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Validation of an Online Adaptation of the Cyberbullying Test in Children and Adolescents

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ABSTRACT

Background/Aim: Currently, there is growing social concern about new forms of socialization among children and adolescents. This includes the emerging risk of cyberbullying. In order to understand this phenomenon, analyze its prevalence, and evaluate the effectiveness of interventions, it is essential to have available valid and reliable assessment instruments. The possibility of using these tools with large groups makes their digital application particularly attractive, as it facilitates both administration and analysis. The aim of this study is to validate an online adaptation of the cyberbullying section of the Cyberbullying Test for children and adolescents. **Method:** A total of 664 children and adolescents (9–17 years) in Galicia (Spain) completed the online bullying and cyberbullying sections of the Cyberbullying Test. **Results:** Descriptive analyses indicate the presence of cyberbullying at these ages, although with a tendency toward low levels. Exploratory and confirmatory factor analyses suggest the scores on the various observable indicators (items) can be grouped into three mutually related factors, corresponding to the roles of victim, perpetrator, and bystander. The model showed a good fit to the data (GFI = .974; AGFI = .971; NFI = .966; RFI = .964; SRMR = .068). Factor invariance analyses suggest that this structure is equivalent for both Primary and Secondary Education students. Each factor's scores showed high or very high reliability in terms of internal consistency. The correlations found between the scores in each cyberbullying factor and those in the bullying section of the test provide evidence supporting the criterion validity of the instrument. **Discussion:** The validated online version of the Cyberbullying Test provides robust psychometric support for its use in research and practice.

Validación de una Adaptación Online del Test Cyberbullying en Niños y Adolescentes

RESUMEN

Antecedentes/Objetivo: En la actualidad existe una creciente preocupación social por las nuevas formas de socialización de niños y adolescentes. Esto incluye los riesgos asociados, como el ciberacoso. Para comprender este fenómeno, analizar su prevalencia y evaluar la eficacia de las intervenciones, es preciso contar con instrumentos de evaluación válidos y fiables. La posibilidad de utilizarlos con amplios grupos de personas hace interesante su aplicación digital, para facilitar su administración y análisis. El objetivo de este trabajo es validar una adaptación online de la sección ciberacoso del Test Cyberbullying en niños y adolescentes. **Método:** Se administraron las secciones bullying y cyberbullying del test a 664 niños y adolescentes de Galicia (España), de 9 a 17 años. **Resultados:** Los análisis descriptivos muestran la existencia de cyberbullying a estas edades, si bien con una tendencia a valores bajos. Los análisis factoriales exploratorios y confirmatorios realizados sugieren que las puntuaciones en los distintos indicadores observables (ítems) se pueden agrupar en tres factores mutuamente relacionados, correspondientes a los roles de víctima, agresor y observador. El modelo mostró un buen ajuste a los datos (GFI = .974; AGFI = .971; NFI = .966; RFI = .964; SRMR = .068). Los análisis de invarianza factorial sugieren que esta estructura es equivalente tanto para Educación Primaria como para Secundaria. Las puntuaciones de cada factor presentan una fiabilidad alta o muy alta, en términos de consistencia interna. Las correlaciones halladas entre las puntuaciones en cada factor de ambas secciones del test, aportan evidencia a favor de la validez de criterio de la prueba. **Discusión:** La versión online del Test Cyberbullying ofrece garantías psicométricas sólidas para su aplicación en investigación y práctica profesional.

Palabras clave:

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Encuestas y Cuestionarios
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Introduction

More than two decades have passed since the first studies on harassment through electronic devices, known as cyberbullying (see, for example, [Jerome & Segal, 2003](#)). During this time, significant advancements have been made. The first, and probably the most significant, is the increased awareness of this harmful phenomenon ([Ishak et al., 2023](#); [Moore et al., 2017](#)). Society and media now reflect not only the benefits of social networks but also the challenges they pose. This concern, along with the greater visibility of the consequences of cyberbullying, has increased the demand for effective prevention tools and intervention programs ([Bautista & Vicente, 2020](#)).

In this article, the definition of cyberbullying adopted refers to it as a form of harassment, aggression, or intimidation carried out by one or more individuals (cyberaggressors) against one or more others (cybervictims) through communication technologies ([Garaigordobil, 2013](#)). The behavior is intended to cause harm or distress, and it involves a power imbalance, which may be based on technological expertise, access to information, or the possibility of remaining anonymous. Anonymity, the persistence of digital content, and the use of both text and images to inflict harm make this form of aggression particularly damaging ([Vismara et al., 2022](#)).

Empirical research indicates that the roles of victim, aggressor, and bystander are closely interrelated both within cyberbullying—where individuals may shift between roles over time ([Garaigordobil, 2015](#); [Eden & Roberto, 2021](#); [Sasson et al., 2024](#))—and across cyber and traditional bullying contexts ([Barlett et al., 2024](#); [Chanda et al., 2024](#); [Li & Hesketh, 2021](#)). Factorial analyses of various adaptations of the *Cyberbullying Test* further confirm this multidimensional structure in diverse samples ([Machimbarrena & Garaigordobil, 2018](#); [Navarro-Rodríguez et al., 2024](#)).

Current findings support the idea that, although traditional bullying and cyberbullying are closely related, they are differentiated constructs, and valid instruments are needed for their proper measurement ([Barlett et al., 2024](#)). Moreover, investigations reveal that the roles of victim, aggressor, and observer tend to be associated across both contexts. For instance, students who are victims of cyberbullying are more likely to report being victims of traditional bullying as well, and similar patterns have been observed for aggressors and observers ([Chanda et al., 2024](#); [Li & Hesketh, 2021](#)).

The research conducted over the years has allowed us to understand the severe consequences of this phenomenon. Recent studies find a causal relationship between being victimized by cyberbullying and health issues such as depression, anxiety, and substance use ([Moore et al., 2017](#)). Victimization due to cyberbullying is also associated with greater suicidal ideation, suicide attempts, and self-harm ([Li et al., 2024](#)). Bullies exhibit greater issues such as substance use ([Marciano et al., 2020](#)), higher levels of anxiety, depression, and general health problems ([Álvarez-García et al., 2025](#); [Barlett et al., 2024](#)). Young people who witness bullying incidents, known as bystanders or observers, show more anxiety-depressive and somatic symptoms ([Doumas & Midgett, 2020](#)).

A series of meta-analyses and large surveys indicate that cyberbullying affects a non-negligible minority of young people.

For instance, pooled data from 42 studies ($n = 266,888$) put the average victimization rate at 11.1 % ([Li et al., 2024](#)), while a European meta-analysis reported prevalence ranges of 2.8 %–31.5 % for victims and 3.0 %–30.6 % for perpetrators ([Henaes-Montiel et al., 2022](#)). In the United States, nearly half of high school students (46%) have experienced cyberbullying—more than double the rate in 2007 ([Vogels, 2022](#)). Similar upward trends appear in recent national samples ([Bali et al., 2023](#); [Evangelió et al., 2022](#)).

[António et al. \(2024\)](#) conducted their study during the COVID-19 pandemic, observing that 61% of young people had suffered cyberbullying in the past three months, while 40.8% admitted having participated in cyberbullying behaviors as aggressors during the pandemic.

The interpretation of these prevalences should be approached with caution. The substantial variability can partly be attributed to methodological differences in the measurement instruments ([Evangelió et al., 2022](#)). Additionally, some studies provide data on severe cyberbullying, while others include any severity level ([Garaigordobil, 2025](#)).

[Chun et al. \(2020\)](#) noted in their systematic review of the instruments used for measuring cyberbullying that many questionnaires were designed to prioritize the research goals and a specific population. [Evangelió et al. \(2022\)](#) found few questionnaires that had been validated by diverse research teams and/or in diverse populations, among which is the *Cyberbullying Test* ([Garaigordobil, 2013](#)), one of the most frequently used in recent studies. Additionally, few instruments meet the recommended guidelines for developing scales ([DeVellis & Thorpe, 2021](#)) and provide solid reliability and validity results ([Vismara et al., 2022](#)).

In the review conducted by [Xie et al. \(2023\)](#), which examined 75 instruments designed to measure bullying and cyberbullying, a notable proportion were self-report measures ($n=73$; 97.3%). The characteristics of self-reports raise doubts about the accuracy and honesty of responses. However, cyberbullying behaviors are not always observable to others, making self-report measures valuable.

The majority of instruments utilize employ multiple items, asking about the occurrence of specific behaviors ([Álvarez-García et al., 2017](#); [Garaigordobil, 2013](#)). Questionnaires with multiple items report higher prevalence rates, likely because it is more challenging to identify oneself as a victim or perpetrator of cyberbullying than to admit that sometimes offensive messages have been received or sent ([Patchin & Hinduja, 2024](#)). The absence of a standardized definition of cyberbullying in measurement instruments is not surprising, given the difficulties in generating a unanimous definition, but it is a relevant limitation.

Only a minority of tools provide a clear definition of cyberbullying. Most omit essential elements such as intentionality, repetition, and power imbalance, even though evidence shows that including these elements improves the instrument's sensitivity and validity ([Patchin & Hinduja, 2024](#); [Zhang et al., 2022](#)). Including these elements may help minors recognize not only the most severe and stereotypical cases of cyberbullying, but also all situations that share these characteristics.

[Xie et al. \(2023\)](#) found that nearly all self-report questionnaires assessing bullying and cyberbullying used Likert-type response formats. While some instruments included detailed frequency options, others relied on vaguer or numeric categories. These variations in response format have important implications for the

validity and comparability of findings. While detailed frequency options may facilitate more precise estimations of victimization prevalence and severity, vague or inconsistent scales may hinder the establishment of thresholds for defining who qualifies as a victim or perpetrator, ultimately complicating cross-study comparisons and the interpretation of intervention outcomes.

Latest reviews have found that a significant percentage of the evaluated instruments did not include a specific time frame to measure cyberbullying: 28.1% of the instruments evaluated by Chun et al. (2020) and 29.7% by Vismara et al. (2022). Among those that did specify a time frame, notable variability was observed: from formulations such as “sometime in life” to defined intervals like “the past year” (Xie et al., 2023). Although adjustments can be made to align reference periods, this practice produces some inaccuracies. Moreover, using broad time frames, such as “at any point in life,” presents a particular limitation by not evaluating the same interval of time for young people of different ages.

Most studies on cyberbullying have focused on secondary school students (Xie et al., 2023; Miličević, 2022). However, the use of technology among minors is beginning at increasingly younger ages. Nearly half of 11-year-old children in Spain already use mobile phones (Instituto Nacional de Estadística, 2023). Additionally, research suggests a higher prevalence of cyberbullying during the transition from primary education to secondary education. However, with some exceptions (Garaigordobil, 2013; Machimbarrena & Garaigordobil, 2017), few instruments have been validated for both educational stages.

The timing of research is a relevant factor to consider. An example is the longitudinal study initiated by Rivers and Noret in 2002, which included questions such as “How often have you received threatening text messages or emails?” Although this type of question was appropriate at the beginning of the millennium, it was necessary to modify the questions in subsequent versions to measure cyberbullying behaviors on social media better (Noret & Rivers, 2006; Rivers & Noret, 2010).

Although most students do not participate directly in cyberbullying situations, existing evidence shows that prevalence levels, while generally low to moderate (Rodríguez-Enríquez et al., 2025), are significant enough to warrant concern; particularly due to the psychological, social, and academic consequences for those involved (Li et al., 2024; Henares-Montiel et al., 2022; Moore et al., 2017). This supports the expectation that most scores in cyberbullying questionnaires will tend to be low, but that even small percentages of involvement can reflect important risks.

Regarding the administration format, most reviewed instruments still use paper and pencil questionnaires. Of the 64 instruments evaluated by Chun et al. (2020), only 12 (20.3%) employed online questionnaires, a percentage similar to that found in another review (19.7%) (Vismara et al., 2022). This preference for the physical format partly reflects the accessibility and familiarity of this medium, although online questionnaires offer significant advantages in terms of reach and ease of administration that could be leveraged. In this context, it is crucial to advance the development and validation of instruments with solid psychometric properties that allow for a more precise analysis of cyberbullying (Evangelio et al., 2022).

Several systematic reviews have analyzed the characteristics and limitations of the most commonly used instruments to assess

cyberbullying (Berne et al., 2013; Chun et al., 2020; Zhang et al., 2022; Miličević, 2022). These reviews highlight that many tools lack solid evidence of validity and reliability, have not been validated across different populations, or fail to address all roles involved in cyberbullying. In contrast, the *Cyberbullying Test* (Garaigordobil, 2013) stands out for its psychometric robustness, comprehensive approach to the three roles (victim, aggressor, and observer), and prior validation in primary and secondary school populations. This makes it a strong candidate for adaptation to a digital format, allowing for greater accessibility and analytical efficiency while maintaining conceptual integrity.

The *Cyberbullying Test* by Garaigordobil (2013) is a measurement tool that meets the recommendations from the review of assessment measures by Berne et al. (2013), such as providing appropriate indicators of validity and reliability, an application manual, and a clear definition of the phenomenon. The test presents a paper-and-pencil format and is divided into two sections to measure traditional bullying and cyberbullying that occurred in the last year. Through factor analysis, this scale demonstrates that it can detect the roles of aggressor and victim, but also that of bystander, a key agent in the emergence, maintenance, and cessation of bullying.

The original version of the questionnaire was validated for Secondary Education students in Euskadi (Spain). Subsequently, it has also been validated for primary education students in the same Autonomous Community (ages 9 to 12) (Machimbarrena & Garaigordobil, 2018) and for Secondary Education students in Mexico (Laca-Arocena et al., 2020; Navarro-Rodríguez et al., 2024). These validations have confirmed the robustness of the three-factor structure and its applicability in different contexts. Moreover, the possibility of using the test from the last years of primary education to the completion of secondary education facilitates the comparison of measures over the medium and long term.

The *Cyberbullying Test* (Garaigordobil, 2013) has psychometric strengths and a multidimensional structure. It was originally developed in a paper-and-pencil format. In the current digital context, where online administration offers advantages such as immediacy, automation of data analysis, and greater scalability, adapting the instrument to a digital format responds both to a practical need and an opportunity for innovation. Furthermore, few instruments with proven validity for children and adolescents are currently available in online formats (Chun et al., 2020; Vismara et al., 2022), highlighting the relevance of this contribution.

Thus, this test has gathered support to be considered a valid and reliable tool. However, additional adaptations should be considered to improve its applicability. Transitioning to a digital format would facilitate data administration and analysis. Additionally, reducing the time frame within which questions are asked from “the last year” to “the last 3 months” could increase the test’s sensitivity, allowing for better measurement of changes after interventions and minimizing the effect of forgetting. Finally, it is necessary to adapt some outdated terms, such as “blog,” to more neutral terms that can capture current and successive technological changes.

The objective of this work has been to validate an online adaptation of the section on cyberbullying from the *Cyberbullying Test* (Garaigordobil, 2013) in a sample of Spanish students from primary and secondary education. For this purpose, (1) firstly, a

descriptive analysis of the scores obtained for each item in the section was conducted; (2) subsequently, the construct validity of the section was analyzed, including an examination of factorial invariance between the groups of primary and secondary school students (3) then, the reliability of the scores in each of the dimensions found was analyzed in terms of internal consistency; and (4) finally, the criterion validity was examined by analyzing the correlation between the scores obtained in each dimension of the Cyberbullying section and those obtained in the offline bullying section of the Cyberbullying Test.

According to prior evidence, we expected that (1) the scores obtained would display a positively skewed and leptokurtic distribution, that is, with a significant tendency toward low values; (2) the three mutually related dimensions model-the three cyberbullying roles (victim, aggressor, or observer)-would adequately fit the empirical data, and this structure would be invariant across the groups of primary and secondary education students (3) the scores of each dimension would show good reliability in terms of internal consistency; and (4) the three dimensions or roles measured by the test would positively correlate with being a victim, aggressor, or observer of offline bullying.

Method

Participants

An incidental sample of 664 students (48.0% girls) participated in the study, ranging from 5th grade of Primary Education to 4th grade of Compulsory Secondary Education (CSE). These students were drawn from 31 classrooms across six schools in Galicia, Spain. Of the total, 23.9% were Primary Education students and 76.1% were CSE students. Participants were aged between 9 and 17 years ($M = 12.78$, $SD = 1.64$). Regarding school type, 60.7% attended public schools and 39.3% subsidized schools; 43.2% were enrolled in rural schools and 56.8% in urban schools.

The total sample size is considered adequate for conducting confirmatory factor analyses (CFA) on the complete dataset, given that recommended minimum sample sizes for CFA generally range between 200 and 500 participants, depending on the complexity of the model (Lloret-Segura et al., 2014). This sample size facilitates reliable and stable estimation of model parameters in the overall analyses. Nevertheless, partitioning the sample into smaller subgroups may result in reduced statistical power.

Measure Instruments

We applied the *Cyberbullying Test* (Garaigordobil, 2013), which consists of two sections. Both sections were computerized and administered online.

The Bullying section assesses the frequency of involvement in offline harassment situations (face-to-face), as a victim, an aggressor, and an observer. After providing a definition of bullying, three scales are presented, one for each role, each scale with four items, referring to physical, verbal, social, and psychological aggression (e.g., "Have you suffered this kind of aggression or harassment in the last year? Physical aggression"). In the version applied in this study, an online questionnaire was generated, maintaining the integrity of the questions and response options on

a four-point Likert scale (0 = *never*, 3 = *always*) but modifying the time frame evaluated, asking about events that had occurred in the last three months. High scores indicate high levels of offline bullying experienced, perpetrated, or observed, depending on the scale. The internal consistency reliability coefficients for each scale, obtained with the sample of this study, were $\alpha = .818$ and $\omega = .827$ for the Victim role scale, $\alpha = .804$ and $\omega = .804$ for the Aggressor scale, and $\alpha = .829$ and $\omega = .831$ for the Observer scale.

The Cyberbullying section was computerized, beginning similarly to the original version with the definition of cyberbullying, followed by 45 items distributed across three scales depending on the role played in the aggression situation. Participants were asked if they had suffered, perpetrated, or observed any of the 15 behaviors related to cyberbullying in the last three months. A four-point Likert scale (0 = *never*, 3 = *always*) was also provided to measure the frequency of the behaviors.

Additionally, "social networks" were included in the definition of cyberbullying as one of the means through which cyberbullying takes place. Moreover, two questions were modified to update them to the reality of technology use in recent years. Item 9, which originally stated: "Has someone signed into your blog, posing as you, writing defamatory comments, lies, or sharing your secrets?" was modified as follows: "Has someone posed as you, making defamatory comments, lies, or sharing your secrets on social networks or the internet?" Item 10, which originally stated: "Has someone stolen your password to prevent you from accessing your blog or email?" was changed as follows: "Has someone stolen your password to prevent you from accessing your accounts, social networks, or email?" (see Appendix). The same modifications were applied to the items for the roles of aggressor and observer.

Procedure

First, authorization was requested and obtained from the author of the original test to digitize the version and make the described modifications. Subsequently, after requesting the necessary approvals, the test was administered at a school with primary and secondary education students to test the viability of the digitized version of the test, detect possible errors and needs, and calculate the application time. As some schools had students with access to laptops and others with tablets, adaptations were made to ensure compatible visibility with any device.

Once the final version was designed, we contacted the school management teams to inform them of the objectives and characteristics of the study, as well as the voluntary nature, anonymity, and confidentiality of the data to be collected. After obtaining their authorization, this same information was provided to families in writing, offering them contact details of the research team so they could raise any questions before consenting to their child's participation. Prior to each classroom application, students were informed about the study, including the anonymous, confidential, and voluntary nature of their participation. They were also encouraged to ask any questions they felt necessary. To ensure anonymity, participants were not asked to provide their names and were assigned a code. The average time to complete the questionnaire was 20 minutes. However, this was flexible based on the students' age, their questions, and characteristics, ensuring that any doubts were addressed thoughtfully without time pressure.

Given that the questionnaire could not be submitted unless all items were completed, there were no missing values. Participants were prompted to respond to any unanswered questions before submission.

Before administering each section of the test (bullying and cyberbullying), students were presented with the definition from the original questionnaire for bullying and cyberbullying, respectively (Garaigordobil, 2013). For students in 5th and 6th grade of primary education, a brief oral introduction was given to improve their understanding of these concepts. This approach was adopted due to comprehension difficulties observed during the pilot testing phase with younger students. Providing this clarification helped resolve doubts and increased the likelihood of obtaining reliable responses. The researchers administered the test to all groups in all the schools during school hours.

This study forms part of a larger research project, the protocol of which was approved by the Ethics Committee of the institution responsible for the study (Ref. CE-DCEC-UVIGO-2020-12-02-8129).

Data Analysis

First, a descriptive analysis of the data obtained for each scale item was performed, examining frequencies, percentages, and indices of skewness and kurtosis.

Next, we analyzed the construct validity of the scale through factorial analysis in two phases. In the first phase, we conducted an exploratory factorial analysis, forcing the extraction of three factors to replicate the procedure and structure found in the original scale's validation (Garaigordobil, 2013; 2017). According to the nature of the data obtained in the present sample, we used principal axis factoring as the extraction method and Oblimin with Kaiser normalization as the rotation method. In the second phase, we conducted a confirmatory factorial analysis using Unweighted Least Squares (ULS) as the estimation method. To assess the goodness of fit of the model to the empirical data obtained, we employed the standardized root mean square residual (SRMR), the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), the Bentler-Bonett normed fit index (NFI), and the Bollen's relative fit index (RFI). Regarding the first one (SRMR), the closer its value is to zero, the better the fit will be, with .08 being the commonly considered cut-off point indicative of a good fit (Hu & Bentler, 1999). For the rest, values equal to or greater than .95 indicate a good fit (Ruiz et al., 2010). The ULS estimation method does not allow obtaining some indices commonly used to assess models' goodness-of-fit, such as the chi-square/degrees of freedom ratio (χ^2/df), the root mean square error of approximation (RMSEA), or the comparative fit index (CFI).

Exploratory and confirmatory factor analyses were conducted with the aim of independent validation and confirmatory replication, given that the instrument had already been validated in the original validation of the scale (Garaigordobil, 2013; 2017) and in other populations (Laca-Arocena et al., 2020; Machimbarrena & Garaigordobil, 2018; Navarro-Rodríguez et al., 2024). On the one hand, in the present work, we conducted exploratory factor analysis

to check, through forced extraction, whether the factorial structure found in the exploratory factor analyses of the original validation would hold in the sample of the present study. On the other hand, this was followed by a subsequent confirmatory factor analysis, which served to more rigorously confirm whether the three-factor model adequately fits the data from the new sample and the factor loadings of each item on each factor. Given the sample size of the present study, which is not very large, the exploratory and confirmatory factor analyses were conducted with the same sample to avoid the loss of statistical power of the two analyses that would result from splitting the data into two halves.

To examine whether the factorial structure identified in the overall sample was equivalent across the Primary and Secondary Education subsamples, a multigroup confirmatory factor analysis was conducted. The feasibility of this analysis was considerably limited by the group sizes, especially the smaller size of the Primary Education group. It was also limited by the estimation method used (ULS), which was chosen due to the characteristics of the data. This method does not allow for the estimation of means and intercepts, and it does not provide some indices commonly used to assess model goodness-of-fit. Initially, an unconstrained invariance model (baseline model) was tested, in which the pattern of factor loadings was held constant across groups according to the structure identified in the total sample, while factor loadings, and error variances were freely estimated within each group. Subsequently, a metric invariance model was tested, in which the factor loadings were constrained to be equal across groups. Finally, a more restrictive model was tested, in which both the error variances and the factor loadings were constrained to be equal across groups.

Once the construct validity was analyzed, we assessed the reliability of the scores on each factor in terms of internal consistency, using the α and ω indices.

Finally, we analyzed the criterion validity of the Cyberbullying section by examining the correlation between the scores obtained in each dimension and those obtained in the section related to face-to-face bullying. For this purpose, we used the Spearman correlation coefficient, given the nature of the scores.

For the descriptive analyses, exploratory factor analysis, the reliability of the scores on each factor, and the Spearman correlations, we used the statistical software SPSS 27.0.1 for Windows. For the confirmatory factor analysis, IBM SPSS Amos 27 software was used.

Results

Descriptive Analysis

The distribution of scores on all items of the scale is positive and leptokurtic. That is, most students tend to respond that they have never experienced (see Table 1), perpetrated (see Table 2), or observed (see Table 3) the cyberbullying behaviors presented in the questionnaire, and very few students report experiencing, perpetrating, or observing these behaviors quite often or always.

Table 1*Descriptive Analysis of the Scores obtained from Items related to being a Cyberbullying Victim in the last 3 Months (N=664).*

	Never	Sometimes	Several times	Always		Skewness (SE=.095)	Kurtosis (SE=.189)
	f(%)	f(%)	f(%)	f(%)	M(SD)		
VCB1	525(79.1)	123(18.5)	13(2.0)	3(0.5)	0.24(0.50)	2.23	5.48
VCB2	608(91.6)	48(7.2)	7(1.1)	1(0.2)	0.10(0.34)	3.97	18.02
VCB3	643(96.8)	18(2.7)	2(0.3)	1(0.2)	0.04(0.23)	7.42	67.41
VCB4	622(93.7)	34(5.1)	5(0.8)	3(0.5)	0.08(0.34)	5.23	32.24
VCB5	647(97.4)	15(2.3)	2(0.3)	0(0.0)	0.03(0.18)	7.05	54.78
VCB6	591(89.0)	59(8.9)	12(1.8)	2(0.3)	0.13(0.41)	3.48	13.41
VCB7	601(90.5)	45(6.8)	12(1.8)	6(0.9)	0.13(0.45)	4.06	18.04
VCB8	633(95.3)	18(2.7)	9(1.4)	4(0.6)	0.07(0.36)	5.74	35.54
VCB9	630(94.9)	26(3.9)	7(1.1)	1(0.2)	0.06(0.30)	5.37	32.47
VCB10	625(94.1)	30(4.5)	9(1.4)	0(0.0)	0.07(0.31)	4.61	22.06
VCB11	647(97.4)	15(2.3)	2(0.3)	0(0.0)	0.03(0.18)	7.05	54.78
VCB12	625(94.1)	24(3.6)	13(2.0)	2(0.3)	0.08(0.37)	4.87	25.23
VCB13	629(94.7)	26(3.9)	8(1.2)	1(0.2)	0.07(0.31)	5.24	30.54
VCB14	628(94.6)	26(3.9)	5(0.8)	5(0.8)	0.08(0.36)	5.74	36.90
VCB15	550(82.8)	82(12.3)	23(3.5)	9(1.4)	0.23(0.57)	2.77	7.90

Note. VCB = Victim of Cyberbullying.**Table 2***Descriptive Analysis of the Scores obtained from the Items related to being a Cyberbullying Aggressor in the last 3 Months (N=664)*

	Never	Sometimes	Several times	Always		Skewness (SE=.095)	Kurtosis (SE=.189)
	f(%)	f(%)	f(%)	f(%)	M(SD)		
ACB1	601(90.5)	61(9.2)	2(0.3)	0(0.0)	0.10(0.31)	3.02	8.35
ACB2	643(96.8)	15(2.3)	6(0.9)	0(0.0)	0.04(0.24)	6.46	44.09
ACB3	654(98.5)	8(1.2)	2(0.3)	0(0.0)	0.02(0.15)	9.53	99.84
ACB4	654(98.5)	7(1.1)	3(0.5)	0(0.0)	0.02(0.17)	9.51	97.16
ACB5	660(99.4)	4(0.6)	0(0.0)	0(0.0)	0.01(0.08)	12.80	162.23
ACB6	647(97.4)	10(1.5)	7(1.1)	0(0.0)	0.04(0.24)	7.07	51.70
ACB7	655(98.6)	7(1.1)	2(0.3)	0(0.0)	0.02(0.15)	10.08	111.25
ACB8	661(99.5)	3(0.5)	0(0.0)	0(0.0)	0.01(0.07)	14.81	217.99
ACB9	657(98.9)	5(0.8)	2(0.3)	0(0.0)	0.01(0.14)	11.44	141.71
ACB10	656(98.8)	6(0.9)	2(0.3)	0(0.0)	0.02(0.15)	10.71	124.98
ACB11	659(99.2)	5(0.8)	0(0.0)	0(0.0)	0.01(0.09)	11.42	128.78
ACB12	654(98.5)	8(1.2)	2(0.3)	0(0.0)	0.02(0.15)	9.53	99.84
ACB13	656(98.8)	5(0.8)	3(0.5)	0(0.0)	0.02(0.16)	10.55	117.87
ACB14	652(98.2)	9(1.4)	3(0.5)	0(0.0)	0.02(0.18)	8.69	81.75
ACB15	651(98.0)	11(1.7)	2(0.3)	0(0.0)	0.02(0.17)	8.24	75.02

Note. ACB = Cyberbullying Aggressor.

Table 3*Descriptive Analysis of the Scores obtained with the Items related to being an Observer of Cyberbullying in the last 3 Months (N=664)*

	Never	Sometimes	Several times	Always		Skewness	Kurtosis
	f(%)	f(%)	f(%)	f(%)	M(SD)	(SE=.095)	(SE=.189)
OCB1	455(68.5)	182(27.4)	24(3.6)	3(0.5)	0.36(0.58)	1.50	1.98
OCB2	556(83.7)	93(14.0)	12(1.8)	3(0.5)	0.19(0.47)	2.74	8.48
OCB3	564(84.9)	81(12.2)	14(2.1)	5(0.8)	0.19(0.49)	3.03	10.26
OCB4	569(85.7)	82(12.3)	11(1.7)	2(0.3)	0.17(0.44)	2.90	9.41
OCB5	598(90.1)	60(9.0)	3(0.5)	3(0.5)	0.11(0.37)	4.00	20.15
OCB6	578(87.0)	74(11.1)	8(1.2)	4(0.6)	0.15(0.44)	3.37	13.50
OCB7	569(85.7)	81(12.2)	12(1.8)	2(0.3)	0.17(0.44)	2.90	9.30
OCB8	614(92.5)	40(6.0)	5(0.8)	5(0.8)	0.10(0.39)	4.89	27.70
OCB9	608(91.6)	47(7.1)	5(0.8)	4(0.6)	0.10(0.38)	4.53	24.41
OCB10	569(85.7)	82(12.3)	10(1.5)	3(0.5)	0.17(0.45)	3.03	10.59
OCB11	595(89.6)	58(8.7)	8(1.2)	3(0.5)	0.13(0.40)	3.79	16.88
OCB12	595(89.6)	57(8.6)	10(1.5)	2(0.3)	0.13(0.40)	3.63	14.94
OCB13	595(89.6)	57(8.6)	8(1.2)	4(0.6)	0.13(0.42)	3.89	17.72
OCB14	595(89.6)	56(8.4)	9(1.4)	4(0.6)	0.13(0.42)	3.87	17.27
OCB15	585(88.1)	66(9.9)	9(1.4)	4(0.6)	0.14(0.43)	3.55	14.71

Note. OCB = Observer of Cyberbullying.

Construct Validity

Exploratory factor analysis

The Kaiser-Meyer-Olkin (KMO) measure of sample adequacy had a value of .915, and Bartlett's sphericity test yielded $\chi^2 = 19919.50$, $df = 990$, and $p < .001$. This suggests that the scores of the items are related, and therefore, the dataset is suitable for conducting a factor analysis.

The exploratory factor analysis conducted, extracting three factors, showed that the three extracted factors explained 46.87% of the variance in the obtained data: Factor 1 explained 28.73% of the variance, Factor 2 explained 12.55%, and Factor 3 explained 5.60%. The extraction of a fourth factor hardly added any explained variance, as observed in the scree plot (see Figure 1).

According to the configuration matrix (see Table 4), Factor 1 groups the items related to being a cyberbully aggressor (ACB), Factor 2 to being a victim of cyberbullying (VCB), and Factor 3 to being an observer of cyberbullying (OCB). Each item has a significant relationship ($> .30$) with only one of the factors, suggesting that each factor represents a clearly defined dimension and that each item is associated clearly and uniquely with a single factor.

Confirmatory factor analysis

We tested a model aligned with the factorial structure derived from the original validation of the questionnaire, which matches the results of the exploratory factor analysis conducted with the

present study's sample. This model consists of three mutually related factors (aggressor, victim, and observer of cyberbullying), each comprising 15 items (see Figure 2).

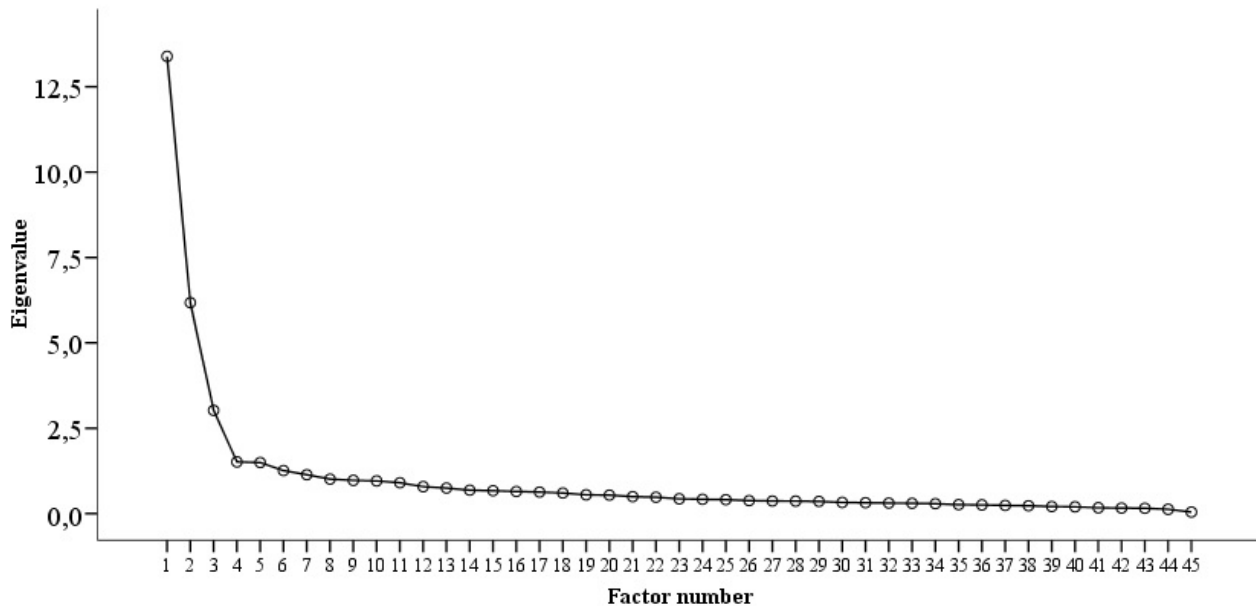
The model tested showed a good fit to the obtained data, with GFI, AGFI, NFI, and RFI indices higher than .95 (GFI = .974, AGFI = .971, NFI = .966, and RFI = .964) and SRMR below .08 (SRMR = .068).

As shown in Figure 2, the standardized factor loadings (β) were good or excellent in the "Observer of Cyberbullying" factor and from acceptable to excellent in the "Bully" factor. In the "Victim of Cyberbullying" factor, five items had loadings below the desirable level (Items 3, 5, 6, 10, and 11), while the remaining 10 items had loadings ranging from acceptable to excellent.

Scores on each factor correlated positively with the other factors. This correlation was stronger between being a victim and being an observer and between being an aggressor and being an observer than between being a victim and an aggressor of cyberbullying (see Figure 2).

The multigroup analyses that could be conducted, considering the group sizes and the characteristics of the data, suggest that the factorial structure identified in the total sample is equivalent in both the Primary Education and Secondary Education groups. The fit indices for the unconstrained invariance model (GFI = .962; AGFI = .958) and the metric invariance model (GFI = .947; AGFI = .943), in which the factor loadings were constrained to equality, indicate a good model fit. The most restrictive model, in which both error variances and factor loadings were constrained to be equal, showed slightly lower fit indices compared to the less restricted models (GFI = .913; AGFI = .909).

Figure 1
Scree Plot.



Reliability

The reliability of the scores for each factor, measured in terms of internal consistency, was high for the factor related to being a victim of cyberbullying ($\alpha = .882$, $\omega = .890$) and very high for the factors related to being an aggressor ($\alpha = .916$, $\omega = .920$) or an observer ($\alpha = .932$, $\omega = .932$).

Criterion Validity

A statistically significant and positive correlation was found between the scores obtained in each of the factors of the Cyberbullying section and those obtained in each of the factors of the Bullying section (see Table 5). For each role (victim, aggressor, or observer) within an environment (face-to-face and online), the highest correlation was found with the same role in the other environment.

Discussion

This work aimed to validate an adaptation of the Cyberbullying section from the *Cyberbullying Test* (Garaigordobil, 2013) in a sample of Spanish primary and secondary students. An online format was used for this adapted version instead of the original version's pencil-and-paper format, and some items' wording was modified, as well as the time period considered (the last three months instead of the last year). Based on our results, this study's adaptation presents adequate statistical guarantees for measuring the informant's involvement in peer cyberbullying situations.

Firstly, we conducted a descriptive analysis of the scores obtained in each item of the section to validate the test. As expected, the distribution of scores in all items of the scale was positive and

leptokurtic. That is, most students tended to respond that they had never experienced, perpetrated, or witnessed the cyberbullying behaviors presented in the questionnaire, and a minority reported experiencing, perpetrating, or observing these behaviors quite often or always. This pattern coincides with those obtained in recent national studies (Díaz-Aguado, 2024; Torrego, 2023).

In our sample, the proportion of students endorsing the highest frequency categories ("Several times" and "Always") was very low, below 5% for both options combined. Similar minimal use of extreme response categories has been reported in primary-school applications (0.1–4.5%; Machimbarrena & Garaigordobil, 2018) and in the original validation (up to 3%; Garaigordobil, 2013). Given these consistently low rates, future adaptations of the scale might consider combining "Several times" and "Always" into a single "Frequently" category. This would help distribute responses more evenly across categories and make the results easier to interpret, while still capturing those students who experience cyberbullying regularly.

Secondly, we analyzed the construct validity of the Cyberbullying section of the test. As expected, the results suggest that the different behavioral indicators (items) that comprise the section can be grouped into three factors, corresponding to the three cyberbullying roles (victim, aggressor, or observer). This aligns with the findings of previous validations of the scale (Garaigordobil, 2013, 2017; Laca-Arocena et al., 2020). The results of the multigroup analysis indicate that the three-factor model operates similarly in the Primary and Secondary Education samples, thereby supporting the validity of the instrument for comparing scores across these groups. The scores on these three factors (roles) positively correlate with each other, suggesting a tendency for them to occur together. This relationship is stronger between being an observer and being either a victim or an aggressor

than between being a victim and an aggressor of cyberbullying. However, in all three cases, it is significant. In other words, it is more likely to be an aggressor or a victim and also an observer of cyberbullying than to be an aggressor and a victim simultaneously, although the probability that all three combinations occur is statistically significant. This result is consistent with previous studies, which found significant overlap among the three roles (González-Calatayud & Espinosa, 2021).

Thirdly, we analyzed the reliability of scores in each identified dimension regarding internal consistency. As expected, the scores for each dimension showed high or very high internal consistency. This result is consistent with previous validations of the test (Garaigordobil, 2013, 2017; Laca-Arocena et al., 2020) and suggests that the behavioral indicators constituting each dimension correlate strongly, measuring the same construct coherently.

Finally, we examined the criterion validity by analyzing the correlation between the scores obtained in each dimension of the Cyberbullying section and those obtained in the offline Bullying section of the *Cyberbullying Test*. As hypothesized, a statistically significant and positive correlation was found between the scores obtained in each factor of the Cyberbullying section and those obtained in each factor of the Bullying section. This result is consistent with previous studies, which have found an overlap between both forms of violence (Estévez et al., 2020) and aligns with the current continuity in socialization in both face-to-face and online contexts.

For all these reasons, it can be concluded that the adapted version of the Cyberbullying section of the *Cyberbullying Test* (Garaigordobil, 2013) examined in this study has appropriate statistical guarantees for measuring the degree of participation in peer cyberbullying situations in the three roles in the analyzed sample. Therefore, this work represents a contribution to the field of study with theoretical and practical implications. From a theoretical perspective, the results provide new evidence of the robustness of the initial theoretical framework, which differentiates the three distinct but mutually related roles in cyberbullying (aggressor, victim, and observer) and the observable indicators that define them.

From a practical perspective, the *Cyberbullying Test* has proven to be a valid and reliable instrument for application in educational, clinical, and research contexts across a wide age range (9 to 17 years). It constitutes an uncommon type of test among those published to measure cyberbullying, as it allows measuring all three roles while also referencing the same 15 behavioral indicators for each role (Garaigordobil, 2017). Although cyberbullying tends to present low prevalence levels (Díaz-Aguado, 2024; Torrego, 2023), it is a highly relevant issue due to the severity of its consequences (Li et al., 2024). Hence, such tools are important for the early detection of cases, the analysis of prevalence, the identification of predictors, the study of its consequences, and the assessment of the efficacy of interventions. This work also shows that the modifications in wording and format made in the adapted version of this study do not significantly affect the good metric guarantees found in previous validations (Garaigordobil, 2013, 2017; Laca-Arocena et al., 2020).

Table 4

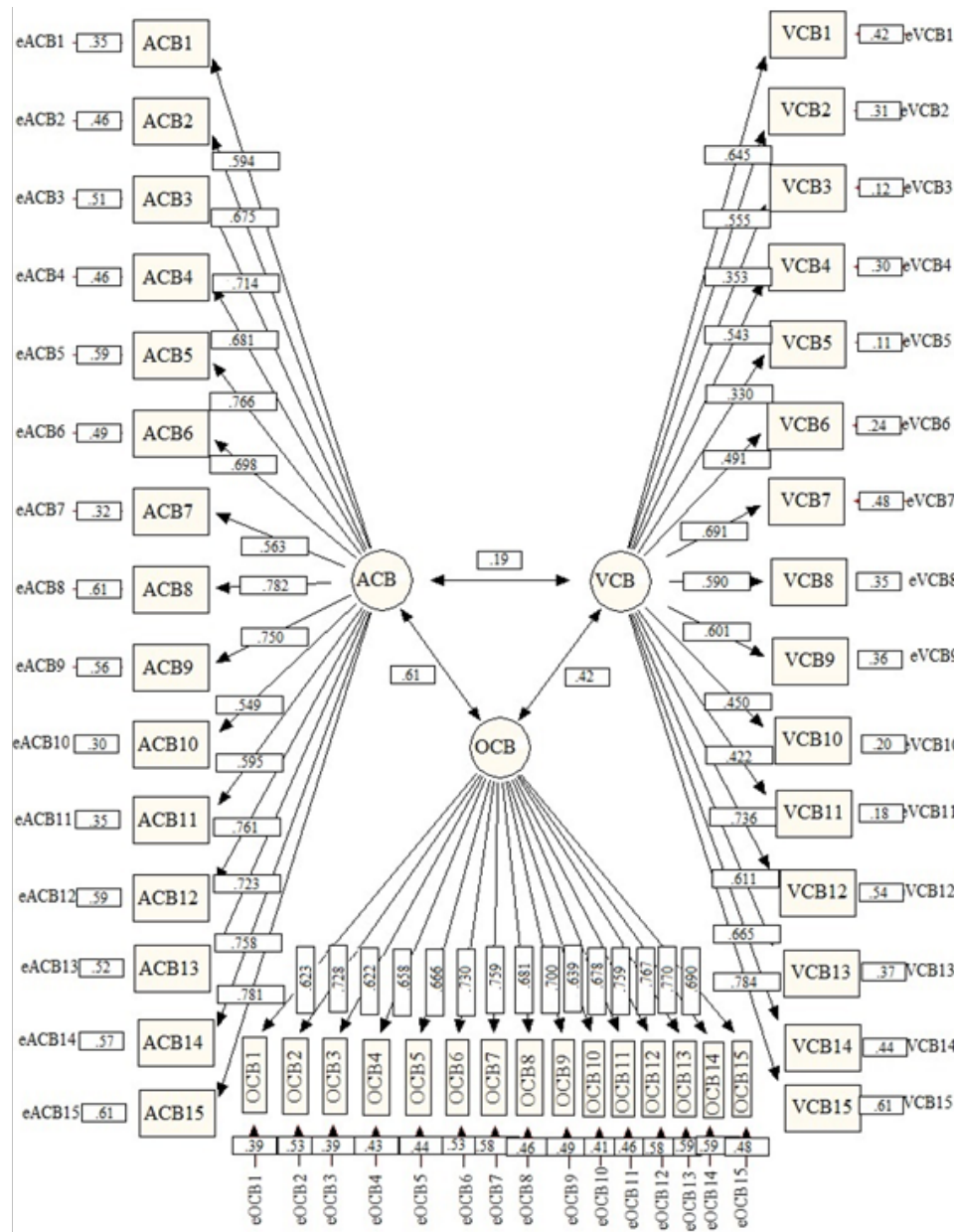
Factor Loadings for the Cyberbullying Test (N=664)

Items	Factor		
	1	2	3
ACB8	.998	-.100	.044
ACB5	.847	-.038	-.017
ACB13	.843	-.073	-.009
ACB4	.795	.018	.041
ACB11	.789	-.065	.053
ACB9	.772	-.026	-.053
ACB3	.721	.067	-.014
ACB12	.706	-.088	-.126
ACB15	.652	-.036	-.147
ACB14	.634	-.010	-.144
ACB2	.618	.065	-.037
ACB6	.614	-.001	-.086
ACB10	.613	.025	.026
ACB7	.586	.017	-.002
ACB1	.413	.246	-.018
VCB12	-.048	.726	-.066
VCB13	.057	.718	.101
VCB7	-.006	.678	-.038
VCB14	-.005	.654	-.031
VCB9	-.005	.636	-.033
VCB1	-.035	.625	-.046
VCB15	-.084	.618	-.212
VCB4	-.018	.578	-.032
VCB2	-.007	.578	-.015
VCB8	-.084	.557	-.115
VCB10	.006	.540	.049
VCB6	-.007	.463	-.080
VCB5	.081	.447	.146
VCB11	-.035	.430	-.046
VCB3	.028	.400	.023
OCB15	-.070	-.014	-.747
OCB12	-.017	.065	-.746
OCB6	.022	-.031	-.744
OCB11	-.010	-.051	-.731
OCB2	-.016	.022	-.712
OCB14	.106	.016	-.709
OCB9	.049	-.017	-.703
OCB13	.101	.076	-.678
OCB8	.079	-.021	-.670
OCB7	.080	.092	-.663
OCB4	.026	-.016	-.659
OCB5	.136	-.056	-.625
OCB1	-.092	.082	-.620
OCB3	.078	-.001	-.566
OCB10	.146	.128	-.495

Note. ACB = Cyberbullying Aggressor; VCB = Victim of Cyberbullying; OCB = Observer of Cyberbullying.

Figure 2

Standardized factorial weights of each item in the Cyberbullying section of the Cyberbullying Test for each factor and correlations between the factors ($N = 664$).

**Table 5**

Spearman Correlation Coefficients between Scores in the Cyberbullying Section Factors and the Scales in the Bullying Section of the Cyberbullying Test ($N = 664$)

Cyberbullying section	Bullying Section		
	Offline Bullying Victim	Offline Bullying Aggressor	Offline Bullying Observer
Victim of Cyberbullying	.43	.29	.30
Cyberbullying Aggressor	.20	.24	.19
Observer of Cyberbullying	.27	.15	.37

Note. All $ps < .001$

On the other hand, the relationship found between the three roles suggests that they are not independent roles, but rather that there is fluidity among them, which must be considered when analyzing participation trajectories in the problem and interventions (Estévez et al., 2020; Walters & Espelage, 2023).

Finally, the relationship found between in-person bullying and cyberbullying suggests that preventive programs aimed at improving school climate should address common risk factors in addition to the specific ones for each type of bullying. Among the common factors, we highlight personality traits (e.g., impulsivity, self-esteem, social skills), family factors (e.g., parenting style), and community factors (e.g., the transmission of social models and values). Among the specific factors, we emphasize promoting responsible, educated, and safe use of social networks (Stonebanks & Shariff, 2023).

Although this work, for all the above reasons, represents a contribution to the field of study, some limitations should be acknowledged. We highlight two of them. On the one hand, the *Cyberbullying Test* is a self-report, which inherently carries some risks, such as social desirability. Therefore, it is advisable to complement this source of information with other methodologies, such as using hetero-reports targeting adults or peers. On the other hand, the adapted version in this study was not tested with a very large sample, and was limited to a specific region of Spain. While the *Cyberbullying Test* has been validated in recent years in different contexts (Garaigordobil, 2013, 2017; Laca-Arocena et al., 2020; Navarro-Rodríguez et al., 2024), it is important to test the adapted version in different contexts to assess its external validity.

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Appendix

Cyberbullying Definition and Behaviors Explored

Cyberbullying is a form of harassment, aggression, or intimidation carried out by one person against another using communication technologies, for example: the Internet (social media, forums, email, etc.) or mobile phones (through messages, calls, or by recording someone and uploading the content online). The aggressor sometimes remains anonymous, and the content sometimes reaches an unlimited number of people, using both text and images. Have you experienced this kind of harassment continuously over the past three months? Please select the appropriate response and indicate whether it is happening now or occurred during the last three months.

[El cyberbullying es una forma de acoso, agresión o intimidación que una persona ejerce contra otra utilizando tecnologías de la comunicación, por ejemplo: Internet (redes sociales, foros, correo electrónico, etc.) o teléfonos móviles (mediante mensajes, llamadas o grabando a alguien y subiendo el contenido en línea). En ocasiones, el agresor permanece en el anonimato, y el contenido a veces llega a un número ilimitado de personas, empleando tanto texto como imágenes. ¿Has sido acosado/a de este modo continuamente durante en los últimos 3 meses? Señala la respuesta adecuada. Informa si te ocurre ahora o si te ha ocurrido en los últimos tres meses.]

1. Have you been sent offensive or insulting messages via mobile or the Internet?
[¿Te han enviado mensajes ofensivos o insultantes a través del móvil o Internet?]
2. Have you received offensive or insulting calls on mobile or through Internet?
[¿Has recibido llamadas ofensivas o insultantes a través del móvil o Internet?]
3. Have you ever been assaulted to be recorded and have it posted on the Internet?
[¿Alguna vez te han agredido para grabarte y publicar el vídeo en Internet?]
4. Have private or compromising photos or videos of you been shared through mobile devices or the Internet?
[¿Se han compartido fotos o vídeos privados o comprometidos tuyos a través de dispositivos móviles o Internet?]
5. Have you been secretly photographed in places like changing rooms, the beach, or bathrooms, and have those photos been shared via mobile or the Internet?
[¿Te han fotografiado a escondidas en lugares como vestuarios, la playa o baños, y esas fotos se han compartido por móvil o Internet?]
6. Have you received anonymous calls intended to scare or intimidate you?
[¿Has recibido llamadas anónimas con la intención de asustarte o intimidarte?]
7. Have you been blackmailed or threatened through calls or messages?
[¿Te han chantajeado o amenazado mediante llamadas o mensajes?]
8. Have you experienced sexual harassment via mobile or the Internet?
[¿Has sufrido acoso sexual a través del móvil o Internet?]
9. Has someone posed as you, making defamatory comments, lies, or sharing your secrets on social networks or the Internet?
[¿Alguien se ha hecho pasar por ti, difamándote, mintiendo o compartiendo tus secretos en redes sociales o en Internet?]
10. Has someone stolen your password to prevent you from accessing your accounts, social networks, or email?
[¿Alguien ha robado tu contraseña para impedirte acceder a tus cuentas, redes sociales o correo electrónico?]
11. Have your photos or videos been altered and shared on social media or websites (like YouTube) to humiliate you or mock you?
[¿Han alterado tus fotos o vídeos y los han compartido en redes sociales o sitios web (como YouTube) para humillarte o burlarse de ti?]
12. Have you been harassed in an attempt to isolate you from your contacts on social media?
[¿Te han acosado con el fin de aislarte de tus contactos en redes sociales?]
13. Have you been blackmailed and forced to do things you did not want to in exchange for keeping your intimate matters private on the Internet or social media?
[¿Te han chantajeado y obligado a hacer cosas que no querías a cambio de mantener en privado tus asuntos íntimos en Internet o redes sociales?]
14. Have you or your family received death threats via mobile, social media, or other technologies?
[¿Tu familia o tú habéis recibido amenazas de muerte a través del móvil, redes sociales u otras tecnologías?]
15. Have you been defamed or had rumors spread about you to harm your reputation through social media?
[¿Te han difamado o difundido rumores para dañar tu reputación a través de redes sociales?]

Note. The 15 items of the Appendix are applied in the victim role (participants report whether they have suffered these behaviors in the past 3 months and with what frequency); then, they are asked if they have carried out these behaviors in the past 3 months and with what frequency (the aggressor role), and finally, they are asked if they have seen some classmates performing these behaviors toward other classmates in the past 3 months and with what frequency (the observer role).

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