

Construction and validation of an instrument for the evaluation of critical thinking in family leisure decision offline and online (ICT_FLD)

Construcción y validación de un instrumento para la evaluación del pensamiento crítico en la decisión familiar de ocio offline y online (IPC_DFO)

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Abstract

Families' critical thinking about shared leisure, both offline and online, influences the quality of family dynamics and the socio-educational development of children. However, research in this area lacks specific and validated instruments that allow for rigorous evaluation, preventing the generation of robust empirical evidence on these processes. This study responds to this need by constructing and validating a quantitative questionnaire. The aim of this study is to construct and evaluate the psychometric properties of an instrument to measure the CT of parents and legal guardians regarding shared offline and online leisure within the family. A total of 740 fathers, mothers or legal guardians of children aged from 5 to 12 years of age, responded to the instrument designed. The psychometric properties of the instrument, which was designed based on a qualitative approach in the development of the items and a content validity process by expert judges, were analyzed. Given the unidimensional nature of the scales, the factorial structure was explored by means of principal components. Subsequently, a first-order confirmatory factor analysis was applied to confirm the joint factor structure of both scales. The instrument shows satisfactory psychometric properties, although the values of the goodness-of-fit indices on the offline shared family leisure scale need to be optimized. This tool could be used to promote personal CT skills in families as it encourages critical and slow reflection on family leisure.

Keywords: family, critical thinking, instrument, leisure, psychometric properties

Resumen

El pensamiento crítico de las familias respecto al ocio compartido, tanto offline como online, influye en la calidad de las dinámicas familiares y en el desarrollo socioeducativo de los menores. Sin embargo, la investigación en este ámbito carece de instrumentos específicos y validados que permitan su evaluación rigurosa, impidiendo generar evidencia empírica robusta sobre estos procesos. Este estudio responde a esta necesidad mediante la construcción y validación de un cuestionario

cuantitativo. El objetivo de este estudio es construir y evaluar las propiedades psicométricas de un instrumento para medir el PC de padres, madres y tutores legales respecto al ocio compartido offline y online dentro de la familia. Un total de 740 padres, madres o tutores legales de menores de entre 5 a 12 años respondieron al instrumento diseñado. Se analizaron las propiedades psicométricas del instrumento diseñado desde un enfoque cualitativo en la elaboración de los ítems y un proceso de validez de contenido por jueces expertos. Dado el carácter unidimensional de las escalas, se exploró la estructura factorial por medio de componentes principales. Posteriormente, se aplicó un análisis factorial confirmatorio de primer orden para confirmar la estructura factorial conjunta de ambas escalas. El instrumento muestra propiedades psicométricas satisfactorias, aunque los valores de los índices de bondad de ajuste en la escala de ocio familiar compartido offline precisan ser optimizados. Esta herramienta podría valorarse para promover las competencias personales en PC de las familias en cuanto a que incita a reflexionar de manera crítica y pausada sobre el ocio en familia.

Palabras clave: familia, pensamiento crítico, instrumento, ocio, propiedades psicométricas

1. Introduction

Free time and leisure time have an impact on personal and social development at an early age and even on health care in later stages. Thus, it is a crucial element for development to be involved in leisure activities from childhood and adolescence that excite and promote the skills necessary for life (Kreutz et al, 2023; Larson, 2000; Mathisen, et al, 2023). Leisure in these stages requires a family dedication in accordance with individual concerns and desires, immensely relevant in the education of a leisure that generates health, wellbeing, and quality of life. The parental role, therefore, requires reflection, conciliation, time distribution and effort (Andrés et al., 2021; Won et al., 2022). Wrong decisions and passive attitudes in family leisure time can have a negative impact on the development of children (Petrović & Dimitrijević, 2020).

From this perspective, the family acquires immense relevance in managing their use of digital media, as responsible for establishing criteria when deciding how to spend their children's time outside of school (Maroñas et al., 2018; Qaiser, 2020), even, as mentors, coming to organize, plan and finance their children's free time, trying to provide stimuli for leisure time (Thoidis et al., 2022). Therefore, this entity stands as a proactive agent in leisure education for its ability to promote an efficient use of time by facilitating quality alternatives, both redistributing and reducing the time devoted to work to build a domestic story in shared time (Hester & Srnicek, 2024; Valdemoros et al., 2015). In this way, greater subjective well-being is also achieved (Chen-Yueh et al., 2019). Thus, parental competencies emerge as essential in decision-making related to childhood leisure, shared leisure time and the type of activities performed (Martín- Quintana et al., 2018).

In the field of entertainment, digital consumption in infants and adolescents has shown a significant increase in recent years (Chunxiao & Lijun, 2022, Fernández-de-Arroyabe-Olaortua et al., 2018). In most cases, parents simply impose rules without employing Critical Thinking (CT) or considering the characteristics of minors and their family environment. This type of management usually generates conflicts. Any type of control exercised by the family over the digital consumption of sons and daughters (restrictive, co-provisioned or technical) is related to less connection time and addiction to mobile devices during their leisure time (Moreno-Carmona et al., 2021). As has been made

explicit, mothers and fathers must mediate and critically manage the appropriateness and quality of the content consumed online (Ramírez-García et al., 2020; Salcines-Talledo et al., 2022).

Given this reality, it is necessary to know if the family is aware and critical when developing shared leisure. However, what is understood by leisure in childhood and what types of leisure are identified? Considering the delimitation of leisure in childhood carried out by Díaz-Herrera et al. (2022), based on other authors (Adesoye & Ajibua, 2015; Llull, 2010; Sandoval, 2017), it materializes as a series of activities carried out in free time, chosen intentionally, which have the purpose of rest or fun, while implying the personal growth of those who put them into practice. These same authors classify different types of leisure activities, some of which are carried out with technology (online) and others not (offline), aimed at fun, recreation and personal growth. Along these lines, Salcines-Talledo et al. (2023) point out as leisure alternatives without technological mediation, that is, offline leisure, the realization of activities such as going out into nature, listening to music or practicing some kind of sport, among others. They also consider digital leisure activities, that is, online leisure, developing activities carried out during free time with the mediation of screens, such as co-watching movies/series or video games, among others.

CT competencies are revalued and become vitally important, allowing the family to judge, analyze, understand, and contrast the different options available, to ultimately be able to make responsible and enriching decisions about shared leisure time (Dekker, 2020; Jiménez-Morales et al., 2020). Therefore, the identification of CT competencies in the choice of offline and online shared leisure time in family seems the starting point to promote healthy leisure.

The approach to the concept of CT presents difficulties since it does not have a univocal definition, in which the authors agree, since its conceptualization can be made from various perspectives and disciplines (Angelico, 2021; Lorencová et al., 2019; Ossa-Cornejo et al., 2017; Re et al., 2019; Rodrigues et al., 2018; Shaw et al., 2019).

To understand CT in depth, it is useful to dissect it and analyze its component parts, although there is no consensus in this regard either. Within the research, CT is understood as a way of thinking that applies reason and divergent thinking to make reasoned, logical, responsible, and fair decisions (Dekker, 2020; Paul & Elder, 2020; Rieiro et al., 2019) while enabling the elaboration of mature explanations in the face of behaviors and dilemmas (O'Reilly et al., 2022). Following this line, Gozávez et al. (2022, p.40) conceptualize CT as: “the human cognitive capacity to judge, assess, discern, interpret, and argue following weighed, known and examined criteria (self-criticism or self-regulation) but susceptible to revision and dialogic contrast. Such capacity also implies detecting and avoiding common biases or fallacies in argumentation”. Therefore, it is considered that the mastery of this thinking predisposes to a conscious and reflective digital consumption, benefiting from its undeniable virtues and facing the challenges it entails; in short, favouring the emancipation of citizenship (Safari, 2019).

Consequently, research on the choice of a type of shared family leisure seems to require the conceptual delimitation of CT in this area. From the Foundation for CT, Paul and Elder (2005) provide a reference framework to analyze and evaluate CT by taking care of universal intellectual standards (clarity, accuracy, precision, relevance, depth, breadth and logic) in the attention to the competences of reasoning (purposes, questions, assumptions, points of view, information, concepts, inferences and implications). The current context characterized by an unprecedented growing digital consumption (ONTSI Report, 2023) that warns about the risk of these practices, especially for minors in the family.

In this regard, authors such as Sánchez-Pérez and Fuentes (2021) have reflected on what type of critical thinking is needed in this new digital context, assessing the relevance of a new version, of critical thinking 2.0 or 3.0, linked to the same technological development. This new environment has generated situations such as Fake News in which it is essential to question the credibility of the information to avoid risks. From this approach, the conceptualization of CT in the choice of family leisure considers the distinction between two types of leisure: offline and online (Díaz-Herrera et al., 2022; Salcines-Talledo et al., 2023).

These considerations lead this research to formulate the CT in the choice of a shared family leisure as the implementation of reasoning processes that allow the analysis of its main elements to weigh the quality of information about offline and online leisure alternatives. All this is taking into account the personal and intellectual characteristics, needs and preferences of the family members in the decision to get involved in a shared way, in activities for fun, leisure and promotion of personal growth.

Regarding CT measurement in the last four decades, different and effective assessment tools have been proposed to address specific professional fields from quantitative and qualitative perspectives (Arancibia et al., 2022; Ossa-Cornejo et al., 2017; Rodrigues et al., 2018). Among the most representative are the following: Watson-Glaser Critical Thinking Assessment (WGCTA); Cornell Critical Thinking Test (CCTT), California Critical Thinking Skill; California Critical Thinking Disposition Inventory (CCTDI); CT Tasks (TPC-CHILE); Cornell Critical Thinking Tests (Ennis & Millman, 2005); Halpern Critical Thinking Assessment using Everyday Situations (HCTAES); PENCRISAL (Pensamiento Crítico Salamanca). Although this variety of instruments offers a wide range of possibilities for the assessment of different cognitive processes and dimensions of CT, no instrument has been identified that is aligned with the subject matter under study. It would be necessary to design a new tool that is easy to apply, brief and stimulating, so that the family is involved in its response, given the motivational difficulty of activating the metacognitive processes required in this type of measurement.

Therefore, the aim of this study is to construct and evaluate the psychometric properties of an instrument for the measurement of parents' (or legal guardians') CT to offline and online shared leisure (Instrument of Critical Thinking in Family Leisure Decision, ICT_FLD), based on the concept formulation and indications of Paul and Elder (2005).

2. Methodology

2.1 Design

The present research proposes, under a quantitative approach with a non-experimental cross-sectional design (Jorrín et al., 2021), the analysis of the psychometric properties of the proposed instrument. Thus, it can be considered an instrumental study as it is directed towards the development of a diagnostic assessment test (Montero & León, 2002). Likewise, the research follows a qualitative approach to the development of the items and their content validation, in which the narrated testimony of the expert judges is essential.

2.2. Participants

This instrument is aimed at the population of fathers and mothers (or legal guardians) of school-aged children between 5 and 12 years of age. Two non-probabilistic purposive and volunteer samples (Sáez-López, 2017) were obtained from this population:

- Initial piloting: with a sample size of 43 subjects which, as indicated by Gil-Pascual (2016), is adequate for this type of application as it is between 25

and 50 people. A diverse sample was obtained in the distribution by context (71.8% urban and 28.2% rural), gender (17.9% men and 82.1% women), family structure (nuclear, single-parent, reconstituted and divorced/separated/unmarried families), age (from 30 to over 50 years old), employment status (public workers, self-employed, employees and household employees) and income level (from less than 1001€ to more than 4000€).

- Validation study of the ICT-FLD: made up of 740 subjects with the characteristics shown in Table 1. The sample was feminized as usually occurs in studies with a sample of families (UNESCO, 2017), comparable in relation to the type of context, with a predominance of nuclear family and the age group between 41 and 50 years of age. In relation to employment status, employed workers and families with incomes between 2001 and 3000 euros per month predominated.

Table 1.
Sample description of the ICT-FLD validation study

Characteristic	Percentage
Context	
• Urban	58%
• Rural	42%
Gender	
• Masculine	15.1%
• Feminine	84.7%
• Other	0.2%
Family Structure	
• Nuclear	81.4%
• Single-Parent	4.2%
• Reconstituted	4.1%
• Extensive	3.5%
• Divorced/Separated and single	5.4%
• Other	1.5%
Age	
• Less than 30 years of age	1.2%
• From 31 to 40 years of age	30.8%
• From 41 to 50 years of age	64.6%
• More than 51 years of age	3.4%
Current situation	
• Public Employee – Civil Servant	27.6%
• Self-Employed	8.2%
• Employee	45.3%
• Unemployed	8.9%
• Retired	2.2%
• Exclusive dedication to domestic/care tasks	5.8%
• Other	2%
Monthly Household Income	
• Less than 1001 euros	5.4%
• Between 1001 and 2000	29.3%
• Between 2001 and 3000	34.9%
• Between 3001 and 4000	18.4%
• More than 4000	12%

2.3. Variables and instrument

In addition to the CT scales in both online and offline leisure shared within the family validated in this study, the questionnaire included other relevant variables:

- a. Sociodemographic: rural-urban residence, family type, employment status, economic income, age, and gender of the respondent.
- b. Frequency of family leisure activities. Four types of activities are presented (cultural, sports, symbolic play and relationship with the environment and nature) exemplified for online and offline format (8 items).
- c. Purpose of leisure activities. Three types of purposes (fun, learning, relationship with peers) are contemplated for the promotion of family leisure activities exemplified in online and offline format (8 items).
- d. CT in shared family leisure. The initial version contemplated 32 items, 16 applied to online leisure and 16 to offline leisure.

The response scale for the last three measures was a 5-level Likert-type scale (1: never, 2: almost never, 3: occasionally, 4: almost always and 5: always).

The online questionnaire applied included initial information indicating the families' participation in a research project on shared family leisure and CT, offering the contact of the project coordinator. The intention of the study was informed, providing assurances that all information would be treated confidentially and anonymously.

In order to access the questionnaire, each participant was asked to accept the informed consent. In this way, they considered themselves informed about the study and decided to participate freely, declaring that they were of legal age.

The estimated time of application of the questionnaire was 15 minutes.

2.4. Procedure and data analysis

Prior to its implementation, the Ethics Committee of the University of Cantabria was asked to evaluate the research project (<https://web.unican.es/RGPD/pccdoc>). After its approval, the Department of Education of the Autonomous Community of Cantabria was contacted to request support for access to the sample. This same entity guaranteed the sending of the questionnaire to all the centers of Infant and Primary Education in the Community.

Data analysis was carried out with statistical software SPSS and JASP.

2.4.1. Item construction

The stages for the design of the items were adopted from De Vellis (2017). These stages started from the establishment of the object of measurement and the need for an ad hoc tool for the measurement of CT in the study context, aimed at fathers, mothers or legal guardians with minors aged between 5 and 12 years of age. The next step included an exhaustive review of the literature in order to conceptualize the CT of families in the choice of shared leisure - online and offline - as a prior step to the generation of a set of items.

Finally, a sufficient number of items were proposed to address the eight standards of reasoning - purposes, questions, assumptions, points of view, information, concepts, inferences and implications - considered in the conceptualization of CT (Paul and Elder, 2005) by applying the wording to the choice of the type of shared leisure in families (online and offline). Thus, 16 items were constructed for which an assessment was requested of the extent to which, as a parent or legal guardian, you carry out these actions in your family to decide what type of leisure to do together, differentiating between online and offline leisure.

It was considered necessary to provide a brief explanation of what is meant by leisure (Díaz-Herrera et al., 2022; Salcines-Talledo et al., 2023), and examples of online leisure (watching movies/series, playing video games, listening to podcasts, etc.) and offline leisure (going out in nature, practicing a sport, etc.).

2.4.2. Content validity

Three expert researchers in the field with experience in the validation of quantitative instruments were selected to constitute the panel of experts, thus initiating the content validation phase (Lam et al., 2018; Santoyo-Sánchez et al. 2022). This panel was sent the first version of the questionnaire together with a template developed by Salcines-Talledo and González-Fernández (2016) to facilitate this work. This instrument consists of a series of questions on seven content blocks (Introduction, Wording, Number and order of questions, Blocks and scales of the questionnaire, Measurement of the items, Instructions and General assessment), with open questions at the end of each block to solicit their advice and facilitate their work. Thus, evidence was obtained on the degree to which the instrument measures the variables of interest (Hernández-Sampieri & Mendoza, 2023), leading to some adjustments in the questionnaire.

2.4.3. Initial piloting

Feedback was asked for the Initial piloting sample ($n = 43$) on the comprehension of the questionnaire, that is, the degree to which the participants understand what they should do and the proposed items (Hernández-Sampieri & Mendoza, 2023).

In addition, this piloting allowed us to perform a preliminary psychometric analysis through a Principal Component Analysis (PCA). It was decided to apply PCA instead of Exploratory Factor

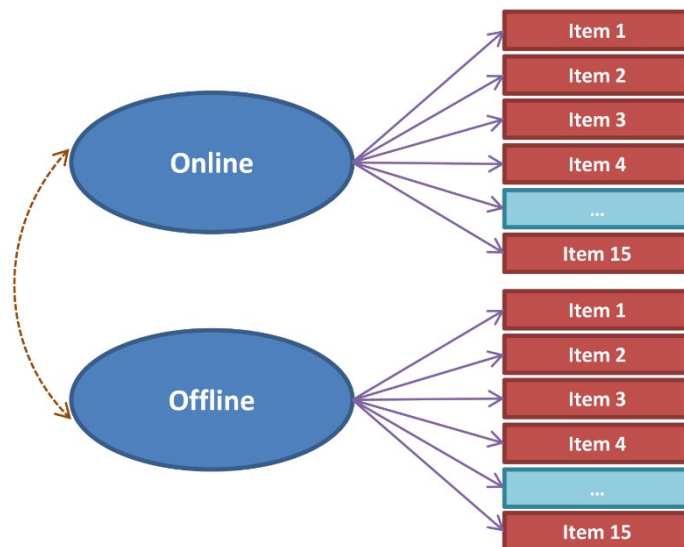
Analysis given the unidimensional character proposed at the theoretical level for the scales. This technique allows studying the contribution of each item to the construct assessed, essential for the validation of instruments that address psychological constructs (Watkins, 2018). In addition, the reliability (internal consistency) of both scales is analyzed with Cronbach's Alpha.

2.4.4. Analysis for the Validation study of the ICT-FLD

To confirm the evidence obtained in the initial pilot on the unidimensionality of both scales, a PCA was applied to a third of the final pilot sample ($n=246$), randomly selected. Given the ordinal nature of the response scale applied and that the sample size was considered sufficiently large, the analysis was applied from the polychoric correlation matrix, more appropriate in the case of ordinal items (Martínez-Abad & Rodríguez Conde, 2017). For this purpose, the R-Factor package was used, which integrates in SPSS a menu that allows applying PCA from this correlation matrix (Basto & Pereira, 2012). The factor weights, the % of variance explained by the factor and its reliability were analyzed through the ordinal Cronbach's Alpha index.

Confirmation of the factorial structure was performed through a Confirmatory Factor Analysis (CFA) on the remaining two thirds of the sample ($n=494$). The parameter estimation method applied was Diagonally Weighted Least Squares (DWLS), suitable for ordinal scales (Brown, 2015). After checking the fit of the individual unidimensional models, a first-order model was applied in which the joint unidimensional factor structure of both scales and their relationship was tested (Figure 1). It should be noted in this regard that the final scales consisted of 15 items, as one of the items was eliminated during the initial piloting process (this is indicated in the results section, section 3.2).

Figure 1.
First-Order Confirmatory Factor Analysis Model



The adjustment bond of the factorial model was studied using absolute (Chi-square, RMSEA and GFI) and incremental (CFI, IFI, NFI) fit indices. On the other hand, the contribution of the items to their respective construct was studied from the analysis of the individual factor weights and the Average Variance Extracted (AVE). The reliability of each scale was studied based on the Composite Reliability (CR) index. The relationship between the two scales was analyzed based on the analysis of covariance between factors of the model.

Finally, the predictive validity of the online and offline scales was analyzed by studying their relationship with the frequency and purpose of leisure activities shared by the family. In this case, Pearson's correlation coefficient was used in the analysis, and its intensity was interpreted taking into account the standard established by Cohen (1988): $r_{xy} \approx |0.1|$ (low intensity); $r_{xy} \approx |0.3|$ (medium intensity); $r_{xy} \approx |0.5|$ (high intensity).

3. Results

3.1. Content validity

The evaluations made by the panel of experts were very positive and allowed the questionnaire to be improved. The three judges gave an overall rating of “excellent” and pointed out some issues related to the clarity in the approach of some items (e.g., On several occasions they proposed to exemplify). The evaluators reflected that the Likert-type response scale with five options was adequate and effective for achieving the proposed research objectives. However, they also suggested that some of the response options of the sociodemographic items that were taken into account (e.g., item on the type of family) should be expanded or qualified. Regarding the instructions accompanying the questionnaire, changes suggested by the judges were made regarding the definition of some of the terms (e.g., what was considered online and offline leisure) and the uniformity of the format for some terms and expressions (e.g., terms used for family members). Finally, they noted that the instrument could lead families to reflect critically and slowly on the issues it raises.

3.2. Initial piloting

The evaluation of the comments made by the initial pilot sample led to new wording changes in the final piloting. Specifically, the vocabulary was improved by replacing some terms with more understandable ones (e.g., *Anticipate* with *foresee*, *consider* with *take into account*).

The results on the descriptive statistics of the items and the PCA (Factor loadings) are shown in Table 2. The previous assumptions of sample adequacy ($KMO_{online}=.68$; $KMO_{offline}=.68$) and non-sphericity (Barlett: $\chi^2_{online}=310.60$, $p<.001$; $\chi^2_{offline}=310.60$, $p<.001$) were met, indicating that the PCA is appropriate for these data (Tourón et al., 2023). Item factor weights were greater than .40 (Brown, 2015) in at least one of the two scales (Online or Offline), except for items 9 and 10 (Table 2). The variance explained in the online scale was 43.1% and in the offline scale 29.82%. The overall Cronbach's Alpha values for the offline scale (.808) and the online scale (.903) were favorable.

In the offline scale, the descriptive statistics comprised mean scores between 2.38 in item 5 and 4.10 in item 16, and the standard deviations presented the lowest value 0.725 in item 15 and the highest value 1.269 in item 5. With respect to the online scale the lower mean value of 2.38 appeared in items 5 and 10 and the highest value 3.67 in item 12. The standard deviations presented punctuations ranging from the minimum value 1.192 in item 11 to the maximum 1.447 in item 8.

Taking into account the statistical values obtained, and the qualitative assessments of the respondents on the difficulty to adequately understand these two items, it was decided to eliminate item 9 and to modify the wording of item 10. Thus, item 10 was modified from: "I reject the arguments proposed by a family member when they are based on prejudices or assumptions (e.g., If I go to the mountain I will get lost; Any online game generates violence) when deciding whether to engage in shared leisure" to "When the arguments of a family member to engage in shared leisure are based on prejudices and assumptions (e.g., If I go to the mountain I will get lost), I question them by offering objective information (e.g., We will use a map)".

Table 2.

Descriptive statistics and PCA results of items in the initial piloting

	Offline			Online		
	Mean	S _x	Loading	Mean	S _x	Loading
Item 1	3.90	0.94	.743	3.00	1.34	.470
Item 2	3.51	1.07	.763	2.92	1.35	.611
Item 3	3.90	0.75	.570	3.03	1.25	.764
Item 4	3.85	1.01	.758	2.90	1.37	.770
Item 5	2.38	1.27	.364	2.38	1.25	.648
Item 6	2.62	1.21	.419	2.56	1.27	.709
Item 7	3.77	1.09	.788	2.77	1.37	.864
Item 8	2.77	1.42	.467	2.56	1.45	.698
Item 9	3.03	1.42	.335	3.59	1.45	.399
Item 10	2.49	1.41	.115	2.38	1.39	.209
Item 11	3.28	1.15	.506	3.00	1.19	.587
Item 12	2.92	0.87	.644	3.67	1.26	.699
Item 13	3.51	1.14	.538	3.28	1.32	.626

Item 14	3.67	0.96	.529	3.31	1.22	.662
Item 15	4.00	0.725	.312	3.64	1.224	.708
Item 16	4.10	0.788	.355	3.62	1.290	.776

3.3. Validation study of the ICT-FLD

After removing item 9 in the previous phase, the stability and construction of the 15 remaining items was checked on both ladders. Just as Table 3 shows, all the items weighed adequately in scales on the initial PCA. Average punctuation and typical departures follow a trend similar to that observed in the initial pilotage. The percentages of variance explained were favorable (above 40%) both in the offline scale (42.49%) and in the online scale (55.07%). Finally, very favorable reliability levels were observed on both scales taking into account the ordinal alpha values ($\text{Alfa}_{\text{online}}=.941$; $\text{Alfa}_{\text{offline}}=.899$).

Table 3.

PCA descriptive statistics and results of the items in the ICT-FLD

	Offline			Online		
	Mean	S _x	Loading	Mean	S _x	Loading
Item 1	4.11	0.94	.771	2.86	1.32	.791
Item 2	3.69	1.13	.737	2.66	1.34	.799
Item 3	4.05	0.84	.787	2.96	1.26	.793
Item 4	4.07	0.91	.781	3.05	1.34	.821
Item 5	2.52	1.23	.457	2.26	1.22	.527
Item 6	2.71	1.33	.479	2.59	1.36	.607
Item 7	3.98	0.88	.798	2.97	1.34	.788
Item 8	2.80	1.32	.531	2.40	1.26	.711
Item 10	3.94	1.13	.639	3.31	1.43	.710
Item 11	3.73	1.05	.596	3.30	1.33	.761
Item 12	4.21	0.90	.729	3.70	1.35	.812
Item 13	3.86	1.14	.573	3.52	1.39	.735
Item 14	3.79	1.03	.593	3.45	1.31	.720
Item 15	4.22	0.79	.639	3.66	1.28	.761
Item 16	4.15	0.81	.518	3.56	1.31	.736

Compared to the CFA model used, which includes combined scales on a first order model, Table 4 presents the absolute and incremental adjustment indices. When you see how, while the absolutely based adjustment indices in the statistics box did not allow for adequate scoring, the GFI index is shy of good values, above .9 in the 3 models studied. As for the incremental adjustment indices, good punctuation was observed on all the indices, both in the independent unidimensional models, on a scale such as in the global model of the first order applied. Finally, online with the evidence obtained in the PCA, the percentage variance values extracted by factor and the calculated reliability resulted in appropriate results.

Table 4.

Absolute and incremental adjustment indices CFA model

	Offline	Online	1 st order model
$\chi^2(p\cdot)$	1389.92 (<.001)	1461.58 (<.001)	9867.48 (<.001)
χ^2/GL	15.44	16.24	24.42
RMSEA	.171	.176	.218
GFI	.946	.973	.915
CFI	.916	.971	.904
TLI	.902	.966	.897
NFI	.911	.969	.901
CR	.991	.995	-
AVE	57.69%	69.41%	-

Bearing in mind that the 1st order model achieved logically adjustable bonding levels, Table 5 presents the factorial weights and the CR and AVE levels obtained in this model. High factorial weights are observed on all factor square items together with very high levels of reliability and adequate levels of variance explained by factor. The covariance between square factors in the model reached a level of .845 ($p < .001$), confirming that there is a high direct intensity relationship between the CT in the online and offline family leisure.

Table 5.

Factor loadings, explained variance and reliability of the 1st order CFA model

	Factor Loadings		CR	AVE
	Offline	Online		
Item 1	.669	.763	CR _{offline} = .989 CR _{online} = .995	AVE _{offline} = 46.74% AVE _{online} = 64.56%
Item 2	.698	.842		
Item 3	.638	.787		
Item 4	.659	.810		
Item 5	.664	.759		
Item 6	.684	.747		
Item 7	.671	.786		
Item 8	.719	.803		
Item 10	.623	.769		
Item 11	.631	.784		
Item 12	.617	.751		
Item 13	.727	.801		
Item 14	.655	.780		
Item 15	.636	.775		
Item 16	.556	.700		

3.4. Predictive validity

Table 6 presents the correlations between home activities performed in the family and the scores in *ICT-FLD* both online and offline. The results are consistent with the expectation of keeping in mind the antecedents (Martín Quintana et al., 2018). Consistently

significant direct correlations were observed, with higher intensities in online-online and offline-offline comparisons (shadow cells), both at the frequency and in the proposed activities. While online-offline relationships occurred at low or medium-low intensities, the intensities of online-online and offline-offline relationships decreased to medium intensities and even medium-high.

Table 6.

Correlation between family activities and the scores in ICT-FLD

	ICT-FLD			
	OFFLINE		ONLINE	
	R _s	p.	R _s	p.
Weekly offline hours	.134	<.001	.032	.382
Weekend offline hours	.174	<.001	.041	.271
Weekly online hours	.065	.075	.209	<.001
Weekend online hours	.052	.161	.239	<.001
Offline activities (average)	.387	<.001	.176	<.001
Online activities (average)	.180	<.001	.421	<.001
Fun offline proposal	.325	<.001	.196	<.001
Learning offline proposal	.332	<.001	.222	<.001
Interaction offline proposal	.281	<.001	.139	<.001
Fun online proposal	.102	.006	.339	<.001
Learning online proposal	.171	<.001	.257	<.001
Interaction online proposal	.142	<.001	.341	<.001

4. Discussion

The construction of the ICT_FLD for parents and mothers (or legal tutors) in the context of shared offline and online leisure within families with children between 5 and 12 years of age was developed taking into account the reasoning skills following the Paul and Elder standards guide (2005). In addition, the formulation of the concept addressed paid attention to the conceptual delimitation of leisure in childhood, discriminating between the offline and online nature because of its interest in research applied to the leisure education (Adesoye & Ajibua, 2015; Díaz-Herrera et al., 2022; Llull, 2010; Sandoval, 2017).

The analysis of the psychometric properties of the instrument through the initial piloting and final validation study demonstrated its factorial structure, internal consistency, and structural and predictive validity. These analyses of the instrument's behavior have allowed us to fine-tune the wording of the items and their understanding by the target population, which is made up of diverse families (De Vellis, 2017). On the other hand, its unidimensional structure is sensitive to the heterogeneity of skills that is activated when making decisions relative to the shared leisure in the Family, the items can integrate these reasoning standards - suggestions, questions, assumptions, points of view, information, concepts, inferences, and implications-. Therefore, although this measure did not consider its factorization in the skills considered, and this could be interpreted as a limitation, it is well known that the characteristics of the CT concept due to its complexity and difficulty of theoretical realization do not easily become apparent. Thus, it has been recognized that the difficulty in defining or extracting the “pure form” of CT

skills can be used at a specific time because thinking skills are profoundly interrelated during cognitive functioning (Nieto et al., 2009).

On the one hand, the significant relationship between the CT in the shared family leisure is understood with the frequency and the purpose diversity of these leisure activities. In other words, the deployment of a CT in family leisure was associated with greater commitment to offline and online activities, and with various purposes such as learning, fun and the relationship of children's relationships with their peers, in line with the results obtained by Martín-Quintana et al. (2018) or with the study by Malfert-Gaupp (2023), to support the benefit of external factors, such as leisure, in promoting CT. These results link recent reflections that defend emancipation in decision-making in the face of the dictatorship of technologies in the use of shared time within the family, even proposing the construction of social networks as a support for the creation of leisure scenarios alternatives (Hester & Srnicek, 2024), such as home environments that shape creativity (Jankowska et al., 2024).

On the other hand, the content validation study by expert judges and the analysis derived from the initial piloting made it possible to determine the educational purpose of the instrument. Thus, the use of a reduced number of items and accessible terminology, easy to use and understand, helped to demonstrate its potential as a support tool to encourage families to critically and pause for thought on the questions raised.

However, a limitation of the study is the values of the goodness-of-fit indices of the instrument, which would be desirable to be better especially on the offline scale of family leisure shared. When analyzing the results, it is noteworthy that the behavior of the participating subjects is more consistent and homogeneous in the online environment compared to the offline one. Further research is needed to improve the offline scale. While a lower homogeneity in offline behavior could be related to the heterogeneity of the types of offline activities (Salcines-Talledo et al., 2023), that can be performed and that a person may have in mind when answering the scale (materials for their performance, environments, requirements, temporal and physical demands, among others), exceeds the diversity in digital leisure.

However, the highest average evaluations appear in the items referring to offline leisure. That is, families activate Critical Thinking to a lesser extent for online leisure. This data is relevant to continue deepening future research on whether there is a relationship between the perception of the digital environment as a risky environment that, by demanding greater effort, is more easily abandoned (Sánchez-Pérez & Fuentes, 2021) and, whether due to daily stress and family conciliation difficulties they use online leisure with their children in a less positive direction (Won et al., 2022), especially given the significant increase in digital consumption among children and adolescents in recent years (Chunxiao & Lijun, 2022, Fernández-de-Arroyabe-Olaortua et al., 2018).

5. Conclusion

In the scenario of the shared leisure in the family, we consider that the CT is part of a life activity that requires development as a way of meditating, listening and making decisions about life in a personal, family, academic or professional context. Then, the CT favors the development of a series of conscious and systematic cognitive skills, enabling constant vital learning and the development of personalized criteria constructed autonomously in interaction with others. Everything from the search for answers, the

curiosity, the formulation of questions, the investigation, the argumentative and justifiable questioning of the points of view of oneself and of the other, to confronting the objections to what the world currently offers with autonomy, proposing changes and alternatives just and equitably within a system such as the family.

This research is necessary and useful in the actual context of caring for the family, based on CT activation in the context of decision-making before implementing offline and online activities that promote healthy habits. In addition, to its usefulness in research, its potential is identified in the field of families education. By paying attention to the review bibliography, it should be noted that a new and current theme is being treated, such as the precise design of the evaluation tools that allow the use of the CT to be identified by the family when choosing the type of leisure shared with the family.

Alternatively, the originality of this research lies in its configuration as a pioneering proposal, incorporating a series of variables (CT and shared leisure) in a community focused on economic and social development (families with children), which will reinforce and expand an already emerging field of study within the international environment. In short, the relevance of the topic to be investigated is undeniable and has been supported by major national and international bodies that have highlighted their preparedness in relation to the risks inherent in online consumption and the internet (Centro Criptológico Nacional Computer Emergency Response Team [CCN-CERT], 2021; Instituto Nacional de Ciberseguridad [INCIBE], 2016; ONTSI, 2021; UNICEF, 2021), as well as the need to educate the population through a CT, just and based on the reason (OCDE, 2019; UNESCO, 2017), and the international norm that provides for the right of children and the general population to actively participate in constructive, binding and similar projects during free time (United Nations, 1989, Art. 31.2; Universal Declaration of Human Rights, 1948, Arts. 22 and 27).

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APPENDIX

Critical reflection on the choice of a shared family home

Value based on what actions are taken by your family to decide what type of home to create together. Differentiating between the online leisure and the offline leisure.

1. I speak clearly to my family about the reasons why we are going to have shared leisure.
2. I motivate my family to reason, argue and debate about why we are having shared leisure.
3. I propose to my family leisure that is balanced between their needs and preferences.
4. I ask my family about their interests in creating a shared leisure.
5. I seek information from experts in various subjects (education, psychology, technology, etc.) to decide and create shared leisure within the family.
6. I take into account information from experts, both against and in favor of my opinion, in order to decide whether to have shared leisure in the family.
7. I share personal experiences and coexistence with my family when we decide to create shared leisure.
8. In my family we come to a conclusion by sharing information from experts in order to decide whether to have shared leisure.
10. When the arguments of a family member to create shared leisure are based on prejudices and allegations (e.g., "If you go to the mountain, you will get lost"), I question them by offering objective information (e.g., "We will use a map").
11. I think with care about the rules or regulations that shared leisure requires before proposing it to my family.
12. I choose precise and thoughtful vocabulary to communicate norms or rules to have shared leisure.
13. I am aware when some member of my family tampers with the information, with the aim of having their point of view considered for shared leisure
14. I foresee the family consequences that my positioning on shared leisure can bring (embarrassment, rejection, singing, love, enthusiasm, surprise) to decide if I suggest the proposal.
15. I consider different family perspectives from my family, including different ones, when deciding to have shared leisure.
16. I consider changing my positioning of the shared leisure after listening and evaluating the arguments of other family members.