



# Longitudinal associations between cybervictimization, cyberperpetration, and cyberbystanding: Cross-lagged panel analysis

R. Escortell-Sánchez<sup>a</sup>, V. Caba-Machado<sup>a</sup>, J.M. Machimbarrena<sup>b</sup>,  
E. González-Abaurrea<sup>b</sup>, D. Sevilla-Fernández<sup>c</sup>, J. González-Cabrera<sup>a,\*</sup>

<sup>a</sup> Instituto de Transferencia e Investigación (ITEI), Universidad Internacional de La Rioja (UNIR), Logroño, Spain

<sup>b</sup> Faculty of Psychology, Universidad Del País Vasco (UPV/EHU), Donostia, Spain

<sup>c</sup> Faculty of Education, Universidad Internacional de La Rioja (UNIR), Logroño, Spain

## ARTICLE INFO

### Keywords:

Cyberbullying  
Bystander  
Violence  
Prevention  
Longitudinal study

## ABSTRACT

In recent years, numerous studies have been carried out showing the longitudinal association between cybervictimization and cyberbullying perpetration, including studies with models that allow estimating the directional effects between variables at different times. However, very little attention has been paid to the dimension of cyberbystanding within this process, and it is key in the processes that legitimize and foment the dynamics of violence. The objectives are: 1) to analyze the autoregressive behavior over time of the cybervictimization, cyberperpetration, and cyberbystanding dimensions; 2) to explore the cross-prediction relationships between each dimension and time. For this purpose, an analytical and longitudinal study was conducted in three waves with approximately six months between each one, in which 1052 Spanish students (43.7 % boys,  $n = 460$ , range 11–17 years) participated. They were from 12 schools in seven different regions of Spain. A cross-lagged panel model was conducted to test the bidirectional and longitudinal relationships between cyberperpetration, cybervictimization, and cyberbystanding in adolescents. The results suggest that all autoregressive effects were positive and significant, implying that all three dimensions were stable over time. In addition, there were several significant cross-effects: between cybervictimization at T1 and cyberbystanding at T2 and between cybervictimization at T1 and cyberbullying perpetration at T2. However, the rest of the cross-effects were nonsignificant ( $p \geq .05$ ). The practical implications of these results in possible prevention programs are discussed, highlighting digital literacy to prevent risks on the Internet and reduce cybervictimization.

## 1. Introduction

Bullying is commonly defined as the repeated and intentional harm by a person or group towards a victim who is less powerful than the perpetrator (Olweus, 1993; Salmivalli & Peets, 2018). After more than four decades of rigorous study, this phenomenon has still not been eradicated, nor has there been a significant reduction at the global level (Cosma et al., 2024). Therefore, bullying continues to be a deeply concerning social challenge for families, teachers, and mental health professionals due to the bio-psycho-social impact entailed for children and adolescents (Chen et al., 2021; Hellfeldt et al., 2019). Being exposed to bullying can be especially painful in adolescence, both because of the need to belong to the peer group and the search for social status (Salmivalli et al., 2021). It is even more aggravating when maintained over time (González-Cabrera et al., 2021). In addition, the universality

of the Internet and the regulatory use of Social Networks (SNs) have generated numerous Internet risks, among which cyberbullying stands out (González-Cabrera et al., 2023). This form of violence overlaps with traditional bullying, but it occurs through relational, information, and communication technologies (RICTs) and has singularities such as its echo effect, the possibility of occurring at any time and place, as well as the difficulty of deleting content (Tokunaga, 2010). In general, peer violence is related to internalizing, externalizing, social and academic problems (Camacho et al., 2023; Chan et al., 2019; Escortell et al., 2023; Fisher et al., 2016), lower quality of life (González-Cabrera et al., 2022), and even to self-injurious behaviors and suicidal ideation (Giumetti & Kowalski, 2022; Iranzo et al., 2019). In line with these data, the mapping review of Kwan et al. (2020) clearly points to the association between cyberbullying and depression, suicidal tendencies, anxiety, hostility/aggression, substance use, Attention Deficit/Hyperactivity Disorder

\* Corresponding author.

E-mail address: [joaquin.gonzalez@unir.net](mailto:joaquin.gonzalez@unir.net) (J. González-Cabrera).

<https://doi.org/10.1016/j.chbr.2025.100662>

Received 29 November 2024; Received in revised form 17 March 2025; Accepted 30 March 2025

Available online 4 April 2025

2451-9588/© 2025 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC license (<http://creativecommons.org/licenses/by-nc/4.0/>).

(ADHD), low self-esteem, problems with peers, anguish, loneliness, and dissatisfaction with life.

Due to its prevalence and impact on adolescents, cyberbullying has become a global public health problem (Barlett et al., 2024), with a wide range of variability in participation percentages. Thus, in the international context, studies indicate prevalences between 1.6 and 56.9 % (Brochado et al., 2017), between 1.9 and 84 % (Camerini et al., 2020), and between 12 and 16 % (Cosma et al., 2024). In the Spanish context, the report by Save The Children (2016) estimates the prevalence of cybervictimization at 6.9 % and of cyberaggression at 7.3 %, and the UNICEF study reports values that vary between 12.2 and 22.5 % in a representative Spanish sample (Andrade et al., 2021). Regarding these alarming prevalences, in recent years, interest in studying the variables that predict participation has grown, with sex, ethnicity, or age being the predictors with the smallest effect size (Guo, 2016). On the contrary, the predictors with the strongest association are: behavioral problems (Baroncelli et al., 2020), internalizing problems (Christina et al., 2021), insecure attachment (Alonso & Romero, 2020), verbal aggression (Eden & Roberto, 2021), empathy and moral disconnection (Falla et al., 2023; Sorrentino et al., 2023), the parental supervision style (Martín-Criado et al., 2021), risky Internet use (Cho & Galehan, 2019; Giumetti & Kowalski, 2022), and Internet risk awareness (Sorrentino et al., 2023). In addition to the previously mentioned, Kasturiratna et al. (2024) reported in an extensive umbrella review that being female, being of school age, frequently use of Internet, and unregulated school environments were significant predictors. However, the vast majority of the literature supports that having been a victim or perpetrator of traditional bullying is the primary predictor (Athanasiaides et al., 2016; Giumetti et al., 2022; Kasturiratna et al., 2024; Sorrentino et al., 2023).

Regarding the analysis of the behavior of each dimension involved in cyberbullying (victimization, perpetration, and bystanding), different theoretical frameworks have tried to provide a partial or total explanation of these dynamics of violence and their direction. Among them, Runions et al. (2018) highlight that victimization can overlap with the dimension of aggression through the displacement of frustration/aggression. Thus, the victim could gain the courage to end up perpetrating online bullying as a means of revenge. In the case of aggression, Barlett-Gentile's Cyberbullying Model (Barlett & Gentile, 2012) is notorious, as it suggests that the particularities of the digital universe (anonymity, permanent accessibility, and permanence of attacks) are influential aspects in the perpetrator's feeling of empowerment (Barlett, 2023).

Considering the behavior over time of the dimensions involved in cyberbullying, the bulk of longitudinal studies present correlative assumptions, so one must resort to analyses that estimate concurrent, autoregressive, and cross-associations (Camacho et al., 2023). In this way, the possible causal influences of how a previous behavior predicts a future behavior can be better understood in order to contrast how the protagonist dimensions of cyberbullying predict each other. In this regard, prior literature has analyzed in detail the dynamics of traditional bullying, finding consensus about the stability of the dimensions over time through the analysis with Cross-Lagged Panel Modeling (CLPM) (Chen et al., 2021; Cogo-Moreira et al., 2023; Davis et al., 2022; Romera et al., 2022; Van Ouytsel et al., 2019). In the case of cyberbullying, characterized by a greater interdependence between the victim and the aggressor (Huang et al., 2022), the analysis is more complex and disparate. Specifically, while some evidence supports the stability of the dimensions of cybervictimization and cyberperpetration over time through CLPM (Akgül & Artar, 2020; Camacho et al., 2021; Chen et al., 2021, 2023; Chu et al., 2018; Giumetti et al., 2022; Pabian et al., 2016; Thornberg et al., 2024; Van Ouytsel et al., 2019), other studies using random interception (RI-CLPM) refute it (Boer et al., 2021; Camacho et al., 2023; Erreygers et al., 2018). Along the same lines, the cross-relationships between the different dimensions have been analyzed, and whereas in traditional bullying it is evident that victimization predicts subsequent bullying (Zhou et al., 2022), in

cyberbullying, the results are still discordant and require further research. In this regard, some studies indicate that there is no significant relationship between cybervictimization and subsequent cyberaggression (Erreygers et al., 2018), whereas others corroborate that cybervictimization is a predictor of cyberaggression (Akgül & Artar, 2020; Camacho et al., 2021, 2023), but not the other way around, inviting further research to provide firm evidence in this regard.

While the dimensions of cybervictimization and cyberperpetration have been widely studied, cyberbystanding has scarcely been addressed, despite being a key piece in successfully completing victimization (Sjögren et al., 2024). Additionally, it has been found that bullying, traditional or online, is not only a phenomenon between victim and bully but is often a group process involving two to seven participants, who is not a homogeneous group in terms of behavior and traits (González-Cabrera et al., 2019; Sarmiento et al., 2019). Furthermore, cyberbystanding is the dimension with the highest score (Gini et al., 2021). In this regard, previous studies place the percentage of participation at around 55 % in the Spanish context (González-Cabrera et al., 2019, 2020).

Including bystanding dynamics is key, as this is a group process with a complex functioning (Salmivalli, 2010), where the aggressor is reinforced more, and those who defend the victim are reinforced less (Saarento et al., 2015; Thornberg & Wänström, 2018). In this sense, this dimension plays an essential role within the ecosystem of bullying and cyberbullying because bystanders can reinforce the aggressor by joining in or being passive agents or, on the contrary, they can contribute to the creation of an anti-bullying ethic by actively intervening and supporting the victim or reporting the situation as defenders (Saarento & Salmivalli, 2015). These behaviors are targeted by interventions of recognized prestige, such as the KiVa Program and No Trap!, which have been successful in empathic understanding and the development of bystanders' self-efficacy (Biernesser et al., 2023; Menesini & Salmivalli, 2017; Palladino et al., 2016; Saarento y Salmivalli, 2015).

Cyberbystanding has also been explained from different theoretical perspectives, with the sociocognitive approach of Bandura (1997, 2016) being the most relevant. In this regard, the processes of moral disengagement and diffusion of responsibility are considered responsible for the stability of the cyberbystanding dimension, as they help prevent the involved individuals from developing feelings of guilt or responsibility. From the statistical sphere, the scarce previous literature with predictive studies suggests that both the pro-aggressive (Orue et al., 2021) and passive (Merlici & Maftai, 2024) behavior of bystanders predicts subsequent cyberbullying. In the same vein, in a longitudinal study, Holfeld and Mishna (2018) found that the observation of cyberbullying over time is associated with subsequent cybervictimization and cyberperpetration. Additionally, cybervictimization predicts subsequent cyberbystanding, but not cyberperpetration.

Other studies have found significant results with similar variables. Specifically, Xu et al. (2025) found, through a RI-CLPM analysis, that cyberostracism is negatively associated with prosocial behaviors over time, and prosocial behaviors can be understood as a form of positive response by bystanders (Hoxmeier et al., 2020). As becomes apparent, there is no known evidence about the stability of cyberbystanding over time, although some findings relate to traditional bullying. Specifically, Thornberg et al. (2024) showed that the bystander's pro-aggressive behavior is stable over time, both with CLPM and RI-CLPM. In the same vein, Sjögren et al. (2024) found that the bystanders' defensive and passive behaviors remain consistent over time, with bidirectional connections between them.

Although there has been much evidence of the association between cybervictimization and cyberbullying perpetration through CLPM studies, still very little attention is paid to the cyberbystanding dimension. Considering the above, it is necessary to fill the existing gap by incorporating cyberbystanding in the dynamics of analysis that make concurrent, autoregressive, and crossed associations with the rest of the dimensions (cybervictimization and cyberperpetration). Therefore, the

objectives of this study are: 1) To analyze the autoregressive behavior over time of the dimensions of cybervictimization, cyberperpetration, and cyberbystanding throughout the three waves of the study; 2) To explore the cross-prediction relationships between each of the dimensions and times. Therefore, we expect that: (H1) the dimensions of cybervictimization, cyberperpetration, and cyberbystanding will remain stable throughout the three waves (e.g. cybervictimized adolescents continue to be so in the following measurements, which would indicate that there is a certain chronification of the roles) (Akgül & Artar, 2020; Camacho et al., 2021; Chen et al., 2021, 2023; Chu et al., 2018; Giumetti et al., 2022; Pabian et al., 2016; Thornberg et al., 2024; Van Ouytsel et al., 2019); (H2) cybervictimization at T1 or T2 is a predictor of subsequent cyberaggression and cyberbystanding at T2 or T3, respectively (Akgül & Artar, 2020; Camacho et al., 2021, 2023); (H3) cyberaggression at T1 or T2 is a predictor of cyberbystanding at T2 or T3, respectively, but not of cybervictimization (Akgül & Artar, 2020; Camacho et al., 2021, 2023; Holfeld & Mishna, 2018); (H4) cyberbystanding at T1 or T2 is a predictor of subsequent cybervictimization or cyberaggression (Holfeld & Mishna, 2018; Merlici & Maftai, 2024; Orue et al., 2021).

**2. Method**

**2.1. Design and participants**

An analytical and longitudinal study was carried out in three waves, with approximately six months between each. A total of 1860 participants were evaluated in Wave 1 (W1), 1685 (90.6 %) in W2, and 1410 (75.8 %) in W3. Ultimately, 1052 students (56.6 % of the original sample) were evaluated in all three phases (43.7 % males,  $n = 460$ ; 56.3 % females,  $n = 592$ ), and, therefore, only they were included in the study. W1 and W2 were carried out at the beginning (November–December) and at the end (April–May) of the same academic year, and W3 during the following academic year (January–February). Participants were students of Compulsory Secondary Education (CSE). In the first year of the study (W1 and W2), 265 (25.2 %) were from 1st grade of CSE (109 boys), 346 (32.9 %) were from 2nd grade of CSE (155 boys), 316 (30 %) were from 3rd grade of CSE (146 boys) and 135 (11.9 %) were from 4th grade of CSE (50 boys). The mean age for W1-W2 was  $13.70 \pm 1.3$  (same school year); for W3, the following school year, it was  $14.60 \pm 1.3$ . The age range ranged between 11 and 17 years. Twelve schools supported by public funds (10 of them in urban environments and 2 in rural areas) participated in the three waves. The schools were chosen for their accessibility, so an incidental non-probabilistic sampling was carried out. The students came from schools in seven Spanish regions (Basque Country, Asturias, Castilla-León, Castilla la Mancha, Valencian Community, Aragon, and Madrid).

**2.2. Assessment instruments**

Sociodemographic data such as sex, age, school, and grade were

collected. In addition, the reduced version of the Cyberbullying Triangulation Questionnaire (CTQ; González-Cabrera et al., 2019), based on the work of Calvete et al. (2010), was used for the dimension of cybervictimization, and on Gámez-Guadix et al. (2015) for cyberaggression. It also incorporates a new dimension of cyberbystanding. Each dimension comprises 9 items, and symmetrical formulas are used for each of the behaviors analyzed (e.g., “I have received/sent/observed threatening or insulting messages being sent to other people”). Each item is rated on a 5-point Likert scale ranging from 1 (*never*) to 5 (*almost every week*). The score for each dimension varies between 9 and 45. The CTQ has adequate indicators of reliability and internal validity (see Table 1 for the reliability indicators for each time and dimension, which are satisfactory in all cases).

**2.3. Procedure**

Participants completed the instrument through the online platform Survey Monkey ©. This process took place in computer classrooms and school classrooms through mobile devices. With the coordination of the guidance departments of each school, the teachers and tutors participated in this process. They received specific instructions to promote the procedure’s standardization in all the schools. The researchers monitored the online collection of data using the records of each school for all groups and classes. In addition, participant detection mechanisms such as those suggested by Niessen et al. (2016), like the “longstring” maximum response time and “person-fit statistics,” were enabled. The time required to complete the questionnaires ranged from 10 to 20 min, depending on the student’s age and reading comprehension.

**2.4. Ethical considerations**

The participants and the school directors consented to participate in this study. A consent form was sent to the families of underage students to inform them of the aims and purposes of the study, its characteristics, those in charge of it, and their right to refuse to participate. The parents or legal guardians of minors who did not allow participation returned the signed consent. Less than 1 % of the sample declined to participate in the study. Students could always decide not to participate by indicating at the beginning of the assessment that they did not wish to participate (this occurred in less than .5 % of cases). This study was approved by the Research Ethics Committee of the [masked for review]. There were no exclusion criteria for the sample.

**2.5. Data analysis**

The descriptive statistics and Pearson’s correlation analysis were conducted using SPSS version 29.0. Additionally, AMOS 29.0 was used to perform CLPM. Despite the non-normally distributed nature of the study variables, Mardia’s (1970, 1974) normalized estimate of multivariate kurtosis was assessed, indicating multivariate non-normality in the sample. However, the Maximum Likelihood Estimator (ML) was

**Table 1**  
Correlation matrix, descriptive statistics, and reliabilities for cyberperpetration, cybervictimization, and cyberbystanding at the three times.

	M	SD	$\alpha$	$\omega$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CB_PerpT1 (1)	10.07	2.139	.708	.723	1								
CB_VictT1 (2)	10.63	2.831	.746	.787	.461**	1							
CB_BysT1 (3)	13.75	5.521	.844	.861	.470**	.495**	1						
CB_PerpT2 (4)	10.16	2.681	.828	.830	.398**	.265**	.302**	1					
CB_VictT2 (5)	11.01	3.692	.835	.842	.269**	.467**	.309**	.559**	1				
CB_BysT2 (6)	14.11	5.985	.875	.883	.371**	.411**	.561**	.502**	.552**	1			
CB_PerpT3 (7)	10.02	2.912	.881	.883	.200**	.129**	.156**	.218**	.169**	.181**	1		
CB_VictT3 (8)	10.61	3.344	.839	.846	.205**	.297**	.200**	.209**	.289**	.256**	.616**	1	
CB_BysT3 (9)	13.21	5.566	.873	.880	.286**	.287**	.388**	.262**	.308**	.438**	.502**	.565**	1

Note. M = mean; SD = standard deviation;  $\alpha$  = Cronbach’s alpha;  $\omega$  = McDonald’s omega; CB\_Perp = cyberperpetration; CB\_Vict = cybervictimization; CB\_Bys = cyberbystanding. \* $p < .05$  \*\* $p < .01$ .

used because it performs well when the sample size is equal to or greater than 500 and the rejection rate is higher than nominal at smaller sample sizes (Hu et al., 1992). First, the longitudinal measurement invariance of the three dimensions used in this study was evaluated, including configural invariance, metric invariance, and scalar invariance, to ensure that the scales assess in the same way at all three points in time (Widaman et al., 2010). Second, a CLPM was constructed to test the longitudinal bidirectional relationships among cyberaggression perpetration, cybervictimization, and cyberbystanding in adolescents. The fit of the model was estimated with the most reliable fit indices (Hu & Bentler, 1999): the Chi square ( $\chi^2$ ), the root mean square error of approximation (RMSEA), the comparative fit index (CFI), the Tucker Lewis index (TLI), and the standardized root mean square residual (SRMR). A model was considered to adequately fit the data at values of  $\leq .08$  for RMSEA,  $\geq .90$  for CFI and TLI, and  $\leq .08$  for SRMR. Furthermore, the 95 % confidence intervals (CI) was calculated using a bias-corrected bootstrap sample that was repeated 5000 times. In addition, to assess the longitudinal measurement invariance using the three incremental levels mentioned previously, the change values of CFI ( $\Delta$ CFI) and RMSEA ( $\Delta$ RMSEA) were used to compare the models. When  $\Delta$ CFI  $\leq .01$  and  $\Delta$ RMSEA  $\leq .015$ , the measurement invariance model was acceptable (Chen, 2007).

### 3. Results

#### 3.1. Descriptive and correlational analyses

Descriptive analyses for all variables, including the means, standard deviations, and Pearson’s bivariate correlations between the variables of the study, are presented in Table 1. All variables were associated with each other across the three time-points (see Table 1).

#### 3.2. Measurement invariance test

Configural invariance models were initially constructed to assess the consistency of the measurements over time (see Table 2). These models demonstrated a good fit across all three scales (cyberperpetration, cybervictimization, cyberbystanding). Next, factor loadings were set to be equal over time to establish metric invariance models. These models demonstrated full invariance in cyberbystanding, and partial invariance in cyberperpetration and cybervictimization by releasing Items 4, 5, 6, and 9 from both dimensions, leaving these items unconstrained and unequal across groups, allowing them to vary freely without any restrictions. Thus, invariance analyses could continue (Byrne, 2016), and analysis of the metric invariance models revealed that changes in CFI and RMSEA were less than .01. Building on the metric invariance model, the equality of the threshold to examine scalar invariance was additionally constrained, with  $\Delta$ CFI and  $\Delta$ RMSEA still falling within acceptable ranges ( $< .01$ ). These results show that the three dimensions maintain measurement consistency, full measurement invariance in the

case of cyberbystanding, and partial measurement invariance for cybervictimization and cyberperpetration, across the three time-points.

#### 3.3. Cross-lagged panel model

The CLPM (Fig. 1) showed a good fit to the data ( $\chi^2(11) = 54.514$ , CFI = .988, TLI = .959, RMSEA = .061, 90 % CI [.046, .078], SRMR = .0456). Table 3 displays the results for the CLPM.

The results suggest that all autoregressive effects were positive and significant, with standardized coefficients ranging from .19 to .66. This implies that the dimensions of cyberperpetration, cybervictimization, and cyberbystanding were stable over time. Furthermore, the cross-lagged effects were significant from cybervictimization at T1 to cyberbystanding at T2 ( $\beta = .208$ ) and from cybervictimization at T1 to cyberaggression perpetration at T2 ( $\beta = 0.126$ ). However, the rest of the cross-lagged effects were nonsignificant ( $p \geq .05$ ).

### 4. Discussion

This longitudinal study, conducted with CLPM, provides empirical evidence on concurrent, autoregressive, and cross-association between the three key dimensions of peer violence through the Internet: cybervictimization, cyberperpetration, and cyberbystanding. The unique aspect of the study is the integration of this last dimension, as there are very few studies on the subject, and it is one of the key points for understanding and putting a stop to cyberbullying (Sjögren et al., 2024).

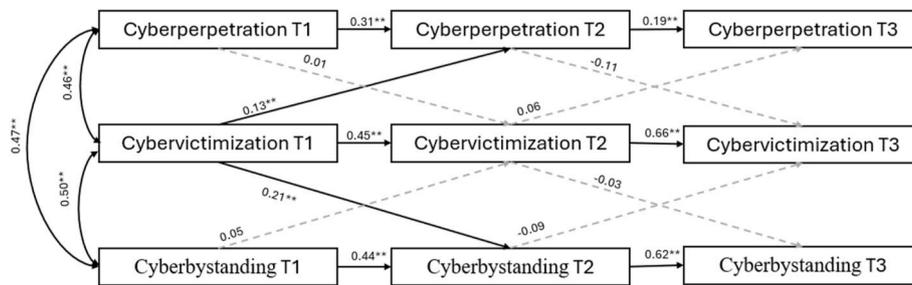
Considering the first objective, all three dimensions remained stable over time. Thus, the first hypothesis (H1) is confirmed, as being a cybervictim, cyberaggressor, or cyberbystander subsequently predicts them. This finding is contrary to other studies with RI-CLPM (Boer et al., 2021; Erreygers et al., 2018), which support that cyberbullying is more sporadic and less sustainable over time than traditional bullying (Huang et al., 2022). However, it is consistent with previous findings that reported significant longitudinal associations in both traditional bullying (Chu et al., 2018; Pabian & Vandebosch, 2016) and cyberbullying (Camacho et al., 2021; Giumetti et al., 2022). In this regard, it seems clear that bullying, whether online or electronic, does not take place isolatedly, and, although it does not have such a marked hierarchical nature as traditional bullying, its perpetration is recurrent (Akgül y Aktar, 2020) and frequent in all stages of adolescence (Pérez-Rodríguez et al., 2024).

Along these lines, it should also be noted that the stability of cybervictimization can be explained as the sum of many processes, among which stand out participation in risky behaviors such as: sharing passwords with friends, sharing personal information, talking to strangers, or sexting (Kowalski et al., 2012; Mishna et al., 2012; Van Ouytsel et al., 2019). Online victimization can also be explained by the continuity of individuals’ interaction styles (Scholte et al., 2007). Thus, bullying experiences can inhibit the development of social skills, preventing adolescents from learning how to react appropriately in peer

**Table 2**  
Measurement invariance models.

	Model	$\chi^2$	df	RMSEA (90 % CI)	CFI	SRMR	TLI	$\Delta$ M	$\Delta\chi^2$	$\Delta$ df	$\Delta$ RMSEA	$\Delta$ CFI
Cyberpepertration	M1	689.15 *	72	.052 (.049-.056)	.948	.0604	.921	-	-	-	-	-
	M2	794.18*	80	.053 (.050-.057)	.939	.0604	.918	M2 vs. M1	105.03	8	.001	-.009
	M3	833.01*	98	.049 (.046-.052)	.938	.0659	.931	M3 vs. M2	38.83	18	-.004	-.001
Cybervictimization	M1	912.44 *	51	.073 (.069-.077)	.909	.0191	.806	-	-	-	-	-
	M2	930.31*	59	.068 (.065-.072)	.908	.0221	.831	M2 vs. M1	17.87	8	-.005	-.001
	M3	982.08*	77	.061 (.058-.064)	.904	.0223	.865	M3 vs. M2	51.77	18	-.007	-.004
Cyberbystanding	M1	869.589 *	78	.057 (.053-.060)	.928	.0415	.901	-	-	-	-	-
	M2	954.878*	94	.054 (.051-.057)	.922	.0495	.910	M2 vs. M1	85.28	1	-.004	-.006
	M3	1035.65*	112	.051 (.048-.054)	.916	.0492	.919	M3 vs. M2	80.772	18	-.003	-.006

Note.  $\chi^2$  = Chi-square; df = degrees of freedom, RMSEA = root mean square error of approximation, CFI = comparative fit index, SRMR = standardized root mean square residual, TLI = Tucker-Lewis index (TLI),  $\Delta$ X2 = Chi-square difference,  $\Delta$ df = difference in degrees of freedom,  $\Delta$ RMSEA = difference in root mean square error of approximation,  $\Delta$ CFI = difference in comparative fit index, M1 = configural model, M2 = metric invariance, M3 = scalar invariance. \* $p < .001$ .



**Fig. 1.** The cross-lagged panel shows the autoregressive and cross-relationships between cyberperpetration, cybervictimization, and cyberbystanding between waves. Note. Dashed arrows represent nonsignificant cross-lagged paths. \* $p < .05$ . \*\* $p < .01$ . Covariances are also shown.

**Table 3**  
Cross-lagged model panel between the dimensions and times of the study.

Path	Effect	SE	LLCI	ULCI
CB_Perp-T1 to CB_Perp-T2	.31	.037	.203	.418
CB_Perp-T2 to CB_Perp-T3	.193	.036	.104	.289
CB_Vict-T1 to CB_Vict-T2	.446	.041	.345	.546
CB_Vict-T2 to CB_Vict-T3	.665	.086	.391	1.046
CB_Bys-T1 to CB_Bys-T2	.435	.029	.357	.510
CB_Bys-T2 to CB_Bys-T3	.617	.054	.474	.775
CB_Perp-T1 to CB_Vict-T2	.014	.044	-.061	.096
CB_Vict-T1 to CB_Bys-T2	.208	.058	.130	.282
CB_Vict-T1 to CB_Perp-T2	.126	.030	.063	.198
CB_Bys-T1 to CB_Vict-T2	.045	.017	-.022	.107
CB_Perp-T2 to CB_Vict-T3	.193	.061	-.339	.082
CB_Vict-T2 to CB_Bys-T3	-.031	.063	-.145	.078
CB_Vict-T2 to CB_Perp-T3	.060	.028	-.024	.162
CB_Bys-T2 to CB_Vict-T3	-.086	.025	-.210	.013

Note. SE = Standard error, LLCI = lower limit confidence interval 95 %, ULCI = upper limit confidence interval 95 %, CB\_Perp = cyberperpetration; CB\_Vict = cybervictimization; CB\_Bys = cyberbystanding.

interactions and fomenting the development of dysfunctional interaction styles that increase the likelihood of being involved in future bullying behaviors (Chu et al., 2018). Moreover, in this case, it is rare for adults to be able to detect these experiences of cybervictimization and, hence, provide support, so they are not a real protective factor (Chu et al., 2018).

As for the cyberperpetration dimension, its autoregressive behavior can be explained, at least partially, by attending to Barlett-Gentile’s Cyberbullying Model (Barlett & Gentile, 2012), which argues that the first instance of someone using internet communication to cause harm to somebody else is a learning test (Barlett, 2023). Specifically, anonymity, as well as the accessibility and permanence of the attacks, empower the perpetrator. In addition, public support and response are key factors in maintaining and predicting future behaviors (Sjögren et al., 2024). Thus, if bullies wish to be visible, powerful, and popular, they can achieve these goals by intimidating others. In addition, cyberbullies can be rewarded for their behavior, either through approval (or lack of disapproval) during bullying situations or by granting them that yearned position of power and status in the long term (Salmivalli, 2014).

Special mention should be made of the behavior of the cyberbystander dimension, as it is the central axis in the dynamics of bullying (Gini et al., 2021). In this regard, the fear of becoming the next victim may be one of the most important reasons to continue behaving as passive agents in the face of cyberbullying dynamics (Forsberg et al., 2018; Strindberg et al., 2020), especially if there is no strong belief in their ability to help victims (Sjögren et al., 2024). Likewise, this behavior can be explained within the sociocognitive framework of Bandura (1997, 2016), with moral disengagement being the reason why people can transgress moral rules without ceasing to believe that their actions are acceptable and justified (Thornberg et al., 2024), and without a mechanism of self-punishment (i.e., feelings of remorse and guilt). On the other hand, within this approach, the diffusion of

responsibility is determinant. Thus, the stability of bystanding behavior may be due to the diffusion of responsibility, which turns the bystanders into a “faceless group” (Bandura, 2016), where any harm can be attributed to others’ behavior. In short, it may be that both moral disengagement and the diffusion of responsibility explain why cyberbystanding is a predictor of the same behavior over time. This could be even clearer the further away the behavior is from the victim’s defense (Thornberg & Jungert, 2014; Tolmatcheff et al., 2022), as well as when assuming a more passive (uninvolved) (Tolmatcheff et al., 2022) or pro-aggressive role (Bjärehed et al., 2020).

Several hypotheses are associated with the second objective: exploring the cross-prediction relationships between each dimension and time. Thus, the data seem to confirm the second hypothesis (H2) because cybervictimization at T1 was a predictor of subsequent cyberbullying perpetration and cyberbystanding at T2, which is consistent with previous evidence (Akgül & Artar, 2020; Camacho et al., 2021, 2023). These results can be explained by taking into account the nature of RICTs. Specifically, the difficulty in identifying the perpetrator and avoiding reprisals can lead to a perception of a lack of responsibility and the deindividuation of behavior (Camacho et al., 2023). This way, the victim may gain the courage to end up perpetrating online bullying as a means of revenge (Runions et al., 2018) or as an attempt to obtain that power or social status that they may have attributed to their aggressors in their past experiences. In addition, the stress produced by victimization can lead to a hostile interpretation of other social situations, which can subsequently lead to cyberaggression, although not necessarily directed at the original aggressor (Ak et al., 2015). Along the same lines, young people with first-hand experience with cybervictimization may become more aware of the dynamics of cyberbullying, improving their ability to recognize these situations in the future (Holfeld & Mishna, 2018) thus, activating defense mechanisms that position them as bystanders, instead of becoming victims.

Cyberperpetration did not predict cybervictimization or cyberbystanding in any of the subsequent waves, so we reject the third hypothesis (H3). These results may support other studies in which cybervictimization precedes cyberperpetration and cyberbystanding (but not in the opposite direction) (Akgül & Artar, 2020; Camacho et al., 2021, 2023; Holfeld & Mishna, 2018). According to Akgül & Aktar (2020), this may suggest that victims learn to cyberbully through exposure or observation. Additionally, cyberaggression constitutes a form of hegemonic position that is influenced by the social benefits that cyberbullies obtain. Therefore, whereas cybervictims may be more likely to become future cyberbullying perpetrators, they are less likely to become future cybervictims or cyberbystanders.

Considering the cyberbystanding dimension, the findings reject the fourth hypothesis (H4). Specifically, the results do not provide evidence that witnessing more acts of cyberbullying at T1 or T2 predicts greater subsequent cybervictimization or cyberaggression. This result was unexpected, as previous studies had established such predictive relationships (Holfeld & Mishna, 2018; Merlici & Maftai, 2024; Orue et al., 2021). Among the aforementioned works, the most related to the present study is that of Holfeld and Mishna (2018). Although both works are

longitudinal with three waves, these authors present a much more heterogeneous sample in terms of age (with students from grade 4 to grade 10), and each wave is done annually (in our case, the participants were in an age range of mainly three years and the waves were every six months). These two aspects may be key to the results, as they provide different visions in a crucial stage like adolescence (Salmera-Aro, 2011). The data from this study could be interpreted, at least partially, through the sociocognitive approach (Bandura, 2016). Thus, it is likely that as adolescence progresses, students become more concerned about their position or social status (Dawes, 2017), such that their moral disengagement to avoid moral self-sanctions and guilt, characteristic of cyberbystanding, makes them feel protected in that role so they do not cross the dividing line that separates them from becoming cyberaggressors or cybervictims.

Additionally, there was no correlation between roles from T2 and T3, even if cybervictimization in T1 was a predictor of itself and the other roles in T2. In this regard, based on the current study's findings, being a cybervictim would give rise to a particular proclivity to adopt any role after six months, but once the interval has passed, each role would become stable and basically operate as a predictor of itself. In this regard, the findings align with previous research that has demonstrated the persistent and recurring nature of the roles involved in cyberbullying (Akgül & Artar, 2020; Camacho et al., 2021; Giumetti et al., 2022). All of this suggests that playing any role would create a kind of mark on each person involved that would remain over time, even though the victims may play different roles at the past.

This study has some limitations that should be taken into account: (1) the evaluation instrument used is a self-report, which can generate biases due to social desirability. This could be improved in future studies by using complementary measures from other sources (tutors, peers, or family) to obtain a more complete triangulated view. (2) Regarding the sample's representativeness, although it is large and includes participants from different regions of the country within the longitudinal study, the extrapolation of the results to the population should be done with caution because the sample is not representative of Spanish adolescents. (3) Although there are no data on the families' educational level or socioeconomic status, the income areas of the 12 participating schools were identified. Two of them were located in high-income areas (above the national average), eight were in middle-income areas, and two were in low-income areas. Therefore, these differences may be susceptible to creating interpretive biases in the results due to the different realities experienced by the subjects. (4) Although the study design followed cross-lagged panel modeling (CLPM), more elaborate studies will be needed to add random interception. This would allow for the estimation of pure intrapersonal autoregressive effects and cross-effects. This way, instead of participants varying around a common group mean over time, each individual would vary around their own group mean. The authors are aware of no studies that have conducted an RI-CLPM including the cyberbystanding dimension.

There are several potential practical implications for education and health professionals. On the one hand, the stability of cybervictimization, cyberperpetration, and cyberbystanding behaviors indicate that the best predictor of future behavior is prior behavior. Hence, interrupting these processes or preventing their occurrence is key to avoiding these dynamics. In this sense, it seems especially relevant to incorporate in the preadolescent stage (10 years or younger) programs that combine digital literacy with preventing Internet risks, especially cyberbullying as the most prevalent risk (Ortega-Barón et al., 2024). It is also necessary to emphasize the reduction of cybervictimization as a key element, as it is the one that best predicts the other dimensions subsequently during the same academic year. Although cyberbystanding at a specific time did not predict other subsequent dimensions, this does not detract from cyberbystanding's relevant role in the dynamics of bullying and cyberbullying. The subroles involved in these observation processes should be studied in greater depth and analyzed according to the direction of their support to determine how to predict future behaviors of

cyberperpetration and cybervictimization.

In conclusion, cybervictimization, cyberperpetration, and cyberbystanding have positive and significant autoregressive effects (i.e., each wave subsequently predicts the same dimension). In addition, cybervictimization at T1 predicts cyberperpetration and cyberbystanding at T2 (within the same school year), so there are also cross-effects between the study dimensions. Cyberbystanding does not predict subsequent cybervictimization or cyberaggression at any time.

#### CRediT authorship contribution statement

**R. Escortell-Sánchez:** Writing – review & editing, Writing – original draft, Supervision, Investigation, Conceptualization. **V. Caba-Machado:** Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Investigation, Formal analysis, Data curation. **J.M. Machimbarrena:** Writing – review & editing, Methodology, Investigation, Conceptualization. **E. González-Aburrea:** Writing – review & editing, Visualization, Investigation. **D. Sevilla-Fernández:** Writing – review & editing, Visualization, Investigation. **J. González-Cabrera:** Writing – review & editing, Validation, Supervision, Resources, Project administration, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization.

#### Statements and declarations

This study was funded by Universidad Internacional de La Rioja [(UNIR Research Plan (2022–2024 & 2024–2026) and ITEI (BC-24-012)].

The authors have no competing interests to declare that are relevant to the content of this article.

The data that support the findings of this study are available from the corresponding author upon reasonable request.

#### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Data availability

Data will be made available on request.

#### References

- Ak, S., Özdemir, Y., & Kuzucu, Y. (2015). Cybervictimization & cyberbullying: The mediating role of anger, don't anger me. *Computers in Human Behavior*, 49, 437–443. <https://doi.org/10.1016/j.chb.2015.03.030>
- Akgül, G., & Artar, M. (2020). Cyberbullying: Relationship with developmental variables and cyber victimization. *Scandinavian Journal of Child and Adolescent Psychiatry and Psychology*, 8(1), 25–37. <https://doi.org/10.21307/sjcap-2020-004>
- Alonso, C., & Romero, E. (2020). Estudio longitudinal de predictores y consecuencias del ciberacoso en adolescentes españoles. *Behavioral Psychology/Psicología Conductual*, 28(1), 73–93.
- Andrade, B., Guadix, I., Rial, A., & Suárez, F. (2021). *Impact of technology on adolescence. Relationships, risks and opportunities*. UNICEF. <https://www.unicef.es/sites/unicef.es/files/comunicacion/Informe%20Impacto%20de%20la%20tecnolog%C3%ADa%20en%20la%20adolescencia.pdf>.
- Athanasiades, C., Baldry, A. C., Kamariotis, T., Kostouli, M., & Psalti, A. (2016). The "net" of the internet: Risk factors for cyberbullying among secondary-school students in Greece. *European Journal on Criminal Policy and Research*, 22(2), 301–317. <https://doi.org/10.1007/s10610-016-9303-4>
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. Freeman & Company.
- Bandura, A. (2016). *Moral disengagement: How people do harm and live with themselves*. Worth Publishers.
- Barlett, C. P. (2023). Cyberbullying as a learned behavior: Theoretical and applied implications. *Children*, 10(2), 325. <https://doi.org/10.3390/children10020325>
- Barlett, C. P., & Gentile, D. A. (2012). Attacking others online: The formation of cyberbullying in late adolescence. *Psychology of Popular Media Culture*, 1(2), 123–135. <https://doi.org/10.1037/a0028113>
- Barlett, C. P., Kowalski, R. M., & Wilson, A. M. (2024). Meta-analyses of the predictors and outcomes of cyberbullying perpetration and victimization while controlling for

- traditional bullying perpetration and victimization. *Aggression and Violent Behavior*, 74, Article 101886. <https://doi.org/10.1016/j.avb.2023.101886>
- Baroncelli, A., Perkins, E. R., Ciucci, E., Frick, P. J., Patrick, C. J., & Sica, C. (2020). Triarchic model traits as predictors of bullying and cyberbullying in adolescence. *Journal of Interpersonal Violence*, 37(5–6), 2–15. <https://doi.org/10.1177/0886260520934448>
- Biernesser, C., Ohmer, M., Nelson, L., Mann, E., Farzan, R., Schwanke, B., & Radovic, A. (2023). Middle school students' experiences with cyberbullying and perspectives toward prevention and bystander intervention in schools. *Journal of School Violence*, 22(3), 339–352.
- Bjärehed, M., Thornberg, R., Wänström, L., & Gini, G. (2020). Mechanisms of moral disengagement and their associations with indirect bullying, direct bullying, and pro-aggressive bystander behavior. *The Journal of Early Adolescence*, 40(1), 28–55. <https://doi.org/10.1177/0272431618824745>
- Boer, M., Stevens, G. W. J. M., Finkenauer, C., de Looze, M. E., & van den Eijnden, R. J. J. M. (2021). Social media use intensity, social media use problems, and mental health among adolescents: Investigating directionality and mediating processes. *Computers in Human Behavior*, 116, Article 106645. <https://doi.org/10.1016/j.chb.2020.106645>
- Brochado, S., Soares, S., & Fraga, S. (2017). A scoping review on studies of cyberbullying prevalence among adolescents. *Trauma, Violence, & Abuse*, 18(5), 523–531. <https://doi.org/10.1177/1524838016641668>
- Calvete, E., Orue, I., Estévez, A., Villardón, L., & Padilla, P. (2010). Cyberbullying in adolescents: Modalities and aggressors' profile. *Computers in Human Behavior*, 26, 1128–1135.
- Camacho, A., Ortega-Ruiz, R., & Romera, E. M. (2021). Longitudinal associations between cybervictimization, anger rumination and cyberaggression. *Aggressive Behavior*, 47(3), 332–342. <https://doi.org/10.1002/ab.21958>
- Camacho, A., Runions, K., Ortega-Ruiz, R., & Romera, E. M. (2023). Bullying and cyberbullying perpetration and victimization: Prospective within-person associations. *Journal of Youth and Adolescence*, 52(2), 406–418. <https://doi.org/10.1007/s10964-022-01704-3>
- Camerini, A. L., Marciano, L., Carrara, A., & Schulz, P. J. (2020). Cyberbullying perpetration and victimization among children and adolescents: A systematic review of longitudinal studies. *Telematics and Informatics*, 49, Article 101362. <https://doi.org/10.1016/j.tele.2020.101362>
- Chan, S. F., La Greca, A. M., & Peugh, J. L. (2019). Cyber victimization, cyber aggression, and adolescent alcohol use: Short-term prospective and reciprocal associations. *Journal of Adolescence*, 74(1), 13–23. <https://doi.org/10.1016/j.adolescence.2019.05.003>
- Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 14(3), 464–504. <https://doi.org/10.1080/10705510701301834>
- Chen, J. K., Wu, C., & Wang, L. C. (2021). Longitudinal associations between school engagement and bullying victimization in school and cyberspace in Hong Kong: Latent variables and an autoregressive cross-lagged panel study. *School Mental Health*, 13(2). <https://doi.org/10.1007/s12310-021-09439-5>
- Chen, J. K., Yang, B., Wang, L. C., Chang, C. W., & Lin, C. Y. (2023). Is psychological distress a risk factor or an outcome of school violence and cyberbullying perpetrated by adolescents? A short-term longitudinal panel study. *Journal of Interpersonal Violence*, 38(3). <https://doi.org/10.1177/08862605231163249>
- Cho, S., & Galehan, J. (2019). The time-concurrent or time-ordered effect of Population Heterogeneity and State Dependence on Cyberbullying: Assessing lagged autoregression and cross-lagged regression models. *Computers in Human Behavior*, 100, 127–137. <https://doi.org/10.1016/j.chb.2019.06.003>
- Christina, S., Magson, N. R., Kakar, V., & Rapee, R. M. (2021). The bidirectional relationships between peer victimization and internalizing problems in school-aged children: An updated systematic review and meta-analysis. *Clinical Psychology Review*, 85, Article 101979. <https://doi.org/10.1016/j.cpr.2021.101979>
- Chu, X. W., Fan, C. Y., Liu, Q. Q., & Zhou, Z. K. (2018). Stability and change of bullying roles in the traditional and virtual contexts: A three-wave longitudinal study in Chinese early adolescents. *Journal of Youth and Adolescence*, 47(11), 2384–2400. <https://doi.org/10.1007/s10964-018-0908-4>
- Cogo-Moreira, H., Gusmoes, J. D., Valente, J. Y., Eid, M., & Sánchez, Z. M. (2023). Does #tamajunto alter the dynamic between drug use and school violence among youth? Secondary analysis from a large cluster-randomized trial. *European Child & Adolescent Psychiatry*, 32, 293–302. <https://doi.org/10.1007/s00787-021-01863-x>
- Cosma, A., Molcho, M., & Pickett, W. (2024). A focus on adolescent peer violence and bullying in Europe, central Asia and Canada. In *Health behaviour in school-aged children international report from the 2021/2022 survey* (Vol. 2) Copenhagen: WHO Regional Office for Europe. <https://iris.who.int/handle/10665/376323>
- Davis, A. C., Farrell, A. H., Brittain, H., Krygsman, A., Arnocky, S., & Vaillancourt, T. (2022). The dark triad and bullying in adolescence: A three-wave random intercept crosslagged panel analysis. *Journal of Research in Personality*, 96, 104178. <https://doi.org/10.1016/j.jrp.2021.104178>, 104111.
- Dawes, M. (2017). Early adolescents' social goals and school adjustment. *Social Psychology of Education*, 20, 299–328. <https://doi.org/10.1007/s11218-017-9380-3>
- Eden, J., & Roberto, A. J. (2021). The role of verbal aggression in cyberbullying perpetration and victimization by middle school students. *Future Internet*, 13(9), 9–223. <https://doi.org/10.3390/fi13090223>
- Erreygers, S., Vandebosch, H., Vranjes, I., Baillien, E., & De Witte, H. (2018). Positive or negative spirals of online behavior? Exploring reciprocal associations between being the actor and the recipient of prosocial and antisocial behavior online. *New Media & Society*, 20(9), 3437–3456. <https://doi.org/10.1177/1461444817749518>
- Escortell, R., Delgado, B., Baquero, A., & Martínez-Montequado, M. C. (2023). Special issue: Child protection in the digital age. Latent profiles in cyberbullying and the relationship with self-concept and achievement goals in preadolescence. *Child & Family Social Work*. <https://doi.org/10.1111/cfs.13024>
- Falla, D., Ortega-Ruiz, R., & Romera, E. M. (2023). Minimizing responsibility in the aggressive dynamics of bullying and its impact on other strategies of moral disengagement: A longitudinal study. *Current Psychology*, 42(36), 32512–32523. <https://doi.org/10.1007/s12144-022-04229-x>
- Fisher, B. W., Gardella, J. H., & Teurbe-Tolon, A. R. (2016). Peer cybervictimization among adolescents and the associated internalizing and externalizing problems: A meta-analysis. *Journal of Youth and Adolescence*, 45(9), 1727–1743. <https://doi.org/10.1007/s10964-016-0541-z>
- Forsberg, C., Wood, L., Smith, J., Varjas, K., Meyers, J., Jungert, T., & Thornberg, R. (2018). Students' views of factors affecting their bystander behaviors in response to school bullying: A cross-collaborative conceptual qualitative analysis. *Research Papers in Education*, 33(1), 127–142. <https://doi.org/10.1080/02671522.2016.1271001>
- Gámez-Guadix, M., Gini, G., & Calvete, E. (2015). Stability of cyberbullying victimization among adolescents: Prevalence and association with bully-victim status and psychosocial adjustment. *Computers in Human Behavior*, 53, 140–148.
- Gini, G., Pozzoli, T., Jenkins, L., & Demaray, M. (2021). Participant roles in bullying. In P. K. Smith, & J. O. Norman (Eds.), *The Wiley blackwell handbook of bullying: A comprehensive and international review of research and intervention* (pp. 76–95). Wiley Blackwell. <https://doi.org/10.1002/9781118482650.ch5>
- Giumetti, G. W., & Kowalski, R. M. (2022). Cyberbullying via social media and well-being. *Current Opinion in Psychology*, 45, Article 101314. <https://doi.org/10.1016/j.copsyc.2022.101314>
- Giumetti, G. W., Kowalski, R. M., & Feinn, R. S. (2022). Predictors and outcomes of cyberbullying among college students: A two wave study. *Aggressive Behavior*, 48(1), 40–54. <https://doi.org/10.1002/ab.21992>
- González-Cabrera, J., Díaz-López, A., Caba-Machado, V., Ortega-Barón, J., Echezarraga, A., Fernández-González, L., & Machimbarrena, J. M. (2022). Epidemiology of peer cybervictimization and its relationship with health-related quality of life in adolescents: A prospective study. *Journal of Adolescence*. <https://doi.org/10.1002/jad.12128>
- González-Cabrera, J., León-Mejía, A., Machimbarrena, J. M., Balea, A., & Calvete, E. (2019). Psychometric properties of the cyberbullying triangulation questionnaire: A prevalence analysis through seven roles. *Scandinavian Journal of Psychology*. <https://doi.org/10.1111/sjop.12518>
- González-Cabrera, J., & Machimbarrena, J. M. (2023). Quality of life and its relationship with bullying and cyberbullying: Face-to-face and online victimization and aggression among peers. In C. Martin, V. R. Preedy, & V. B. Patel (Eds.), *Handbook of anger, aggression and violence: Causes, pathology and treatments*. Springer. [http://10.03.239/978-3-030-98711-4\\_171-1](http://10.03.239/978-3-030-98711-4_171-1)
- González-Cabrera, J., Montiel, I., Ortega-Barón, J., Calvete, E., Orue, I., & Machimbarrena, J. M. (2021). Epidemiology of peer victimization and its impact on health-related quality of life in adolescents: A prospective study. *School Mental Health*. <http://10.1007/s12310-021-09421-1>
- González-Cabrera, J., Sánchez-Álvarez, N., Calvete, E., León-Mejía, A., Orue, I., & Machimbarrena, J. M. (2020). Psychometric properties of the triangulated version of the European bullying intervention Project questionnaire: Prevalence across seven roles. *Psychology in the Schools*, 57(1), 78–90. <https://doi.org/10.1002/pits.22320>
- Guo, S. (2016). A meta-analysis of the predictors of Cyberbullying Perpetration and Victimization. *Psychology in the Schools*, 53(4), 432–453. <https://doi.org/10.1002/pits.21914>
- Hellfeldt, K., López-Romero, L., & Andershed, H. (2019). Cyberbullying and psychological well-being in young adolescence: The potential protective mediation effects of social support from family, friends, and teachers. *International Journal of Environmental Research and Public Health*, 17(1), 45. <https://doi.org/10.3390/ijerph17010045>
- Holfeld, B., & Mishna, F. (2018). Longitudinal associations in youth involvement as victimized, bullying, or witnessing cyberbullying. *Cyberpsychology, Behavior, and Social Networking*, 21(4), 234–239. <https://doi.org/10.1089/cyber.2017.0369>
- Hoxmeier, C., Mennicke, A., & McMahon, S. (2020). Bystander intervention opportunities and prosocial behaviors among gender and sexual minority college students. *Journal of Interpersonal Violence*, 37(9–10), 6439–6465. <https://doi.org/10.1177/0886260520967131>
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Hu, L., Bentler, P. M., & Kano, Y. (1992). Can test statistics in covariance structure analysis be trusted? *Psychological Bulletin*, 112(2), 351–362. <https://doi.org/10.1037/0033-2909.112.2.351>
- Huang, J., Huebner, E. S., & Tian, L. (2022). Stability and changes in traditional and cyberbullying perpetration and victimization in childhood: The predictive role of depressive symptoms. *Journal of Interpersonal Violence*, 34, Article 17300. <https://doi.org/10.1177/08862605211028004>, 17324.
- Iranzo, B., Buelga, S., Cava, M., & Ortega-Barón, J. (2019). Cyberbullying, psychosocial adjustment, and suicidal ideation in adolescence. *Psychosocial Intervention*, 28(2), 75–81. <https://doi.org/10.5093/pi2019a5>
- Kasturiratna, K. T. A. S., Hartanto, A., Chen, C. H. Y., Tong, E. M. W., & Majeed, N. M. (2024). Umbrella review of meta-analyses on the risk factors, protective factors, consequences and interventions of cyberbullying victimization. *Nature Human Behavior*, 1–32. <https://doi.org/10.1038/s41562-024-02011-6>
- Kowalski, R. M., Limber, S. P., & Agatston, P. W. (2012). *Cyberbullying: Bullying in the digital age* (2nd ed.). Wiley Blackwell.

- Kwan, I., Dickson, K., Richardson, M., MacDowall, W., Burchett, H., Stansfield, C., Brunton, G., Sutcliffe, K., & Thomas, J. (2020). Cyberbullying and children and young people's mental health: A systematic map of systematic reviews. *Cyberpsychology, Behavior, and Social Networking*, 23(2), 72–82. <https://doi.org/10.1089/cyber.2019.0370>
- Mardia, K. V. (1970). Measures of multivariate skewness and kurtosis with applications. *Biometrika*, 57(3), 519–530. <https://doi.org/10.1093/biomet/57.3.519>
- Mardia, K. V. (1974). Applications of some measures of multivariate skewness and kurtosis in testing normality and robustness studies. *Sankya: The Indian Journal of Statistics, Series B*, 36(2), 115–128.
- Martín-Criado, J. M., Casas, J. A., & Ortega-Ruiz, R. (2021). Parental supervision: Predictive variables of positive involvement in cyberbullying prevention. *International Journal of Environmental Research and Public Health*, 18(4), 1562. <https://doi.org/10.3390/ijerph18041562>
- Menesini, E., & Salmivalli, C. (2017). Bullying in schools: The state of knowledge and effective interventions. *Psychology Health & Medicine*, 22(1), 240–253. <https://doi.org/10.1080/13548506.2017.1279740>
- Merlici, I. A., & Maftai, A. (2024). The moral maze of cyberbullying: Navigating the roles of victims, bystanders, and perpetrators in the cycle of harm. *Deviant Behavior*. <https://doi.org/10.1080/01639625.2024.2327563>. Advance online publication.
- Mishna, F., Khoury-Kassabri, M., Gadalla, T., & Daciuc, J. (2012). Risk factors for involvement in cyber bullying: Victims, bullies and bully-victims. *Children and Youth Services Review*, 34(1), 63–70. <https://doi.org/10.1016/j.childyouth.2011.08.032>
- Niessen, A. S. M., Meijer, R. R., & Tendeiro, J. N. (2016). Detecting careless respondents in web-based questionnaires: Which method to use? *Journal of Research in Personality*, 63, 1–11. <https://doi.org/10.1016/j.jrp.2016.04.010>
- Olweus, D. (1993). *Bullying at school. What we know and what we can do*. Backwell Publishing.
- Ortega-Barón, J., Machimbarrena, J. M., Díaz-López, A., Caba-Machado, V., Tejero-Clave, B., & González-Cabrera, J. (2024). Efficacy of a multi-risk Internet prevention program: Safety.net. *Revista de Psicodidáctica*. <https://doi.org/10.1016/j.psicoe.2024.02.001>
- Orue, I., Fernández-González, L., Machimbarrena, J. M., González-Cabrera, J., & Calvete, E. (2021). Bidirectional relationships between cyberbystanders' roles, cyberbullying perpetration, and justification of violence. *Youth & Society*. <https://doi.org/10.1177/0044118X211053356>
- Pabian, S., & Vandebosch, H. (2016). An investigation of short-term longitudinal associations between social anxiety and victimization and perpetration of traditional bullying and cyberbullying. *Journal of Youth and Adolescence*, 45(2), 328–339. <https://doi.org/10.1007/s10964-015-0259-3>
- Pabian, S., Vandebosch, H., Poels, K., & Van Cleemput, k. (2016). Exposure to cyberbullying as a bystander: An investigation of desensitization effects among early adolescents. *Computers in Human Behavior*, 62, 480–487. <https://doi.org/10.1016/j.chb.2016.04.022>
- Palladino, B. E., Nocentini, A., & Menesini, E. (2016). Evidence-based intervention against bullying and cyberbullying: Evaluation of the NoTrap! program in two independent trials. *Aggressive Behavior*, 42, Article 194206. <https://doi.org/10.1002/ab.21636>
- Pérez-Rodríguez, P., Machimbarrena, J. M., Ortega-Barón, J., Díaz-López, A., Caba-Machado, V., & González-Cabrera, J. (2024). Peer cybervictimization and cyberaggression as a function of developmental stage during adolescence: A preliminary study. *Acta Psychologica*. <https://doi.org/10.1016/j.actpsy.2024.104280>
- Romera, E. M., Carmona-Rojas, M., Ortega-Ruiz, R., & Camacho, A. (2022). Bidirectional association between normative adjustment and bullying perpetration in adolescence: A prospective longitudinal study. *Revista de Psicodidáctica*, 27(2), 132–140. <https://doi.org/10.1016/j.psicoe.2022.03.001>
- Runions, K. C., Salmivalli, C., Shaw, T., Burns, S., & Cross, D. (2018). Beyond the reactive-proactive dichotomy: Rage, revenge, reward, and recreational aggression predict early high school bully and bully/victim status. *Aggressive Behavior*, 44, 501–510. <https://doi.org/10.1002/ab.21770>
- Saarento, S., Garandeau, C. F., & Salmivalli, C. (2015). Classroom-and school- level contributions to bullying and victimization: A review. *Journal of Community & Applied Social Psychology*, 25(3), 204–218. <https://doi.org/10.1002/casp.2207>
- Saarento, S., & Salmivalli, C. (2015). The role of classroom peer ecology and bystanders' responses in bullying. *Child Development Perspectives*, 9(4), 201–205. <https://doi.org/10.1111/cdep.12140>
- Salmera-Aro, K. (2011). Stages of adolescence. In E. B. B. y M. J. Prinstein (Ed.), *Encyclopedia of adolescence* (pp. 360–368). Academic Press.
- Salmivalli, C. (2010). Bullying and the peer group: A review. *Aggression and Violent Behavior*, 15(2), 112–120. <https://doi.org/10.1016/j.avb.2009.08.007>
- Salmivalli, C. (2014). Participant roles in bullying: How can peer bystanders be utilized in interventions? *Theory Into Practice*, 53(4), 286–292. <https://doi.org/10.1080/00405841.2014.947222>
- Salmivalli, C., Laninga-Wijnen, L., Malamut, S. T., & Garandeau, C. F. (2021). Bullying prevention in adolescence: Solutions and new challenges from the past decade. *Journal of Research on Adolescence*, 31(4), 1023–1046. <https://doi.org/10.1111/jora.12688>
- Salmivalli, C., & Peets, K. (2018). Bullying and victimization. In K. Rubin, W. Bukowski, & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 302–321). Guilford Press.
- Sarmiento, A., Herrera-López, M., & Zych, I. (2019). Is cyberbullying a group process? Online and offline bystanders of cyberbullying act as defenders, reinforcers and outsiders. *Computer in Human Behavior*, 99, 328–334. <https://doi.org/10.1016/j.chb.2019.05.037>
- Scholte, R. H. J., Engels, R. C. M. E., de Kemp, R. A. T., Harakeh, Z., & Overbeek, G. (2007). Differential parental treatment, sibling relationships and delinquency in adolescence. *Journal of Youth and Adolescence*, 36(5), 661–671. <https://doi.org/10.1007/s10964-006-9155-1>
- Sjögren, B., Thornberg, R., & Pozzoli, T. (2024). Reciprocal longitudinal associations of defender self-efficacy with defending and passive bystanding in peer victimization. *Psychology in the Schools*, 61(5), 1766–1788. <https://doi.org/10.1002/pits.23134>
- Sorrentino, A., Esposito, A., Acunzo, D., Santamato, M., & Aquino, A. (2023). Onset risk factors for youth involvement in cyberbullying and cybervictimization: A longitudinal study. *Frontiers in Psychology*, 13, Article 1090047. <https://doi.org/10.3389/fpsyg.2022.1090047>
- Strindberg, J., Horton, P., & Thornberg, R. (2020). The fear of being singled out: Pupils' perspectives on victimization and bystanding in bullying situations. *British Journal of Sociology of Education*, 41(7), 942–957. <https://doi.org/10.1080/01425692.2020.1789846>
- Thornberg, R., & Jungert, T. (2014). School bullying and the mechanisms of moral disengagement. *Aggressive Behavior*, 40(2), 99–108. <https://doi.org/10.1002/ab.21509>
- Thornberg, R., Sjögren, B., Gini, G., & Pozzoli, T. (2024). Testing the reciprocal longitudinal association between pro-aggressive bystander behavior and diffusion of responsibility in Swedish upper elementary school students. *Social Psychology of Education*, 27(1), 215–235. <https://doi.org/10.1007/s11218-023-09839-2>
- Thornberg, R., & Wänström, L. (2018). Bullying and its association with altruism towards victims, blaming the victims, and classroom prevalence of bystander behaviors: A multilevel analysis. *Social Psychology of Education*, 21(5), 1–19. <https://doi.org/10.1007/s11218-018-9457-7>
- Tokunaga, R. S. (2010). Following you home from school: A critical review and synthesis of research on cyberbullying victimization. *Computers in Human Behavior*, 26(3), 277–287. <https://doi.org/10.1016/j.chb.2009.11.014>
- Tolmatcheff, C., Galand, B., & Roskam, I. (2022). Validation of the French version of the moral disengagement in bullying scale: Testing Bandura's conceptual model. *Journal of School Psychology*, 91, 81–96. <https://doi.org/10.1016/j.jsp.2022.01.002>
- Van Ouytsel, J., Lu, Y., Ponnet, K., Walrave, M., & Temple, J. R. (2019). Longitudinal associations between sexting, cyberbullying, and bullying among adolescents: Cross-lagged panel analysis. *Journal of Adolescence*, 73(1), 36–41. <https://doi.org/10.1016/j.adolescence.2019.03.008>
- Widaman, K. F., Ferrer, E., & Conger, R. D. (2010). Factorial invariance within longitudinal structural equation models: Measuring the same construct across time. *Child Development Perspectives*, 4(1), 10–18. <https://doi.org/10.1111/j.1750-8606.2009.00110.x>
- Xu, C., Xie, X., & Tang, Y. (2025). More cyber-ostracism, less prosocial behaviors? Longitudinal associations between cyber-ostracism and prosocial behaviors in Chinese adolescents. *Journal of Children and Media*, 19(18), 107–125. <https://doi.org/10.1080/17482798.2024.2402267>
- Zhou, J., Huebner, E. S., & Tian, L. (2022). Perceived parental warmth, peer perpetration, and peer victimization: Unraveling within-child associations from between-child differences. *Prevention Science*, 23(2), 295–305. <https://doi.org/10.1007/s11121-021-01325-5>