

Psychometric properties of the Cybergossip Questionnaire in Peruvian adolescent

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KEYWORDS

Digital behavior
Social networks
Psychological assessment
Adolescence
Instrument validation

ABSTRACT

The increasing use of social media among adolescents has fostered the emergence of behaviors such as cybergossip, highlighting the need for valid and reliable instruments to assess this phenomenon across different cultural contexts. The present study aimed to examine the psychometric properties of the *Cybergossip Questionnaire for Adolescents* in a sample of Peruvian adolescents. A total of 1,521 students aged 11 to 19 years ($M = 14$, $SD = 1.38$) participated. A confirmatory factor analysis was conducted, measurement invariance was evaluated, group comparisons by gender and age were performed, and an item response theory approach was applied using the graded response model. The results showed an adequate model fit ($CFI = .965$; $RMSEA = .073$) and satisfactory internal consistency ($\alpha = .84$; $\omega = .84$). Measurement invariance was confirmed across all levels, and the item parameters indicated precise measurement. Overall, the findings support the validity of the instrument, which is suitable for assessing cybergossip among Peruvian adolescents. In this regard, the scale enables its application in educational and research settings to assess cybergossip among adolescents.

Propiedades psicométricas del Cuestionario de Ciberchisme en adolescentes peruanos

PALABRAS CLAVE

Comportamiento digital
Redes sociales
Evaluación psicológica
Adolescencia
Validación de instrumentos

RESUMEN

El uso creciente de las redes sociales en adolescentes ha favorecido la aparición de conductas como el ciberchisme, lo que hace necesaria la disponibilidad de instrumentos válidos y confiables para su evaluación en distintos contextos culturales. El presente estudio tuvo como objetivo analizar las propiedades psicométricas del *Cuestionario de Ciberchisme para Adolescentes* en una muestra de adolescentes peruanos. Participaron 1,521 estudiantes entre los 11 y 19 años ($M = 14$; $DT = 1.38$). Se realizó un análisis factorial confirmatorio, se evaluó la invarianza de medición, comparaciones entre grupos (género y edad) y se aplicó la teoría de respuesta al ítem mediante el modelo de respuesta graduada. Los resultados mostraron un ajuste adecuado del modelo ($CFI = .965$; $RMSEA = .073$) y una adecuada consistencia interna ($\alpha = .84$; $\omega = .84$). Asimismo, se confirmó la invarianza en los cuatro niveles y los parámetros indicaron una medición precisa. En conjunto, los hallazgos respaldan la validez del instrumento, el cual resulta adecuado para evaluar el ciberchisme en adolescentes peruanos. En este sentido, la escala permite su aplicación en contextos educativos y de investigación para evaluar el ciberchisme en adolescentes.

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Cite this article as: C. Puma-Maque, & Cárdenas-Zúñiga, M. C. (2026). Psychometric properties of the Cyber Gossip Questionnaire in Peruvian adolescent.

Psychology, Society & Education, 18(2), 51-60. <https://doi.org/10.21071/pse.v18i2.18734>

Received: 7 November 2025. First review: 19 February 2026. Accepted: 17 April 2026.

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ISSN 1989-709X | © 2026. Psy, Soc & Educ.



In recent years, the continuous use of social media has fostered a range of behaviors associated with the exchange of ideas, values, and activities. This phenomenon is particularly evident among adolescents who, due to their frequent exposure to and participation in these digital platforms, are highly influenced by them. Such influence exposes them to various negative experiences, including cyberbullying (Smith et al., 2008), identity theft, harassment, flaming (sending aggressive or provocative messages intended to initiate heated discussions or conflicts in forums or social networks), the dissemination of private content (outing) (Kumar & Sachdeva, 2019), defamation (Zakaria & Harun, 2020), grooming (contacting minors through digital or physical platforms for the purpose of manipulation, exploitation or abuse) (Whittle et al., 2013), doxing (the publication of an individual's personal or confidential information, such as address, telephone number, or workplace) (Douglas, 2016), and coordinated group attacks (the collective organization of individuals to harass a person, thereby amplifying psychological harm through social pressure) (Heinen et al., 2022). Finally, the dissemination of rumors in digital environments, referred to as cybergossip, involves spreading information, whether true or false, about an individual with the intention of damaging their reputation (López-Pradas et al., 2017; Romera et al., 2018).

Gossip, understood as a form of social communication, can be defined from multiple perspectives. According to Dunbar (2004) it is conceived as conversation about social topics and individuals, characterized as trivial talk or everyday interaction. Other authors describe it as the act of speaking about someone who is not present (Bergmann, 1993; Besnier, 1989; Hanners, 1967; Yerkovick, 1977). From a more evaluative perspective, gossip can be understood as the expression of judgments or opinions, either positive or negative, that influence the social perception of a third person (Baumeister et al., 2004; Rosnow, 2001). It may also refer to the dissemination of evaluative information about someone in their presence, whether in ritualized, strategic, or socially confrontational contexts (Gilmore, 1978; Handelman, 1973). Likewise, Medini and Rosenberg (1976) expand the notion of gossip by including the revelation of personal information, wherein an individual shares details about their own life in a manner similar to how one would speak about a third party in a gossip conversation. Although different approaches to gossip exist, the present study adopts Foster's (2004) definition, which conceptualizes gossip as the exchange of information or evaluative comments about a third person who is absent from the conversation.

Gossip serves various functions that extend beyond the mere exchange of information. From an evolutionary perspective, it has functioned as a survival tool, as the information provided about relatives, rivals, potential partners, offspring and political allies was essential for making strategic decisions (Barkow, 1992; Foster, 2004). Foster (2004) conceptualized gossip within a multidimensional theoretical framework that integrates social and psychological perspectives, identifying several core functions such as the transmission of social information, the regulation of group norms, the strengthening of interpersonal relationships, and the generation of entertainment within social

interactions. In addition, gossip may serve a psychological function, as it helps individuals release negative emotions such as anger, anxiety, or guilt, allowing them to regain a more stable emotional state. It also operates as a mechanism of social control or influence, reinforcing behavioral norms by publicly identifying those who transgress them and shaping public opinion either in favor of or against particular individuals. However, this same process may entail significant risks, such as public shaming, social ostracism, or reputational harm, particularly if the information disseminated is exaggerated, decontextualized, or false, potentially contributing to processes of stigmatization and social exclusion. Finally, gossip does not always serve an instrumental purpose, as it may also arise as a form of entertainment, reflecting that human interactions, including gossip, can be motivated by pleasure and enjoyment.

Nevertheless, traditional gossip and cybergossip require distinct analytical approaches, as they operate within different communicative contexts. While traditional gossip occurs in face-to-face interactions and relies on verbal and nonverbal language, cybergossip manifests through text messages, images, or videos shared in digital environments. Online communication, by leaving permanent records, enables the exact and large-scale reproduction of messages, thereby amplifying their impact. Moreover, virtual settings facilitate instant dissemination and access to a broader audience, however, the absence of gestures, tone of voice, or facial expressions may lead to misunderstandings and misinterpretations (Romera et al., 2018).

Within this virtual context, the Cybergossip Questionnaire for Adolescents (CGQ-A) (López-Pradas et al., 2017) emerged. This instrument was developed based on Foster's (2004) Gossip Functions Questionnaire, which conceptualizes gossip as fulfilling several social functions. Accordingly, the CGQ-A assesses four main functions of gossip, information, influence, friendship, and entertainment. These dimensions provide a framework for understanding how adolescents engage in gossip-related behaviors within digital environments.

The CGQ-A has demonstrated adequate psychometric indicators in various studies. López-Pradas et al. (2017) conducted both exploratory and confirmatory factor analyses with a sample of 866 primary school students, obtaining results that supported a unidimensional structure of nine questionnaire items and its discriminant validity in relation to another variable (cyberbullying). Similarly, the study by Romera et al. (2018) replicated these results with samples of 1,931 Colombian adolescents and 1,816 Spanish adolescents. Through confirmatory factor analysis, the unidimensional structure of the CGQ-A was confirmed, along with discriminant validity and configurational invariance across country and gender. Additionally, the instrument has been applied in countries such as Spain (Casas et al., 2019; Cebollero-Salinas et al., 2022; Falla et al., 2021; Romera et al., 2018), Colombia (Romera et al., 2018), and Iran (Farzadi et al., 2025).

Regarding gender differences, the results of various studies show contradictory findings. Some studies indicate that female adolescents are more engaged in cybergossip than males (Falla et al., 2021). However, other authors have found opposite

results, suggesting that males exhibit higher levels of cybergossip (Dueñas-Casado et al., 2025) which contrasts with the previously mentioned findings. In contrast, Cebollero-Salinas et al. (2024) reported that participation in cybergossip is similar between males and females. Similarly, García-Fernández et al. (2022) and Romera et al. (2018) reported similar levels of participation across gender groups, with no significant differences observed. From a developmental perspective, early adolescents (10-13 years) show a higher frequency of cybergossip and greater levels of cybervictimization associated with problematic internet use. However, in middle adolescence (15 years), is more closely linked to maladaptive internet use, while victimization is primarily associated with evaluative comments on social media (Cebollero-Salinas et al., 2022). Nevertheless, these findings contrast with those reported in a recent study, which suggested that cybergossip tends to increase with age and that similar patterns are observed across males and females (Cebollero-Salinas et al., 2024), highlighting the need for further comparative research.

Despite the growing international interest in the study of cybergossip, the psychometric properties of the CGQ-A have not yet been examined in the Peruvian context. Conducting a rigorous psychometric evaluation of this population and establishing the validity and reliability of the CGQ-A will contribute to a better understanding of the dynamics of gossip in digital environments among Peruvian adolescents. Validating the CGA-A in Peru is particularly relevant given the rapid expansion of internet access and social media use among adolescents, together with the country's sociocultural diversity and socioeconomic disparities, which may shape patterns of digital interaction. Peru presents distinctive educational, social, and technological characteristics compared to the European contexts in which the instrument was originally validated. These contextual factors may influence the expression, frequency, and social meaning of cybergossip behaviors. Therefore, examining the psychometric adequacy of the CGQ-A in these settings is essential to ensure its cultural relevance and measurement validity.

The present study

The present study aims to evaluate the psychometric properties of the CGQ-A in a sample of Peruvian adolescents. Specifically, five objectives are proposed: 1) to examine the internal structure of the instrument through confirmatory factor analysis, 2) to assess its reliability using internal consistency indices, 3) to test measurement invariance across gender and developmental stages (early vs. middle adolescence), 4) to compare CGQ-A scores across gender and age groups, and 5) to analyze item functioning using Item Response Theory (IRT) models.

Based on previous research on the CGQ-A, the following hypotheses were proposed: H1) the CGQ-A will show an adequate one-dimensional factor structure in the Peruvian adolescent sample, H2) the instrument will demonstrate satisfactory reliability indices, H3) measurement invariance will be supported across gender groups, and H4) the items will present adequate

discrimination and difficulty parameters according to IRT models.

Method

Design

The current study was classified as instrumental, as it addresses issues focused on demonstrating the psychometric properties of measurement instruments (Ato et al., 2013).

Participants

The sample consisted of 1,521 adolescents (104 students were excluded as they did not complete the instrument properly). Of the total, 48.1% were male (732) and 51.9% were female (789). Gender was recorded as a binary demographic variable (male/female) based on participants' self-report. The average from 11 to 19 years ($M = 14$ years; $SD = 1.38$). Regarding school grade, students were enrolled in secondary education, which in the Peruvian educational system comprises five academic years (grades 1 to 5 of secondary school). Specifically, 20.6% (313) were in the first year of secondary education, 22.9% (349) in the second year, 21% (319) in the third year, 19.1% (291) in the fourth year, and 16.4% (249) in the fifth year. With respect to the type of educational institution, 76.3% (1,161) of the students attended public school, while 23.7% (360) studied in private schools. All participating schools were situated in urban areas.

Instruments

The *Cybergossip Questionnaire for Adolescents* (CGQ-A, López-Pradas et al., 2017) is an instrument designed to measure the frequency and impact of cybergossip among adolescents. This questionnaire was implemented in its original validated version, without any linguistic, structural or cultural modifications, following the format established by Romera et al. (2018). The CGQ-A consists of nine items, which are answered using a Likert-type scale with five response options: 0 = *Never*, 1 = *Almost never*, 2 = *Normally*, 3 = *Almost always*, and 4 = *Always*. Regarding the internal structure of the scale, it has been confirmed to be unidimensional. Finally, the internal consistency of the questionnaire showed adequate reliability.

Participants' age was collected as part of the sociodemographic data and subsequently categorized into developmental stages following theoretical criteria (Steinberg, 2014). Two groups were established, early adolescence (10-13 years) and middle adolescence (14-16 years). This categorization was used for the analysis of measurement invariance and group comparisons.

Procedure

The study was approved by the ethics committee of the Universidad Nacional de San Agustín de Arequipa, ensuring compliance with the ethical principles established for research involving human participants. Authorization to use the CGQ-A

was obtained from the authors of the original instrument. The questionnaire was administered in its original validated version without any linguistic, structural, or cultural modifications. Prior to data collection, five fourth-year psychology students were trained in the standardized administration of the instrument. The surveys were administered in paper format during school hours and the average time required to complete the questionnaire was approximately 15 minutes per participant.

Authorization to administer the surveys was obtained from nine educational institutions after presenting the objectives and procedures of the study to the authorities of each school. In addition, written informed consent was obtained from the parents or legal guardians of the students, as well as assent from the adolescent participants themselves. All procedures were conducted in accordance with the Ethics Code of the Colegio de Psicólogos del Perú (2018), ensuring the principles of confidentiality, anonymity, and voluntary participation throughout the research process.

Data analysis

A confirmatory factor analysis (CFA) was conducted, using the weighted least squares mean and variance adjusted estimator (WLSMV) as the items of the instrument are ordinal in nature (Brown, 2015). To assess the model fit, the RMSEA (Root Mean Square Error Approximation) and SRMR (Standardized Root Mean Square Residual) fit indices were used. According to established criteria, an RMSEA value lower than .05 indicated good model fit, while values between .05 and .08 are considered acceptable (Kline, 2023). Additionally, the CFI (Comparative Fit Index) was used, with values above .95 reflecting good fit and values above .9 indicating acceptable fit (Shumacker & Lomax, 2015). To evaluate internal consistency, both the alpha and omega coefficients were used, with values greater than .7 generally considered acceptable (Viladrich et al., 2017).

To evaluate gender invariance, configural invariance (reference model) was first assessed, followed by metric invariance (equality of factor loadings), scalar invariance (equality of factor loading and intercepts), and finally, strict invariance (equality of factor loadings, intercepts, and residuals). Invariance between groups was evaluated using the difference in CFI values (Δ CFI), where a difference lower than .01 suggests that the model is invariant across groups (Chen, 2007). Additionally, the difference in the RMSEA index (Δ RMSEA) was used, considering that a variation lower than .015 indicates that the model maintains its invariance across the evaluated groups (Chen, 2007). With respect to comparisons by gender and age, Welch's *t*-test was used. This test is a variation of Student's *t*-test designed for situations in which the groups being compared have unequal variances and/or different samples sizes, therefore, Welch's *t*-test provides more robust results (Delacre et al., 2017). To assess the magnitude of the differences, Cohen's *d* was calculated.

For Item Response Theory (IRT) the Graded Response Model (GRM, Samajima, 1997; Van der Linden, 2016) was applied. This model is an extension of the two-parameter logistic model

(2-PLM), specifically designed for polytomous items (Hambleton et al., 2011). For each item, two types of parameters were estimated: discrimination (a) and difficulty (b). The discrimination parameter measures the ability of the items to differentiate between individuals with different levels of the latent trait being assessed, reflecting how the probability of responding to an item changes as a function of these levels. A higher value of the parameter indicates that the item is more effective at between individuals with varying levels of the trait in question. In contrast, the difficulty parameters represent the level of the latent trait required for an individual to have a certain probability of responding to an item in a particular way. In the case of scales with five response categories, as in this study, four difficulty parameters are generated, one for each threshold between categories. These thresholds indicate the level of the latent trait at which an individual has a 50% probability of selecting a response category equal to or higher than a specified value. All statistical procedures were conducted in the *RStudio* environment for R, specifically *lavaan* version 0.6-17 (Rosseel, 2012), *psych* version 2.4.3 (Revelle, 2024), *mirt* version 1.41 (Chalmers, 2012).

Results

Descriptive statistics

Item 7 exhibited the highest mean score ($M = 1.06$), while item 4 showed the lowest mean score ($M = .44$). The polychoric correlations between the item revealed moderate correlation coefficients, all statistically significant, as detailed in Table 1. Additionally, the item-total correlations were appropriate, with values exceeding .3.

Confirmatory factor analysis and reliability

A unidimensional model evaluation was conducted, which showed satisfactory fit indices $\chi^2 = 200.99$, $gl = 22$, $p < .001$, CFI = .96, RMSEA = .07 [.062 - .085]. Reliability assessed using both alpha and omega coefficients, showed positive results ($\alpha = .84$; $\omega = .84$). Additionally, the standardized factor loadings were all greater than .55, with an average loading of .7 (see Figure 1).

Scale invariance by gender and developmental stage

The evaluation of invariance was conducted considering the gender of the participants. The results obtained from this analysis indicate that satisfactory invariance was achieved between groups (see Table 2). No significant issues were identified at any of the evaluated levels, which supports the robustness of the measurement used. Similarly, with respect to measurement invariance across participants' developmental stage, comparable results were obtained as the two groups analyzed (early adolescence, 10-13 years and middle adolescence, 14-16 years) exhibited invariance. Additionally, scalar invariance was established a crucial finding that facilitates valid score comparisons between the different groups.

Table 1

Descriptive statistics results

	<i>M</i>	<i>SD</i>	<i>g1</i>	<i>g2</i>	Item-total		Polychoric correlations							
A1 I have made comments about other friends or classmates to get into a group on social network or WhatsApp [He hecho comentarios de otros amigos o compañeros para conseguir estar dentro de un grupo en las redes sociales o WhatsApp]	0.6	0.8	1.7	2.9	.5	1								
A2 I talk about others on social network or WhatsApp because it makes me feel closer to my group of friends [Hablo sobre los demás por las Redes Sociales o WhatsApp porque me hace sentir más cerca de mi grupo de amigos o amigas]	0.9	1.1	1.1	0.5	.52	.5	1							
A3 I have told things about a classmate or friend on social network or WhatsApp to make the group change their opinion about him/her [He hablado sobre un compañero o amigo por las redes sociales o WhatsApp para que el grupo cambie su opinión sobre él o ella]	0.8	1.1	1.2	0.8	.47	.5	.4	1						
A4 When I'm angry with a classmate or friend, I talk about it on social network or WhatsApp [Cuando me enfado con un compañero o amigo lo cuento en las redes sociales o WhatsApp]	0.4	0.8	2.2	4.9	.53	.5	.5	.4	1					
A5 I have said negative things about another person on social network or WhatsApp without realizing it [He contado cosas malas sobre otra persona por las redes sociales o WhatsApp sin darme cuenta de ello]	0.6	0.8	1.6	2.5	.65	.6	.5	.5	.7	1				
A6 I have shared a classmate's secret with others on social network or WhatsApp [He contado un secreto que me ha dicho un compañero o compañera de clase por las redes sociales o WhatsApp]	0.5	0.9	1.8	3	.55	.4	.4	.4	.6	.6	1			
A7 I use social network or WhatsApp to share stories I hear about others with my friends [Le cuento a mis amigos por las redes sociales o WhatsApp las cosas que me entero que les pasan a otros]	1.1	1.1	.9	0.2	.57	.4	.4	.4	.5	.6	.5	1		
A8 When somebody in my group does something bad, I tell the rest of my classmates on social network or WhatsApp so they know about it [Cuando alguien de mi grupo hace algo que está mal, lo cuento al resto de compañeros por las redes sociales o WhatsApp para que lo sepan]	0.7	0.9	1.5	2	.56	.4	.5	.4	.5	.6	.5	.5	1	
A9 I talk with my friends on social network on or WhatsApp about what's going on with other classmates for fun [Hablo en mi grupo de amigos de las redes sociales o WhatsApp sobre lo que les pasa a los otros compañeros del colegio para divertirme]	0.7	1	1.4	1.6	.61	.5	.5	.5	.5	.6	.6	.6	.6	1

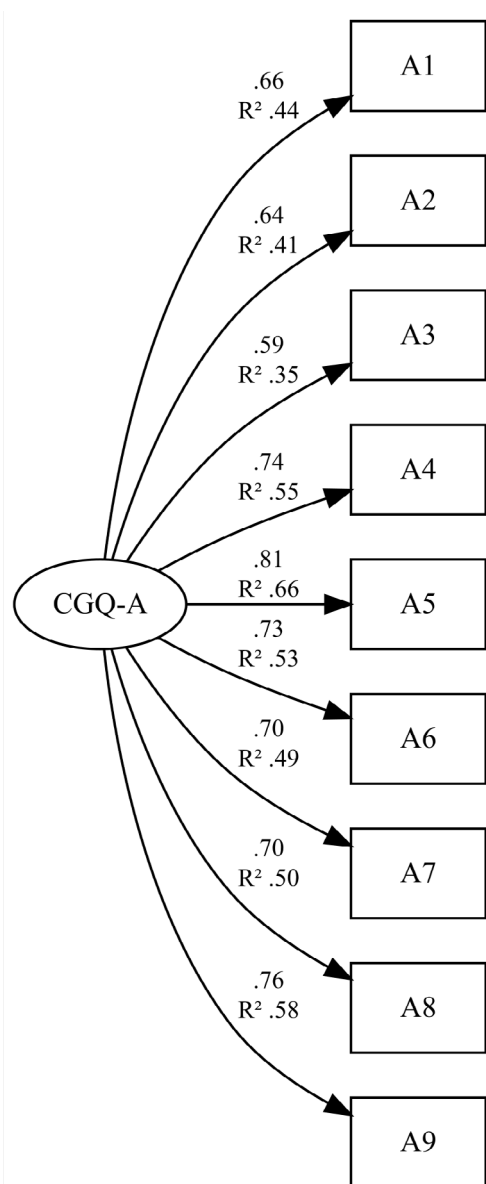
Note. *M* = Mean, *SD* = Standard deviation, *g1* = Skewness, *g2* = Kurtosis

Table 2

Invariance by gender and age

Model	<i>CFI</i>	<i>RMSEA</i>	<i>ACFI</i>	<i>ΔRMSEA</i>
<i>Results of invariance by gender (male and female)</i>				
Configural invariance	.965	.078		
Metric invariance	.97	.075	.005	-.003
Scalar invariance	.971	.065	.001	-.01
Strict invariance	.971	.065	0	0
<i>Results of invariance by age (Early adolescence: 10–13, Middle adolescence: 14–16)</i>				
Configural invariance	.966	.079		
Metric invariance	.97	.077	.004	-.002
Scalar invariance	.971	.068	.001	-.009
Strict invariance	.971	.068	0	0

Figure 1
Unidimensional structure the CGQ-A



Comparisons by gender and developmental stage

The results indicated that as a function of gender, statistically significant differences were found in CGQ-A scores, with males showing slightly higher mean scores ($M = 6.67, SD = 5.7$) compared to females ($M = 6.03, SD = 5.56$), $t(\text{Welch}) = 2.21, p = .027$. However, the effect size was small ($d = .11$), suggesting limited practical significance. Regarding age, no statistically significant differences were observed between early adolescence ($M = 6.47, SD = 5.63$) and middle adolescence ($M = 6.28, SD = 5.66$), $t(\text{Welch}) = 0.67, p = .505$. Likewise, the effect size was very small ($d = .04$), indicating minimal differences between these age groups.

Item response theory model: GRM model

The results obtained from the CFA support the assumption of unidimensionality of the model. In this regard, the Graded Response Model (GRM) shows acceptable fit indices $M2(gI) = 209.1966 (27); p < .001; RMSEA = .067; SRMR = .05; TLI = .97; CFI = .98$ (see Table 3). Additionally, all item discrimination parameters (a) exceed the value of 1, which is considered indicative of good discrimination ability (Hambleton et al., 2011). The values range from 1.27 (A3) to 2.52 (A5), indicating a moderate to high level of discrimination. Item A5 stands out with the highest discrimination value ($a = 2.52$), suggesting it is the most effective item in differentiating between individuals' levels of ability or trait.

On the other hand, the difficulty parameters (b) indicate the thresholds at which an individual with a given level of the latent trait has a 50% probability of selecting a specific category on the scale. For example, item A1 presents $b1 = 0.38$ (indicating an easy response) up to $b4 = 3.46$ (indicating a more difficult response), suggesting that it covers a broad range of skill levels. In contrast, item A7, with $b1 = -0.34$, suggests that it is relatively accessible to individuals with low levels of the trait, but also addresses higher levels with $b4 = 2.34$. This demonstrates that the scale used allows the assessment of a variety of levels of the analyzed construct, providing precise and differentiated measurement.

Table 3
Item response theory analysis

Model	Item	Item parameters					GRM Model Fit Indices					
		<i>a</i>	<i>b1</i>	<i>b2</i>	<i>b3</i>	<i>b4</i>	<i>M2 (gl)</i>	<i>p</i>	<i>RMSEA</i>	<i>SRMR</i>	<i>CFI</i>	<i>TLI</i>
	A1	1.6	0.38	1.72	2.68	3.46	209.1966 (27)	< .001	.067	.055	.976	.968
	A2	1.4	-0.19	1.03	2.17	2.94						
	A3	1.27	0.05	1.22	2.37	3.28						
	A4	2.04	0.74	1.7	2.33	2.94						
	A5	2.52	0.38	1.39	2.19	2.82						
	A6	1.96	0.51	1.53	2.44	3.02						
	A7	1.72	-0.34	0.75	1.75	2.4						
	A8	1.79	0.17	1.44	2.31	3.08						
	A9	2.1	0.25	1.21	1.97	2.6						

Discussion

The aim of the present study was to examine the psychometric properties of the CGQ-A, a simple and easy-to-apply instrument that represents a useful tool for assessing cybergossip among adolescents. This study constitutes the first evaluation of these properties in the Peruvian context. Overall, the findings provide empirical support for all the proposed hypotheses.

In line with the initial hypothesis, the results supported a unidimensional structure, consistent with previous studies (López-Pradas et al., 2017; Romera et al., 2018), where the same structure was maintained. Although the RMSEA values were slightly higher compared to previous studies, the overall fit indices were adequate. Beyond statistical adequacy, these findings suggest that cybergossip can be understood as a coherent and unified latent construct in the Peruvian adolescent context. This implies that adolescents tend to engage in cybergossip as a consistent behavioral pattern rather than as fragmented or independent actions.

As anticipated, the instrument demonstrated adequate internal consistency, with the alpha and omega coefficients being .84 and .84, respectively, indicating excellent internal consistency. These findings align with previous studies conducted in Spanish and Colombian samples (López-Pradas et al., 2017; Romera et al., 2018). Moreover, this level of reliability indicates that the items operate homogeneously and consistently capture the underlying construct, reinforcing the stability and coherence of the measurement across respondents.

From the functional perspective of gossip proposed by Foster (2004), the psychometric results obtained in this study provide evidence that the CGQ-A is a robust tool for assessing cybergossip among Peruvian adolescents. This finding is of theoretical relevance, as Foster's conceptualization of gossip presents it as a multifunctional social phenomenon that serves roles in communication, influence, social control, bonding, friendship, and entertainment. In this regard, the confirmation of a unidimensional structure suggests that these functions may operate in an integrated manner within digital environments, rather than as independent dimensions. Thus, the structural validity of the instrument supports the possibility of analyzing these underlying functions in the digital context, where the exchange of information takes on new forms and broader reach.

As hypothesized, measurement invariance was supported across gender and developmental stage. Based on these structural results and the adequate internal consistency obtained, the next step was to examine measurement invariance of the model across participants' gender and age. The study successfully established configural, metric, scalar, and strict invariance, confirming and allowing for valid comparisons between the analyzed groups (Putnick & Bornstein, 2016). In particular, scalar invariance is a key finding, as it ensures that observed differences in item means reflect real variations in the latent construct. This enables meaningful comparisons between groups without the influence of external factors. Furthermore, the establishment of measurement invariance suggests that the meaning and interpretation of cybergossip behaviors remain

consistent across both gender and age groups. This finding is especially relevant, as it represents the first study to establish all levels of invariance in this context, thereby constituting a significant methodological advancement for the CGQ-A. In practical terms, the establishment of invariance indicates that the construct is understood and measured in the same way regardless of participants' gender and age, meaning that any observed differences are attributable to real variations in the construct rather than to measurement bias.

Partially consistent with the initial expectations, differences in CGQ-A scores were observed across gender, but not across developmental stage. Previous evidence shows inconsistent findings depending on the context. In Spanish samples, Falla et al. (2021) reported greater female involvement in cybergossip, whereas Dueñas-Casado et al. (2025), also in Spain, found a higher prevalence among males. In contrast, Romera et al. (2018), using Spanish and Colombian samples, did not identify significant gender differences, a finding consistent with Cebollero-Salinas et al. (2024) in a Spanish population. These discrepancies may be attributable to developmental, sociocultural, or methodological factors, including variations in measurement instruments and age ranges examined. In this context, the results of the present study indicate the presence of statistically significant differences in CGQ-A scores as a function of gender. However, the magnitude of these differences was small, suggesting that, although variations between genders can be identified, these are not substantial in practical terms. This finding indicates that cybergossip behaviors tend to be relatively similar across genders and that any observed differences may not represent meaningful distinctions in how adolescents engage in these behaviors. With regard to age, the results of the present study indicate that no significant differences were observed between the analyzed groups (early adolescence 10-13 years, middle adolescence 14-16 years). However, these findings differ from those reported by Cebollero-Salinas et al. (2024), who found that the frequency of cybergossip tends to increase with age, while similar patterns are maintained across males and females.

As hypothesized, the results showed satisfactory item functioning within the IRT framework. The results obtained from IRT indicate that the evaluated scale has adequate psychometric quality (Hambleton et al., 2011). In particular, the GRM presented satisfactory fit indices. Regarding the discriminative ability of the items, the obtained values were above 1, which reflects an adequate capacity to differentiate between individuals with different levels of the latent trait (Baker, 1992). This finding is consistent with what was reported by Romera et al. (2018), who, using the Three-Parameter Logistic Model (3PL), identified similar difficulty values. Beyond these results, the high discrimination parameters indicate that the items are particularly effective in distinguishing between adolescents with different levels of involvement in cybergossip. In addition, the present study conducted a more detailed examination of item difficulty by considering four response levels for each item. The results indicated that these values ranged from -.34 to 3.46, suggesting a more differentiated progression in item difficulty. This implies that the scale not only allows for accurate evaluation of

different levels of the measured trait but also captures a broad continuum from low to high levels, enhancing its sensitivity and precision. In this sense, the use of IRT represents a methodological contribution, as it allows for a more detailed evaluation of item functioning compared to classical test theory approaches.

Limitations and practical implications

Despite the solid findings obtained, it is necessary to recognize certain limitations that should be considered for future research. First, although the sample included over 1,000 participants, it is necessary to include a larger number of adolescents and expand the sample to include participants from other regions, as the fact that they come from a single city limits the generalizability of the results. Additionally, it would be pertinent to include samples of adolescents from other provinces, as this population is particularly prone to engaging in such interactions in virtual environments. Similarly, future research could extend to other populations, such as children and adults, to obtain a more comprehensive view of the phenomenon. Second, the use of self-report measures may have introduced response bias due to social desirability, as participants might have minimized the expression of their behaviors about themselves. Third, while the alpha and omega coefficient values were adequate, no test-retest reliability was performed to evaluate the stability of the measurement over time, highlighting the need for longitudinal studies that allow for the analysis of the instrument's consistency at different time points. Another limitation of this study is that discriminant validity was not examined, the instrument was not tested against related constructs to determine its distinctiveness. Future research should address this to strengthen construct validity evidence. Lastly, regarding age-related differences, only two groups were considered in the present study (early adolescence and middle adolescence). Although the classification proposed by the United Nations Children's Fund also includes late adolescence, this group was not incorporated due to limitations in sample size (UNICEF, 2020). Consequently, the analyses of measurement invariance and group comparisons were restricted to early and middle adolescence. Future research should aim to include a larger representation of late adolescents in order to conduct a more comprehensive psychometric evaluation across all developmental stages.

In addition, the study presents several strengths. The unidimensional structure of the instrument was empirically supported through adequate goodness-of-fit indices in the confirmatory factor analysis, indicating that the items converge on a single latent construct and are consistent with evidence reported in other cultural contexts. The Item Response Theory (IRT) analysis, conducted using the graded response model, yielded appropriate discrimination parameters and ordered thresholds, confirming that the items effectively differentiate across levels of the trait and cover a broad range of the latent continuum, thus providing more fine-grained evidence of measurement precision beyond classical test theory approaches. Furthermore, this study represents the first evaluation of the CGQ-A in a Peruvian population using IRT model, extending validity evidence

to a new cultural context while incorporating a more advanced methodological approach into the local literature. In addition, the confirmation of measurement invariance across gender ensures the equivalence of the instrument between groups, strengthening its validity for between-group comparisons and reinforcing its utility in research.

From an applied perspective, the validation of the CGQ-A in the Peruvian context provides a reliable instrument for the early detection and systematic assessment of cybergossip among adolescents. The combined evidence of unidimensionality and measurement invariance allows score differences to be interpreted as reflecting true variations in the construct rather than measurement bias, which is particularly relevant for educational institutions seeking to objectively monitor patterns of digital interaction and identify risk dynamics in online peer communication.

In practical terms, the instrument can be integrated into school-based psychosocial assessment systems to identify groups or contexts in which cybergossip is more prevalent, thereby informing the design of targeted interventions such as digital citizenship programs, socio-emotional skills training, and strategies aimed at fostering responsible online communication. Additionally, the precision and discriminative capacity demonstrated through the IRT parameters support its use in screening processes, enabling more accurate identification of students with higher levels of the trait and facilitating early interventions focused on empathy development, interpersonal regulation, and conflict resolution in digital contexts. Consequently, the instrument supports not only assessment but also evidence-based decision-making in educational settings.

In clinical contexts, the CGQ-A may contribute to the identification of maladaptive patterns of online interaction that may precede or coexist with other forms of cyberaggression, such as cyberbullying. Early detection of these patterns enables more timely and targeted interventions, supporting individualized counseling processes that promote healthier technology use and more adaptive interpersonal relationships among adolescents.

Conclusions

Overall, these findings provide strong evidence for the validity and reliability of the CGQ-A in the Peruvian adolescent population. In addition to supporting its psychometric robustness, the results contribute to a deeper understanding of cybergossip as a measurable and consistent behavioral construct within digital social interactions. This advances the empirical literature and provides a solid foundation for future research and interventions aimed at understanding and addressing digital social behaviors among adolescents.

Author contributions

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Validation: M.C.C.-Z.
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Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of interests

The authors declare that there is no conflict of interest.

Data availability statement

The data that support the findings of this study are available at <https://osf.io/bc8xr/overview>

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