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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).

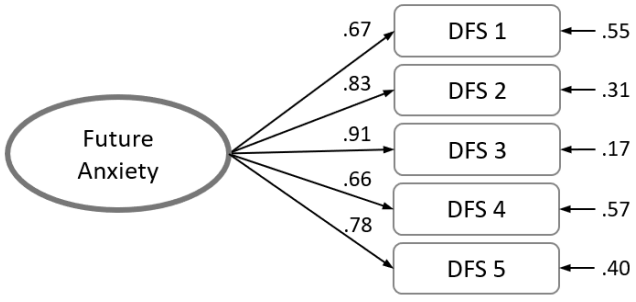

Figure 1. Standardised estimates of DFS confirmatory structural model (λ, R^2, n = 996, Sample 2). Source: Own elaboration.

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.

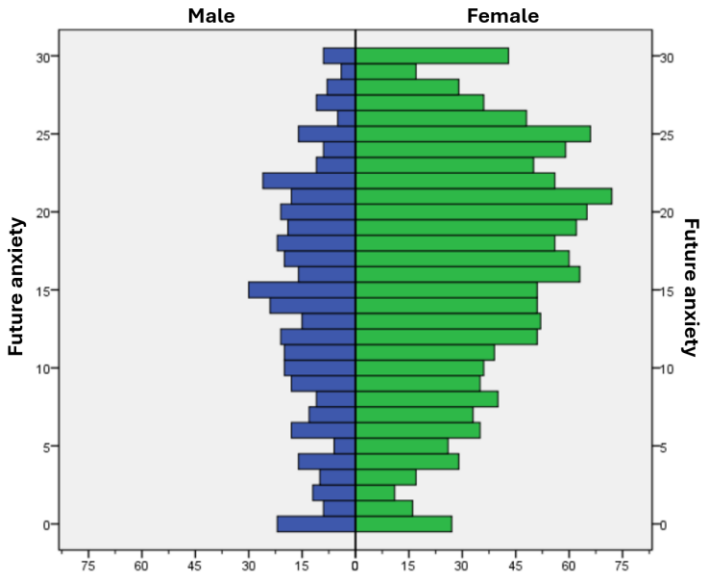

Figure 2. Comparative histogram of the distribution of Future Anxiety by sex (N = 1861).
Source: Own elaboration.

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).

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