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Validity and Reliability of the ECIP-Q Among Peruvian Adolescents: A Tool for Monitoring Cyberbullying and School Coexistence

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Abstract

Cyberbullying is a public health concern in adolescence that requires measures with valid and comparable evidence across subgroups. This study examined the validity and reliability evidence of the European Cyberbullying Intervention Project Questionnaire (ECIP-Q) in Peruvian adolescents. Using an instrumental cross-sectional design, 729 students aged 12–18 years (M_age = 14.6; SD = 1.27) from Lima, Trujillo, and Piura were recruited through non-probabilistic sampling. Items were treated as ordinal; polychoric correlations were estimated (WLSMV, theta parameterization), and a reproducible prevalence-based recoding was applied to mitigate pileups in category 0. Competing CFA and ESEM models were tested for 22- and 19-item specifications, incorporating two residual covariances for "mirror-pair" items. Sex invariance was evaluated at configural, metric, and scalar levels. The two-factor, 19-item ESEM with two residual covariances showed the best fit (χ^2 = 291.164; df = 130; CFI = 0.982; TLI = 0.976; RMSEA = 0.041 [0.035–0.048]; SRMR = 0.091). Reliability was adequate for cybervictimization (CR = 0.737, ω = 0.888, factor determinacy [fd] = 0.965) and cyberaggression (CR = 0.282, ω = 0.805, fd = 0.938). Cyberbullying dimensions correlated positively with aggression and moral disengagement and weakly with empathy. Regarding sociodemographic variables, cyberbullying was associated with age, grade, and Internet use; moreover, cyberaggression was higher in boys than in girls. Having more friends and better relationships with teachers were negatively associated with cyberbullying, whereas perceiving the school environment as unsafe was positively associated with cyberbullying. Overall, the 19-item ECIP-Q demonstrates acceptable structural validity, reliability, and sex invariance in Peruvian adolescents, supporting its use for screening and monitoring school coexistence.

Keywords: cyberbullying; adolescents; reliability and validity; psychometrics

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1. Introduction

In recent years, the emergence of information technologies (smartphones and the Internet) among adolescents has permeated multiple aspects of physical, mental, and social development (Ives et al., 2025). Excessive use of mobile phones and computers has been linked to technology addiction (Topan et al., 2025), psychological problems (Maurya et al., 2022), and cyberbullying (Santre, 2023).

Cyberbullying has been defined as the use of digital technology to harass, harm, or intimidate others (Daniels et al., 2021). The World Health Organization (World Health Organization, 2024) reported that 12% of adolescents have experienced cyberbullying; moreover, boys are more likely to be cyberbullied than girls. Another study indicated that school-age youth reached prevalence rates ranging from 20% to 40% among adolescents and from 9% to 25% among children (Englander, 2019). Country-specific estimates also vary widely: in Saudi Arabia, cyberbullying prevalence among adolescents was 42.8% (Gohal et al., 2023); in Nigeria, 23.9% reported cyberperpetration and 39.8% reported being victims of cyberbullying (Olumide et al., 2016). In Spain, 69.8% had engaged in some form of cyberbullying (Garaigordobil, 2015). Furthermore, systematic reviews of longitudinal studies show considerable heterogeneity, with victimization ranging from 1.9% to 84% and perpetration from 5.3% to 66.2% (Camerini et al., 2020). A systematic review and meta-analysis conducted in the European Union reported victimization rates between 2.8% and 31.5% and perpetration between 3% and 30.6% (Henares-Montiel et al., 2022).

In Latin America, estimates also differ by country. A regional bibliometric review reported prevalence between 2.5% and 42.5% (Herrera-López et al., 2018). More specifically, Ecuador recorded a relatively low prevalence of cyberbullying victimization (3%); however, 82% reported having experienced at least one cyberattack (Moya-Solís & Moreta-Herrera, 2022). In Brazil, the National School Health Survey reported 13.2% cyberbullying among adolescents (Malta et al., 2024); in Argentina, a cross-sectional study found that 8.1% of schoolchildren experienced cyberbullying (Pengpid & Peltzer, 2023); and higher rates were reported in Colombia, where 19.6% of secondary students had experienced cyberbullying (Cassiani-Miranda et al., 2022). In Peru, prevalence appears higher than in several other Latin American countries: 24.6% reported cyberbullying victimization, with boys more often affected than girls (Miranda et al., 2019). Complementarily, qualitative evidence indicates that cyberbullying is the second most frequently reported problem in Peru (Oriol et al., 2021).

Definitional clarity has been challenging due to limited scientific consensus (Zhang et al., 2022). Many scholars emphasize continuity with traditional bullying—harm, power imbalance, and repetition (Alipan et al., 2015)—whereas others argue that focusing solely on "cyberbullying" may be overly restrictive and that constructs such as online aggression or cyber cruelty warrant attention (Corcoran et al., 2015). Understanding cyberbullying is further complicated by features of the online environment: perpetrators can hide behind anonymity, which may embolden more aggressive behavior in offline interactions (Amalina et al., 2021); digital content can be rapidly disseminated, amplifying harm to victims (Kuhlmann et al., 2013); and online disinhibition can facilitate more extreme expressions of aggression (Tordo, 2020). These dynamics are frequently explained through moral disengagement and aggression, which contribute to cycles of cyberbullying perpetration and victimization (Colella et al., 2025; Dominguez-Vergara et al., 2023).

Cyberbullying therefore constitutes a significant public health problem with direct implications for adolescent mental health. Victims often report elevated depression and anxiety (Aledeh et al., 2024; Sharma et al., 2024; Donia et al., 2025), as well as higher rates of suicidal ideation and behavior (Maurya et al., 2022; Rodelli et al., 2018; Amadori et al., 2025). Additional psychological correlates among both victims and perpetrators include low self-esteem (Al-Amer et al., 2025; Shkurina, 2024), stress (Shkurina, 2024), and feelings of loneliness (W. Yang et al., 2025). Research further suggests that peer conflicts can precipitate cybervictimization and cyberperpetration, with mediating roles for depression and hostility and sex-related differences in these pathways (Ding et al., 2025).

Given these risks, robust measurement tools are essential. Some instruments focus on the emotional impact of cybervictimization, such as the Cybervictimization Emotional

Impact Scale (CVEIS), which demonstrates adequate internal consistency for both subscales and the total score (Elipe et al., 2017). Others assess peer victimization across online/offline contexts, such as the Multidimensional Offline and Online Peer Victimization Scale (MOOPV), a four-factor measure (offline direct, offline indirect, online direct, online indirect) with solid internal structure and reliability (Haid-Stecher et al., 2020). In contrast, the European Cyberbullying Intervention Project Questionnaire (ECIP-Q) assesses cyberbullying roles through two factors (cybervictimization and cyberaggression) drawing on Dooley et al. (2009) and Ortega-Barón et al. (2016). The ECIP-Q has been translated and validated in several contexts, including Iran (Saedi & Rahmati, 2024), China (Zhu et al., 2022), Portugal (Monteiro et al., 2025), and Colombia (Herrera-López et al., 2017), typically via confirmatory approaches that support its bidimensional structure and, in many cases, measurement invariance by sex—features that favor its use across diverse populations.

In sum, valid and reliable instruments are needed to estimate the prevalence and incidence of school violence and to inform prevention and intervention efforts. Given rapid technological change, rigorous measurement of cyberbullying is especially necessary. Accordingly, the present study examined the validity and reliability evidence of the ECIP-Q in Peruvian adolescents.

2. Materials and Methods

2.1. Design

Following the instrumental design proposed by Montero and León (2005), we examined the ECIP-Q's internal structure to evaluate its construct validity and overall psychometric consistency in a sample of Peruvian adolescents.

2.2. Participants

A total of 729 adolescents from three Peruvian provinces—Lima, Trujillo, and Piura—were recruited using non-probabilistic convenience sampling. Ages ranged from 12 to 18 years (M_age = 14.6; SD = 1.27). Boys predominated (56.9%) over girls (43.1%). Additional sociodemographic characteristics are presented in Table 1.

Table 1. Sociodemographic characteristics of the sample (N = 729).

Variable	*f*	%
Sex		
Male	415	56.9%
Female	314	43.1%
School grade		
1st year of secondary	118	16.2%
2nd year of secondary	131	18.0%
3rd year of secondary	193	26.5%
4th year of secondary	218	29.9%
5th year of secondary	69	9.5%
Type of School		
Public	244	33.5%
Private	485	66.5%
Internet use		
Once a week	11	1.5%
Two–three times per week	13	1.8%
Once–twice per day	86	11.8%
Three–six times per day	141	19.3%
Seven–twelve times per day	75	10.3%
Almost all day	403	55.3%

Table 1. *Cont.*

Variable	*f*	%
Living arrangement		
With both parents	488	66.9%
With father only	16	2.2%
With mother only	164	22.5%
Others (e.g., uncles, grandparents, guardian)	61	8.4%
Friends		
I have no friends	50	6.9%
I have some friends	422	57.9%
Yes, I have several friends	257	35.3%
Perceived school safety		
Neither unsafe nor dangerous	434	59.5%
Moderately unsafe and/or dangerous	268	36.8%
Very unsafe and/or dangerous	27	3.7%
Relationship with teachers		
Poor	8	1.1%
Moderate	309	42.4%
Good	412	56.5%

2.3. Instruments

2.3.1. European Cyberbullying Intervention Project Questionnaire (ECIP-Q; Ortega-Ruiz et al., 2016; Version by Herrera-López et al., 2017)

This instrument was developed to assess cyberbullying. It comprises 22 items rated on a five point Likert type scale, with response options coded from 0 (never) to 5 (always). It evaluates two dimensions: cybervictimization (11 items), for example, "Someone has used bad language or insulted me on the Internet (email, social networks, calls, or SMS)" or "Someone has posted personal information about me on the Internet", and cyberaggression (11 items), for example, "I have posted someone's personal information on the Internet (for example, on social networks)." The Spanish translation was presented by Ortega-Ruiz et al. (2016), whose confirmatory factor analysis supported two correlated factors with optimal fit (χ^2 = 270.11, $p < 0.001$; NNFI = 0.95; CFI = 0.96; RMSEA = 0.05; SRMR = 0.06). In the present study we used the adaptation by Herrera-López et al. (2017), who, through an expert panel and a pilot test, modified items for better suitability to the Latin American context. Their psychometric validation was adequate, confirming the two-factor structure through confirmatory factor analysis (χ^2 SB = 644.97; χ^2 SB divided by degrees of freedom 208 = 3.10; $p < 0.001$; CFI = 0.97; RMSEA = 0.047; AIC = 228.96). Reliability coefficients were acceptable for cybervictimization (omega = 0.94) and cyberaggression (omega = 0.91).

2.3.2. Moral Disengagement Scale (MMDS; Bandura et al., 1996)

The Moral Disengagement Scale assesses the extent to which individuals endorse psychological mechanisms that exonerate harmful conduct. It contains 32 items rated on a five point Likert scale (1 = strongly disagree to 5 = strongly agree). The MMDS provides a total score and eight subscales: moral justification, euphemistic labeling, advantageous comparison, displacement of responsibility, diffusion of responsibility, distortion of consequences, dehumanization, and attribution of blame. The Spanish translation and psychometric evidence were reported by Bautista et al. (2020), who conducted a confirmatory factor analysis and obtained adequate fit (χ^2 divided by degrees of freedom = 2.03; CFI = 0.97; RMSEA = 0.05, 90% confidence interval 0.038 to 0.065; SRMR = 0.03; AIC = 159.07). Reliability estimated with omega exceeded 0.65 in the subscales and reached 0.93 for the total moral disengagement score.

2.3.3. Basic Empathy Scale (BES; Jolliffe & Farrington, 2006)

The original questionnaire comprises 20 items. The adaptation used here includes 9 items selected from the pilot by Oliva Delgado et al. (2011) in Spain, after removing items with unsatisfactory psychometric performance such as low factor loadings, factorial complexity, poor item to total correlations, or conceptual mismatch with the target factor. The resulting structure comprises two subscales: Affective Empathy (items 1, 2, 3, and 6) and Cognitive Empathy (items 4, 5, 7, 8, and 9). In Peru, Merino-Soto and Grimaldo-Muchotrigo (2015) validated the bidimensional model through structural equation modeling, obtaining acceptable fit (SB χ^2 = 26.789; CFI = 0.99; TLI = 0.99; SRMR = 0.06) and adequate reliability.

2.3.4. Aggression Questionnaire (Buss & Perry, 1992)

Aggression was assessed with the short form of the Buss Perry Aggression Questionnaire (Morales-Vives et al., 2005). This scale includes 20 items rated on a five point Likert scale from 1 (very rarely) to 5 (very frequently). It comprises four dimensions: Physical Aggression for example, "Sometimes I cannot control the urge to strike another person", Verbal Aggression for example, "When I am not in agreement with my friends, I argue with them", Anger for example, "I get irritated easily, but it passes quickly", and Hostility for example, "Sometimes I wonder why I feel so resentful about certain things". The Spanish translation was provided by Vigil-Colet et al. (2005). Psychometric evidence reported by Chahín-Pinzón et al. (2012) showed good fit (CFI = 0.92; NFI = 0.90; RMSEA = 0.049, 90% confidence interval 0.044 to 0.057). Cronbach alpha ranged from 0.58 to 0.75 across subscales and reached 0.82 for the total aggression score.

2.4. Procedure

School authorities in the provinces of Lima, Trujillo, and Piura were contacted, and the principal of each institution provided written authorization for the study and logistical coordination. Parents or legal guardians received an informed consent form for review and signature. Only after consent was obtained were adolescents invited to participate. In a classroom prepared for the study and free of interruptions, the research team explained the study objective, procedures, potential benefits and risks, the voluntary nature of participation, and the confidentiality of the information. Students then signed the assent form. Questionnaires were administered in paper and pencil format under supervision by trained staff and were completed individually and anonymously. No difficulties were encountered during data collection; however, the research team established a referral protocol to the school educational psychologist in the event of distress or discomfort. Data were collected from April to August 2024.

2.5. Ethical Considerations

The study was conducted in accordance with the Declaration of Helsinki and the CIOMS guidelines for research involving human participants. The protocol was reviewed and approved by the Institutional Ethics Committee of the Universidad Tecnológica del Perú, approval code No. 266-2024 CEI UTP. Because the participants were adolescents, written informed consent was obtained from parents or legal guardians, followed by written assent from each student after the study details had been explained. To protect privacy, questionnaires were completed individually and anonymously, coded with alphanumeric identifiers, and stored on a password protected computer with restricted access. Participation did not involve financial incentives or other compensation.

2.6. Data Analysis

First, we inspected the ECIP Q ordinal responses to identify outliers and missing values. Descriptive statistics included the mean, median, standard deviation, minimum, maximum, skewness, and kurtosis. Items were treated as ordinal and analyzed with polychoric correlations and thresholds (Lyhagen & Ornstein, 2023; Moss & Grønneberg, 2023). Given evidence of heavy tails and pileups at response level 0, we applied a prevalence based recoding procedure (Arostegui et al., 2013).

To evaluate the internal structure, we estimated confirmatory factor analysis models and exploratory structural equation models with target rotation. For ESEM, we specified a target matrix with a primary loading per item and allowed small cross loadings that were not fixed to zero, which reduces bias from undue constraints (Yamashita, 2025; Xiao et al., 2019). Estimation used WLSMV with theta parameterization on the polychoric matrix (Li, 2016). Model fit was assessed with chi square and degrees of freedom, CFI, TLI, RMSEA with a 90 percent confidence interval, and SRMR, and we inspected standardized loadings and item level R squared values.

Measurement invariance by sex was tested using a multigroup framework at the configural, metric, and scalar levels. We adopted the following criteria for changes in fit: Delta CFI less than or equal to 0.010 and Delta RMSEA less than or equal to 0.015; for Delta SRMR we used less than or equal to 0.010 when constraining loadings and less than or equal to 0.005 when constraining intercepts (Schroeders & Gnambs, 2020).

Reliability was estimated with composite reliability CR following Raykov, which uses model based loadings and errors (Peterson & Kim, 2013), categorical omega for ordinal indicators computed from the standardized solution (Y. Yang & Xia, 2019), and factor determinacy understood as the correlation between the true factor and the estimated score (Rigdon et al., 2019). These indices were preferred over alternative estimators because they are aligned with ordinal factor models and they accommodate potential cross loadings in ESEM.

For validity evidence based on external variables, we correlated factor scores with psychological variables moral disengagement, empathy, and aggression and with sociodemographic variables age, sex, grade, type of school, frequency of internet use, family living arrangement, number of friends, relationship with teachers, and perceived school safety. We used Spearman correlations rho given the ordinal and non normal nature of the variables. When a dichotomous by continuous association was involved, we reported the rank biserial coefficient.

All analyses were conducted in RStudio (RStudio Team, 2018, version 4.4.2) using the lavaan, semTools, and tidyverse packages.

3. Results

3.1. Descriptive Analysis

Descriptive indices for the ECIP Q items showed low means, ranging from 0.01 to 0.46, with marked positive skewness. Cyberaggression items displayed high kurtosis across all items, with values from 8.38 to 389.69, as well as pronounced skewness, with values from 2.38 to 18.21. These patterns indicate heavy tails and a pileup at response option 0. Item correlations were adequate, exceeding the 0.20 criterion for all items (Table 2).

Table 2. Descriptive statistics, item test correlations, and response proportions for the ECIP Q items.

ECIP-Q	M	SD	Sk	Ku	Item-Total Correlation
CV-1	0.46	0.82	2.38	6.46	0.47
CV-2	0.42	0.77	2.44	7.21	0.52
CV-3	0.17	0.44	3.05	11.30	0.50
CV-4	0.13	0.36	2.79	7.44	0.36
CV-5	0.18	0.46	3.59	18.38	0.34
CV-6	0.13	0.43	4.70	31.08	0.24
CV-7	0.07	0.29	4.67	26.11	0.48
CV-8	0.05	0.25	5.15	28.40	0.34
CV-9	0.09	0.34	4.72	31.86	0.43
CV-10	0.44	0.74	2.38	7.31	0.31
CV-11	0.23	0.60	3.64	16.53	0.42
CA-1	0.39	0.79	2.72	8.38	0.53
CA-2	0.24	0.63	3.75	16.51	0.54
CA-3	0.04	0.22	7.23	66.71	0.51
CA-4	0.03	0.23	10.70	148.69	0.47
CA-5	0.03	0.22	10.55	150.59	0.46
CA-6	0.06	0.30	7.75	83.81	0.33
CA-7	0.01	0.17	18.21	389.69	0.50
CA-8	0.02	0.18	15.67	304.93	0.45
CA-9	0.05	0.30	8.92	99.83	0.38
CA-10	0.29	0.66	3.40	14.43	0.26
CA-11	0.03	0.25	10.15	128.90	0.40

Note. N = 729. M = Mean; SD = Standard deviation; Sk = Skewness; Ku = Kurtosis.

3.1.1. Prevalence Based Recoding of Items

Because item responses were highly concentrated at category 0, we applied an automatic and reproducible recoding procedure based on prevalences. Items with p2 + p3 + p4 greater than 5 percent were kept with four categories. Items with p2 + p3 + p4 less than or equal to 5 percent were collapsed to three categories. When p1 + p2 was less than or equal to 5 percent, responses were binarized. Accordingly, the table reports the rule applied to each item and the resulting number of categories (Table 3).

3.1.2. Confirmatory Factor Analysis

Confirmatory models were evaluated for the ECIP Q with two factors, cybervictimization and cyberaggression. The 22 item CFA showed insufficient fit. The questionnaire was therefore refined to 19 items, for which the ESEM with target rotation provided better fit, and further improved when including two residual method covariances between mirror item pairs that describe the same behavior in victim and aggressor roles: CV10 “I have been excluded or ignored from a social network or chat” with CA10 “I have excluded or ignored someone on a social network or chat,” and CV11 “Someone has spread rumors about me on the Internet” with CA11 “I have spread rumors about someone on the Internet” (χ^2 = 291.164; df = 130; CFI = 0.982; TLI = 0.976; RMSEA = 0.041 [0.035 to 0.048]; SRMR = 0.091). By contrast, the two factor CFA with two residual covariances achieved comparatively lower fit (χ^2 = 512.27; df = 149; CFI = 0.960; TLI = 0.954; RMSEA = 0.058 [0.052 to 0.063]; SRMR = 0.109) (Table 4). These findings support adopting the two factor 19 item ESEM with target rotation and two residual covariances (Figure 1).

Table 3. Response percentages and prevalence based recoding by item.

ECIP-Q	Prevalence Based Recoding					Prevalence Based Recoding		Applied Rule	Categories
	p0	p1	p2	p3	p4	p2 + p3 + p4	p1 + p2		
CV-1	67	26	4	1	2	7.41	29.49	p2 + 3 + 4 > 5% → 4cat (0, 1, 2, (3–4))	4 categories
CV-2	69	24	5	1	2	7.13	28.4	p2 + 3 + 4 > 5% → 4cat (0, 1, 2, (3–4))	4 categories
CV-3	85	13	1	1	0	1.51	14.13	p2 + 3 + 4 ≤ 5% → 3cat (0, 1, (2–4))	3 categories
CV-4	88	11	1	0	0	0.96	11.93	p2 + 3 + 4 ≤ 5% → 3cat (0, 1, (2–4))	3 categories
CV-5	85	13	1	1	0	1.23	14.68	p2 + 3 + 4 ≤ 5% → 3cat (0, 1, (2–4))	3 categories
CV-6	89	10	0	0	0	0.96	10.84	p2 + 3 + 4 ≤ 5% → 3cat (0, 1, (2–4))	3 categories
CV-7	94	6	1	0	0	0.69	6.31	p2 + 3 + 4 ≤ 5% → 3cat (0, 1, (2–4))	3 categories
CV-8	95	4	1	0	0	0.69	4.66	p1 + 2 ≤ 5% → bin (0 vs. ≥1)	Binary
CV-9	92	7	1	0	0	0.82	8.09	p2 + 3 + 4 ≤ 5% → 3cat (0, 1, (2–4))	3 categories
CV-10	65	30	2	2	1	4.8	31.69	p2 + 3 + 4 ≤ 5% → 3cat (0, 1, (2–4))	3 categories
CV-11	83	14	2	1	1	3.02	15.91	p2 + 3 + 4 ≤ 5% → 3cat (0, 1, (2–4))	3 categories
CA-1	72	22	2	1	2	5.9	24.28	p2 + 3 + 4 > 5% → 4cat (0, 1, 2, (3–4))	4 categories
CA-2	83	14	1	1	1	3.02	14.95	p2 + 3 + 4 ≤ 5% → 3cat (0, 1, (2–4))	3 categories
CA-3	91	3	0	0	0	0.27	3.16	p1 + 2 ≤ 5% → bin (0 vs. ≥1)	Binary
CA-4	98	2	0	0	0	0.41	2.19	p1 + 2 ≤ 5% → bin (0 vs. ≥1)	Binary
CA-5	97	2	0	0	0	0.27	2.47	p1 + 2 ≤ 5% → bin (0 vs. ≥1)	Binary
CA-6	95	5	0	0	0	0.27	4.94	p1 + 2 ≤ 5% → bin (0 vs. ≥1)	Binary
CA-7	99	1	0	0	0	0.14	0.82	p1 + 2 ≤ 5% → bin (0 vs. ≥1)	Binary
CA-8	99	1	0	0	0	0.14	1.23	p1 + 2 ≤ 5% → bin (0 vs. ≥1)	Binary
CA-9	96	3	0	0	0	0.41	3.43	p1 + 2 ≤ 5% → bin (0 vs. ≥1)	Binary
CA-10	78	19	1	1	2	2.88	20.03	p2 + 3 + 4 ≤ 5% → 3cat (0, 1, (2–4))	3 categories
CA-11	97	2	0	0	0	0.41	2.33	p1 + 2 ≤ 5% → bin (0 vs. ≥1)	Binary

Note. CV = Cybervictimization; CA = Cyberaggression; p0 = "No"; p1 = "Yes, once or twice"; p2 = "Yes, once or twice a month"; p3 = "Yes, about once a week"; p4 = "Yes, more than once a week." Categories: 4 categories = 0, 1, 2, (3 to 4 recoded as 3); 3 categories = 0, 1, (2 to 4 recoded as 2); binary = 0 versus (1 to 4 recoded as 1).

Table 4. Fit indices for CFA and ESEM models.

Model	k (ítems)	Type	Rotation	Method Covariances	χ^2	gl	CFI	TLI	RMSEA	IC90 RMSEA	SRMR
ESEM 2F (22, target)	22	ESEM	target	No	527.368	186	0.971	0.964	0.05	[0.045, 0.055]	0.113
ESEM 2F (19 final, target)	19	ESEM	target	No	374.488	132	0.973	0.965	0.05	[0.044, 0.056]	0.097
ESEM 2F (19, target + 2 covariances)	19	ESEM	target	Sí (2)	291.164	130	0.982	0.976	0.041	[0.035, 0.048]	0.091
CFA 2F (19, +2 covariances)	19	CFA	-	Sí (2)	512.27	149	0.96	0.954	0.058	[0.052, 0.063]	0.109

Notes. WLSMV with theta parameterization and ordered variables. "Method covariances" refers to residual covariances between mirror pairs victim and aggressor. χ^2 = chi square; df = degrees of freedom; SRMR = standardized root mean square residual; TLI = Tucker–Lewis Index; CFI = Comparative Fit Index; RMSEA = root mean square error of approximation.

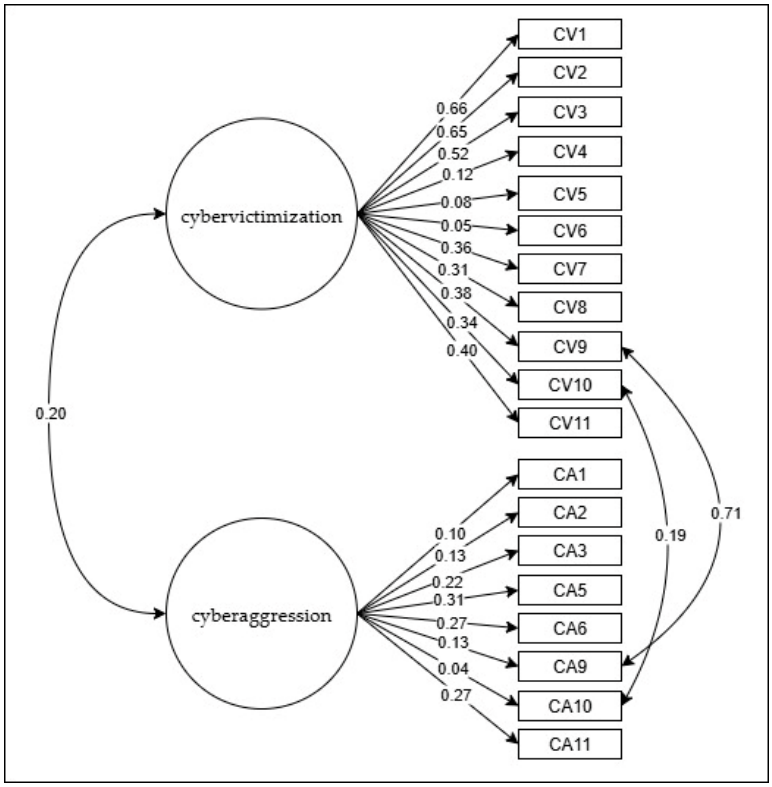


Figure 1. Path diagram of the two factor ESEM model with 19 items and two residual covariances.

3.1.3. Factors Loadings

For the cybervictimization factor, standardized loadings were positive and mostly moderate to high in magnitude, ranging from 0.05 to 0.66. Higher values were observed for items CV1 to CV3 (λ = 0.52 to 0.66) and CV7 to CV11 (λ = 0.31 to 0.48), whereas CV4 to CV6 showed small loadings (λ = 0.05 to 0.12). Despite this, most R^2 values were high, with strong values for CV5 (R^2 = 0.76) and CV7 (R^2 = 0.67) and the lowest for CV10 (R^2 = 0.21).

For the cyberaggression factor, loadings ranged from 0.05 to 0.34. Although the loadings were low to moderate, several items showed high R^2 values, indicating that explained variance reflects both the primary loading and small cross loadings that are expected in an ESEM framework with target rotation (Table 5).

Table 5. Factor loadings.

Item	Factor 1 (λ) Cybervictimization	Factor 2 (λ) Cyberaggression	R^2
CV1	0.66		0.496
CV2	0.65		0.543
CV3	0.52		0.493
CV9	0.48		0.570
CV11	0.40		0.471
CV7	0.36		0.670
CV10	0.34		0.209
CV8	0.31		0.350
CV4	0.12		0.570
CV5	0.08		0.755
CV6	0.05		0.352
CA5		0.34	0.500
CA11		0.30	0.527
CA6		0.29	0.221
CA9		0.24	0.482
CA3		0.23	0.631
CA2		0.12	0.820
CA1		0.10	0.792
CA10		0.05	0.167

3.1.4. Reliability

In the final ESEM model with WLSMV and theta parameterization, the Cybervictimization dimension showed adequate reliability, with CR = 0.737 and categorical omega = 0.888, together with factor determinacy fd = 0.965, indicating very well determined latent scores. For Cyberaggression, CR = 0.282 was low, which is consistent with smaller primary loadings in ESEM; nevertheless, categorical omega = 0.805 and fd = 0.938 indicated acceptable internal consistency and well recovered latent scores (Table 6).

Table 6. Reliability.

ECIP-Q	CR	Categorical Omega (ω)	fd
Cybervictimization	0.737	0.888	0.965
Cyberaggression	0.282	0.805	0.938

Note. CR = composite reliability (Raykov); ω = categorical omega (estimated from the ordinal model); fd = factor determinacy (correlation between the true factor and the estimated score).

3.1.5. Measurement Invariance by Sex

Measurement invariance by sex was tested in three steps—configural, metric, and scalar—for the two factor ESEM with target rotation (19 items plus two residual covariances). Fit was good in both groups, and changes across models were minimal. From configural to metric, CFI decreased by 0.002, RMSEA was unchanged, and SRMR increased by 0.006, all within conventional thresholds ($\Delta CFI \leq 0.01$; $\Delta RMSEA \leq 0.015$; $\Delta SRMR \leq 0.03$ for the metric step). From metric to scalar, CFI decreased by 0.001, RMSEA increased by 0.001, and SRMR decreased by 0.002 (from 0.125 to 0.123), also within suggested criteria ($\Delta SRMR \leq 0.01$ for the scalar step).

Although absolute SRMR values were relatively high at all three steps, their stability and the small changes in fit indices support both metric and scalar invariance. These SRMR levels are expected in ordinal models estimated with WLSMV and multiple thresholds.

The two method covariances were left free across groups, and the target rotation ensured comparable solutions for boys and girls (Table 7).

Table 7. Measurement invariance by sex.

Model	χ^2	gl	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔRMSEA	ΔSRMR
Configural	332.822	260	0.991	0.988	0.028	0.119			
Metric (λ)	382.069	296	0.989	0.987	0.028	0.125	−0.002	0.000	0.006
Scalar (λ + τ)	407.345	310	0.988	0.986	0.029	0.123	−0.001	0.001	−0.002

Note: χ^2 = chi square; df = degrees of freedom; SRMR = standardized root mean square residual; TLI = Tucker–Lewis Index; CFI = Comparative Fit Index; RMSEA = root mean square error of approximation; ΔCFI = change in Comparative Fit Index; ΔRMSEA = change in root mean square error of approximation.

3.1.6. Relations with Other Variables

Both ECIP Q dimensions showed moderate positive correlations with aggression (CV: r = 0.38 ***; CA: r = 0.33 ***) and small positive correlations with moral disengagement (CV: r = 0.21 ***; CA: r = 0.27 ***). Empathy showed a small negative correlation with cyberaggression (CA: r = −0.11 *), suggesting a weak role of empathy.

Regarding sociodemographics, ECIP Q scores correlated positively with age (CV: r = 0.13 **; CA: r = 0.10 *). Sex coded as 1 for male and 2 for female correlated negatively with cyberaggression (r = −0.14 **), indicating higher perpetration among boys. School grade showed small positive associations with cybervictimization and cyberaggression (CV: r = 0.16 ***; CA: r = 0.14 ***). Frequency of internet use was positively associated with both cybervictimization and cyberaggression (r = 0.17 *** for each). Having more friends related negatively to cybervictimization (r = −0.14 **), whereas perceiving the school environment as unsafe correlated positively with both dimensions (CV: r = 0.17 ***; CA: r = 0.12 **). Finally, a better relationship with teachers was negatively associated with cybervictimization (r = −0.15 ***) and cyberaggression (r = −0.16 ***) (Table 8).

Table 8. Relations with other variables.

ECIP Q with Psychological Variables	**1**	**2**	**3**	**4**				
1. Cybervictimization	-							
2. Cyberaggression	0.47 *** [a]	-						
3. Aggression	0.38 *** [a]	0.33 *** [a]	-					
4. Empathy	0.05 [a]	−0.11 * [a]	−0.10 ** [a]	-				
5. Moral disengagement	0.21 *** [a]	0.22 *** [a]	0.27 *** [a]	0.10 * [a]				
ECIP-Q con variables sociodemográficas	1	2	3	4	5	6	7	8
1. Cybervictimization	-							
2. Cyberaggression	0.47 *** [a]	-						
3. Age	0.126 ** [a]	0.096 * [a]	-					
4. Sex (1 = Male/2 = Female)	−0.021 [b]	−0.136 *** [b]	0.067 [b]	-				
5. School grade (1st, 2nd, 3rd, 4th, 5th)	0.164 *** [a]	0.142 *** [a]	0.893 *** [a]	0.079 * [a]	-			
6. Internet use (1 = once a week/2 = two or three times per week/3 = once or twice per day/4 = three to six times per day/5 = seven to twelve times per day/6 = almost all day)	0.173 *** [a]	0.166 *** [a]	0.084 * [a]	0.045 [a]	0.150 ** [a]	-		
7. Friends (0 = I have no friends/1 = I have some friends/2 = Yes, I have several friends)	−0.138 *** [a]	−0.027 [a]	−0.068 [a]	−0.226 *** [a]	−0.058 [a]	0.031 [a]	-	
8. Unsafe place (0 = neither unsafe nor dangerous/1 = moderately unsafe and or dangerous/2 = very unsafe and or dangerous)	0.170 *** [a]	0.124 ** [a]	0.113 ** [a]	0.014 [a]	0.094 * [a]	0.02 [a]	−0.084 [a]	-
9. Relationship with teachers (0 = poor/1 = fair/2 = good)	−0.147 *** [a]	−0.158 *** [a]	−0.047 [a]	0.048 [a]	−0.044 [a]	−0.069 [a]	0.230 *** [a]	−0.185 [a]

Note. [a] Spearman correlation, [b] rank biserial correlation, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

4. Discussion

This study aimed to gather validity and reliability evidence for the ECIP Q in Peruvian adolescents. Findings confirmed the bidimensional structure, with the two factor ESEM model of 19 items and two covariances between mirror pairs showing the best fit. Reliability was acceptable for both cybervictimization and cyberaggression based on categorical omega, composite reliability, and factor determinacy. The ECIP Q showed metric and scalar invariance by sex, enabling valid comparisons between boys and girls. With respect to external variables, both dimensions were positively associated with aggression and moral disengagement; empathy was weakly and negatively related to cyberaggression, suggesting a minor role. At the sociodemographic level, cybervictimization and cyberaggression were positively associated with age, grade, frequency of internet use, and unsafe settings, and negatively associated with student teacher relationships; cyberaggression was higher among boys, and cybervictimization was more common among adolescents with fewer friends. Taken together, the measure is a useful tool to identify and profile cyberbullying along cybervictim and cyberaggressor dimensions.

The bidimensional model showed better performance for ESEM than for CFA. This agrees with recent literature documenting small cross loadings that more accurately capture interdependence between victim and aggressor roles in digital contexts (Konold & Sanders, 2024; Prokofieva et al., 2023; Steenkamp & Maydeu-Olivares, 2023). Such cross loadings reduce specification bias and reflect the interplay of behaviors in online ecosystems, for example responding aggressively after being victimized or alternating roles across platforms (Mai et al., 2018; Faraci, 2024). Residual covariances between mirror items for example CV9 "Someone edited photos of me that I had posted online" and CA9 "I have edited someone else's photos or videos that were posted online" represent shared method variance due to behavioral symmetry and item design (Maydeu-Olivares & Shi, 2017). Convergent associations with aggression and moral disengagement align with processes that justify harmful acts without guilt (Dueñas-Casado et al., 2025; Gao et al., 2020; Wang et al., 2024), and with the role of anger as a facilitator of cyberbullying (J. Yang et al., 2022; Wang et al., 2017). Thus, psychological variables such as moral disengagement and aggression help explain behavioral variance in complex school settings. Reliability showed higher categorical omega for cybervictimization than for cyberaggression, which is consistent with the lower prevalence of perpetration behaviors and the piling of responses at floor options (Müssig et al., 2022). Nevertheless, the high factor determinacy indicates that latent scores for cyberaggression are usable for research and screening (Rigdon et al., 2019).

These findings are consistent with prior validations that support the two dimensional structure of the ECIP Q in adolescent populations (Álvarez-Marín et al., 2022; Saedi & Rahmati, 2024; Monteiro et al., 2025; Zhu et al., 2022; Herrera-López et al., 2017), as well as evidence of sex invariance (Álvarez-Marín et al., 2022). The pattern and direction of associations with moral disengagement can be explained by moral inhibition processes and the justification of harmful actions in digital environments, which increase the likelihood of cyberbullying behaviors (Fissel et al., 2025).

The convergence between cyberbullying and aggression was to be expected, as cyberbullying is a type of aggression, albeit expressed indirectly and covertly (Veiga et al., 2014). Offline aggression is a factor that predicts online aggression and, consequently, cyberbullying (Strimbu & O'Connell, 2021). Furthermore, the associations between cyberbullying and aggression indicate that high levels of physical aggression and anger increase the likelihood of being a victim or perpetrator, or both (Martínez-Monteagudo et al., 2019).

The weak relationship found between cyberaggression and empathy differs from previous studies reporting that affective empathy predicts cyberaggression (Utomo et al., 2020) in males (Ang & Goh, 2010). The discrepancy may be attributed to the fact that this

study did not differentiate between cognitive and affective empathy; however, it is possible that empathy may play a moderating role alongside gender. A previous study reported that when empathy in males is low, it interacts with online disinhibition and strengthens the impact on cyberbullying (Wang et al., 2022).

Sociodemographic variables were also associated with cyberbullying. Regarding gender differences, boys participate more frequently in cyberbullying than girls (Martínez-Soto et al., 2024). Some studies also report higher cybervictimization among boys compared to girls (Durán & Martínez-Pecino, 2015). Age correlated positively with both cyberbullying dimensions. Cyberbullying is more frequent between 12 and 18 years (Cebollero-Salinas et al., 2022), with the highest prevalence occurring at older adolescent ages (Muhammed & Samak, 2025). Problematic internet use is linked to cyberbullying, and adolescents with more frequent internet use are more likely to experience it (Yudes et al., 2021; Yudes et al., 2022; Küçük et al., 2023). Having more friends related to less involvement in cyberbullying, suggesting that peer support may operate as a protective factor for both victims and aggressors (Arató et al., 2022; Wright, 2024). Conversely, unsafe environments may be important risk factors: exposure to neighborhood violence is associated with a higher risk of cyberbullying victimization (Khoury-Kassabri et al., 2019), and a hostile school climate is strongly related to cyberbullying (Ortega-Barón et al., 2016). Finally, positive teacher student relationships act as a protective factor against cyberbullying (Gao et al., 2025).

In practical terms, integrating the ECIP Q into school screening and monitoring protocols can support the evaluation of school coexistence and guide institutional actions. We recommend digital literacy for students with emphasis on rumors, online exclusion, and the sharing of personal information, so that adolescents can recognize rumor signals, detect exclusion dynamics, and distinguish between private and public information. Teacher training to strengthen a positive relational climate with students may reduce cyberaggression and cybervictimization through programs that emphasize co created norms of coexistence, restorative responses, and family engagement. Intervention programs can include modules on emotion regulation, anger management, and moral responsibility to reduce cyberbullying. The ECIP Q can be administered by school psychologists in advisory, school coexistence, and guidance services. Systematic screening can inform classroom level risk maps and early referrals to counseling teams.

Despite its strengths, this study has limitations. The cross-sectional design precludes causal inferences. Self report measures may induce social desirability and underreporting of aggressive behaviors, thereby underestimating the true prevalence of cyberbullying. Non probabilistic sampling limits generalization to other sociocultural contexts. Collapsing response categories improved the stability of the polychoric matrix, although it may reduce comparability with studies that retain five response options. Finally, the SRMR index often takes higher values in large ordinal models; however, the consistency of fit indices across invariance steps and the good performance of other metrics mitigate this concern.

Given the limitations of this research, it is recommended that future work should move toward psychometric studies with longitudinal features to test directionality among cybervictimization, cyberaggression, aggression, and moral disengagement. In addition, the alternative application of Polytomous IRT would allow estimation of item thresholds and severities and facilitate DIF analyses by sex, age, and type of school. Longitudinal invariance testing would further support the development of practically meaningful cutoffs.

5. Conclusions

The study confirms the internal structure of the ECIP, consisting of two correlated factors, cyber victimization and cyber aggression, for Peruvian adolescents. The ECIP shows adequate internal consistency and equity in assessments according to gender. Therefore, the

interpretations of the scores derived from its application are consistent with the theoretical domain of the instrument, without differential measurement bias. These psychometric qualities, as well as the convergence of the ECIP with moral disengagement and aggression, enable its use for decision-making and for the development of new research in the context of adolescent school coexistence.

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