1992). The Development Of Markers For The Big Five Factor Structure. *Psychological Assessment*, *Vol.4*, 26–42.

Goleman, D. (1998). Working with emotional intelligence. New York: Bantam.

Gori, A., Craparo, G., Sareri, G. I., Caretti, V., Giannini, M., & Meringolo, P. (2014). Antisocial and psychopathic personalities in a sample of addicted subjects: Differences in psychological resources, symptoms,

alexithymia and impulsivity. *Comprehensive Psychiatry*, *55*(7), 1580–1586. https://doi.org/10.1016/j.comppsych.2014.05.023

Hoerger, M., Chapman, B. P., Epstein, R. M., & Duberstein, P. R. (2012). Emotional intelligence: A theoretical framework for individual differences in affective forecasting. *Emotion*, *12*(4), 716–725. https://doi.org/10.1037/a0026724

Hofstee, W. K. B. (2001). Intelligence and personality: Do they mix? In J. Collis & S. Messick (Eds.), *Intelligence and personality: Bridging the gap in theory and measurement* (pp. 43–60). Mahwah, NJ: Lawrence Erlbaum.

Howe, J., Falkenbach, D., & Massey, C. (2014). The Relationship among Psychopathy, Emotional Intelligence, and Professional Success in Finance. *International Journal of Forensic Mental Health*, *13*(4), 337–347. https://doi.org/10.1080/14999013.2014.951103

John, O. P., Donahue, E. M., & Kentle, R. L. (1991). The Big Five Inventory - Versions 4a and 54. Berkeley, CA: University of California, Berkeley, Institute of Personality and Social Research.

Kong, F., Zhao, J., & You, X. (2012). Emotional intelligence and life satisfaction in Chinese university students: The mediating role of self-esteem and social support. *Personality and Individual Differences*, *53*(8), 1039–1043. https://doi.org/10.1016/j.paid.2012.07.032

Landa, J. M. A., Martos, M. P., & López-Zafra, E. (2010). Emotional intelligence and personality traits as predictors of psychological well-being in Spanish undergraduates. *Social Behavior and Personality*, *38*(6), 783–794. https://doi.org/10.2224/sbp.2010.38.6.783

Larsen, R. J., Diener, E., & Emmons, R. A. (1986). Affect Intensity and Reactions to Daily Life Events. *Journal of Personality and Social Psychology*, *51*(4), 803–814. https://doi.org/10.1037/0022-3514.51.4.803

Mayer, J. D., Salovey, P., & Caruso, D. R. (2002). Mayer–Salovey–Caruso emotional intelligence test (MSCEIT). User's manual. Toronto, Canada: Multi-Health Systems.

Mayer, J. D., Roberts, R. D., & Barsade, S. G. (2008). Human Abilities: Emotional Intelligence. *Annual Review of Psychology*. https://doi.org/10.1146/annurev.psych.59.103006.093646

Mayer, J. D., Salovey, P., Caruso, D. R., & Sitarenios, G. (2001). Emotional intelligence as a standard intelligence. *Emotion*. https://doi.org/10.1037//1528-3542.1.3.232

Miller, J. D., Gaughan, E. T., Maples, J., & Price, J. (2011). A Comparison of Agreeableness Scores From the Big Five Inventory and the NEO PI-R: Consequences for the Study of Narcissism and Psychopathy. *Assessment*, *18*(3), 335–339. https://doi.org/10.1177/1073191111411671

Miners, C. T. H., Côté, S., & Lievens, F. (2018). Assessing the Validity of Emotional Intelligence Measures. *Emotion Review*, *10*(1), 87–95. https://doi.org/10.1177/1754073917693688

Palmer, B., Donaldson, C., & Stough, C. (2002). Emotional intelligence and life satisfaction. *Personality and Individual Differences*, *33*(7), 1091–1100. https://doi.org/10.1016/S0191-8869(01)00215-X

Pérez, J. C., Petrides, K. V., & Furnham, A. (2005). Measuring trait emotional intelligence. *Emotional Intelligence: An International Handbook*, 181–201.

Petrides, K. V. (2001). *A psychometric investigation into the construct of emotional intelligence*. University College London, London, England.

Petrides, K. V., & Furnham, A. (2006). User manual of the trait emotional intelligence questionnaire (TEIQue). University of London: Institute of Education.

Petrides, K. V., & Furnham, A. (2000). On the dimensional structure of emotional intelligence. *Personality and Individual Differences*, *29*(2), 313–320. https://doi.org/10.1016/S0191-8869(99)00195-6

Robitschek, C. (1998). Personal growth initiative: The construct and its measure. *Measurement & Evaluation in Counseling & Development (American Counseling Association)*, *30*(4), 183.

Rosenberg, M. (1965). *Society and the Adolescent Self-Image. American Sociological Review* (Vol. 31).

Ruiz-Aranda, D., Extremera, N., & Pineda-Galán, C. (2014). Emotional intelligence, life satisfaction and subjective happiness in female student health professionals: The mediating effect of perceived stress. *Journal of Psychiatric and Mental Health Nursing*. https://doi.org/10.1111/jpm.12052

Saklofske, D. H., Austin, E. J., & Minski, P. S. (2003). Factor structure and validity of a trait emotional intelligence measure. *Personality and Individual Differences*, *34*(4), 707–721. https://doi.org/10.1016/S0191-8869(02)00056-9

Salovey, P., & Mayer, J. D. (1990). Emotional Intelligence. *Imagination, Cognition and Personality*, *9*(3), 185–211. https://doi.org/10.2190/DUGG-P24E-52WK-6CDG

Schutte, N. S., Malouff, J. M., Hall, L. E., Haggerty, D. J., Cooper, J. T., Golden, C. J., & Dornheim, L. (1998). Development and validation of a measure of emotional intelligence. *Personality and Individual Differences*, *25*(2), 167–177. Retrieved from http://rave.ohiolink.edu/databases/login/psyc/1998-10376-001

Schutte, N. S., Malouff, J. M., Simunek, M., McKenley, J., & Hollander, S. (2002). Characteristic emotional intelligence and emotional well-being. *Cognition and Emotion*, *16*(6), 769–785.

https://doi.org/10.1080/02699930143000482
Shorey, H. S., Little, T. D., Snyder, C. R., Kluck, B., & Robitschek, C. (2007). Hope and personal growth initiative: A comparison of positive, future-oriented constructs. *Personality and Individual Differences*, *43*(7), 1917–1926. https://doi.org/10.1016/j.paid.2007.06.011
Śmieja, M., Orzechowski, J., & Stolarski, M. S. (2014). TIE: An ability test of emotional intelligence. *PLoS ONE*, *9*(7). https://doi.org/10.1371/journal.pone.0103484
Tsaousis, I., & Nikolaou, I. (2005). Exploring the relationship of emotional intelligence with physical and psychological health functioning. *Stress and Health*, *21*(2), 77–86. https://doi.org/10.1002/smi.1042

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