

RUNNING HEAD: CYBERBULLYING TEST

**Psychometric properties of the Cyberbullying Test, a screening instrument to measure
cybervictimization, cyberaggression, and cyberobservation**

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Abstract

The purpose of the study was to analyze the psychometric properties of the Cyberbullying Test. The sample included 3,026 participants from the Basque Country (northern Spain), aged 12 to 18 ~~years~~. Results confirmed high internal consistency and moderate temporal stability. Exploratory factor analysis yielded three moderately correlated factors (cyberobserver, cyberaggressor, and cybervictim). Confirmatory factor analysis ratified adequate model fit of the three ~~_factors_~~model. Convergent and discriminant validity were confirmed: (1) cybervictims use a variety of ~~conflict~~ ~~resolution~~ conflict resolution strategies, scoring high in neuroticism, openness, antisocial behavior, attention to their emotions, school-academic problems, shyness-withdrawal, psychopathological disorders, anxiety, and psychosomatic complaints, and low in agreeableness, responsibility, self-esteem, and social adjustment; and (2) cyberaggressors use many aggressive conflict~~_~~resolution strategies, scoring high in neuroticism, antisocial behavior, school-academic problems, psychopathological and psychosomatic disorders, and low in empathy, agreeableness, responsibility, emotion regulation, and social adjustment. The ~~investigation~~~~study confirms~~provides evidence of the test's reliability and validity ~~of the test~~.

Keywords: cyberbullying, adolescence, assessment, instrumental study.

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Introduction

The most basic definition of cyberbullying, and the one most researchers agree on, is that it is a form of bullying others by using electronic communication technologies (Kowalski, Giumetti, Schroeder, & Lattanner, 2014). In other words, it consists of using Information and Communication Technologies (ICT)—mainly Internet (e-mail, SMS, websites, blogs, online videogames, etc.) and mobile phones—to carry out psychological peer harassment. According to Smith et al. (2008), cyberbullying is an aggressive and intentional behavior repeated frequently over time by means of the use—by an individual or group—of electronic facilities-devices targeting a victim who cannot easily defend him- or herself.

Cyberbullying is similar to bullying in that it is a premeditated, intentional, and repetitive violent behavior, based on an asymmetric relationship of power-submission with another person. Nevertheless, cyberbullying presents some peculiarities that differentiate it from presential bullying, for example, the victims cannot escape (because they are constantly receiving messages on their mobile or computer), the amplitude-breadth of the audience (it reaches an infinite number of people), the bullies' invisibility, the duration (the harassment content may be permanent), as well as the speed and ease with which it is carried out. Cyberbullying is a type of bullying but it should be noted that the harm caused through the use of ICT is different from that produced by traditional violence. One of the differences is that a single behavior (for example, uploading a photo or video on the web) can greatly harm a person because, among other reasons, a photo or video can be instantaneously sent to a huge-quantitylarge number of people-individuals with a single click (Garaigordobil & Martínez-Valderrey, 2015) and may be durable. The rapid development and growth of this new form of harassment has generated the urgent need for its study (Garaigordobil, 2011).

Review of studies analyzing the prevalence of cyberbullying showed that violence through-using ICTs—and within it, the phenomenon of cyberbullying—has recently become

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a severe problem, present in all developed countries (Barlett, 2015; Garaigordobil, 2011, 2015; Kowalski & Limber, 2007; Tokunaga, 2010). Although still in its formative stages, a large amount of literature has reported the pervasive nature of cyberbullying. As with traditional bullying, the prevalence of cyberbullying is difficult to estimate because the measures used ~~are~~ until now have varied significantly; however, research indicates that approximately 30 to 70% of children report having been victimized by a cyberbully (Fenaughty & Harré, 2013; Stewart, Drescher, Maack, Ebesutani, & Young, 2014; Wade & Beran, 2011; Walrave & Heirman, 2011).

Results of a prevalence study carried out recently in the Basque Country ~~agree with~~ are similar to the data obtained in others countries: 69.8% of the sample was involved in cyberbullying (suffered, performed, or observed it ~~one or more times~~ once or more in the past year), 30.2% were cybervictims, 15.5% were cyberaggressors, and 65.1% were cyberobservers (Garaigordobil, 2015). ~~The Basque Country (nNorthern Spain), is one of the seventeen autonomous regions that make up of Spain, was granted powers of self-governance through its- Autonomy Statute of Since 1979-1979, the Basque Country has had an Autonomy Statute, meaning that it is self-governing. It is a small region with an area of 7,234.8 kKm² and a population of 2,174,033 inhabitants, located near the French border. According to the Basque Statistics Institute, it has an advanced industrial and technological development and a is well-developed industrially and technologically, and has a high rate of human development. The majority, according to the Basque Statistical Institute. A large percentage of the population belongs to the middle socio-economic-cultural level, without -and no extremes situations of poverty or wealth are observed.~~

Emotional harm ~~occurring as a consequence of~~ arising from cyberbullying is very important. Reviews (Garaigordobil, 2011; Hinduja & Patchin, 2010; Soler, Paretilla, Kirchner, & Forns, 2013; Stewart et al., 2014) have shown that: (1) *cybervictims* have

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feelings of social anxiety, depression, suicidal ideation, stress, fear, low self-esteem, anger and frustration, helplessness, nervousness, irritability, somatization, sleep disorders, concentration difficulties affecting academic performance, etc.; and (2) *cyberaggressors* are more likely to display moral disengagement, lack of empathy, difficulties following rules, problems due to their aggressive behavior, delinquent behavior, alcohol and drug consumption, dependence on technologies, truancy, etc. In addition, victims and aggressors are at risk for developmental problems that can persist into adulthood. At its most extreme point, cyberbullying can lead to suicide and youth violence.

The high prevalence and the negative consequences of cyberbullying reveal the need for systematic assessments to detect and intervene in these situations, which having negative impacts on human development, and thus requires assessment instruments. During the past decade, many investigations have focused on the analysis of cyberbullying, producing-generating some instruments to-for its assessment and identify-ification. Measuring cyberbullying is difficult because there are few valid and reliable instruments, and there is an ongoing debate about the most appropriate methodological approaches. There are currently two approaches: (1) assessing cyberbullying as a function of the means employed, for example, asking the frequency with which certain behaviors were suffered or carried out through Internet, e-mail, cellphone, etc.; and (2) measuring certain behavioral categories regardless of the means employed, for example, asking about behaviors such as lying, stealing someone's password, humiliating, etc. (see Menesini & Nocentini, 2009; Nocentini, Menesini, & Calussi, 2009).

Recent systematic reviews of cyberbullying assessment instruments have been performed-recently undergone systematic reviews (Berne et al., 2013; Stewart et al., 2014). Among the first instruments, we note the 88-item Cyberbullying Questionnaire (Smith, Mahdavi, Carvalho, & Tippett, 2006). The questionnaire was applied to 92 students, aged 11

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to_16, from 14 schools ~~of-in~~ London. It comprised multiple-choice questions, with some qualitative sections. It examined the incidence of cyberbullying in and out of school, distinguishing seven types: text message bullying, picture/video clip bullying (via mobile phone cameras), phone call bullying, email bullying, chat_room bullying, bullying through instant messaging, and bullying via websites.

Researchers generally use instruments that were developed for their specific studies, which has hindered the generalization of the nature and frequency of peer victimization across samples. Moreover, many measures have not been adequately researched in terms of their psychometric properties (Berne et al., 2013). Nevertheless, a few recent works have performed psychometric analyses, ~~providing-that-have-shown-support-for~~ the reliability and validity of some questionnaires.

Some cyberbullying questionnaires are unifactorial whereas others explore various factors. Some were designed to assess the frequency with which the informer is the aggressor or the victim of violence through cellphones or Internet. Among them, we note **the Berlin Cyberbullying-Cybervictimization Questionnaire (BCCQ; Schultze-Krumbholz & Scheithauer, 2009)**, the European Cyberbullying Intervention Project Questionnaire (ECIPQ) (Brighi et al., 2012), the Cyberbullying Questionnaire (CBQ) (Gámez-Guadix, Villa-George & Calvete, 2014), and the Cyberbullying Scale (CS) (Menesini, Nocentini, & Calussi, 2011). Another group of questionnaires specifically measure cybervictimization. Among them, **the Cybervictimization Scale (Akbulut, Levent-Sahin, & Eristi, 2010)**, the E-victimization scale (E-VS; Lam & Li, 2013), the Cyberbullying Scale (CBS; Stewart et al., 2014), the Cybervictimization Scale of the Revised Cyberbullying Inventory (RCBI; Topcu & Erdur-Baker, 2010) or the Cybervictimization Questionnaire (CBV; Álvarez-García, Dobarro & Nuñez, 2015) are unifactorial. **Among the most recent unidimensional instruments, the Cyberbullying Scale (CBS; Stewart et al., 2014) is notable for its psychometric properties.**

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The authors examined the factor structure and reliability of the CBS in 736 sixth- to twelfth-grade students in six Northern Mississippi schools. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) indicated that the CBS structure was best represented by a one-factor model. The CBS displayed strong psychometric properties, including excellent internal consistency (Cronbach's $\alpha = .94$) and significant positive correlations with the related constructs of anxiety, depression, and loneliness. Results support the CBS as a measure of cybervictimization among adolescents.

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Among the multifactorial instruments are: the two-factor Adolescent Victimization through Mobile Phone and Internet Scale (CYBVIC; Buelga, Cava, & Musitu, 2012); the three-factor Cybervictim and Bullying Scale (CVBS; Çetin, Yaman, & Peker, 2011), measuring verbal cyberbullying, concealing identity, and cyberfalsification; or the four-factor Online Victimization Scale (OVS; Tynes, Rose, & Williams, 2010), measuring general victimization, sexual harassment, individual racial discrimination, and vicarious racial discrimination.

Despite an increasing body of research on cyberbullying, there is no consensus about the best way to define and measure it. The construct of cyberbullying is problematic because it is complex, and difficult to operationalize and subject to varying interpretations across populations. Its classification becomes almost immediately obsolete due to the new technologies makes any classification obsolete almost immediately. This construct may be interpreted differentially in different populations, as the complexity and fast evolution of the new technologies makes any classification obsolete almost immediately. In view of these conceptual and methodological difficulties, the measurement of cyberbullying must bedemands improvedimprovement. In general, theoretical and empirical efforts are needed to overcome these difficulties and to directly capture the meaning of cybernetic problems for children, adolescents, and youth in the digital era.

Within this context, we designed the Cyberbullying Test to which assesses 15

behavioral categories regardless of the means ~~employed~~used, collecting three types of information: adolescents and youths report their own experiences of cybervictimization, the ir own cyberaggressive behaviors ~~they perform~~, and the cyberbullying behaviors they observe in others. ~~The instrument's triangular perspective. Among the novelties of the instrument compared is a novelty compared~~ with previous assessment tools, ~~is its triangular perspective, which allowing the appraisal of~~ apprai~~each individual's sal of the~~ degree of cybervictimization, cyberaggression, and cyberobservation ~~of each individual~~.

The goal of this investigation is to perform psychometric analyses providing data about the instrument's reliability (internal consistency, test-retest reliability) and validity (exploratory and confirmatory factor analysis, intercorrelations, convergent and discriminant validity). Within this framework, we hypothesize that the Cyberbullying Test will present strong psychometric guarantees of reliability and validity according to the standards of test construction, including ~~an acceptable model-good fit to-for thea three -factors -model~~ (cybervictimization, cyberaggression, and cyberobservation).

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Method

Participants

The sample comprised 3,026 participants from the Basque Country (northern Spain), aged 12 to 18 ~~years~~, 1,469 (48.5%) males and 1,557 (51.5%) females. The participants were ~~studying~~ Secondary Education (75.4%) and High School (24.6%) ~~students, and were~~ enrolled in various public (45.6%) and private (54.4%) schools ~~in~~of the Basque Country. The distribution of the sample by sex and age is ~~presented~~shown in Table 1. To obtain a representative sample of the Basque Country, we consulted the latest population survey of the Basque Statistical Institute, confirming a population of 101,757 students ~~of~~enrolled in Compulsory Secondary Education and High School. Using a 99% confidence level and a

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sample error of .024 for a population variance of .50, a representative sample should include 2,802 students. To select a representative sample of students from the Basque Country, we used a stratified, proportional, and randomized sampling technique, taking into account the proportionality of the schools in each province and balancing the diverse conditions (socio-economic-cultural levels and school types of ~~type of school~~: public-private, urban-rural, secular-religious, etc.).

Insert Table 1

Instruments

~~The Cyberbullying Test was administered along with 7 assessment instrument to~~
~~order to~~ determine ~~the its~~ reliability and validity ~~of the Cyberbullying Test, it was~~
~~administered along with 7 assessment instruments.~~ The Cyberbullying Test assesses 15
 cyberbullying behaviors (see Appendix) through 45 items, grouped around the role performed
 in the situation of aggression ~~situation~~: cybervictim, cyberaggressor, and cyberobserver.
 Participants ~~must~~ read the statements describing the behaviors and report the frequency with
 which these behaviors were suffered, performed, or observed during the past year. Each
 behavior is scored (*never* = 0, *sometimes* = 1, *several times* = 2, *always* = 3); and a direct
 global score is obtained for each role, respectively. The test provides information on 4 indices
 of cyberbullying: level of cybervictimization, cyberaggression, cyberobservation and
 aggressive-cybervictimization. These indices provide the mean score of these behaviors
 suffered, performed, and witnessed in the past year. The test also provides cut-off points to
 determine whether the respondent has "no problems", is "at risk", or has a "problem" in the
 four indices. The establishment of the two cut-off points delimiting these three score ranges is
based on statistical criteria. Respondents with scores equal to or higher than percentile 85
(about one standard deviation above the mean) are considered to be within the "at risk" range

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of the Cyberbullying Test, and respondents with scores equal to or higher than percentile 95 (two standard deviations above the mean) are considered to be within the “problem” range.

In addition, the following 7 assessment instruments with psychometric guarantees (see manuals) were also administered. The Empathy Questionnaire (EQ; Mehrabian & Epstein, 1972) assesses the capacity to cognitively and affectively respond to other people’s emotions. The Conflictalk measures three conflict management styles in youth and adolescents (Kimsey & Fuller, 2003): Aggressive or self-oriented (wanting to do everything one’s own way, being aggressive and authoritarian when dealing with conflict), Cooperative or problem-oriented (seeking the cause of conflict and specifically identifying the problem in collaboration with the other to find the best solution and cooperative action), and Avoidant or other-oriented (thinking that conflict is always bad, dealing passively with it). The NEO Five-Factor Inventory (NEO-FFI; Costa & MacCrae, 1999; Spanish adaptation by Cordero, Pamos, & Seisdedos, 1999) measures five big personality factors: (1) Neuroticism (maladapted, emotionally unstable, with a tendency to experience negative feelings such as fear, melancholy, shame, anger, guilt, etc.); (2) Extraversion (outgoing, sociable, assertive, active, talkative, likes excitement and stimulation, cheerful, energetic, and optimistic); (3) Openness (open, unconventional, given to questioning authority and willing to accept new ethical, social, and political ideas); (4) Agreeableness (friendly, altruistic, sympathetic towards others, willing to help); and (5) Responsibility (responsible, strong-willed, ~~determined to achieve~~ goal-oriented, ~~tends to have ing toward~~ good academic-professional performance, conscientious, punctual, and reliable). The Antisocial-Delinquent Behavior Questionnaire (AD; Seisdedos, 1995) assesses antisocial behaviors such as ~~entering-visiting~~ a banned site, painting graffiti, breaking or throwing other peoples' possessions on the floor, fighting with others, hitting, insulting, or using offensive language). The Rosenberg Self-esteem Scale (RSE; Rosenberg, 1965) assesses general self-esteem with statements focusing on global

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feelings of self-appraisal. The Trait Meta-Mood Scale (TMMS24; Salovey, Mayer, Goldman, Turvey, & Palfai, 1995; Spanish adaptation by Fernández-Berrocal, Extremera, & Ramos 2004) assesses intrapersonal emotional intelligence with three factors: Attention, Clarity, and Emotional repair. Attention to Feelings is the amount of attention paid to one's emotional states; Emotional Clarity refers to understanding one's emotional states; and Emotional Repair is the ability to regulate one's emotional states (the belief in one's ability to release and regulate negative emotional states and to extend positive ones). The Behavioral Problems Scale (parents' assessment) (BPS; Navarro, Peiró, Llácer, & Silva, 1993) includes 99 items grouped into 7 scales: School-academic problems (related to low academic performance), Antisocial behavior (behaviors that can be classified as aggressive and behaviors that, while not aggressive, might impair social relationships), Shyness-withdrawal (tendency to solitude and susceptibility in social relationships), Psychopathological disorders (serious problems which generally have a depressive component), Anxiety problems (behaviors expressing fear and/or generalized anxiety), Psychosomatic disorders (physical disorders without a medical cause), and a Positive scale of Social Adjustment (adjustment to social rules).

Procedure

This instrumental study was carried out using a prospective, single group, *ex post facto*, transversal design. ~~With regard to the design. The~~ procedure ~~established;~~ the following phases ~~were established:~~ (1) ~~we sent a~~ letter ~~was sent~~ to the directors of the ~~schools randomly~~ selected ~~randomly schools taken~~ from the list of schools in ~~the~~ Basque Country, explaining the project and requesting their collaboration; (2) ~~w~~We interviewed those who agreed to collaborate, ~~introducing to present~~ the project and ~~hand out~~distributing the informed consent forms for the participants' parents to sign ~~(i-~~If a director of a selected school refused to collaborate, the procedure was repeated with the next school on the list, taking into account

the type (public-private) and/or the socio-economic-cultural level of the excluded school));

(3) ~~a~~After receiving the parents' consent, the research team (Psychology graduates~~s~~ and Ph.D. students) administered the assessment instruments. The ~~study was approved by the Ethic Committee of the Basque Country~~ Ethics Committee of the University of the Basque ~~Country approved the study~~ University.

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Analysis

Reliability: to analyze internal consistency, Cronbach's alpha was calculated for the 45 items of the Cyberbullying Test and each ~~one~~ of its factors. As the test provides ordinal scores (no problem, at risk, problem); to calculate test-retest reliability, we used the ordinal gamma statistic, a measure of rank correlation indicating the strength of the association between ordinal variables. Like the Pearson correlation coefficient, ~~its~~ values range between -1 and +1.

Validity: after randomly dividing the sample into two ~~partsgroups~~, exploratory factor analysis (EFA) was used to analyze the first ~~partgroup~~, and confirmatory factor analysis (CFA) for the second ~~partgroup~~. In addition, the correlations of the items of each factor with the total score were calculated for cybervictimization, cyberaggression, and cyberobservation, respectively. Subsequently, to analyze convergent and discriminant validity, partial correlation coefficients were calculated between cybervictimization and cyberaggression and diverse variables (empathy, conflict resolution, personality traits, self-esteem, emotional intelligence, antisocial behavior, and behavioral problems), while controlling for the effects of sex and age. To assess whether the characteristics of cybervictims of this study converge with those obtained in previous studies, we performed analysis of variance of the scores obtained in cybervictimization and cyberaggression with the rest of the variables. The analyses were carried out with the SPSS 21.0 and EQS 6.1 programs.

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Results

Reliability: Internal consistency and test-retest reliability

The Cronbach alpha coefficients obtained for the 45 items were high ($\alpha = .91$), as were those obtained for its 3 factors, cybervictimization ($\alpha = .82$), cyberaggression ($\alpha = .91$) and cyberobservation ($\alpha = .87$), showing evidence of the test's internal consistency ~~of the test~~. To calculate test-retest reliability, we used a sample of 83 adolescents aged ~~from~~ 12 to 16, who completed the test two times, with a 3-month interval. The results of the correlation (ordinal gamma) between the scores at both applications (see Table 2) showed moderate values of temporal stability, suggesting that adolescents who suffer, perform, and observe cyberbullying behaviors are fairly likely to continue doing so three months later.

Insert Table 2

Exploratory Factor Analysis (EFA) and inter-scale correlations

Firstly, principal component analysis was conducted to examine test dimensionality. Previously, the Kaiser-Meyer-Olkin sample adequacy measurement (KMO) and Bartlett's sphericity test were calculated. The KMO index yielded a value of .93, which can be considered adequate, and Bartlett's test was statistically significant ($\chi_{990} = 40959.99$, $p < .001$), indicating that principal component analysis was appropriate. We used Varimax factor rotation method. Taking into account the Kaiser factor-extraction criterion, we extracted three factors with Eigenvalues-eigenvalues higher than 1, explaining 42.39% of the variance (see Table 3). Considering the value .30 as the cut-off point to assign an item to a factor, the structure of each of the three obtained factors was very clear. The first factor comprised 15 items concerning the role of cyberaggressor, the second one had 15 items referring to the role

of cyberobserver, and the third included 15 items referring to the role of cybervictim. These data confirmed the expected factor structure of the test.

Insert Table 3

Pearson correlations between the 15 items of cybervictimization and the total [cybervictimization] ~~scale~~-score were calculated, as well as correlations between ~~the~~ cyberaggression and cyberobservation items with the total scores of these scales, respectively. The results revealed moderate and high correlations ($p < .001$) between the items and their respective scales (cybervictimization, $r = .45 - .63$; cyberaggression $r = .66 - .78$; cyberobservation $r = .55 - .68$). Moderate correlations were found between cybervictimization and cyberaggression ($r = .48$), between cybervictimization and cyberobservation ($r = .44$), and between cyberaggression and cyberobservation ($r = .39$).

Confirmatory Factor Analysis (CFA)

Secondly, the fit of the three-factor model was examined with CFA, showing a good statistical fit, $\chi^2 = 4604.73$ (942), $p < .000$, $\chi^2/df = 4.88$, Satorra-Bentler $\chi^2/df = 1.28$, CFI = .91, NNFI = .90, GFI = .92. The model had a RMSEA value of .056, with an adequate 90% confidence interval: CI [.056, .063], and SRMR was .050. Overall, the fit indices suggested acceptable fit of the model, and the NNFI and CFI indicated that the model fit the data well.

Convergent and discriminant validity: relations between cybervictimization/cyberaggression and behavioral, cognitive, emotional, and social variables

Partial correlation coefficients (controlling for the effects of sex and age) were calculated between cybervictimization and cyberaggression and numerous variables. The results (see Table 4) showed positive correlations between cybervictimization and the use of

conflict-resolution strategies (aggressive, passive, cooperative), neuroticism, openness, antisocial behavior, emotional perception, and diverse behavioral problems assessed by parents (school-academic problems, antisocial behavior, shyness-withdrawal, psychopathological disorders, anxiety problems, psychosomatic disorders). Negative correlations were found between cybervictimization and agreeableness, responsibility, self-esteem, and social adjustment.

Regarding cyberaggression, the coefficients obtained confirmed significant positive relationships with aggressive conflict-resolution, neuroticism, antisocial behavior, and behavioral problems (school-academic problems, antisocial behavior, shyness-withdrawal, psychopathological disorders, anxiety problems, psychosomatic disorders). Negative correlations were found between cyberaggression and empathy, agreeableness, responsibility, self-esteem, emotional intelligence (perception, comprehension, emotion regulation), as well as with social adjustment.

Insert Table 4

Convergent and divergent validity: Profiles of cybervictims and cyberaggressors

To ratify validity, the participants were divided into cybervictims (they had received some aggression through electronic means in the past year) and non-cybervictims (they had not suffered any cyberbullying behavior), as well as cyberaggressors (they had performed cyberbullying behaviors in the past year) and non-cyberaggressors (they had not performed any cyberbullying behavior).

To assess whether the characteristics of cybervictims and cyberaggressors of this study were similar to those obtained in prior studies (confirming test validity), we analyzed the participants' profiles, that is, the characteristics of those who had been cybervictims and cyberaggressors versus those who had not. For this purpose, we performed analysis of

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variance with the scores obtained in diverse behavioral, cognitive, emotional, and social variables, the results of which are presented in Table 5.

Insert Table 5

Table 5 shows that cybervictims displayed: (1) significantly greater use of cooperative, passive, and aggressive responses as a conflict-resolution technique, and higher levels of neuroticism, antisocial behavior, school-academic problems, shyness-withdrawal, psychopathological disorders, anxiety, and psychosomatic problems; and (2) significantly lower levels of agreeableness, responsibility, self-esteem, and social adjustment. Cybervictims also showed significantly more openness and a high emotional perception of their emotions. Nevertheless, the effect size was low, except for neuroticism. No differences were found in empathy, extroversion, comprehension, and emotion regulation.

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Cyberaggressors (see Table 5) displayed: (1) significantly greater use of aggressive and passive conflict-resolution techniques, higher neuroticism, antisocial behavior, school-academic problems, psychopathological disorders, and psychosomatic problems; and (2) significantly lower levels of empathy, agreeableness, responsibility, self-esteem, emotion regulation, and social adjustment. The effect size was medium-high in some variables (aggressive conflict resolution, antisocial behavior, agreeableness). No significant differences were found in the use of cooperative conflict-resolution strategies, extroversion, openness, emotional perception and comprehension understanding, shyness-withdrawal, and anxiety disorders.

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Discussion

The psychometric analyses of the Cyberbullying Test showed a high level of internal consistency. Moreover, moderate values of temporal stability were confirmed, suggesting that adolescents who suffer, perform, and observe cyberbullying behaviors are fairly likely to continue doing so three months later, although direct participation, either as a victim or an

aggressor, seems more variable over time. These results are similar to those found by other authors analyzing the temporal stability of cyberbullying behaviors (Del Rey, Elipe, & Ortega-Ruiz, 2012). Therefore, the instrument shows evidence of an adequate level of reliability.

The results of the EFA yielded three factors (cyberobserver, cyberaggressor, and cybervictim), ratifying the expected factor structure. In general, high correlations were found between the items and the total score of each ~~one~~ of the three factors, as well as moderate correlations between the three scales. The CFA confirmed an adequate fit to a three-factor model. Unlike other assessment instruments that collect information about cybervictims and cyberaggressors, the Cyberbullying Test also identifies cyberobservers, a significant role in the phenomenon of harassment that has rarely been taken into account in other tests. This is important because the role of observers in cyberbullying is crucial. Bullying in all its forms (face-to-face and technological) is largely perpetuated as a result of the silence and inaction of ~~the~~ observers (who tend to say nothing due to lack of empathy or ~~to~~ out of fear of becoming the target of the aggressors). Therefore, an instrument that identifies ~~the~~ observers may be helpful, as it would allow us to implement actions to encourage their active involvement, to denounce what they witness and to support the victim, which would surely inhibit ~~the~~ harassment. In addition, this information may lead to the implementation of more qualitative studies on the role of observers, asking them, for example, what actions they undertake when they witness situations of cyberbullying, to whom they communicate what they witnessed, the reasons for their behavior, their feelings when witnessing such situations, etc. Moreover, the instrument's emphasis on ~~the~~ observers could be disseminated through ~~the~~ social communication media in order to raise awareness ~~about~~of the importance of their role ~~in~~ in eradicating ~~the~~ eradication of bullying in all its forms.

The results of the analyses of convergent and discriminant validity suggest that

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cybervictims tend to use a variety of conflict-resolution strategies, obtaining high scores in neuroticism, openness, antisocial behavior, school-academic problems, shyness-withdrawal, psychopathological disorders, anxiety, and psychosomatic complaints. In addition, they pay considerable attention to their emotions and obtain low scores in agreeableness, responsibility, self-esteem, and social adjustment. Cyberaggressors use many aggressive conflict-resolution strategies, scoring high in neuroticism, antisocial behavior, school-academic problems, and psychopathological and psychosomatic disorders. They also obtain low scores in empathy, agreeableness, responsibility, emotion regulation and social adjustment. As a whole, the results confirm the validity of the test, as they are consistent with the profiles of cybervictims and cyberaggressors identified in other studies.

This study provides a tool to assess cyberbullying with psychometric guarantees of reliability and validity in a broad, representative sample, and the test is easy to administer, score, and interpret. Compared with previously designed instruments (Alvarez-García et al., 2015; Brighi et al., 2012; Gámez-Guadix et al., 2014; Menesini et al., 2011): (1) It employs a triangular perspective, collecting information about the level of cybervictimization, cyberaggression, and cyberobservation in students between-aged 12 and to 18-years-of-age; and (2) It has standardized norms, to-appraisinge the four indices of cyberbullying (cybervictimization, cyberaggression, cyberobservation, and aggressive-cybervictimization).

In view of the high prevalence of cyberbullying (Fenaughty & Harré, 2013; Garaigordobil, 2015; Stewart et al., 2014; Topçu et al., 2008; Wade & Beran, 2011; Walrave & Heirman, 2011) and its negative effects (Hinduja & Patchin, 2010; Ortega et al., 2012; Soler et al., 2013; Stewart et al., 2014), these results have practical implications: (1) in-for assessment, by emphasizing the importance of assessing cyberbullying systematically in all the-schools; and (2) forin intervention, by because they allow us to-identifying relevant variables that the programs should contain-include to prevent to-prevent and-intervenand

Comentado [SMS15]: Something has “practical implications” for something else.

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intervene e-in cyberbullying (Garaigordobil & Martínez-Valderrey, 2014ab, 2015), which should promote socio-emotional development by stimulating social adjustment, self-esteem, prosociability, comprehension and expression of emotions, empathy, agreeableness, etc. Applied in educational settings, these programs can help to decrease cybervictimization and cyberaggression.

As a limitation of the study, we note the use of self-reports, due to their inherent social desirability ~~involved~~. Hence, in the future, it is recommended to contrast the results of self-reports, for example, with data obtained from sociometric or hetero-report techniques by peers, teachers, and parents. The study also has the inherent-intrinsic limitations of anonymous survey-based studies in general, as well as the specific sociolinguistic or ethnographic limitations of this particular survey group. Cross-cultural validation of the test could be a ~~Another future line of research could be to perform a cross-cultural validation of the test.~~ In this sense, we note that the test is currently being applied in various countries (Argentina, Meéxico, Colombia) wherefore data will be available ~~, so in the near future, there will be available data~~ to analyze its cross-cultural validity. Furthermore, a ~~Another interesting line of future~~ future line of research would ~~could~~ be to apply the test to children abetween-ged 10 to -11-years. The test has currently been applied to a representative sample of 1,993 children-enrolled-in fifth and sixth graders of Primary Education of-in the Basque Country. The work has revealed the suitability of the test for application during late childhood, and in the future, the norms established with this sample will be incorporated included in the test manual.

In addition, it would be useful to carry out qualitative studies asking victims, aggressors, and observers open questions. For example, by asking: (1) the victims+ what actions they performed, to whom did they report the situation, what they felt because-as a result of the situation, the effects of the experience, etc.; (2) the aggressors+ how long have

Comentado [SMS16]: Simplemente por no repetir "inherent" de la primera frase

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they have bullied, who ~~do~~ they bully, ~~is it~~ whether they bully individually or in groups, why they ~~do it~~ bully, what ~~do~~ they feel when they bully others; and (3) the *observers*: what ~~do~~ they do or whom ~~do~~ they inform when they observe a classmate bullying others, how ~~do~~ they feel when witnessing these behaviors, etc. Collecting information on the known strategies for dealing with this situation, whether as victims or observers. It would also be useful have practical implications for intervention ~~to collect information on the known strategies for dealing with this situation, either as victims or as observers.~~

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Appendix. Cyberbullying behaviors explored by the Cyberbullying Test

1. Have they ever sent you offensive and insulting messages by cellphone or Internet?
2. Have you ever received offensive and insulting calls on your cellphone or by Internet (Skype...)?
3. Have you ever been assaulted in order to tape the assault and hang it on the Internet?
4. Have they ever diffused your private or compromising pictures or videos by Internet or cellphone?
5. Have they ever taken pictures of you without your permission in places like locker rooms, beaches, or toilets and hung them on the Internet or diffused them by cellphone?
6. Have you ever received anonymous calls in order to scare or frighten you?
7. Have they ever blackmailed or threatened you with calls or messages?
8. Have they ever harassed you sexually by cellphone or on the Internet?
9. Has anybody ever signed your blog, pretending to be you, making slandering comments, lying, or revealing your secrets?
10. Have they ever stolen your password to prevent your access to your blog or email?
11. Have they ever touched up your photos or videos to diffuse them through social networks or YouTube in order to humiliate you or make fun of you?
12. Have they ever harassed you in order to isolate you from your social network contacts?
13. Have they ever blackmailed you, making you do things you did not want to do in order to prevent them from diffusing your intimate matters on the network?
14. Have they ever threatened to kill you or your family by cellphone, the social networks, or any other type of technology?
15. Have they ever slandered you through the Internet, telling lies about you in order to discredit you? Have they ever spread rumors about you in order to harm you?

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

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Table 1. Description of the sample: frequency and percentage of males and females in the three age groups

	12-13 years	14-15 years	16-18 years	Total
Males	543(51.2%)	536(49%)	390(44.8%)	1,469(48.5%)
Females	518(48.8%)	558(51%)	481(55.2%)	1,557(51.5%)
Total	1,061(100%)	1,094(100%)	871(100%)	3,026(100%)

Table 2. Test-retest reliability

	Test		Retest		Gamma
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Cybervictimization	0.90	3.41	1.51	3.80	.63
Cyberaggression	0.25	0.93	0.70	1.77	.74
Cyberobservation	2.60	2.94	3.37	5.21	.80
Aggressive-cybervictimization	1.16	3.69	2.20	5.43	.77

Table 3. Rotated factor matrix

Item	Factor 1 cyberaggressor	Factor 2 cyberobserver	Factor 3 cybervictim
13.	.814	.080	.098
14.	.811	.135	.067
7.	.762	.129	.127
11.	.752	.088	.152
8.	.718	.151	.028
5.	.709	.099	.191
12.	.703	.179	.123
2.	.679	.157	.065
4.	.678	.130	.055
9.	.673	.093	.175
3.	.666	.080	.083
15.	.636	.197	.118
1.	.589	.211	.149
10.	.587	.161	.129
6.	.586	.247	.143
11	.042	.681	.098
9.	.126	.665	.112
6.	.079	.662	.113
7.	.052	.646	.140
1.	.061	.640	.126
12.	.178	.635	.059
15.	.052	.628	.093
10.	.094	.622	.116
13.	.175	.606	.153
2.	.100	.601	.132
4.	.166	.592	.117
5.	.185	.557	.133
8.	.283	.533	.172
3.	.127	.528	.178
14.	.269	.500	.184
2.	.146	.105	.622
1.	.009	.109	.589
14.	.416	.021	.580
15.	.033	.257	.576
13.	.144	.126	.573
7.	.122	.144	.571
6.	.037	.129	.546
12.	.084	.102	.538
11.	.019	.064	.534
10.	.025	.184	.509
5.	.299	.141	.507
4.	.168	.083	.492
9.	.075	.240	.484
8.	.288	.071	.415
3.	.222	.061	.411
% variance explained	26.22	9.68	6.49

Extraction method: maximum likelihood.

Table 4. Partial correlations between cybervictimization and cyberaggression with behavioral, cognitive, emotional and social variables

	Cybervictimization	Cyberaggression
Empathy	-.02	-.14***
Conflict resolution		
Cooperative	.09***	.00
Aggressive	.11***	.15***
Avoidant	.13***	.03
Personality dimensions		
Neuroticism	.18***	.08***
Extraversion	-.00	-.01
Openness	.06***	.01
Agreeableness	-.12***	-.16***
Responsibility	-.08***	-.10***
Antisocial behavior	.13***	.17***
Self-esteem	-.12***	-.07***
Emotional Intelligence		
Emotional perception	.06***	-.03*
Emotional understanding	.00	-.06***
Emotional regulation	.01	-.08***
Behavioral Problems		
School-academic problems	.17***	.14***
Antisocial behavior	.18***	.17***
Shyness-withdrawal	.10***	.05*
Psychopathological disorders	.19***	.12***
Anxiety problems	.09***	.04*
Psychosomatic disorders	.13***	.11***
Social adjustment	-.12***	-.12***
Behavioral problems total	.20***	.15***

Note: * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 5. Profiles of cybervictims and cyberaggressors in behavioral, cognitive, emotional and social variables

	Non- Cybervictim (<i>n</i> = 2,114)	Cybervictim (<i>n</i> = 912)	<i>F</i> _{1, 3024} victimization	<i>d</i>	Non- Cyberaggressor (<i>n</i> = 2,557)	Cyberaggressor (<i>n</i> = 469)	<i>F</i> _{1, 3024} aggression	<i>d</i>
	<i>M</i> (<i>DT</i>)	<i>M</i> (<i>DT</i>)			<i>M</i> (<i>DT</i>)	<i>M</i> (<i>DT</i>)		
Empathy	16.11(3.74)	16.38(3.67)	3.10ns	0.07	16.38(3.67)	15.13(3.83)	44.36***	0.33
Conflict resolution								
Cooperative	15.94(5.95)	17.13(5.95)	54.54***	-.19	16.24(5.97)	16.55(6.04)	1.01ns	-.05
Aggressive	9.81(3.57)	10.59(3.94)	27.43***	-.20	9.72(3.45)	11.83(4.39)	130.98***	-.53
Avoidant	11.56(3.68)	12.67(3.81)	24.64***	-.29	11.80(3.74)	12.42(3.81)	10.52***	-.16
Personality dimensions								
Neuroticism	19.71(7.24)	23.56(7.49)	159.07***	-.52	20.51(7.47)	22.85(7.75)	34.38***	-.30
Extraversion	33.37(6.74)	33.54(7.16)	0.36ns	-.02	33.37(6.82)	33.68(7.13)	0.71ns	-.04
Openness	24.95(6.87)	26.38(7.07)	24.89***	-.20	25.36(7.02)	25.49(6.62)	0.12ns	-.01
Agreeableness	29.39(5.87)	27.76(6.15)	43.92***	.27	29.46(5.86)	25.80(5.87)	138.41***	.62
Responsibility	28.40(7.06)	26.78(6.78)	31.09***	.23	28.41(6.95)	25.05(6.71)	84.23***	.49
Antisocial behavior	7.18(5.18)	9.07(5.40)	78.83***	-.35	7.16(5.14)	11.07(5.05)	217.81***	-.76
Self-esteem	30.15(5.26)	28.55(5.10)	55.76***	.30	29.88(5.22)	28.50(5.34)	25.23***	-.26
Emotional Intelligence								
Emotional perception	24.72(7.04)	26.37(7.56)	30.89***	-.22	25.19(7.11)	25.32(7.91)	0.11ns	-.01
Emotional understanding	25.03(6.72)	24.90(6.78)	0.23ns	.01	25.05(6.75)	24.64(6.68)	1.32ns	.06
Emotional regulation	26.29(6.46)	25.96(6.76)	1.49ns	.04	26.37(6.47)	25.20(6.96)	11.50***	.17
Behavioral Problems								
School-academic problems	5.57(5.32)	7.68(6.42)	45.94***	-.35	5.81(5.55)	8.24(6.30)	37.23***	-.40
Antisocial behavior	5.11(4.42)	6.88(5.31)	47.27***	-.36	5.26(4.50)	7.64(5.62)	52.57***	-.46
Shyness-withdrawal	6.25(3.78)	7.07(3.96)	14.90***	-.21	6.41(3.84)	6.91(3.89)	3.39ns	.12
Psychopathological disorders	3.17(2.91)	4.45(3.99)	51.41***	-.36	3.42(3.19)	4.11(3.81)	8.94**	-.19
Anxiety problems	4.32(2.94)	5.00(3.19)	16.55***	-.22	4.46(3.01)	4.81(3.01)	2.74ns	-.11
Psychosomatic disorders	1.38(1.87)	2.00(2.31)	31.75***	-.29	1.47(1.96)	2.04(2.31)	16.45***	-.26
Social adjustment	25.60(3.90)	24.76(4.24)	14.74***	.20	25.56(3.84)	24.22(4.76)	22.86***	.30
Behavioral problems total	25.79(15.73)	33.08(19.09)	62.53***	-.41	26.81(16.41)	33.74(19.33)	34.18***	-.38

Note: ns = nonsignificant, *d* = Cohen's *d*. ** *p* < .01. *** *p* < .001.

Con formato: Inglés (Estados Unidos)