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Doctoral Thesis

**Sexting among adolescents:  
Profiles, prevalences and the  
development of the new A-SextS  
measurement scale**

By

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Under the supervision of

**Dra. Emelina López González**

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Doctoral Programme in Education



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# SEXTING AMONG ADOLESCENTS: PROFILES, PREVALENCES AND THE DEVELOPMENT OF THE NEW A-SEXTS MEASUREMENT SCALE



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DE VALÈNCIA

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## Informe favorable

Los doctores, Emelina López González, con NIF 00401672T, y Josep Maria Losilla Vidal, con NIF 77832898R, como directores de la Tesis Doctoral de Cristian Mollà Esparza, identificado con NIF 48605647T, alumno del Programa de Doctorado en Educación (Código 3117), emiten este INFORME FAVORABLE en relación a la Tesis Doctoral titulada: *Sexting en adolescentes: Perfiles, prevalencias y desarrollo de la nueva escala de medida A-SextS*, presentada mediante la modalidad de compendio de publicaciones. El doctorando presenta tres artículos, ya publicados en revistas indexadas en JCR, y su respectivo contenido, desarrollado satisfactoriamente por el estudiante a lo largo de su programa doctoral. El compendio de artículos lo forman las siguientes publicaciones:

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Los directores, Emelina López González y Josep Maria Losilla Vidal, para que así conste y surta los efectos oportunos, expiden el presente informe en Valencia, a 14 de enero de 2021.

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## **Doctoral Programme in Education: Competences, Abilities and Skills**

In accordance with the Spanish Higher Education Qualifications Framework (MECES) (as per Royal Decree 1027/2011 of 15 July) and the Doctoral Programme in Education Study Plan (as per Royal Decree 99/2011, Code 3117), in the preparation of this doctoral thesis, the required set of procedures to develop the basic competencies, capacities and personal skills of the doctoral student as a researcher have been duly applied. In this regard, it is to be noted that such competences, as established in the guidelines of the Doctoral Programme and of the Higher Education Qualifications Framework, and in relation to this research, have been attained.

Basic Competences:

- BC 11: Systematic understanding of a field of study and mastery of the skills and methods of research associated with that field.
- BC 12: Ability to conceive, design or create, implement and adopt a substantial process of research or creation.
- BC 13: Ability to contribute to the expansion of the frontiers of knowledge through original research.
- BC 14: Ability to carry out a critical and assessment analysis and synthesis of new and complex ideas.
- BC 15: Ability to communicate with the academic and scientific community and society in general about their areas of knowledge in the ways and languages commonly used in the international scientific community.
- BC 16: Ability to promote, within academic and professional contexts, scientific, technological, social, artistic or cultural advancement in a knowledge-based society.

Royal Decree 99/2011 also highlights the high professional training of doctors in other fields and aspects, especially those requiring creativity and innovation. In this regard, doctors of the Doctoral Programme in Education are deemed to have acquired personal capacities and skills in relation to:

Personal abilities and skills:

- CA 01: Knowing how to navigate in contexts where there is little specific information.
- CA 02: Finding the key questions that must be answered to solve a complex problem.
- CA 03: Designing, creating, developing and launching new and innovative projects in their field of knowledge.
- CA 04: Working both in team and independently in an international or multidisciplinary context.
- CA 05: Integrating knowledge, handling complexity, and making judgments with limited information.
- CA 06: The criticism and intellectual defence of solutions.

The results of this doctoral thesis may, therefore, serve as a criterion for evaluating the achievement of such competencies, capacities and skills in relation to the Doctoral Programme and the Higher Education Qualifications Framework.



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# Keywords

Keywords in alphabetical order for cataloguing purposes.

## General

Internet safety;  
Online sex;  
Profiles;  
Self-produced sexual media content;  
Sexual activity;  
Sexual messaging;

## Article 1

Adolescents;  
Family;  
Information and Communications Technology;  
School;  
Sexting prevalence;

## Article 2

Heterogeneity;  
Multilevel meta-analysis;  
Multiple outcomes;  
Online sexual activities;  
Sexting measure;  
Sexting prevalence;

## Article 3

Adolescents;  
Definition;  
Measurement;  
Sexting;  
Validation;



## Abstract

**Introduction:** Sexting is generally defined as the exchange of sexual media contents (or ‘sexts’) via the internet. This practice has been adopted by adolescents as a means of exploring and managing their sexual intimacy and affective relationships. Adolescents’ engagement in this practice, however, may also involve certain risks, such as the non-consensual distribution of sexts beyond the intended recipient. Sexting prevalence rates observed in adolescents are highly variable, and sociodemographic correlates are still inconclusive. Such heterogeneity makes it difficult to effectively determine the scope of the practice among adolescents. Several critical studies on this topic have attributed the empirical heterogeneity to issues such as the lack of a common operational definition of sexting and of a standardized measuring instrument.

**Study goals:** This doctoral thesis had three sequential goals: (1) to empirically explore the prevalence of sexting in adolescents and analyze its demographic correlates; (2) to systematically review the literature and examine the moderating effect of factors that might explain the observed heterogeneity in sexting prevalence; and (3) to develop and validate an adolescent sexting measurement scale.

**Methodology:** A first study was conducted to examine the prevalences of sending, receiving and forwarding sexts, and identified several associated socio-demographic, family situation and educational correlates in a sample of Spanish secondary school students. The results of this study encouraged a second study exploring sexting prevalences via a systematic literature review and a three-level, mixed-effects meta-analysis in order to elaborate a meta-estimate of sexting prevalence and to analyse conceptual and methodological aspects that might moderate the observed sexting estimated heterogeneity. The meta-analysis provided the basis for a third study aimed at developing a sexting measure in order to resolve conceptual and methodological issues with the definition of sexting affecting previous prevalence rates. The Adolescent Sexting Scale (abbreviated as ‘A-SextS’) was thus developed and validated on a sample of Spanish secondary school students.

**Results:** The results of the first study suggested high prevalences of sending, receiving and forwarding sexts. Certain subgroups of students, including males, older adolescents, those reporting use of a greater number of social media platforms, and those spending

more time using technological communication devices and social media platforms, were more likely to have engaged in sexting. The second study suggested that sexting prevalence increases over time and with age. The results highlighted the importance of methodological aspects such as sampling techniques, administration procedures and the sexting measure time-frame. Conceptual aspects such as media content type were also observed to moderate the prevalence of sexting. Furthermore, the results indicated a lack of common sexting operationalizations and defining elements. Consequently, the third study was oriented to the development and validation of an instrument to measure sexting that overcomes the identified conceptual and methodological shortcomings.

**Conclusions:** On the basis of the three studies, suggestions for future research and for the potential implementation of preventive educational measures were formulated. A future study will aim to explore the demographic profile of adolescents involved in sexting according to the A-SextS measurement scale.

## Resumen

**Introducción:** La práctica de sexting se define de forma general como el intercambio de contenidos multimedia de índole sexual ('sexts') a través de Internet. Esta práctica es adoptada también por los adolescentes como medio para explorar y gestionar su intimidad sexual y sus relaciones afectivas. Sin embargo, la participación de los adolescentes en el sexting puede suponer algunos problemas, como la difusión no consentida de contenidos íntimos más allá del destinatario previsto. Las tasas de prevalencia de sexting en adolescentes muestran una gran variabilidad y sus correlatos sociodemográficos todavía no son concluyentes. Esta variabilidad dificulta conocer el alcance real del sexting en la vida de los adolescentes. Estudios críticos sobre el tema atribuyen la heterogeneidad de la prevalencia a cuestiones como la falta de una definición operativa de sexting y a la ausencia de un instrumento estandarizado para su medida.

**Objetivos:** Esta Tesis Doctoral tuvo tres objetivos secuenciados: (1) estudiar empíricamente la prevalencia de sexting en adolescentes y explorar sus correlatos demográficos; (2) examinar y revisar sistemáticamente el efecto moderador de factores susceptibles de explicar la heterogeneidad de la prevalencia, y (3) desarrollar y validar una escala de medida de sexting para adolescentes.

**Metodología:** En un primer estudio se examinaron las prevalencias de envío, recepción y reenvío de sexts en una muestra de estudiantes españoles de educación secundaria, identificando también diversos correlatos sociodemográficos, familiares y educativos. Los resultados animaron a explorar más a fondo las prevalencias anteriores con una revisión sistemática y un meta-análisis de efectos mixtos de tres niveles, objetivo del segundo estudio, estimando la prevalencia de sexting y analizando aspectos conceptuales y metodológicos susceptibles de moderar la heterogeneidad de la prevalencia. Los resultados obtenidos en el meta-análisis aportaron argumentos para construir una medida de sexting orientada a cubrir elementos conceptuales y metodológicos de su definición que inciden en las tasas de prevalencia. Por lo tanto, en el tercer estudio se desarrolló la Escala de Sexting para Adolescentes (A-SextS) y se validó en una muestra de estudiantes españoles de secundaria.

**Resultados:** Los resultados del primer estudio sugirieron altas prevalencias de envío, recepción y reenvío de sexts. Ciertos subgrupos de estudiantes, en especial los varones,

los adolescentes más mayores, los usuarios de un mayor número de redes sociales y con un mayor consumo de tiempo utilizando dispositivos tecnológicos y redes sociales, tenían mayor probabilidad de haber realizado sexting. El segundo estudio reveló que la prevalencia de sexting aumenta con el tiempo y la edad. Los resultados destacaron la importancia de atender a aspectos metodológicos, como las técnicas de muestreo, los procedimientos de administración y el marco temporal de las medidas de sexting. Aspectos conceptuales, como el formato multimedia de los sexts, también moderaron la prevalencia de sexting. Otro resultado a destacar fue la falta de operacionalizaciones similares de sexting y de reporte de sus elementos definatorios. En consecuencia, en el tercer estudio se desarrolló y se validó un instrumento para medir sexting que superara las deficiencias conceptuales y metodológicas detectadas previamente.

**Conclusiones:** Sobre la base de estos tres estudios, se formularon propuestas de investigación futura y sugerencias para la implementación de medidas educativas preventivas. Un estudio futuro se orientará a determinar el perfil demográfico de los adolescentes involucrados en la práctica de sexting de acuerdo con las medidas obtenidas con la escala A-SextS.



## List of Abbreviations

Abbreviations used in the Preface, Introduction and Methodology sections.

| <b>Abbreviation</b>     | <b>Meaning</b>   |
|-------------------------|--|
| Sexts                   | Message containing sexual content                                  |
| A-SextS                 | Adolescent Sexting Scale   |
| ICT                     | Information and Communications Technology devices                  |
| 95% CI                  | 95% Confidence Interval  |
| EDIMA                   | Intimate Images Diffusion Scale                                    |
| SPSS                    | Statistical Package for the Social Sciences                        |
| PRISMA                  | Preferred Reporting Items for Systematic Reviews and Meta-Analyses |
| CRs                     | Credibility intervals  |
| <i>Q</i>                | Cochran's Q for heterogeneity detection                            |
| <i>Tau</i> <sup>2</sup> | Between-study variance   |
| R                       | Software environment for statistical computing and graphics        |



## Preface

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This doctoral thesis project, entitled '*Sexting among adolescents: Profiles, prevalences and the development of the new A-SextS measurement scale*', emerged from the intention to give continuance to studies on sexting and other related practices, linked to the use of technologies and virtual spaces by adolescents, carried out as part of the final projects of a Social Education undergraduate degree and a Secondary Education Teaching Master's degree. Both studies were developed to explore how the practice of sexting had been conceptualized and evaluated by researchers, what the main motivations of adolescent participants were, and what risks they were exposed to. The results obtained in these studies highlighted a need to develop the definition and evaluation of sexting, the descriptive aspects of its prevalence, and predictive models relating to the various correlates involved in the practice of sexting by adolescents.

The doctoral thesis thus presented here had, as its first goal, the study of the prevalence of sexting and the determination of associated predictors in a sample of adolescents in the Valencian Community of Spain. For this purpose, a first empirical study was conducted not only to determine the mere prevalence of sexting, but also to seek to describe certain characteristics of participants in the practice and to analyse the relations between individual, family, school and ICT use factors. From this emerged several reference elements for defining sexting, including sexting experiences, multimedia formats, transmission channels and contents protagonists. It also allowed for a sociodemographic profiling of adolescents involved in sexting, according to such variables.

The results obtained in this first study oriented further research to achieve a second goal of systematically reviewing the literature and elaborating a meta-estimate of the prevalence of sexting in adolescents. For this purpose, 79 studies, published up to February 2020, with samples from various countries, were analysed using a three-level model to obtain a meta-estimate of the prevalence of sending, receiving and forwarding sexting content. The moderating effect of conceptual and methodological factors on the prevalence of sexting was also studied.

The results obtained these two studies highlighted the need to create a more reliable and effective instrument for measuring the practice of sexting in adolescents. The

development of such an instrument became the third main goal of the thesis. However, first, it was necessary to find a workable definition of the practice of sexting, by thoroughly reviewing the meanings and concepts of sexting common in the specialist literature. Next, discussion groups were held with adolescents in order to define the necessary contents and validity of the instrument, as well as to clarify certain domains and terminological questions regarding sexting that the previous literature had considered inconsistent. Subsequent efforts were oriented to studying instrument concurrent and criterion validity. The fruit of this work was the development of the Adolescent Sexting Scale (abbreviated as A-SextS), an instrument demonstrated to have adequate psychometric properties.

Finally, in each of the studies, new lines of research and suggestions for the implementation of educational measures regarding sexting were presented. The doctoral research thus led to the publication of the three scientific articles that make up this thesis.

# 1. Introduction

---

The internet has provided a new context for communication, changing the way in which adolescents interact and establish their most intimate relationships. Indeed, electronic devices and mobile applications are now frequently used by adolescents in activities oriented to exploring and expressing their sexuality (Döring, 2014). Sexting is one such activity, and involves the exchange of sexual media contents between participants (Madigan et al., 2018). The term ‘sexting’ has thus commonly been used to refer to the sending, receiving and forwarding of sexual messages via the internet (Klettke et al., 2014). Nonetheless, critical review studies on the subject have highlighted that a variety of ways are, in fact, used to define the practice and measure it in empirical studies, thus resulting in very different prevalence figures (Barrense-Dias et al., 2017; Cooper et al., 2016; Klettke et al., 2014; Kosenko et al., 2017; Madigan et al., 2018).

Participating in sexting during adolescence may offer certain benefits, but also imply certain risks, and, at this developmental stage, adolescents may still not have acquired sufficient maturity to recognize the potential consequences of the practice (Gámez-Guadix & De Santisteban, 2018; Houck et al., 2014). Due to such implications, research on adolescent sexting is split between two clearly differentiated discourses (Cooper et al., 2016). On the one hand, many studies support the notion that sexting is merely yet another form of sexual expression in the context of contemporary sexual and romantic relations (Cooper et al., 2016; Döring, 2014). On the other hand, other studies highlight the multiple potential risks of sexting behaviours (Gassó et al., 2019; Kernsmith et al., 2018). The lack of a consensus on the theoretical foundations aimed at explaining sexting dynamics and the processes leading to it has also stimulated this debate. Few studies have tried to relate sexting with existing psychological, social, and educative frameworks (De Wolf, 2020; van Ouytsel et al., 2019), though a growing literature supports the notion that sexting is a normative practice commonly used for sexual purposes (Burkett, 2015; Döring, 2014). From this perspective, the practice of sexting facilitates adolescents in initiating new affective or sexual relationships by obviating the need for direct face-to-face interaction with the other person. Indeed, the most common motivations for sexting cited by adolescents in many studies relate to the initiation and maintenance of incipient or established romantic relationships, whether in proximity or

over a distance (Cooper et al., 2016; van Ouytsel et al., 2019; Walker et al., 2013). The exchange of erotic content via digital media may also be considered an indicator of sexual development in terms of an availability and willingness to engage in sexual experimentation activities. Accordingly, several empirical and review studies have found the exchange of sexual content over the internet to be related to increased sexual activity in adolescents (Handschuh et al., 2019; Mori et al., 2019). Other studies, however, place an emphasis on the multiple potential risks of adolescent sexting (Gassó et al., 2019; Kernsmith et al., 2018), with the main risk being an intentional, non-consensual distribution of third-party sexual images. Such studies have thus focused on malicious actions involving the unwanted distribution of sexts and related consequences, including various forms of cybervictimization, or cyberbullying, sextortion, grooming and dating violence (Medrano et al., 2018; van Ouytsel et al., 2019; Wolak et al., 2018). Likewise, some studies have also associated sexting with symptoms of anxiety and depression, as well as with attempted or ideated suicide (Medrano et al., 2018; Mori et al., 2019).

Due to such implications, there has been a proliferation of studies on sexting prevalence, although sufficiently precise figures in samples of adolescents are still lacking. Nonetheless, a meta-analysis carried out by Madigan et al. (2018) provided a mean prevalence of sending and receiving sexts of 14.8% (95% CI: 12.8, 16.8) and 27.4% (95% CI: 23.1, 31.7), respectively, with a high variability in results ( $I^2 = 98\%$  to  $99\%$ , respectively), and a prevalence of non-consensual distribution of sexting contents between 8.4% and 15.6%. Some studies on adolescent sexting have also focused on analysing demographic correlates such as sex and age, though results have led to disparate conclusions here too. The most supported findings concerning correlates have suggested that sexting is more prevalent with increasing age and that is significantly related to other adolescent sexual behaviours (Handschuh et al., 2019; Madigan et al., 2018). For example, some studies have suggested that frequent use of technological communication devices and social media platforms can be seen to correlate with adolescent sexting (Baumgartner et al., 2012, 2014). However, empirical evidence on other factors, such as family situation and schooling aspects, in relation to adolescent sexting, is still too scarce to be conclusive.

The high variability in prevalence rates and findings regarding correlates appears mainly due to conceptual and methodological shortcomings (Barrense-Dias et al., 2017; Klettke et al., 2014). One conceptual reason that explains such variability is a lack of consensus on the operational definition of sexting. Several critical review studies on

sexting have identified up to six referent elements constituting its definition and have revealed substantial differences in its assessment (Barrense-Dias et al., 2017). In particular, definitions of sexting differ, among studies, in elements such as the actions that the practice of sexting entails, the transmission mode, the different types of media content transmitted, the degree of sexual explicitness of the content, the timeframe of the measure, the willingness of participants, and the general context in which sexting is practiced. Furthermore, while some studies have only considered active experiences of sexting, such as sending sexts, others have included passive experiences, such as receiving them (Barrense-Dias et al., 2017). Certain studies have distinguished ‘primary sexting’, when a person sends their own personal sexts to others, from ‘secondary sexting’, which implies the further dissemination of such material without the consent of the person referenced by the sext (Calvert, 2009), or highlighted differences in methods of transmission, such as using a computer, a mobile phone, or an unspecified method (i.e. the internet in general) (Barrense-Dias et al., 2017). While some definitions have only considered text messages, others have additionally included audio-visual content (e.g., images, videos), characterizing it using very general adjectives, such as ‘sexy’, ‘sexual’, or ‘provocative’ (Barrense-Dias et al., 2019). Another conceptual consideration is that the timeframe of measures used to assess sexting has varied considerably across studies, with some accounting for a month prior to surveying, and others referring to lifetime prevalences (Dolev-Cohen & Ricon, 2020; Frankel et al., 2018). Only a few studies have assessed and reported sexting considering different addressees, such as partners, friends or strangers (Burén & Lunde, 2018; Dolev-Cohen & Ricon, 2020). This deficiency in the literature can be considered especially important when dealing with adolescents, since the risks they are exposed to may vary with different sexting recipients. Although sexting is often thought of as a voluntary practice, most studies do not specify it as such, nor consider the indirect pressure to exchange sexts that adolescents may feel or receive from these recipients (Gámez-Guadix et al., 2017; Lippman & Campbell, 2014). The purpose behind exchanging sexts in such contexts and with such recipients is an aspect that has been considered in very few studies (Gregg et al., 2018; Houck et al., 2014).

Previous studies have also suggested the dispersion in sexting prevalence is associated with the variability of methodological strategies used in terms of research goals, sampling techniques, measuring instruments and administration procedures (Cooper et al., 2016; Klettke et al., 2014; Kosenko et al., 2017). Indeed, the most notable limitation of research on sexting is the absence of a consensus on its measurement and on

the methodological strategy to employ in empirical studies. To the best of our knowledge, there has only been one validated sexting instrument tested on adolescents, the Intimate Images Diffusion Scale (EDIMA) (Penado et al., 2019), which, however, does not resolve the conceptual and methodological limitations mentioned above. This instrument, like many other empirical sexting measures, consider that sexting occurs exclusively via mobile phones or social network sites, without taking into account other possible technologies and platforms, and other possible media formats, such as audio (Hertlein & Twist, 2017). Such studies tend to characterize sexts with very general adjectives subject to the interpretation of respondents. Additionally, the voluntariness of participation in sexting is not generally considered or clearly defined, making it difficult to distinguish between fine-grained degrees of voluntariness, such as intentional sexting, unwanted but consensual sexting, and coerced sexting.

It is, therefore, evident that research on adolescent sexting needs to overcome the abovementioned conceptual and methodological limitations in order to allow academics and professionals to obtain reliable prevalence figures, based on agreed definitions of sexting, to understand how such definitions and methodological concerns moderate sexting prevalence, and to develop and validate new sexting measures that covers the gaps identified in the previous literature. In this context, this doctoral thesis set out to achieve three sequential goals.

The first goal was to assess and analyse the prevalence of sexting experiences in a sample of Spanish secondary school students, differentiating, in particular, between sexting definition reference elements, and identifying potential sociodemographic, family situation, educational, technological and media format correlates.

The second goal was to perform a systematic literature review and meta-analysis of sexting prevalence in adolescents, and, given the great variability in previous empirical and review studies on sexting prevalence, to explore conceptual and methodological factors capable of moderating such variability.

The third and final goal was to develop and validate an instrument for measuring sexting among adolescents aimed at overcoming the identified conceptual and methodological shortcomings, not only in previous empirical and review studies, but also in previous scales developed for measuring sexting.



## **2. Methodology**

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### **Article 1**

In response to the first thesis goal, an empirical study was carried out using a cross-sectional survey method. The data was collected via a voluntary and anonymous paper questionnaire distributed in school classrooms to a non-random sample of adolescent students.

The sample consisted of 647 adolescents (52.2% males), aged between 12 and 18 years, from two secondary charter schools and two state schools in the south of the Spanish Province of Valencia. The questionnaire employed to analyze the prevalence of sexting was composed of 23 questions, and aimed to also address basic reference elements in the definition of sexting that had only partially been considered or had been totally ignored in the previous literature. The questionnaire thus sought responses on the three main sexting experiences of sending, receiving, and forwarding, on five multimedia formats (including text messages, images, videos, audio messages, and links), the profile of protagonists featuring in sexts, and the content transmission channel. The questionnaire furthermore assessed sociodemographic variables, such as sex and age, family composition and work status, school characteristics, such as attendance of a public or charter school, being a student new to the school, the repetition of a grade or expected academic performance, and the use of technological communication devices and social media.

Descriptive statistics were computed and chi-squared tests applied to assess dichotomous data, and effect sizes were calculated as the difference of proportions (95% CI). Binary logistic regression models were also elaborated in order to analyze the effect of potential predictor variables, and assumptions, atypical and influential values were duly checked. The analyses were performed using SPSS version 25.0.

### **Article 2**

To achieve the second thesis goal, a systematic review and a meta-analysis were carried out following the 'Preferred Reporting Items for Systematic Reviews and Meta-Analyses' (PRISMA) methodology. Between October 2019 and February 2020, a systematic search was conducted on the ERIC, PsycINFO, MEDLINE, Scopus, WoS databases and grey

literature regarding sexting prevalence empirical studies with adolescent samples up to 18 years of age. The results of all studies reporting prevalence rates of sending, receiving and forwarding sexts were recorded. The risk of bias and its potential effect on prevalence estimates was assessed. Potential moderators in terms of methodological aspects (e.g., the sampling techniques and administration procedure used) and conceptual aspects (e.g., the degree of sexual explicitness of the media content, the context in which sexting is practiced, the willingness of participants or the timeframe of the measure) were coded and analyzed.

A three-level, mixed-effects, meta-analysis was performed in order to estimate the mean prevalences of sexting experiences, with 95% confidence intervals (CI) and credibility intervals (CRs) around the estimates. This strategy took into account the dependence among effect sizes from the same study, opportune in the case of studies on sexting prevalence reporting the prevalence of various sexting experiences.  $Q$  and  $Tau^2$  statistics were computed to assess the statistical heterogeneity of effect sizes. Between-study heterogeneity was also examined using  $Q$  statistic (categorical moderators) and meta-regressions (quantitative moderators). The profile likelihood plots of the variance components, the potential outlying and influential studies/outcomes, and the potential publication bias were examined. Analyses were carried out with the Metafor package (version 2.4-0) for R.

### Article 3

To achieve the third thesis goal, the Adolescent Sexting Scale (abbreviated as ‘A-SextS’) was developed for validation on a sample of Spanish secondary school students. The convenience sample was composed of 579 adolescents (52.7% males), aged 11–18 years, from two secondary charter schools located respectively in a metropolitan and a rural area of the Autonomous Community of Valencia, in Spain. The data collection took place between 2nd March 2020 and 13th March 2020. A-SextS was administered to the participating adolescents in their usual classrooms, during regular class hours, and took approximately 40 minutes. Participants received all the instructions via a video tutorial recorded by a real professional speaker, and then recorded their own responses on paper questionnaires.

The study was carried out in two stages. In the first stage, content and face validity were addressed via three strategies: (a) conducting an extensive literature review, (b) conducting adolescent discussion groups, and (c) conducting a pilot study. The second

stage was then aimed at obtaining a set of concurrent and criterion validity evidences regarding the instrument. Content and face validity were addressed by analyzing measures applied in empirical studies on the prevalence of sexting with adolescent samples, derived from our previous meta-analytical study (article 2). After the extensive literature review, two discussion groups were conducted to examine content and semantic validity of the scale, characterizing some domains and clarifying certain wordings and terminologies that previous literature had defined as inconsistent and vague. Both the literature review and the discussion groups provided useful insights on covering conceptual shortcomings in research on adolescent sexting.

Finally, A-SextS' updated list of 67 questionnaire items was pilot-tested on 96 secondary school pupils. Ambiguous items were modified where deemed necessary. Concurrent validity was examined by comparing our A-SextS' prevalences in this study's sample with prevalence estimates reported in previous meta-analytic studies or similar individual empirical studies. Criterion validity was supported by relations between A-SextS and different variables in the available literature. This was the case for age, sexual activity, and pornography consumption, which have consistently found to positively correlate with sexting.

To assess criterion validity, first of all, the essential unidimensionality of each subscale was checked using different criteria: a parallel analysis with principal components and polychoric correlations, taking as a mean criterion the number of eigenvalues higher than one and a ratio between the first and second eigenvalue higher than 4. Furthermore, average communalities, Cronbach's Alpha, and McDonald's Omega were also evaluated for each subscale. Secondly, Kendall's Tau coefficient between each subscale and each criterion variable was computed. Both the magnitude and statistical significance of the correlations were then assessed. Three different types of regression were also conducted: binary logistic regression, Poisson regression, and negative binomial regression. Analyses were performed using the statistical software R.



### 3. Results

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The three articles are signed by the doctoral candidate as first author. Articles have been previously assessed by peers, accepted and published in English and exclusively in specialized high impact journals, appropriately indexed and belonging to first quartiles (Q1 and Q2) according to JCR (Journal Citation Reports) and SJR (Scimago Journal Rank) indices from last year. The results obtained in this doctoral thesis have resulted in the following articles:

1. Molla-Esparza, C., López-González, E., & Losilla, J. M. (2021). Sexting Prevalence and Socio-Demographic Correlates in Spanish Secondary School Students. *Sexuality Research and Social Policy*, 18, 97-111. <https://doi.org/10.1007/s13178-020-00434-0>
  - a. Impact Factor ISI-JCR (2019): 2.405 (2019); 5-Years Impact Factor ISI-JCR (2019): 2.269 (SSCI edition). *Sexuality Research and Social Policy* now ranks 21/108 (Q1, First quartile) in ‘Social sciences, interdisciplinary’ (SSCI edition).
  - b. Impact Factor SJR (2019): 1.091. *Sexuality Research and Social Policy* now ranks Q1 (First quartile) in ‘Gender studies’, Q1 in ‘Health (Social sciences)’, and Q1 in ‘Sociology and Policy sciences’.
2. Molla-Esparza, C., Losilla, J. M., & López-González, E. (2020). Prevalence of Sending, Receiving and Forwarding Sexts among Youth: A Three-Level Meta-Analysis. *PLoS ONE* 15(12): e0243653. <https://doi.org/10.1371/journal.pone.0243653>
  - a. Impact Factor ISI-JCR: 2.740 (2019); 5-Years Impact Factor: 3.227 (2019) (SCIE edition). *PLoS ONE* now ranks 27/71 (Q2, Second quartile) in ‘Multidisciplinary sciences’.
  - b. Impact Factor SJR (2019): 1.023. *PLoS ONE* now ranks Q1 (First quartile) in ‘Multidisciplinary’.

3. Molla-Esparza, C., Nájera, P., López-González, E., & Losilla, J.-M. (2020). Development and Validation of the Adolescent Sexting Scale (A-SextS) with a Spanish Sample. *International Journal of Environmental Research and Public Health*, 17(21), 8042. <https://doi.org/10.3390/ijerph17218042>
  - a. Impact Factor ISI-JCR: 2.849 (2019); 5-Years Impact Factor: 3.127 (2019) (SSCI edition). The International Journal of Environmental Research and Public Health now ranks 32/171 (Q1, First quartile) in 'Public, environmental and occupational health' (SSCI edition).
  - b. Impact Factor SJR (2019): 0.739. The International Journal of Environmental Research and Public Health now ranks Q2 (Second quartile) in 'Public, environmental and occupational health'.

To know the specific results of each one of the articles, please see the complete manuscripts in the Appendix section.

## 4. Conclusions

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This doctoral thesis contributes original scholarship to the body of research on adolescent sexting. Its first study expanded on previous research by presenting and analyzing disaggregated sexting prevalence data in relation to various basic reference elements in the definition of sexting. This allowed the profiling of sexting participants better than previous studies, which had only partially studied or had totally ignored certain characterising aspects. The study also further explored the relationship between sexting and correlates regarding sociodemographic, family situation, schooling and technological communication device and social media platform usage aspects. The results confirm that sexting is prevalent among Spanish secondary school students. The most exchanged sexting contents were in image and video formats, were received mainly through one-to-one channels, and featured adolescent protagonists known personally by and of the opposite sex to respondents. The results also indicated that almost a fifth of the sample had forwarded a sext, and that sexts received exclusively via group channels most often featured protagonists that were peers of the same sex as the recipient. These results suggest that, in some occasions, the phenomenon of sexting is far from being a consensual and private sexual practice between two individuals. The sociodemographic, family, and educational profiling of adolescents most involved in sexting experiences indicates that those who had sent sexts were more likely to have repeated a grade and to report using a greater number of social media platforms on a more frequent basis. Certain subgroups of the students, including males, older adolescents, those living in a single-parent family, those reporting use of a greater number of social media platforms, and those spending more time using technological communication devices and social media platforms, were significantly more likely to have received sexts. Those reporting to have forwarded sexts were more likely to be male, to be older, to use a greater number of social media platforms, and to have low performance expectations in the school subject of Math.

The second study of the thesis provided an updated meta-analysis estimate of sexting prevalence in adolescents, with a differentiating contribution being the classification and analysis of methodological and conceptual factors capable of moderating the heterogeneity of results reported in the empirical literature. The results gave high mean prevalences of sending and receiving sexts involving adolescents in

studies published between 2009 and 2020. Additionally, mean prevalences of sending, receiving and forwarding sexts increased with data collection year and age. The results also indicated difficulties in accurately determining the prevalence of sexting experiences. In this regard, the high heterogeneity of the meta-analysis results was affected by both methodological and conceptual issues. The low quality of our meta-analytic sample was an important aspect to highlight in this research, as it affected the estimated sexting prevalence rates. The study results highlight the importance of methodological aspects such as sampling techniques, as probabilistic samples helped to explain the encountered heterogeneity, and led to lower mean prevalence estimates in the global time period studied than studies with non-probabilistic samples. Self-reported administration procedures also led to more homogeneous prevalence estimates than interview methods. Furthermore, the prevalence of forwarding sexts varied slightly according to the timeframe of the measure. Regarding conceptual factors, media content type also moderated the prevalence of sexting, with text messages transmitted more frequently than images or videos. Similar operationalizations of sexting and a more detailed report of its defining elements would allow us in the future to more accurately compare the prevalences of sexting and study the reasons of its heterogeneity.

The third and final study validated a new instrument, demonstrating that it had adequate psychometric properties for assessing adolescent sexting. The instrument fills a certain gap in the field by providing researchers with a homogeneous, extensive and objective measure of sexting that considers the riskiest aspects of the practice (e.g., showing one's face in pictographic sexts), and provides good evidence of content, concurrent, and criterion validity. The instrument overcomes conceptual and methodological shortcomings identified not only in the thesis' empirical and meta-analytical studies (articles 1 and 2), but also in other previous empirical and review studies and scales developed for measuring sexting. Furthermore, the modular structure of the A-SextS instrument allows academics and teachers to combine or focus on the study of certain particular aspects, including relationship type, multimedia content, explicitness and degree of voluntariness. Lastly, the instrument helps break a vicious circle that, in our opinion, has characterized much of sexting research to date: a body of empirical results from poor quality sexting measures making it difficult to develop consensual theoretical explanations of the practice.

Based on the results of this compendium of studies, various suggestions for future research and for potential implementation of educational measures have been discussed.



In order to continue the work done under this doctoral thesis, the next step should be to further explore the demographic profile of adolescents involved in sexting according to A-SextS scale, in order to provide more accurate prevalence estimates, a more complete characterization of adolescent sexting and a better description of the profile of adolescents involved in the practice. Lastly, the accumulation of empirical studies based on a standardized measure, such as A-SextS, will contribute significantly to accomplish an adequately operationalized definition of the practice of sexting.



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## **6. Appendix**

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Articles included in the research compendium are presented in their original submission format.





## 6.1. Article 1: Sexting Prevalence and Socio-Demographic Correlates in Spanish Secondary School Students

Sexuality Research and Social Policy  
<https://doi.org/10.1007/s13178-020-00434-0>

### Sexting Prevalence and Socio-Demographic Correlates in Spanish Secondary School Students



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# **Sexting Prevalence and Socio-Demographic Correlates in Spanish Secondary School Students**

Cristian MOLLA-ESPARZA<sup>1\*</sup> · Emelina LÓPEZ-GONZÁLEZ<sup>2</sup> · Josep-Maria LOSILLA<sup>3</sup>

## **Abstract**

This research analyzes the prevalence of sexting and socio-demographic correlates in a sample of 647 adolescents administered a questionnaire at secondary schools in Valencia (Spain). The questionnaire results indicate that 61% of respondents reported being involved in at least one case of sexting, with 24, 58 and 18% reporting having sent a sext, received a sext and forwarded a sext, respectively. More males and older adolescents reported having received and forwarded sexts than female and younger adolescents. Furthermore, time spent using Information and Communications Technology (ICT) devices, use and frequency of use of social media, grade repetition, low academic performance expectations in Math and a single-parent family situation appear to correlate with an increase in the prevalence of sexting experiences. Our study also provides results that can support new lines of inquiry into analyzing the relationship between sexting and certain socio-demographic, family situation and educational variables in relation to adolescents.

**Keywords:** sexting prevalence, adolescents, ICT, school, family

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## Sexting Prevalence and Socio-Demographic Correlates in Spanish Secondary School Students

Sexting is a form of communication recently adopted by adolescents as a means of exploring and managing sexual intimacy via digital media (Döring, 2014; Parker, Blackburn, Perry, & Hawks, 2013). It is often considered a normalized form of sexual expression in the context of sexual or romantic relations (Cooper, Quayle, Jonsson, & Svedin, 2016; Döring, 2014). Sexting also allows many adolescents, particularly those who are otherwise less prepared to do so, to initiate new affective relationships or to fulfill a sexual purpose (Burkett, 2015; Döring, 2014; Lenhart, 2009; Lippman & Campbell, 2014). In this regard, sexting may be construed as a legitimate form of personal exchange, usually aimed at connecting with, flirting with or seducing other people. However, over the past few years, literature on sexting has primarily focused on its associated risks, particularly to the well-being of adolescents (Barrense-Dias, Berchtold, Suris, & Akre, 2017; Drouin, Ross, & Tobin, 2015; Ybarra & Mitchell, 2014). Adolescence is an intense period of biological, physiological and social transition and of sexual identity development (Burén & Lunde, 2018). Participating in sexting during this transitional and developmental stage may expose adolescents to undue risks as they may not yet have the maturity to recognize the potential consequences of such sexually charged activities (Gámez-Guadix & Santisteban, 2018; Houck, Barker, Rizzo, Hancock, Norton, & Brown, 2014). One of the main concerns is intentional yet non-consensual distribution of sexting contents (or 'sexts'), whose prevalence among youths has been shown to lie between 8.40% and 15.60% (Madigan, Ly, Rash, Van Ouytsel, & Temple, 2018). Therefore, at the same time as adolescents are pursuing their own sexual interests, they are also being exposed to various forms of online and offline victimization (Gassó, Klettke, Agustina & Montiel, 2019; Kernsmith, Victor, & Smith-Darden, 2018). Some researchers have found, for example, that adolescents engaging in sexting were more likely to experience dating violence, sexual harassment and sexual solicitation in general (Gámez-Guadix & Mateos-Pérez, 2019; Morelli, Bianchi, Baiocco, Pezzuti, & Chirumbolo, 2016a; Van Ouytsel, Ponnet, & Walrave, 2018). Furthermore, a longitudinal bidirectional association has been identified between sexting and the severe online form of victimization known as cyberbullying (Van Ouytsel, Lu, Ponnet, Walrave, & Temple, 2019). Due to such possible negative consequences of sexting, more empirical research is needed to develop a deeper understanding of this practice and its prevalence.

The phenomenon of sexting has, indeed, triggered a proliferation of studies on its prevalence, although sufficiently precise figures in samples of adolescents are still lacking (Barrense-Dias et al., 2017; Madigan et al., 2018; Ybarra & Mitchell, 2014). As recent reviews on the subject have indicated, a major reason for high variability in prevalence estimates is the great variety of reference elements in the definition of sexting used in empirical studies (Barrense-Dias et al., 2017). Although there has been sufficient consensus considering sexting as the act of sending sexts, that is, sexually suggestive photos or videos of oneself (Lenhart, 2009; Walker & Moak, 2010), considerable conceptual and methodological differences exist in the precise definition of sexting used in individual studies. For example, in studies by Mitchell, Finkelhor, Jones and Wolak (2012) and Crimmins and Seigfried-Spellar (2014), sexting was taken to mean original sexual content sent and received, while Hudson and Fetro (2015) also included the forwarding of such content. Other reference elements used in previous studies include: (a) multimedia content formats, such as text messages, images and videos (Gámez-Guadix, Santisteban, & Resett, 2017); (b) recipient types (Branch, Hilinski-Rosick, Johnson, & Solano 2017; Morelli, Bianchi, Baiocco, Pezzuti, & Chirumbolo, 2016b); (c) types of relationship with the sender or receiver, such as committed, casual or spontaneous partner or internet acquaintance (Drouin, Couple, & Temple, 2017); (d) consent to sending the content (Morelli et al., 2016b; Morelli et al., 2016a); and (e) the frequency of the practice (Lim, Vella, Horyniak, & Hellard, 2016). In summary, such variability in conceptual elements has been a major obstacle to obtaining precise prevalence estimates in adolescent samples (Klettke, Hallford, & Mellor, 2014; Madigan et al., 2018). Consequently, a further attempt at assessing the prevalence of sexting in adolescents, bringing together for consideration in one study the varied conceptual references used in previous literature, is justified and can undoubtedly contribute to a clearer and more universal operational definition of sexting (Barrense-Dias et al., 2017).

Studies on sexting in adolescents have also focused on analyzing associated correlates, though results have led to disparate conclusions. Though the majority of studies have considered similar correlates, such as technological device use, social media use, age and sex (Baumgartner, Sumter, Peter, Valkenburg, & Livingstone, 2014), few similarities appear in the results. For example, regarding sex, although some studies suggest that males were considerably more likely to practice sexting (Gregg, Somers, Pernice, Hillman, & Kernsmith, 2018; Patrick, Heywood, Pitts, & Mitchell, 2015; West et al., 2014), others suggest that, on the contrary, females were more likely to participate

in the practice (Reyns, Henson, & Fisher, 2014; Ybarra & Mitchell, 2014), or that sex was not a significant correlate (Baumgartner et al., 2014; Benotsch, Snipes, Martin, & Bull, 2013; Gámez-Guadix & Mateos-Pérez, 2019; Hinduja & Patchin, 2010; Lenhart, 2009; Ricketts, Maloney, Marcum, & Higgins, 2015). Regarding age, while some studies suggest the prevalence of sexting increased considerably with age (Bianchi, Morelli, Baiocco, & Chirumbolo, 2019; Cox Communications, 2009; Dake, Price, Maziarz, & Ward, 2012; Gámez-Guadix & Mateos-Pérez, 2019; Gregg et al., 2018; Mitchell et al., 2012; Rice et al., 2012; Rice et al., 2018; Vanden Abeele, Campbell, Eggermont, & Roe, 2014; Wood, Barter, Stanley, Aghtaie, & Larkins, 2015),<sup>4</sup> other studies suggest no significant correlation (Benotsch et al., 2013; Gordon-Messer, Bauermeister, Grodzinski, & Zimmerman, 2013; Morelli et al., 2016b; Ricketts et al., 2015; Woodward, Evans, & Brook, 2017). Regarding the use of the internet and technological communication devices, it has generally been found that: adolescents who used the internet more frequently were more likely to practice sexting (Baumgartner, Sumter, Peter, & Valkenburg, 2012; Baumgartner et al., 2014); the frequency of sending text messages positively correlated with the sending of sexts (Dake et al., 2012; Martínez-Prather & Vandiver, 2014; Rice et al., 2018; Strassberg, Cann, & Velarde, 2017; West et al., 2014);<sup>5</sup> and internet addiction issues correlated with increased sexting (Ricketts et al., 2015). However, in a study by Bauermeister, Yeagley, Meanley & Pingel (2014), no significant correlations were identified in this regard.

In general, there is a lack of research on sexting correlates concerning family situation and schooling. Family composition has sometimes been considered, with some studies suggesting that children of single-parent families were more likely to be involved in sexting (Chaudhary, Peskin, Temple, Addy, Baumler, & Shegog, 2017; Dake et al., 2012; Vanden Abeele et al., 2014; Woodward et al., 2017), though other studies suggest that family composition was not significantly correlated (Van Ouytsel, Van Gool, Ponnet, & Walrave, 2014). Campbell & Park (2014) examined family connectivity in relation to adolescent sexting via the social emancipation model, with researchers identifying a negative association between mobile contact with family members and sexting. Indeed,

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<sup>4</sup> Wood et al. (2015) reported a greater likelihood of sending sexual images with increased age in all countries where they carried out their study and in both sexes. The only exception being in the country of Cyprus.

<sup>5</sup> West et al. (2014) found that, in males, one of the factors associated with an increased likelihood of sexting was the excessive sending of text messages.

the reception of sexts was found to be less prevalent among adolescents, particularly females, who were involved in more frequent mobile phone communications with their families. However, the work status of parents has not previously been researched as a predictor variable in adolescent samples. In adult samples, it has only been studied with descriptive indexes (Houck et al., 2014; Ybarra & Mitchell, 2014). Schooling has been studied as the relationship between educational level and sexting, but results have been contradictory. Some studies suggest no significant relationship between educational level and sexting (Benotsch et al., 2013; Yeung, Horyniak, Vella, Hellard, & Lim, 2014). Baumgartner et al. (2012), on the other hand, suggest that adolescents with lower educational levels were more likely to experience moderate online risk situations in general, including the practice of sexting. Other studies indicate significant positive correlations between attained educational levels and sexting (Bauermeister et al., 2014), as well as between educational level and the probability of receiving sexts (Davis, Powell, Gordon, & Kershaw, 2016). According to Ricketts et al. (2015), a higher average of academic qualifications was associated with increased sexting prevalence.

To summarize, the lack of conclusive data on the most commonly studied socio-demographic correlates of sexting is undoubtedly not only affected by the diversity of conceptual references used in the various studies, as highlighted above, but also by methodological differences, such as in research objectives, data collection strategies, the quality of the measuring instruments, and so on. This all contributes to a lack of clear or similar definitions for the practice of sexting. In addition, there is a notable lack of published research on the role of the family in influencing adolescent sexting, and, consequently, on the extent to which parents' circumstances may influence adolescents' participation in sexting, which is particularly relevant given evidence of the positive influence of the family on decisions that adolescents make regarding their sexual activities (Campbell & Park, 2014). Empirical evidence on the influence of schooling variables is even more scarce, with a better understanding of the relationship between sexting and education levels needed according to Baumgartner et al. (2012) and Ricketts et al. (2015). In particular, it would be useful to be able to better identify adolescents more likely to participate in risk-associated online practices, including sexting (Baumgartner et al., 2012).

In this context, our research set out to achieve two main goals. The first was to conduct research into the prevalence of sexting practices in secondary school students in Spain, since sexting research has mostly been conducted in the United States, as



evidenced by Klettke et al. (2014) in their study on the number and global distribution of sexting studies, and by Madigan et al. (2018) in their recent sexting prevalence meta-analysis. In Spain, sexting research remains particularly scarce, though relevant contributions have been made regarding young Spanish adults by authors such as Gámez-Guadix et al. (2017) and Villacampa (2017). The present study aims to further analyze the prevalence of sexting by differentiating between the following four conceptual references used in previous studies: (a) the experiences involved in sexting, such as sending, receiving or forwarding; (b) the format of multimedia content transmitted as sexts, such as text message, image, video, audio or link; (c) the type of protagonist of the sext, such as an acquaintance, student of the same school or a non-acquaintance; and (d) the transmission channel of the content. The second goal was to study the relationship between sexting experiences and socio-demographic variables, such as sex and age, family composition and work status, school characteristics, such as attendance of a public or charter school, being a student new to the school, the repetition of a grade or expected academic performance, and the use of technological communication devices and social media.

### **Methodology**

The research design of this study was of cross-sectional survey type, with data collection through a voluntary and anonymous paper questionnaire distributed in school classrooms to a non-random sample of adolescent students.

### **Participants**

The sample consisted of 647 adolescents (52.20% identifying as male and 47.80% identifying as female), aged between 12 and 18 years ( $M = 13.70$ ,  $SD = 1.24$ ), from two secondary charter schools and two state schools in the south of the Spanish Province of Valencia. Most participants attended state schools (71.90%), had not repeated a grade (77%), and lived with both parents (90.20%). They used an average of 2.76 ( $SD = 1.50$ ) technological communication devices, used for a mean of 3 hours on a typical weekday, and engaged with an average of 3.42 ( $SD = 3.12$ ) social media platforms with a high frequency of use ( $M = 4.07$ ). Additional demographic, family and educational characteristics are presented in Table 1.

Table 1

*Respondents' socio-demographic, family and schooling characteristics*

|                                     | Total sample<br><i>n</i> = 647,<br>% ( <i>n</i> ) |       |
|-------------------------------------|---|-------|
| <b>Sex</b>                          |   |       |
| Male                                | 52.20   | (338) |
| Female                              | 47.80   | (309) |
| <b>Age (years)</b>                  |   |       |
| Minimum                             | 12  |       |
| Maximum                             | 18  |       |
| Range                               | 6   |       |
| Mean ( <i>M</i> )                   | 13.70   |       |
| Standard deviation ( <i>SD</i> )    | 1.24  |       |
| 12                                  | 20.70   | (134) |
| 13                                  | 24.10   | (156) |
| 14                                  | 27.60   | (178) |
| 15                                  | 21.50   | (139) |
| ≥16                                 | 6.10  | (40)  |
| <b>Family situation</b>             |   |       |
| Nuclear family                      | 90.20   | (581) |
| Single-parent family                | 9.80  | (63)  |
| <b>No. of siblings</b>              |   |       |
| None                                | 27.40   | (170) |
| One                                 | 57.70   | (358) |
| Two                                 | 12.30   | (76)  |
| Three                               | 1.60  | (10)  |
| Four or more                        | 1   | (6)   |
| <b>Family work status</b>           |   |       |
| Neither parent works                | 6.70  | (43)  |
| At least one parent works           | 40.30   | (259) |
| Both work                           | 52.60   | (340) |
| <b>School type</b>                  |   |       |
| State                               | 71.90   | (465) |
| Charter                             | 28.10   | (182) |
| <b>School grade</b>                 |   |       |
| First grade                         | 29.80   | (193) |
| Second grade                        | 26  | (168) |
| Third grade                         | 23.50   | (152) |
| Fourth grade                        | 20.70   | (134) |
| <b>School seniority</b>             |   |       |
| Not in the first year at the school | 76.70   | (494) |
| In the first year at the school     | 23.30   | (150) |

|                                   | Total sample<br><i>n</i> = 647,<br>% ( <i>n</i> ) |       |
|-----------------------------------|---|-------|
| Year repeated                     |   |       |
| No                                | 77  | (498) |
| Yes                               | 23  | (149) |
| Expected result in Math           |   |       |
| Fail                              | 16.70   | (108) |
| Pass (Pass or Good)               | 50.10   | (324) |
| Good grade (Merit or Distinction) | 33.20   | (215) |
| Expected result in Spanish        |   |       |
| Fail                              | 7.10  | (46)  |
| Pass (Pass or Good)               | 58  | (375) |
| Good grade (Merit or Distinction) | 34.90   | (226) |

### Data collection

A questionnaire was designed to achieve the stated objectives of this study, with questions aimed at allowing the researchers to collect data on technological communication device and social media use, socio-demographics, family situation, schooling variables and sexting experiences. The questionnaire was composed of 23 questions with different answer types: dichotomous, single or multiple selection choice, Likert scales with four and five linguistic quantifiers, and short open-ended (see Appendix 1).

**Use of technological communication devices and social media.** The questionnaire asked the number of technological devices used and their use in hours per day (questions 11 to 13), as well as the number of social media platforms used, their frequency of use, on a 5-point Likert scale, and the format of multimedia content most frequently exchanged on such platforms (questions 14 to 17). The five-point scale was subsequently dichotomized as follows: low usage frequency, 1 to 3, versus high usage frequency, 4 or 5. The formats of multimedia non-sexual content considered were: text messages, images/photos, videos, audio messages and internet links.

**Socio-demographic, family and educational variables.** The participants indicated their sex, age, family situation and the work status of their parents (questions 1, 3, 5 and 6). Regarding their family situation, they were asked whether they lived with both parents or only one, the number of siblings they had and the parents' work status, that is whether both were working, only one was working or both were not working. Regarding schooling, respondents were asked whether their school was a state or charter

school, which grade they were in, whether it was their first year at the school, and whether they had repeated a grade (questions 2, 4, 7 and 8). Regarding academic performance, respondents indicated whether they expected to fail, pass or get a good mark in the subjects of Math and Spanish (questions 9 and 10).

**Sexting experiences.** Sexting questions were developed through two processes: (a) a conceptual and semantic adaptation of surveys used in previous research on sexting (Bauermeister et al., 2014; Baumgartner et al., 2012; Benotsch et al., 2013; Mitchell et al., 2012; Rice et al., 2014; Temple, Paul, van den Berg, Le, McElhany, & Temple, 2012), and (b) a discussion group conducted with adolescents. This strategy was proposed in order to adapt the questionnaire to the participants. The discussion group was formed by ten adolescents with the same profile of the respondents, that is students in their last grade of primary school and students in secondary education, selected by convenience, and the discussion lasted for 70 minutes.

In the questionnaire, sexting experiences were first recorded by three questions, with a 5-point Likert response, assessing lifetime experience of sending, receiving and forwarding of provocative or erotic content by mobile or internet (question 18). Secondly, the format of the multimedia content sent or received as sexts was indicated (question 19), as well as the sex of the protagonist of the sexts (question 20) and the transmission channel (question 21). Furthermore, it was asked whether or not the content of the sexts was intended to harm their protagonists (question 22). Finally, respondents were asked whether they thought any educational measures should be implemented in schools to inform them of sexting practices (question 23).

## **Procedure**

The administrations of the schools were contacted by telephone in order to arrange meetings and explain the study's goals. In each case, the school principal, together with the school board members, decided whether or not the school should participate. Parents were informed of the study and of their right to refuse the participation of their children; 1.22% ( $n = 8$ ) rejected it.

The questionnaire was administered to the participating adolescents in their usual classrooms, during regular class hours. The questionnaire included an introductory section explaining the aims of the study and informing the participants of its voluntary, anonymous and confidential nature. The participants also received verbal instructions

from the researchers. The procedure respected the fundamental principles of the participants' right to be informed, of the protection of their personal data, of the guarantee of the confidentiality of such data, of non-discrimination and of the freedom for the participants to abandon the study at any time during the data collection. Participants did not receive any compensation.

### **Data analysis**

We computed descriptive statistics regarding the socio-demographic, family situation and educational characteristics associated with the adolescents. Sexting prevalence was assessed in the overall sample, as well as by sex. Chi-squared statistics were used to assess dichotomous data and effect sizes were calculated as the difference of proportions (95% CI).

Questionnaire response options corresponding to the experiences of sending, receiving and forwarding sexts were dichotomized and three binary logistic regression models were constructed with the maximum likelihood adjustment method in order to analyze the effect of potential predictor variables (Hair, Black, Babin, & Anderson, 2010). The three models included the following predictor variables: sex, age, family situation, parents' work status, school type, being new to the school, repetition of a grade, expected academic performance in Math and Spanish, the number of technological communication devices used and their frequency of use, and the number of social media platforms used and their frequency of use. Since the three sexting experiences analyzed, that is sending, receiving and forwarding, have a strong substantive association, each of the three regression models excluded the other two sexting experiences as covariates. To guarantee the statistical validity of the models, the assumptions of linearity of the covariates were checked against the logit of responses, error independence, and the absence of overdispersion, of collinearity between covariates and of atypical and influential values.

An analysis of missing values gave percentages not exceeding 5% in any of the three response variables (i.e. sending, receiving or forwarding sexts). The results of an MCAR (Missing Completely at Random, Little & Rubin, 2002) test questioned the randomness of the distribution of the missing responses. Consequently, simple imputations were made according to the metrics of these variables, as well as posterior comparisons between imputed and non-imputed pairs of variables, which did not reveal significant differences in any of them. The modeling of the regression equations was

performed with 97.50% of the total sample. All analysis was performed using SPSS version 25.0.

## Results

### Prevalence and characteristics of sexting experiences

Table 2 shows prevalence results for sending, receiving and forwarding sexts. 60.59% (95% CI: 56.82%, 64.35%) of the sample had been involved in at least one of the sexting experiences. 24.27% (95% CI: 20.96%, 27.57%) of the adolescents had sent sexts one or more times, 57.96% (95% CI: 54.16%, 61.76%) had received sexts, and 17.93% (95% CI: 14.97%, 20.88%) had forwarded sexts.

Table 2

*Prevalence of sending, receiving and forwarding sexts among adolescents*

|                        | %     | Total sample<br>( <i>n</i> = 647)<br>(95% CI) | ( <i>n</i> ) | Males<br>%, ( <i>n</i> )                   | Females<br>%, ( <i>n</i> ) |
|------------------------|-------|---|--------------|--|----------------------------|
| <b>Sending sexts</b>   |       |   |              |  |                            |
| Never                  | 74.50 | (71.14, 77.86)                                | (482)        | 51.70, (249)                               | 48.30, (233)               |
| Had sent sexts         | 24.27 | (20.96, 27.57)                                | (157)        | 52.90, (83)                                | 47.10, (74)                |
| At least once          | 14.84 | (12.10, 17.58)                                | (96)         | 46.90, (45)                                | 53.10, (51)                |
| Occasionally           | 7.26  | (5.26, 9.26)                                  | (47)         | 57.40, (27)                                | 42.60, (20)                |
| Often                  | .93   | (.19, 1.67)                                   | (6)          | 100, (6)                                   | 0, (0)                     |
| Very often             | 1.24  | (.38, 2.09)                                   | (8)          | 62.50, (5)                                 | 37.50, (3)                 |
|                        |       |   |              | 52.90, (83)                                | 47.10, (74)                |
|                        |       |   |              | Chi-square test: ( <i>p</i> -value = .80)  |                            |
|                        |       |   |              | Effect size ( <i>d</i> ) -.01; (-.10, .08) |                            |
| <b>Receiving sexts</b> |       |   |              |  |                            |
| Never                  | 42.04 | (38.24, 45.84)                                | (272)        | 47.80, (130)                               | 52.20, (142)               |
| Had received sexts     | 57.96 | (54.16, 61.76)                                | (375)        | 54.92, (201)                               | 45.08, (165)               |
| At least once          | 25.81 | (22.44, 29.18)                                | (167)        | 47.50, (75)                                | 52.50, (83)                |
| Occasionally           | 19.47 | (16.42, 22.53)                                | (126)        | 57.90, (73)                                | 42.10, (53)                |
| Often                  | 9.89  | (7.59, 12.19)                                 | (64)         | 68.80, (44)                                | 31.30, (20)                |
| Very often             | 2.78  | (1.51, 4.05)                                  | (18)         | 50, (9)                                    | 50, (9)                    |
|                        |       |   |              | 54.92, (201)                               | 45.08, (165)               |
|                        |       |   |              | Chi-square test: ( <i>p</i> -value = .05)  |                            |
|                        |       |   |              | Effect size ( <i>d</i> ) -.08; (-.15, .00) |                            |

|  | %     | Total sample<br>( <i>n</i> = 647)<br>(95% CI) | ( <i>n</i> ) | Males<br>%, ( <i>n</i> )                    | Females<br>%, ( <i>n</i> ) |
|--|-------|---|--------------|---|----------------------------|
| Forwarding sexts                       |       |   |              |   |                            |
| Never                                  | 82.07 | (79.12, 85.03)                                | (531)        | 48.70, (253)                                | 51.30, (267)               |
| Had forwarded sexts                    | 17.93 | (14.97, 20.88)                                | (116)        | 65.52, (76)                                 | 54.92, (40)                |
| At least once                          | 11.44 | (8.98, 13.89)                                 | (74)         | 67.60, (50)                                 | 32.40, (24)                |
| Occasionally                           | 4.79  | (3.15, 6.44)                                  | (31)         | 58.10, (18)                                 | 41.90, (13)                |
| Often                                  | .77   | (.10, 1.45)                                   | (5)          | 80, (4)                                     | 20, (1)                    |
| Very often                             | .93   | (.19, 1.67)                                   | (6)          | 66.70, (4)                                  | 33.30, (2)                 |
|  |       |   |              | 65.52, (76)                                 | 54.92, (40)                |
|  |       |   |              | Chi-square test: ( <i>p</i> -value = .00)   |                            |
|  |       |   |              | Effect size ( <i>d</i> ) -.16; (-.26, -.07) |                            |
| Had been involved any such experiences | 60.59 | (56.82, 64.35)                                | (392)        | 55.40, (217)                                | 44.60, (175)               |
|  |       |   |              | Chi-square test: ( <i>p</i> -value = .03)   |                            |
|  |       |   |              | Effect size ( <i>d</i> ) -.09; (-.17, -.01) |                            |

Note. *p*-value associated with Chi-square test.

Sending and forwarding experiences were reported as sporadic or occasional ('at least once' or 'occasionally'), while receiving sexts was reported to have occurred at higher frequencies ('often' or 'very often') (Table 2). Sending sexts correlated with receiving sexts ( $p = .00$ ) ( $d = .39$ ; .95% CI: .32, .46) and forwarding sexts ( $p = .00$ ) ( $d = .22$ ; 95% CI: .14, .30), and receiving sext correlated with forwarding sexts ( $p = .00$ ) ( $d = .26$ ; 95% CI: .21, .31).

As shown in Table 3, although the type of general non-sexual content that adolescents most sent or received via technological devices were text messages (94.28%; 95% CI: 92.49%, 96.07%), the content most sent or received as sexts were images (47.60%; 95% CI: 43.76%, 51.45%) and videos (23.18%; 95% CI: 19.93%, 26.44%). Among those who had sent or received sexts, males exchanged more erotic videos than females (65.20% vs. 34.80%) ( $p = .00$ ) ( $d = -.15$ ; 95% CI: -.25, -.05), as well as more internet links than females (67.80% vs. 32.20%) ( $p = .04$ ) ( $d = -.15$ ; 95% CI: -.28, -.01).

Table 3

*Sexts exchanged by males and females*

| Media content | General media content (no sexts) |                |     | Sexting media content (sexts) |                |     | Sexts exchanged by |                 | Chi-square test; Effect size & 95% CI    |
|---------------|----------------------------------|----------------|-----|-------------------------------|----------------|-----|--------------------|-----------------|--|
|               | %                                | (95% CI)       | (n) | %                             | (95% CI)       | (n) | Males % , (n)      | Females % , (n) |  |
| Texts         | 94.28                            | (92.49, 96.07) | 610 | 17.47                         | (14.54, 20.39) | 113 | 49.10 (53)         | 50.90 (55)      | $p = .12$ ;<br>$d = .09$ (-.02, .20)     |
| Images        | 92.27                            | (90.21, 94.33) | 597 | 47.60                         | (43.76, 51.45) | 308 | 56.30 (165)        | 43.70 (176)     | $p = .56$ ;<br>$d = -.03$ , (-.15, .08)  |
| Videos        | 90.68                            | (88.44, 92.93) | 584 | 23.18                         | (19.93, 26.44) | 150 | 65.20 (92)         | 34.80 (49)      | $p = .00$ ;<br>$d = -.15$ , (-.25, -.05) |
| Audios        | 90.57                            | (88.32, 92.82) | 586 | 6.49                          | (4.59, 8.39)   | 42  | 45 (18)            | 55 (22)         | $p = .16$ ;<br>$d = .12$ , (-.05, .28)   |
| Links         | 83.85                            | (81.01, 86.69) | 540 | 9.74                          | (7.45, 12.02)  | 63  | 67.80 (40)         | 32.20 (19)      | $p = .04$ ;<br>$d = -.15$ , (-.28, -.01) |

Note. p-value associated with Chi-square test.

Note. "ES" = Effect size and 95% CI.



As shown in Table 4, received sexts mainly featured protagonists that were known adolescents (42.50%; 95% CI: 38.69%, 46.31%) (18.90% males and 23.60% females). Also protagonists in sexts, although to a lesser extent, were unknown adolescents (23.90%; 95% CI: 20.65%, 27.19%) (8% males and 15.90% females), students at the same school (23.30%, 95% CI: 20.10%, 26.60%) (11.10% males and 12.20% females), unknown adults (11.70%, 95% CI: 9.24%, 14.18%), and known adults (3.10%, 95% CI: 1.76%, 4.42%). The results evidence that males received more sexts with female protagonists than male protagonists, while females received more sexts with male protagonists than female protagonists.

Table 4

*Protagonists of sexts received by males and female*

|                                 | %     | (95% CI)       | (n)   | Received by<br>males<br>%, (n) | Received by<br>females<br>%, (n) | Chi-square test;<br>Effect size & 95% CI |
|---------------------------------|-------|----------------|-------|--------------------------------|----------------------------------|--|
| Adolescent males I know         | 18.90 | (15.84, 21.87) | (122) | 36.10 (44)                     | 63.90 (78)                       | $p = .00$ ;<br>$d = .20, (.10, .29)$     |
| Adolescent males at my school   | 11.10 | (8.71, 13.55)  | (72)  | 48.60 (35)                     | 51.40 (37)                       | $p = .51$ ;<br>$d = .04, (-.08, .16)$    |
| Adolescent males I don't know   | 8     | (5.94, 10.13)  | (52)  | 28.80 (15)                     | 71.20 (37)                       | $p = .00$ ;<br>$d = .25, (.12, .38)$     |
| Adolescent females I know       | 23.60 | (20.37, 26.92) | (153) | 62.70 (96)                     | 37.30 (57)                       | $p = .00$ ;<br>$d = -.14, (-.23, -.05)$  |
| Adolescent females at my school | 12.20 | (9.69, 14.73)  | (79)  | 64.60 (51)                     | 35.40 (28)                       | $p = .02$ ;<br>$d = -.14, (-.25, -.03)$  |
| Adolescent females I don't know | 15.90 | (13.10, 18.74) | (103) | 65 (67)                        | 35 (36)                          | $p = .01$ ;<br>$d = -.15, (-.25, -.05)$  |
| Adults I know                   | 3.10  | (1.76, 4.42)   | (20)  | 60 (12)                        | 40 (8)                           | $p = .48$ ;<br>$d = -.08, (-.30, .14)$   |
| Adults I don't know             | 11.70 | (9.27, 14.23)  | (76)  | 60.50 (46)                     | 39.50 (30)                       | $p = .12$ ;<br>$d = -.09, (-.21, .02)$   |

*Note.* p-value associated with Chi-square test.

Regarding transmission channels, sexts were mainly received via one-to-one channels (63.20%, 95% CI: 58.32%, 68.08%). 43.40% (95% CI: 38.22%, 48.54%) had received sexts exclusively via one-to-one channels, 33.24% (95% CI: 28.34%, 38.14%) exclusively via group channels, and 23.38% (95% CI: 18.98%, 27.78%) via both types of channel. As shown in Table 5, males who received sexts exclusively via one-to-one channels mainly featured female adolescent protagonists they knew (54.90%), followed by female students of the same school (22%), while males who received sexts exclusively via group channels mainly featured protagonists who were male adolescents from their own school (26.90%), followed by male adolescents they knew (25.60%). Females who received sexts exclusively via one-to-one channels mainly featured protagonists who were known male adolescents (59%). However, females who received sexts exclusively via group channels featured protagonists who were known female adolescents (28.60%). When sexts were received exclusively via one-to-one channels, the results were similar to when the transmission channel was indistinguishable in that the adolescents received more sexts with adolescent protagonists of the opposite sex. The same was not true with sexts received exclusively via group channels.

Table 5

*Protagonists of sexts received by males and females via one-to-one or group channels*

|                        | Received via one-to-one channel |                   |  | Received via group channel |                   |  |
|------------------------|---------------------------------|-------------------|--|----------------------------|-------------------|--|
|                        | Males<br>(n), %                 | Females<br>(n), % | Differences by sex<br>(Chi-square test & ES) | Males<br>(n), %            | Females<br>(n), % | Differences by sex<br>(Chi-square test & ES) |
| Males I know           | (13)                            | (46)              | $p = .00$ ;                                  | (20)                       | (11)              | $p = .24$ ;                                  |
| % within this category | 22%                             | 78%               | $d = .49, (.35, .62)$                        | 64.50%                     | 35.50%            | $d = -.12, (-.31, .07)$                      |
| % within sex           | 14.30%                          | 59%               |  | 25.60%                     | 7.50%             |  |
| Males at my school     | (7)                             | (16)              | $p = .02$ ;                                  | (21)                       | (15)              | $p = .67$ ;                                  |
| % within this category | 30.40%                          | 69.60%            | $d = .27, (.07, .48)$                        | 58.30%                     | 41.70%            | $d = -.04, (-.23, .15)$                      |
| % within sex           | 7.70%                           | 20.50%            |  | 26.90%                     | 23.80%            |  |
| Males I don't know     | (2)                             | (11)              | $p = .00$ ;                                  | (4)                        | (12)              | $p = .01$ ;                                  |
| % within this category | 15.40%                          | 84.60%            | $d = .42, (.21, .63)$                        | 25%                        | 75%               | $d = .34, (.11, .57)$                        |
| % within sex           | 2.20%                           | 14.10%            |  | 5.10%                      | 19%               |  |
| Females I know         | (50)                            | (23)              | $p = .00$ ;                                  | (19)                       | (18)              | $p = .57$ ;                                  |
| % within this category | 68.50%                          | 31.50%            | $d = -.26, (-.40, -.11)$                     | 51.40%                     | 48.60%            | $d = .05, (-.13, .24)$                       |
| % within sex           | 54.90%                          | 29.50%            |  | 24.40%                     | 28.60%            |  |
| Females at my school   | (20)                            | (13)              | $p = .39$ ;                                  | (14)                       | (7)               | $p = .26$ ;                                  |
| % within this category | 60.60%                          | 39.40%            | $d = -.08, (-.27, .10)$                      | 66.70%                     | 33.30%            | $d = -.13, (-.35, .09)$                      |
| % within sex           | 22%                             | 16.70%            |  | 17.90%                     | 11.10%            |  |
| Females I don't know   | (17)                            | (8)               | $p = .12$ ;                                  | (18)                       | (15)              | $p = .92$ ;                                  |
| % within this category | 68%                             | 32%               | $d = -.17, (-.37, .03)$                      | 54.50%                     | 45.50%            | $d = .01, (-.18, .20)$                       |
| % within sex           | 18.70%                          | 10.30%            |  | 23.10%                     | 23.80%            |  |
| Adults I know          | (0)                             | (3)               | $p = n/a$                                    | (8)                        | (0)               | $p = n/a$                                    |
| % within this category | 0%                              | 100 %             | $d = n/a$                                    | 100%                       | 0%                | $d = n/a$                                    |
| % within sex           | 0%                              | 3.80%             |  | 10.30%                     | 0%                |  |
| Adults I don't know    | (14)                            | (4)               | $p = .03$ ;                                  | (14)                       | (16)              | $p = .28$ ;                                  |
| % within this category | 77.80%                          | 22.20%            | $d = -.24, (-.48, -.06)$                     | 46.70%                     | 53.30%            | $d = .11, (-.09, .31)$                       |
| % within sex           | 15.40%                          | 5.10%             |  | 17.90%                     | 25.40%            |  |

Note. p-value associated with Chi-square test; "ES" = Effect size and 95% CI; "n/a" = not applicable.

When asked whether the contents of sexts were intended to harm their protagonists, 58.93% (95% CI: 54.29%, 63.58%) of participants responded 'no', while 41.07% (95% CI: 36.42%, 45.71%) of participants responded 'yes'. When considering both the total sample and the subsample of adolescents involved in any of the sexting experiences, more females than males reported that sexts were intended to harm the protagonist ( $p = .00$  and  $p = .02$ , respectively) ( $d = .14$ ; 95% CI: .05, .24 and  $d = .12$ ; 95% CI: .02, .22, respectively).

Regarding the potential implementation of educational measures in schools in order to inform students on the phenomenon of sexting, 73.78% (95% CI: 70.35%, 77.20%) of the sample considered such measures necessary, while 26.22% (95% CI: 22.80%, 29.65%) of the sample considered them unnecessary. Both in the total sample and in the subsample of those involved in any of the sexting experiences, more females than males felt it necessary to implement such educational measures ( $p = .00$  and  $p = .00$ , respectively) ( $d = -.18$ ; 95% CI: -.27, -.10 and  $d = -.19$ ; 95% CI: -.29, -.09, respectively).

### **Analysis of socio-demographic, family situation and educational correlates of sexting experiences**

Table 6 indicates the results of the binary logistic regression model for sending sexts, including exclusively the values of predictor variables whose Adjusted Odds Ratios (ORadj) were statistically significant. The data reveals a significant global adjustment ( $\chi^2(16) = 52.17$ ;  $p = .00$ ), with the covariates reducing the divergence of the null model fit by 12.10% ( $R^2$  Nagelkerke = .12). The Hosmer and Lemeshow test indicates a good model fit (.21). Three covariates appeared to have a statistically significant effect on sending sexts: repetition of a grade ( $p = .04$ ), the number of social media platforms used ( $p = .00$ ), and the frequency of their use ( $p = .03$ ).

The sending of sexts correlated significantly with the number of social media platforms networks used (OR: 1.18, 95% CI: 1.07, 1.30). In addition, adolescents who used social media more frequently were 2.12 times more likely to have sent a sext (95% CI: 1.09, 4.13). Furthermore, those who had repeated a grade were 1.70 times (95% CI: 1.02, 2.82) more likely to have sent a sext than those who had never repeated a grade.

Table 6

Summary of binary logistic regression models predicting sexting experiences among adolescents

|  | OR <sub>adj</sub> (95% CI)    | (OR <sub>adj</sub> - 1) * 100 | p-value                                   |
|--|-------------------------------|-------------------------------|---|
| Model 1: Sending sexts                     |                               |                               | $\chi^2 = 52.17^{***}$ ;<br>$R^2 = .121$  |
| Grade repetition (vs. repeated a grade)    | 1.70 (1.02, 2.82)             | 69.38% (2%, 181.50%)          | .042                                      |
| Number of social media platforms           | 1.18 (1.07, 1.30)             | 18.06% (7%, 30%)              | .001                                      |
| Social media use frequency (vs. daily use) | 2.12 (1.09, 4.13)             | 112.34% (9.09%, 312.90%)      | .027                                      |
| Constant                                   | $B = -4.88$ ; ( $SE = 1.42$ ) |                               | .001                                      |
| Model 2: Receiving sexts                   |                               |                               | $\chi^2 = 139.56^{***}$ ;<br>$R^2 = .272$ |
| Sex (vs. females)                          | .58 (.40, .85)                | -41.70% (-60%, -15%)          | .005                                      |
| Age  | 1.50 (1.22, 1.83)             | 49.60% (22.30%, 83%)          | .000                                      |
| Family situation (vs. single-parent)       | 2.82 (1.37, 5.83)             | 182.20% (36.60%, 482.70%)     | .005                                      |
| Number of social media platforms           | 1.24 (1.12, 1.38)             | 24.30% (12%, 38%)             | .000                                      |
| Social media use frequency (vs. daily use) | 2.30 (1.38, 3.85)             | 130.30% (37.90%, 284.70%)     | .001                                      |
| Device use time                            | 1.09 (1.02, 1.17)             | 9.20% (1.60%, 17.40%)         | .017                                      |
| Constant                                   | $B = -6.51$ ( $SE = 1.44$ )   |                               | .000                                      |
| Model 3: Forwarding sexts                  |                               |                               | $\chi^2 = 60.58^{***}$ ;<br>$R^2 = .154$  |
| Sex (vs. females)                          | .44 (.27, .71)                | -56.10% (-72.70%, -29.50%)    | .001                                      |
| Age  | 1.37 (1.10, 1.70)             | 36.50% (9.50%, 70%)           | .006                                      |
| Expected result in Math (vs. good marks)   | .59 (.36, .97)                | -40.90% (-63.90%, -3.20%)     | .037                                      |
| Number of social media platforms           | 1.13 (1.02, 1.26)             | 13.10% (1.70%, 25.0%)         | .023                                      |
| Constant                                   | $B = -6.81$ ( $SE = 1.59$ )   |                               | .000                                      |

*Note 1.* Logistic regression Adjusted Odds Ratio ( $OR_{adj}$ ), 95% confidence intervals (95% CI) and p-values (p).  $(OR_{adj} - 1) * 100$  indicates the effect of covariables on sexting practices expressed as a percentage change.  $\chi^2$  = Chi-square value.  $R^2$  = Nagelkerke R squared. SE = standard error. \* p < .05; \*\* p < .01; \*\*\* p < .001.

*Note 2.* The three binary logistic regression models included the following complete list (Entry) of covariates: sex; age; family situation; family work status; school type; school seniority; grade repeated; expected result in Math; expected result in Spanish; number of devices used; time using devices; number of social media platforms used and frequency of social media use.

Results for the logistic regression analyzes for receiving sexts (Table 6) show that the final model contributes considerably to improving the null model fit ( $\chi^2(7) = 139.56$ ;  $p = .000$ ). The Hosmer and Lemeshow test indicates a good model fit (.57). According to the Nagelkerke coefficient, 27.20% of the dependent variable (receiving sexts) is indicated by the covariates: sex ( $p = .01$ ), age ( $p = .00$ ), family situation ( $p = .01$ ), number of social media platforms used ( $p = .00$ ), their frequency of use ( $p = .00$ ), and technological communication device use time ( $p = .017$ ).

The final model shows that receiving sexts correlated significantly with sex, with more males involved in this experience (OR: .58, 95% CI: .40, .85). Age also turned out to be a clearly significant predictor variable, indicating that older adolescents in general were more likely to have received sexts (OR: 1.50, 95% CI: 1.22, 1.83). Regarding family situation, adolescents who reported living in a single-parent family were 2.82 times more likely to have received sexts (95% CI: 1.37, 5.83). Regarding the use of social media, adolescents who reported engaging with a greater number of social media platforms (OR: 1.24, 95% CI: 1.12, 1.38) were more likely to receive sexts. Likewise, the frequency of use of social media positively correlated with receiving sexts (OR: 2.30, 95% CI: 1.38, 3.85). Regarding the use of technological communication devices, the more time they reported using such devices, the more likely adolescents were to have received sexts (OR: 1.09, 95% CI: 1.02, 1.17).

The third regression model concerning forwarding sexts shows that the proposed model contributes significantly to reducing the divergence of the null model ( $\chi^2(16) = 60.58$ ;  $p = .00$ ). The Hosmer and Lemeshow test indicates an adequate model fit (.632). The set of included variables reduced the divergence in relation to the null model by 15.40%. Four covariates appeared to have a statistically significant effect on forwarding sexts: sex ( $p = .00$ ), age ( $p = .01$ ), respondents' expectations for academic results in Math ( $p = .04$ ), and the number of social media platforms used ( $p = .02$ ).

The results indicate that being male correlated significantly with forwarding sexts (OR: .44, 95% CI: .27, .71). Older adolescents were 1.37 times (OR: 1.37, 95% CI: 1.10, 1.70) more likely to have reported forwarding sexts. Furthermore, adolescents with lower expectations for their academic results in Math were more likely to have forwarded sexts (OR: .59, 95% CI: .36, .97). Finally, a greater number of social media platforms used significantly increased the likelihood of having forwarded sexts (OR: 1.13, 95% CI: 1.02, 1.26).



## **Discussion**

This study examines the prevalence of the phenomenon of sexting, and identifies several associated socio-demographic, family situation and educational correlates. It is one of only a few studies that presents and analyzes disaggregated sexting prevalence data in relation to various basic reference elements in the definition of sexting. The study considers three main sexting experiences, sending, receiving and forwarding, five multimedia formats (texts, images, videos, audio messages and links), the profile of the protagonists featuring in the sexts and the content transmission channel. By including a broader range of sexting's defining elements, we have been able to characterize sexting participants better than previous studies that have only partially studied or totally ignored such elements.

Our results suggest that sexting is a common practice among Spanish adolescents. In our sample of adolescents from 12 to 18 years of age, around 24% admitted to having sent sexts, 58% to having received sexts, and 18% to having forwarded sexts. Such results are consistent with estimates of sexting prevalences yielded by research conducted across five European countries (see Stanley et al., 2018, and Wood et al., 2015). Our prevalence for sending sexts was, however, higher than that reported by other recent studies carried out in Spain (Gámez-Guadix & Mateos-Pérez, 2019; Gámez-Guadix & Santisteban, 2018; Gámez-Guadix, Santisteban, & Resett, 2017), although comparisons should be made with caution, considering the considerable conceptual and methodological differences between studies, as discussed in the introduction to this study.

The predominant format of sexts reported by our sample of adolescents were images, in agreement with results from Villacampa (2017) and Hudson & Marshall (2016), but not from Gámez-Guadix et al. (2017) and the National Campaign to Prevent Teen and Unplanned Pregnancy (NCPTUP, 2008), which reported a more common exchange of sexual content in the form of written text than in the form of photos, images or videos. It is important to note that the exchange of sexual pictures may require a higher degree of exposure and of trust between the sender and receiver compared to the exchange of sexual text messages. In this regard, our study went a step further in considering not only the text messages, images and videos commonly considered in previous studies, but also audio recordings of a sexual nature, which can very easily be used by adolescents to stimulate or satisfy their own or others' sexual pleasures. The present study also expanded on previous research in an important way by differentiating between the protagonists

featured in the sexts. As protagonists of the sexts, our respondents mostly reported known adolescents, more than half of whom females, or students from their own school. This confirms the results of Villacampa (2017), which reported 78% of sexts having protagonists that were minors. In relation to the transmission channel used, we found that sexts received by male and female adolescents through one-to-one channels had, above all, protagonists of the opposite sex respectively, while sexts received by male and female adolescents through group channels had, predominantly, protagonists of the same sex respectively. This finding suggests that the exchange sexual content through groups is far from being a consensual and exclusive sexual practice between a sender and a receiver. This is a particularly sensitive issue since, as suggested by Lloria (2013), the dissemination of intimate content without the consent of the protagonist beyond the one-to-one realm may have considerable psychological, physiological, sexual, academic and/or social consequences, even more so when framed by a public or threatening context. Another relevant result of our study is that involvement in any of the experiences of sending, receiving or forwarding sexts seems to correlate with the likelihood of being involved in the other experiences. This confirms the previous results of Rice et al. (2014, 2018) regarding the experiences of sending and receiving sexts.

This study also explores sexting's associations with socio-demographic, family situation and schooling correlates, and the use of technological communication devices and social media platforms. Regarding socio-demographic correlates, our study found that adolescent males receive and forward more sexts than adolescent females. This is in agreement with various previous studies reporting that adolescent males receive more sexts than females (Gordon-Messer et al., 2013; Hinduja & Patchin, 2010; Morelli et al., 2016b; Strassberg, McKinnon, Sustaíta, & Rullo, 2013). However, our data is not in agreement with the studies of Dake et al. (2012), Lenhart (2009), NCPTUP (2008), Rice et al. (2012) and Temple et al. (2012), which reported no significant sex differences. One possible explanation for this finding is that females experienced more pressure to send sexts than boys (Drouin & Tobin, 2014; Lippman & Campbell, 2014; Wood et al., 2015; Burén & Lunde, 2018). The decision to engage in sexting may have been influenced by how their immediate environment perceive this practice, in addition to other online and offline sexual risk-associated behaviors. Indeed, the influence of peer groups on sharing sexual content on the internet has been proven in various studies (Houck et al., 2014; Van Ouytsel, Ponnet, Walrave & d'Haenens, 2017). Regarding age, our study suggests that older adolescents are more likely to have received and forwarded sexts, in agreement with

previous studies (Cox Communications, 2009; Dake et al., 2012; Lenhart, 2009; Mitchell et al., 2012; Rice et al., 2012; Rice et al., 2014; Rice et al., 2018; Strassberg et al., 2013). This may be the result of the combination of the possibilities offered by ICT use and age-typical sexual needs, for example, the growing need to learn about one's own body and reproductive physiology, to self-explore and to self-stimulate in order to satisfy one's growing sexual desires, and to initiate one's first sexual relationships. Such needs may be satisfied via ICT, which can provide a wealth of information on topics of sexuality, offer a non-physical space for interaction, and play an important role in the development and sexual satisfaction of young people (Bianchi, Morelli, Baiocco & Chirumbolo, 2017; Bianchi et al., 2019).

Regarding technological means, our study differentiates between the use of technological communication devices and social media platforms. It indicates that using a greater number of devices was not associated with sexting, though the frequency of their use did correlate positively with having received sexts. Increased number and frequency of use of social media platforms also correlated with higher rates of having sent, received and forwarded sexts. This is a particularly relevant result given that a number of studies have found a relationship between an adolescent's degree of exposure to the internet and being a victim of both online and offline harassment (Englander, 2015; Choi, Van Ouytsel, & Temple, 2016; Wolak, Finkelhor, Walsh, & Treitman, 2018), including blackmail, pressure and coercion.

As highlighted previously in this article, few studies have considered variables in the school environment as possible correlates of sexting. In this regard, the present study has relevant research implications as it confirms the importance of taking into account the roles of family and schooling variables. Our study examined as many as five variables concerning the school context: the type of school, being new to the school, repetition of a grade and academic expectations in Math and in Spanish. Our data indicates that repeating a grade was statistically associated with sending sexts. Regarding academic aspects, Baumgartner et al. (2012) were the first to warn that adolescents with lower educational performance were more likely to experience moderate risk situations on the internet, including sexting. On the contrary, Bauermeister et al. (2014) found that adolescents with a higher educational level practiced more sexting, although it is likely that the educational level is modulated by age, which this study suggests is a differentiating variable for whether adolescents are involved in sexting or not. In other studies, academic performance was not found to influence sexting (Benotsch et al. 2013;

Yeung et al., 2014). In our study, the educational level was operationalized in the form of respondents' expectations of academic performance in the subjects of Math and Spanish, suggesting that adolescents with low expectations of academic performance in Math were more likely to have forwarded sexts. In agreement, the study carried out by Baumgartner et al. (2012) implied that low academic performance was not only a predictor of participation in sexting but also of a diverse range of online and offline sexual risk behaviors. Although our findings concur that academic variables may be relevant markers or indicators of participation in sexting, evidently more research is needed to clarify the predictive power of such variables.

Regarding the family situation of adolescents, research in this field underlines the importance of the relationship between parents and children. Our study suggests that living in a single-parent family environment was associated with an increased likelihood of having received sexts, while Dake et al. (2012), Vanden Abeele et al. (2014) and Chaudhary et al. (2017) obtained similar results, detecting a significant increase in involvement in sexting in children of divorced or separated parents. Research by Baumgartner et al. (2012) also suggested that adolescents from less cohesive families were more likely to participate in situations of moderate risk relating to the use of the internet, including involvement in sexting. It is possible that adolescents living in a single-parent family environment have less support when it comes to discussing issues as important as the self-management of intimate and sexual relationships. Indeed, some studies suggest that adolescents who perceive low levels of practical and emotional support from their families are more likely to send sexts (Burén & Lunde, 2018; Campbell & Park, 2014). Such findings highlight the connection between the parent-adolescent relationship and online sexual practices, a connection that merits further exploration.

### **Implications for future research**

Based on the results of the present study and the scope of sexting practice in general, various suggestions for future research may be formulated for a better understanding of this topic. Considering that the most exchanged sext format in our sample was that of images, and that the consequences of the malicious use of pictures or videos in which one is easily identifiable or recognizable may be particularly harmful, future research should clarify the importance of whether or not the faces of participants are visible in the pictures or videos. Already several studies have indicated that a significant proportion of participants reporting having sent nude and semi-nude depictions admitted having

included faces in such depictions (Perkins, Becker, Tehee, & Mackelprang, 2014; Crimmins & Seigfried-Spellar, 2014).

Our study suggests that living in a single-parent family was associated with higher sexting rates. Further research is needed to explore how family dynamics, including educational and communication styles, emotional attachment and parental control strategies, can influence sexting practice among youths. For instance, it has already been suggested that some parental strategies to control and monitor sexting are largely ineffective (Campbell & Park, 2014). Such research would help the development of practical advice for parents regarding their roles in their children's sex education in the digital sphere.

Regarding schooling aspects, we analyzed performance expectations in the school subjects of Math and Spanish in relation to sexting. In future research, it would be interesting to further explore whether better social and communicative skills, associated with better performance in language subjects, contribute to increased involvement in sexting (see Woodward et al., 2017). It is, indeed, possible that adolescents with better communication skills send and receive more sexts, as some studies have already suggested that personality factors, such as extraversion (Olatunde & Balogún, 2017; Delevi & Weisskirch, 2013), are related to the prevalence of sexting.

Regarding the potential implementation of educational measures in schools to inform students about the phenomenon of sexting, our findings provide support for further consideration of such measures, as 70% of our respondents considered such measures necessary. Research already recommends that such measures should revolve around four fundamental principles. Firstly, as Bianchi et al. (2017) point out, education in this area should provide detailed information on the innate characteristics of actions committed on the internet: the potential for a considerable and widespread audience, the possibility of acting under anonymity or not, the imperishability of or difficulty to eliminate content, the ease of modification and distribution of content without any control (Chalfen, 2009; Dake et al., 2012; Patrick et al., 2015). Secondly, educational measures should address the opportunities, risks and consequences of the specific practice of sexting (Yeung et al., 2014), and provide information on cyber-victimization under the guises of sextortion, grooming, cyberbullying and revenge pornography. Thirdly, considering that sexting relates to the intimacy and sexual development of young people, information on ethical issues, such as willingness and consensus when exchanging of sexually natured messages between sender and receiver, could be useful (Albury & Crawford, 2012; Patrick et al.,

2015). Fourthly, given the relational nature of sexting, and as a consequence of the above, training and reinforcement of assertive skills in adolescents could be useful in dealing with pressure to send sexts (Choi et al., 2016; Gámez-Guadix & Mateos-Pérez, 2019; Gregg et al., 2018).

Beyond educational measures, accessible and appropriate legal measures should also be introduced with respect to sexting incidents (Van Ouytsel, Walrave, & Van Gool, 2014). Approximately 41% of our sample believed that the contents of sexts received were intended to harm their protagonists. For this reason, professionals directly involved in adolescent development should also receive information and action guidelines on sexting and other possible online risk practices (Khubchandani, Telljohann, Price, Dake, & Hendershot, 2013).

### **Our study's limitations**

Our results must be interpreted within the context of the study's limitations. The cross-sectional nature of the study limits the establishment of causal relationships between the practice of sexting and the correlates analyzed. The development of longitudinal studies would, indeed, help to confirm our results, particularly in light of the fact that sexting practices may evolve with time and the advancement of information and communications technology. Furthermore, the study's sample was chosen for convenience, limiting its wider validity and the generalization of the data to other aspects, such as other educational levels. Additionally, answers provided by adolescents regarding sexting via the method of self-reporting may be influenced by social desirability effects (Hudson & Fetro, 2015; Livingstone & Görzig, 2012). Finally, although our work provided more detailed information on adolescent sexting practices, developing its questions to respondents based on previous study instruments and on the results of a discussion group, the lack of a standardized definition or set of measures of sexting still makes it challenging to accurately estimate or find consensus on its prevalence.

### **Conclusions**

Our study suggests that sexting is prevalent among Spanish secondary school students: over 60% of our sample had been involved in some sort of sexting (24% of respondents had sent a sext, 58% had received one and 18% had forwarded one).

The most exchanged sexting contents in our sample were in image and video formats, were received mainly through one-to-one channels and featured adolescent protagonists known personally by and of the opposite sex to respondents. Although only 40% of our study sample believed that the sexts exchanged had been intended to harm their protagonists, more than 70% thought it necessary to implement educational measures at their school to inform them about the potential negative consequences of the practice of sexting. This is particularly important in light of the fact that 18% of our sample had forwarded a sext to others and that sexts received exclusively via group channels most often featured protagonists that were peers of the same sex as the recipient. These results suggest that the phenomenon of sexting was far from being a consensual and private sexual practice between two individuals.

The socio-demographic, family and educational profiling of adolescents most involved in sexting experiences indicates that those who had sent sexts were more likely to have repeated a grade and to report using a greater number of social media platforms on a more frequent basis. Certain subgroups of the students, including males, older adolescents, those living in a single-parent family, those reporting use of a greater number of social media platforms and those spending more time using technological communication devices and social media platforms were significantly more likely to have received sexts. Those reporting to have forwarded sexts were more likely to be male, to be older, to use a greater number of social media platforms and to have low performance expectations in the school subject of Math. Finally, our study also provides results that can support new lines of inquiry into analyzing the relationship between sexting and certain socio-demographic, family situation and educational variables in relation to adolescents.

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**Data sharing**

The datasets generated and analyzed in this study are not publicly available, but are available from the corresponding author on reasonable request.

**Compliance with ethical standards****Conflict of interest**

The authors declare that they have no conflict of interest.

**Ethical approval**

The authors received due ethical approval for all research conducted in this study.



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## Appendix 1

1. Sex  Male  Female      2. Type of School  State school  Charter school      3. Age: \_\_\_\_ years      4. School grade: \_\_\_\_

### 5. Family situation

- Living with both parents       Living with my father or mother and his or her current partner  
 Living with my father and not my mother       I have \_\_\_\_ brother(s) / sister(s)  
 Living with my mother and not my father       Other family members:

### 6. Current family work status

- Only my father works       Neither of my parents works  
 Only my mother works       Another situation: \_\_\_\_\_  
 Both my parents work

### 7. Is this your first year at this school?

- Yes  
 No

### 8. Have you repeated a grade?

- Yes, in this school  
 Yes, in another school  
 No

### 9. Expected result in Math

- I will fail  
 I will pass (Pass or Good)  
 I will get a good mark (Merit or Distinction)

### 10. Expected result in Spanish

- I will fail  
 I will pass (Pass or Good)  
 I will get a good mark (Merit or Distinction)

11. How many technological devices (e.g. cell phone, tablet) do you use on a typical weekday? \_\_\_\_ devices.

12. For approximately how many hours a day do you use such devices? \_\_\_\_ hours.

13. How frequently do you use a ...?

|               | Daily | Several days a week | Several days a month | Almost never | Never |
|---------------|-------|---------------------|----------------------|--------------|-------|
| Cell phone    |       |                     |                      |              |       |
| Tablet        |       |                     |                      |              |       |
| Computer      |       |                     |                      |              |       |
| <b>Others</b> |       |                     |                      |              |       |
| _____         |       |                     |                      |              |       |
| _____         |       |                     |                      |              |       |

14. Do you use social media?  Yes  No

15. Number of social media platforms you use: \_\_\_\_

16. How often do you use them?

- Daily       Several days a week       Several days a month       Almost never       Never

17. Sort by frequencies what type of non-sexual content is the most you exchange over the internet (regardless of the device used). Answer: 1 = more frequent; 5 = Less frequent.

| Send          |     | Receive       |     | Forward       |     |
|---------------|-----|---------------|-----|---------------|-----|
| Text messages | ___ | Text messages | ___ | Text messages | ___ |
| Photos        | ___ | Photos        | ___ | Photos        | ___ |
| Videos        | ___ | Videos        | ___ | Videos        | ___ |
| Audios        | ___ | Audios        | ___ | Audios        | ___ |
| Links         | ___ | Links         | ___ | Links         | ___ |
| Other         | ___ | Other         | ___ | Other         | ___ |

**18. Sexting experiences**

Very often      Often      Occasionally      At least once      Never

|   | Very often | Often | Occasionally | At least once | Never |
|---|------------|-------|--------------|---------------|-------|
| a) I have SENT erotic or provocative content, such as a text message, photo, audio or video of myself, to a person I know via cell phone or internet. |            |       |              |               |       |
| b) I have RECEIVED erotic or provocative content, such as a text message, photo, audio or video of someone I know via cell phone or internet.         |            |       |              |               |       |
| c) I have FORWARDED erotic or provocative content, such as a text message, photo, audio or video of someone I know via cell phone or internet.        |            |       |              |               |       |
| Another similar situation:  |            |       |              |               |       |

**19. If you have answered positively to any of the items in question 18, what kind of erotic and provocative content have you sent or received?** (Multiple responses allowed):

- Text messages       Pictures       Videos       Audios       Links       Other: \_\_\_\_

**20. If you have answered positively to question 18 b), mark with an X the protagonists of such content** (Multiple responses allowed)

- Adolescent males I know       Adolescent females I know  
 Adolescent males at my school       Adolescent females at my school  
 Adolescent males I don't know       Adolescent females I don't know  
 Adults I know       Adults I don't know

**21. I have RECEIVED this content** (multiple responses allowed)

- Via a one-to-one channel       Via a group channel

**22. Was the content of these messages intended to hurt the protagonist?**

- Yes, of course       Maybe       I don't think so       Of course not

**23. Do you think any educational measures should be implemented in schools to inform you of such practices?**

- Yes       No

## 6.2. Article 2: Prevalence of Sending, Receiving and Forwarding Sexts among Youths: A Three-Level Meta-Analysis

**PLOS ONE**

RESEARCH ARTICLE

### Prevalence of sending, receiving and forwarding sexts among youths: A three-level meta-analysis

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Full Title

Prevalence of Sending, Receiving and Forwarding Sexts among Youths: A  
Three-Level Meta-Analysis

Short Title

Sexting Prevalence among Youths: A Three-Level Meta-Analysis

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## Abstract

By systematic review with a three-level, mixed-effects meta-analysis, this paper examines the prevalence of sexting experiences among youths aimed at analyzing conceptual and methodological moderators that might explain its heterogeneity. A search was conducted of five bibliographic databases and grey literature up until February 2020. The risk of bias in primary studies was assessed. A total of seventy-nine articles met the set inclusion criteria. Mean prevalences for sending, receiving and forwarding sexts were .14 (95% CI: .12, .17), .31 (95% CI: .26, .36) and .07 (95% CI: .05, .09), respectively, expressed as fractions over one. Moderator analyses showed that all sexting experiences increased with age (e.g., the mean prevalence for sending sexts at the age of 12 was .04, whereas, at the age of 16, it was .21) and year of data collection (e.g., the mean prevalence for sending sexts in studies collecting data in 2009 was .07, whereas, in studies collecting data in 2018, it was .33). Subgroup analysis revealed that studies with probabilistic samples led to significantly lower mean prevalences for the sexting experiences of sending (.08, 95% CI: .06, .11), receiving (.19, 95% CI: .15, .24) and forwarding sexts (.04, 95% CI: .03, .07). Self-reported administration procedures also led to more homogeneous prevalence estimates than interviews. Prevalence estimates also varied according to the type of media content (e.g., the mean prevalence for sending sexual text messages was .22, whereas, for sending sexual images or videos, it was .12). Overall, our meta-analysis results suggest high and increasing prevalences of sending and receiving sexts among youths.



## Introduction

Sexting, generally defined as the sending, receiving or forwarding of erotic or sexual media content (e.g. messages, photos or videos, commonly collectively referred to as 'sexts'), through interactive technological devices, mainly mobile devices, is prevalent among youths [1,2]. In the last few years, sexting has gained increasing empirical attention due to its implications and possible consequences. A part of the research literature frames sexting as a normalized and legitimate sexual activity that allows youths to satisfy certain needs relating to the exploration and discovery of their own sexual identity, and the initiation or maintenance of new affective or sexual relationships [3,4]. However, the available empirical evidence also suggests that sexting entails risks such as the intentional, non-consensual distribution of sexts beyond the intended recipient [5]. Several empirical studies have also found that sexting involvement was associated with participation in undesirable dynamics such as dating violence, sextortion, cyberbullying and grooming [6–10]. Likewise, in some studies, sexting has also been associated with anxiety and depression symptomology, as well as attempted or ideated suicide [11–13].

Sexting prevalence rates observed in youths indicate great variability, and demographic correlates are inconclusive, especially concerning gender differences [1,2,14]. To date, a number of studies have examined sexting prevalence rates among youths. Klettke et al.[1] analyzed 12 studies with samples of adolescents under 19 years old, obtaining a mean prevalence of sending and receiving sexts of 10% (95% CI: 2%, 19%) and 16% (95% CI: 12%, 20%), respectively, with a large confidence interval of means. This review [1] also conclude that studies with non-probabilistic samples obtained higher point prevalence estimates compared to those with probabilistic samples. Also, the prevalence of sending and receiving erotic content appeared to be lower among youths than among adults. More recently, Madigan et al.[2] contributed to the field by conducting a meta-analysis of 39 studies with participants under 18 years old, obtaining mean prevalences for sending (from 34 studies), receiving (from 20 studies) and forwarding (from 5 studies) sexts of 15% (95% CI: 13%, 17%), 27% (95% CI: 23%, 32%) and 12% (95% CI: 8%, 16%), respectively, again with a high variability in results ( $P = 98\%$  to  $99\%$ , respectively). Madigan et al. [2] also showed that prevalence rates were higher among older youths and that they increased over time. Furthermore, they found that rates of sexting were not moderated by publication status (e.g. peer reviewed vs. dissertation/report) or geographical location. In addition, both the aforementioned

reviews [1,2] agreed that the prevalence of receiving sexts was higher than the prevalence of sending sexts. Both reviews also agreed in proposing further study of conceptual aspects such as distinguishing between different media formats and degrees of explicitness of the exchanged contents. Thus far, the Madigan et al. [2] study has been the only review that has elaborated a meta-estimate of the sexting prevalence among youths.

The review study carried out by Barrense-Dias et al.[15] noted that definitions of sexting among studies differ in elements such as the actions the practice of sexting entails, the different types of media content transmitted, the degree of sexual explicitness of the content, the timeframe of the measure, and the context in which sexting is practiced. For example, while some studies have focused on asking about the sending of nude pictures to romantic partners without indicating a temporal timeframe [16], others have asked whether during the last twelve months prior to the survey participants have received sexual text messages, images or videos without defining the context in which the action was carried out [17,18].

Given the great heterogeneity encountered in prevalence estimates and the growing trend of this risky behavior over time, we considered it opportune to conduct a new meta-analysis. Therefore, the first aim of this research was to update the previous meta-analytic synthesis on sexting prevalence among youths [2]. The second aim was to identify and analyze new potential moderators in terms of methodological aspects (e.g., the sampling techniques and administration procedure used) and conceptual aspects (e.g., the degree of sexual explicitness of the media content, the context in which sexting is practiced, the willingness of participants or the timeframe of the measure) that may explain the observed heterogeneity in sexting prevalences. The present study also adds to the current literature by applying a state-of-the-art, three-level meta-analytic approach to estimating the mean prevalence of sexting experiences, considering the dependence among multiple sexting experiences from the same study. The ultimate goal is to contribute to the development of consensus on a clear definition of sexting.

## Method

A systematic review and meta-analysis were carried out following the methodology of ‘Preferred Reporting Items for Systematic Reviews and Meta-Analyses’ (PRISMA) [19,20].

### Document search and selection

A search was carried out between October 2019 and February 2020, resulting in the selection of the following databases: Education Resources Information Center (ERIC), via ProQuest; Psychological Information (PsycINFO), via APA PsycNET; Medical Literature Analysis and Retrieval System (MEDLINE), via ProQuest; Scopus, via Elsevier; and ISI Web of Science (WoS CORE Collection), via Thomson Reuters. The search strategy followed the ‘Peer Review of Electronic Search Strategies’ (PRESS) guideline [21]. The term ‘sexting’ used in previous review studies [1,2,4,15,22–25] was applied as a descriptor in order to identify a significant number of studies originating in various scientific fields, such as those of Psychology, Education, Sociology, Technology, Health Sciences and Legal Sciences. In order to provide a more comprehensive review, a ‘gray literature’ search was carried out using the Google and Google Scholar search engines with the following terms: "sexting", "sext", "sexual texting" and "sexual messaging". Weekly alerts were programmed for new research in PsycINFO, Web of Science, and Scopus, up until March 10<sup>th</sup>, 2020. The reference lists of relevant empirical articles and reviews were also checked to identify other potentially eligible studies. Additionally, we contacted corresponding authors via e-mail and/or ResearchGate to request full-texts or to gather additional information on their studies (6 out of 17 solicitations were answered, and 3 met our requests). To facilitate replication of this review, S1 Table contains the specific search strategy used in each database consulted.

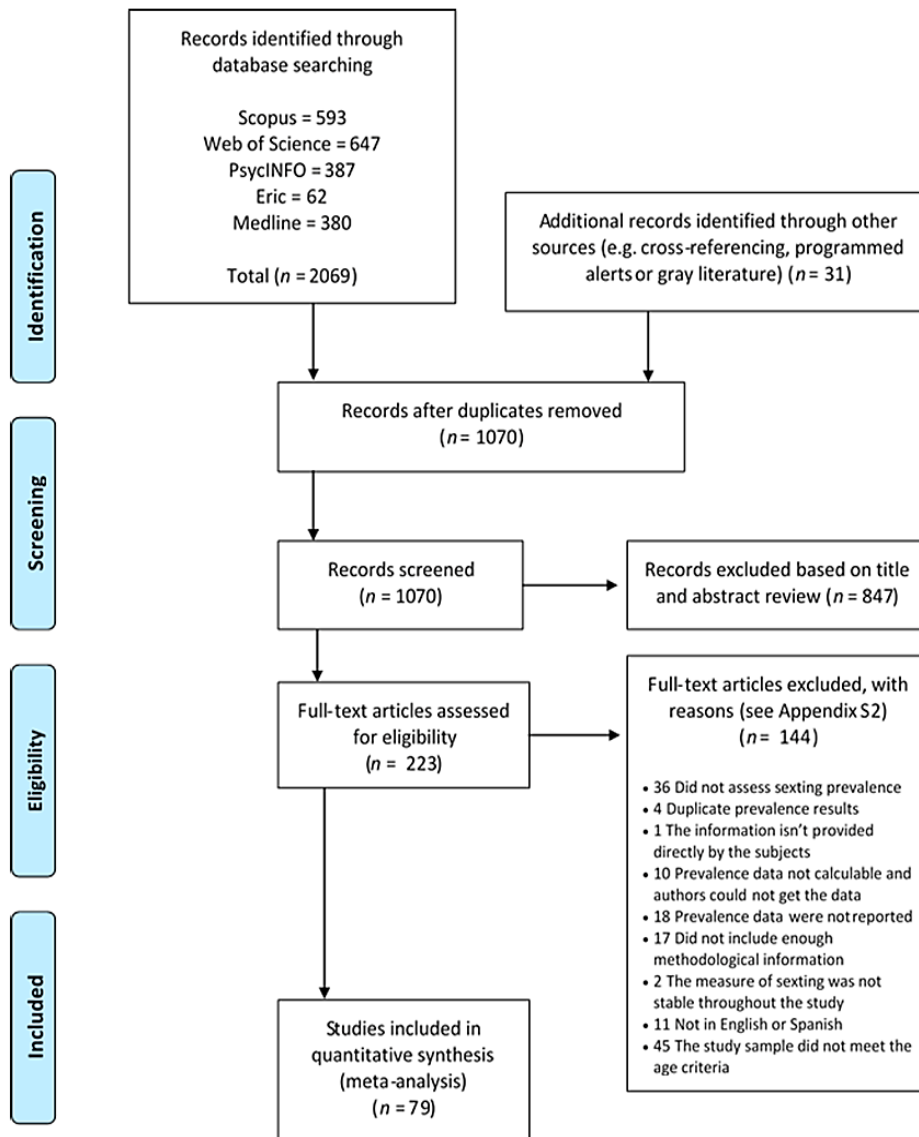
### Inclusion and exclusion criteria

In accordance with the stated objectives of this research, studies were included if they: a) aimed to examine the prevalence of sexting and/or its correlates; b) comprised a sample of participants up to 18 years old; c) provided original empirical data; and d) were available in English or Spanish. Regarding the inclusion criterion a), three possible

prevalence percentages were considered in relation to each study, corresponding respectively to the specific actions of: sending; receiving; and forwarding.

First, articles meeting the inclusion criteria were selected, and, when decisions could not be made from the title and abstract alone, the full paper was retrieved as well. The selected papers were checked independently by the authors CME and ELG. Any discrepancies were resolved through discussion with a third author (JML) where necessary.

Different studies analyzing data from the same research project were included only when the sample or the measure of sexting differed among them. S2 Table summarizes the excluded studies, while Fig 1 illustrates the flowchart of the systematic review process. The studies included in the meta-analysis are referenced in S1 Appendix.

**Fig 1. PRISMA flowchart of the study selection process.**

## Data coding

For coding purposes, the following data, including bibliometric information and the research strategies of the original studies, was recorded: a) type of publication (degree or master thesis, article or report, peer-reviewed, not peer-reviewed or under review); b) year of publication of the study; c) year of data collection; d) geographical origin of the samples classified according to seven-continent model: Africa, Asia, Europe, North America, South America, Antarctica and Oceania/Australia; e) study design (cross-sectional or longitudinal survey); f) type of sample (probabilistic or non-probabilistic); g) reference population (e.g., preadolescents, middle school students, high school students);

h) sample size and proportion of women; i) range, mean and standard deviation of the age of the participants; j) administration procedure (telephone or face-to-face interview, online, paper-based or mixed survey); k) message content (text messages, images/videos, or both); l) degree of sexual explicitness of the content (nude, not nude, both); m) context in which sexting is practiced (romantic relationship, others or not defined); n) willingness of the participants in sexting actions (sending: voluntary, not voluntary, not defined; receiving: solicited, unsolicited, not defined; forwarding: with consent, without consent, not defined); o) timeframe of the measure of sexting ( $\leq 6$  months or  $> 6$  months, lifetime, or not defined); and p) sexting action prevalence results (sending, receiving, forwarding).

In certain cases, additional calculations were made to determine percentages. In addition, when a study was longitudinal, only the prevalence rate of the first timeframe was recorded.

## Study quality assessment

A critical appraisal of the studies (see S3 Table) was performed using a tool elaborated by the authors based on that proposed by the National Institute of Health and Care Excellence (NICE) [26] for prognostic studies. This tool evaluates five methodological quality domains: a) study design (cross-sectional or longitudinal survey); b) sampling technique (probabilistic or non-probabilistic); c) sexting measure quality (evidence of validity and reliability in the study sample or in comparable samples, same or equivalent measure procedure for all participants, and non-significant proportion of non-responses); d) timeframe of the sexting behaviors (well defined or undefined); and e) response rate (calculated by dividing the number of participants completing the survey by the number of solicited participants).

Data extraction and quality assessment of the included studies were performed by the authors CME, JML and ELG. Any discrepancies regarding data extraction and quality assessment of the included studies were resolved through consensus. The potential effect of study quality on prevalence values was assessed and indicated in the results tables.

## Analysis

The meta-analysis was conducted using multilevel, linear, random and mixed effects models in order to estimate the mean prevalences of sexting experiences, with associated 95% confidence intervals (CI) and credibility intervals (CRs) around the estimates. In



particular, the adjusted three-level, meta-analytic model featured variance components distributed as follows: a sampling variation for each effect size at level one; a variation over outcomes within a study at level two; and a variation over studies at level three [27,28]. Unlike the traditional two-level, univariate approach, this three-level strategy is more efficient since it allows all data from studies with multiple outcomes to be analyzed simultaneously, taking into account the dependence among effect sizes from the same study, opportune in the case of studies about sexting prevalence which usually report the prevalence of various sexting experiences (i.e., sending, receiving, and forwarding sexts). By ignoring the dependence in effect sizes, the two-level model can result in standard errors that are too small, and therefore in largely deflated coverage proportions of confidence intervals [29]. Furthermore, the application of a three-level meta-analysis is especially appropriate when the outcomes of interest vary in measurement form across studies [30].

All prevalence rates were transformed into logit event rate effect sizes before the analysis, and the results were retransformed into fractions over 1 in order to facilitate ease of interpretation.  $Q$  and  $Tau^2$  statistics were computed to assess the statistical heterogeneity of effect sizes. Between-study heterogeneity was also examined using  $Q$  statistic (categorical moderators) and meta-regressions (quantitative moderators) [31]. Specific functions were used to examine a) profile likelihood plots of the variance components, b) potential outlying and influential studies and/or outcomes, and c) potential publication bias. No data points had a Cook's distance exceeding the cut-off value of 3 standard deviations (SD). Studies with the highest studentized residuals and Cook's D values (Maheux et al. [32] and Fix et al. [33] for sending sexts, and Gewirtz-Meydan et al. [34] and Mitchell et al. [35] for receiving sexts) were retained from the original model because of their limited influence (with small weights ranging from .26% to .27%) and also because, after reviewing these studies in detail, we found no reasons to exclude them.

All analyses were carried out with the Metafor package (version 2.4-0) for R [36]. Relevant R code and graphs are provided in S2 Appendix.

## Results

### Search results

The initial systematic literature search yielded 2069 potentially eligible studies. A further 31 studies were subsequently added from cross-referencing, programmed alerts and the gray literature search. After duplicates had been eliminated, 1070 studies remained, of which 991 were excluded on the basis of their titles, abstracts or content (see Fig 1 and Table S2). Consequently, a total of 79 articles relating to sexting prevalence were included in the final meta-analysis and quality assessment.

The documents analyzed were predominantly articles published in scientific journals and subject to the peer-review process ( $n=71$ , 90%). Most of the studies reporting sexting prevalence were conducted in the United States ( $n=34$ , 43%) and Spain ( $n=11$ , 14%) (Table S4 B contains detailed information on the geographical origin of the samples). More than half ( $n=48$ , 61%) were published between 2016 and 2020. The most commonly used tools to measure prevalence were questionnaires, employed online ( $n=20$ , 27%) or on paper ( $n=36$ , 48%), followed by telephone or face-to-face interviews ( $n=6$ , 8%), and mixed online and paper surveys ( $n=5$ , 7%) (Table 1). The included studies involved a total of 184695 participants. Finally, in all studies reporting prevalences of sending and receiving sexts, subjects received more sexts than they sent (detailed information on the studies included is provided in S4 A Table).

**Table 1. Summary of the critical appraisal of studies included in the review.**

|                                  |                          | Studies ( $n=79$ )                               |
|----------------------------------|--------------------------|--|
|                                  |                          | $n$ (%)  |
| Study design                     | Cross-sectional          | 71 (90%)   |
|                                  | Longitudinal             | 8 (10%)  |
| Sampling technique               | Probabilistic            | 28 (35%)   |
|                                  | No probabilistic         | 51 (65%)   |
| Q. Measurement<br>(Risk of bias) | Low risk                 | 15 (19%)   |
|                                  | Significant risk         | 57 (72%)   |
|                                  | Insufficient information | 7 (9%)   |
| Temporal framework               | Well defined             | 34 (43%)   |
|                                  | Lifetime or undefined    | 45 (57%)   |
| Response rate                    | Reported                 | 19 (24%);<br>IQR:<br>25.70% – 76%;<br>M: 45.04%. |
|                                  | Not reported             | 60 (76%)   |

Table legend. “IQR” = Interquartile range, “M” = Median

## Study quality and methodological moderators

The quality assessment revealed that almost all the studies analyzed were cross-sectional studies ( $n=71$ , 90%) (Table 1). Most used non-probabilistic sampling techniques ( $n=51$ , 65%). As indicated in Table 3, analysis of the sampling techniques applied in the studies revealed statistically significant differences in prevalence estimates of the sexting experiences of sending, receiving and forwarding ( $Q_M(3) = 32.88$ ,  $p < .01$ ). Lower prevalences were obtained from probabilistic samples (.08, 95% CI: .06, .11; .19, 95% CI: .15, .24; and .04, 95% CI: .03, .07) than from non-probabilistic ones (.19; 95% CI: .15, .22; .39, 95% CI: .34, .45; and .10, 95% CI: .07, .13, respectively). Regarding the quality of the measure, only 19% ( $n=15$ ) of the included studies reported any reliability index or evidence of the validity of the sexting measures applied. In the case of forwarding sexts, studies classified with a low risk of bias indicated a significantly higher estimate (.15; 95% CI: .09, .25) than studies classified with a significant risk (.06; 95% CI: .04, .07) ( $Q_M(3) = 18.67$ ,  $p < .01$ ).

Additionally, 76% of the studies ( $n=60$ ) provided no information on the response rate. Among the studies that reported such information ( $n=19$ , 24%), participation was generally low: more than half ( $n=11$ ) reported  $\leq 60\%$  of solicited participants responding, whereas only four studies reported  $\geq 80\%$  responding. Lastly, regarding the experience of forwarding sexts, analysis of the timeframe of the measure revealed statistically significant differences in its prevalence estimates ( $Q_M(3) = 9.54$ ,  $p = .02$  and  $p = .01$  for this experience). Studies evaluating the prevalence of forwarding sexts in timeframes equal to or less than 6 months reported significantly lower prevalences (.03; 95% CI: .02, .06) compared to studies without timeframes or with indicated timeframes exceeding six months (.08; 95% CI: .06, .11). In summary, most of the studies considered were cross-sectional and non-probabilistic, with low or unreported response rates and poor measure quality.

## **Sexting prevalence and conceptual moderators**

As indicated in Table 2, the analysis of the differences between sexting experiences revealed relevant and statistically significant differences ( $Q_M(3) = 681.28$ ,  $p < .01$ ). Receiving sexts had a considerably higher global prevalence (.31; 95% CI: .26, .36) than sending sexts (.14; 95% CI: .12, .17) and forwarding sexts (.07; 95% CI: .05, .09). These prevalences increased over time ( $Q_M(3) = 23.13$ ,  $p < .01$ ), with the trend showing, for example, that sending sexts in studies collecting data in 2009 gave .07 (95% CI: .05, .10), whereas studies collecting data in 2018 gave .33 (95% CI: .22, .46). The same trend was also observed in receiving and forwarding experiences (Table 2).

**Table 2. Overall mean prevalences of sending, receiving and forwarding sexts by year of data collection.**

|            | <i>K</i> | <i>eff</i> | (95% CI)   | (95% CRs)  | <i>Tau</i> <sup>2</sup> | Overall prevalences:<br>Test of Residual Heterogeneity<br>and Moderators | Year of data collection:<br>Test of Residual Heterogeneity<br>and Moderators                   |
|------------|----------|------------|------------|------------|-------------------------|--|--|
| Sending    | 57       | .14        | (.12, .17) | (.03, .47) | .73                     | $Q_E (106) = 12232.15, p < .01$<br>$Q_M (3) = 681.28, p < .01$           | $Q_E (64) = 7053.10, p < .01$<br>$Q_M (3) = 23.13, p < .01$<br><br>For sending sexts $p < .01$ |
| 2009       | 5        | .07        | (.05, .10) | (.02, .27) |                         |  |  |
| 2014       | 16       | .16        | (.13, .20) | (.04, .48) |                         |  |  |
| 2018       | 14       | .33        | (.22, .46) | (.09, .71) |                         |  |  |
| Receiving  | 39       | .31        | (.26, .36) | (.08, .70) | .69                     |  | For receiving sexts $p < .01$  |
| 2009       | 4        | .16        | (.11, .23) | (.04, .50) |                         |  |  |
| 2014       | 15       | .34        | (.28, .41) | (.10, .72) |                         |  |  |
| 2018       | 10       | .58        | (.43, .71) | (.20, .88) |                         |  |  |
| Forwarding | 13       | .07        | (.05, .09) | (.01, .30) | .76                     |  | For forwarding sexts $p < .01$   |
| 2009       | 1        | .03        | (.01, .07) | (.00, .15) |                         |  |  |
| 2014       | 1        | .08        | (.05, .12) | (.02, .30) |                         |  |  |
| 2018       | 4        | .20        | (.09, .37) | (.04, .60) |                         |  |  |

Table legend. “*k*” = number of studies included, “*eff*” = effect size (prevalence), “95% CI” = 95% confidence interval, “95% CRs” = 95% credibility intervals, “ $Q_E$ ” = within-categories statistic to test the model misspecification, “ $Q_M$ ” = between-categories statistic to test the influence of the moderator variable on the prevalence rates, “*Tau*<sup>2</sup>” = Residual heterogeneity for the levels of the inner factor, “*p*” = p-values for the test statistics.

Note 1: To estimate overall prevalence and make subsequent calculations regarding studies that reported more than one rate, we used the closest at the time of data collection.

Note 2: Among the included studies reporting the year of data collection, none reported a year beyond 2018.

**Table 3. Results of the three-level, meta-regression analyses with moderators of the prevalences of sending, receiving and forwarding sexts.**

|                            | Sending  |     |            |                         |          | Receiving |     |            |                         |          | Forwarding |     |            |                         |          | Comparison   |
|----------------------------|----------|-----|------------|-------------------------|----------|-----------|-----|------------|-------------------------|----------|------------|-----|------------|-------------------------|----------|--|
|                            | <i>k</i> | eff | (95% CI)   | <i>Tau</i> <sup>2</sup> | <i>p</i> | <i>k</i>  | eff | (95% CI)   | <i>Tau</i> <sup>2</sup> | <i>p</i> | <i>k</i>   | eff | (95% CI)   | <i>Tau</i> <sup>2</sup> | <i>p</i> |  |
| Document type              |          |     |            | .73                     | .70      |           |     |            | .69                     | .95      |            |     |            | .95                     | .25      | $Q_E(103) = 12085.73, p < .01$<br>$Q_M(3) = 3.38, p = .34$ |
| Not peer-reviewed          | 8        | .13 | (.07, .21) |                         |          | 8         | .31 | (.20, .44) |                         |          | 3          | .09 | (.05, .18) |                         |          |  |
| Peer-reviewed              | 49       | .14 | (.12, .17) |                         |          | 31        | .30 | (.26, .36) |                         |          | 10         | .06 | (.04, .08) |                         |          |  |
| Sampling technique         |          |     |            | .53                     | <.01     |           |     |            | .43                     | <.01     |            |     |            | .55                     | <.01     | $Q_E(103) = 7869.97, p < .01$<br>$Q_M(3) = 32.88, p < .01$ |
| Non-probabilistic          | 39       | .19 | (.15, .22) |                         |          | 23        | .39 | (.34, .45) |                         |          | 9          | .10 | (.07, .13) |                         |          |  |
| Probabilistic              | 18       | .08 | (.06, .11) |                         |          | 16        | .19 | (.15, .24) |                         |          | 4          | .04 | (.03, .07) |                         |          |  |
| Administration procedure   |          |     |            | .75                     | .08      |           |     |            | .56                     | <.01     |            |     |            |                         |          | $Q_E(85) = 10532.89, p < .01$<br>$Q_M(2) = 7.28, p = .03$  |
| Interview (PI or TI)       | 3        | .07 | (.03, .15) |                         |          | 6         | .18 | (.11, .28) |                         |          |            |     |            |                         |          |  |
| Self-reported              | 50       | .15 | (.12, .18) |                         |          | 30        | .34 | (.29, .39) |                         |          |            |     |            |                         |          |  |
| Quality of the measure     |          |     |            | .74                     | .08      |           |     |            | .61                     | .16      |            |     |            | .57                     | <.01     | $Q_E(92) = 10165.23, p < .01$<br>$Q_M(3) = 18.67, p < .01$ |
| Significant risk           | 41       | .12 | (.10, .15) |                         |          | 28        | .28 | (.24, .33) |                         |          | 10         | .06 | (.04, .07) |                         |          |  |
| Low risk                   | 10       | .19 | (.12, .28) |                         |          | 7         | .37 | (.26, .49) |                         |          | 2          | .15 | (.09, .25) |                         |          |  |
| Temporality of the measure |          |     |            | .74                     | .71      |           |     |            | .67                     | .42      |            |     |            | .51                     | .01      | $Q_E(103) = 11709.47, p < .01$<br>$Q_M(3) = 9.54, p = .02$ |
| < Six months               | 9        | .13 | (.08, .20) |                         |          | 5         | .27 | (.17, .38) |                         |          | 3          | .03 | (.02, .06) |                         |          |  |
| > Six months               | 48       | .14 | (.12, .17) |                         |          | 34        | .32 | (.27, .37) |                         |          | 10         | .08 | (.06, .11) |                         |          |  |

|  | Sending  |     |            |                         | Receiving |          |     |            | Forwarding              |          |          |     | Comparison |          |                         |   |
|--|----------|-----|------------|-------------------------|-----------|----------|-----|------------|-------------------------|----------|----------|-----|------------|----------|-------------------------|---|
|  | <i>k</i> | eff | (95% CI)   | <i>Tau</i> <sup>2</sup> | <i>p</i>  | <i>k</i> | eff | (95% CI)   | <i>Tau</i> <sup>2</sup> | <i>p</i> | <i>k</i> | eff |            | (95% CI) | <i>Tau</i> <sup>2</sup> | <i>p</i>  |
| Geographical origin of samples <sup>a</sup>  |          |     |            |                         |           |          |     |            |                         |          |          |     |            |          |                         |   |
| Europe                                       | 23       | .13 | (.10, .17) |                         |           | 14       | .31 | (.24, .39) |                         |          | 4        | .10 | (.05, .19) |          |                         | <i>Q</i> <sub>E</sub> (38) = 7482.50, <i>p</i> < .01<br><i>Q</i> <sub>M</sub> (3) = 158.32, <i>p</i> < .01  |
| Spain  | 6        | .16 | (.10, .25) |                         |           | 7        | .29 | (.20, .41) |                         |          | 3        | .14 | (.08, .21) |          |                         |   |
| Belgium                                      | 4        | .16 | (.08, .30) |                         |           | 2        | .27 | (.25, .28) |                         |          |          |     |            |          |                         |   |
| Netherlands                                  | 2        | .11 | (.03, .34) |                         |           |          |     |            |                         |          |          |     |            |          |                         |   |
| Czech Republic                               | 4        | .16 | (.08, .30) |                         |           |          |     |            |                         |          |          |     |            |          |                         |   |
| North America                                | 28       | .14 | (.10, .18) |                         |           | 21       | .26 | (.20, .33) |                         |          | 7        | .07 | (.04, .10) |          |                         | <i>Q</i> <sub>E</sub> (53) = 3616.95, <i>p</i> < .01<br><i>Q</i> <sub>M</sub> (3) = 1327.73, <i>p</i> < .01 |
| Canada                                       | 2        | .14 | (.13, .16) |                         |           | 2        | .27 | (.26, .29) |                         |          |          |     |            |          |                         |   |
| Northern America                             | 25       | .17 | (.12, .22) |                         |           | 18       | .25 | (.18, .33) |                         |          | 6        | .08 | (.05, .11) |          |                         |   |
| South America                                | 2        | .26 | (.12, .47) |                         |           | 3        | .43 | (.29, .58) |                         |          | 1        | .18 | (.12, .25) |          |                         | <i>Q</i> <sub>E</sub> (3) = 95.03, <i>p</i> < .01<br><i>Q</i> <sub>M</sub> (3) = 97.77, <i>p</i> < .01      |
| Ecuador                                      | 2        | .26 | (.12, .47) |                         |           | 2        | .48 | (.29, .67) |                         |          |          |     |            |          |                         |   |
| Asia   | 2        | .22 | (.11, .37) |                         |           |          |     |            |                         |          |          |     |            |          |                         |   |
| Content of messages                          |          |     |            | .62                     | <.01      |          |     |            | .54                     | <.01     |          |     |            |          |                         |   |
| Text   | 6        | .22 | (.18, .27) |                         |           | 2        | .37 | (.32, .43) |                         |          |          |     |            |          |                         | <i>Q</i> <sub>E</sub> (78) = 5854.67, <i>p</i> < .01  |
| Images or videos                             | 37       | .12 | (.10, .15) |                         |           | 27       | .27 | (.23, .32) |                         |          |          |     |            |          |                         | <i>Q</i> <sub>M</sub> (2) = 366.07, <i>p</i> < .01  |
| Explicitness of images / videos <sup>b</sup> |          |     |            |                         |           |          |     |            |                         |          |          |     |            |          |                         |   |
| Nude   | 10       | .15 | (.11, .21) |                         |           | 10       | .30 | (.21, .42) |                         |          | 5        | .09 | (.08, .10) |          |                         | <i>Q</i> <sub>E</sub> (24) = 1438.82, <i>p</i> < .01<br><i>Q</i> <sub>M</sub> (3) = 2175.17, <i>p</i> < .01 |
| Not nude                                     | 1        | .15 | (.11, .19) |                         |           | 2        | .05 | (.00, .51) |                         |          |          |     |            |          |                         | <i>Q</i> <sub>E</sub> (2) = 65.58, <i>p</i> < .01<br><i>Q</i> <sub>M</sub> (2) = 119.76, <i>p</i> < .01     |

|                        | Sending  |     |            |                         |          | Receiving |     |            |                         |          | Forwarding |     |            |                         |          | Comparison  |   |
|------------------------|----------|-----|------------|-------------------------|----------|-----------|-----|------------|-------------------------|----------|------------|-----|------------|-------------------------|----------|---|---|
|                        | <i>k</i> | eff | (95% CI)   | <i>Tau</i> <sup>2</sup> | <i>p</i> | <i>k</i>  | eff | (95% CI)   | <i>Tau</i> <sup>2</sup> | <i>p</i> | <i>k</i>   | eff | (95% CI)   | <i>Tau</i> <sup>2</sup> | <i>p</i> |   |   |
| Context <sup>c</sup>   |          |     |            |                         |          |           |     |            |                         |          |            |     |            |                         |          |   |   |
| Romantic               | 5        | .19 | (.09, .35) |                         |          | 2         | .30 | (.27, .34) |                         |          |            |     |            |                         |          | <i>Q</i> <sub>E</sub> (5) = 202.64, <i>p</i> < .01<br><i>Q</i> <sub>M</sub> (2) = 442.69, <i>p</i> < .01  |   |
| Willingly <sup>d</sup> |          |     |            |                         |          |           |     |            |                         |          |            |     |            |                         |          |   |   |
| Voluntary              | 5        | .13 | (.07, .23) |                         |          | -         | -   | -          |                         |          | -          | -   | -          |                         |          | <i>Q</i> (4) = 253.01, <i>p</i> < .01   |   |
| Unsolicited            | -        | -   | -          |                         |          | 4         | .23 | (.15, .34) |                         |          | -          | -   | -          |                         |          | <i>Q</i> (3) = 31.83, <i>p</i> < .01  |   |
| Without consent        | -        | -   | -          |                         |          | -         | -   | -          |                         |          | 2          | .04 | (.02, .06) |                         |          | <i>Q</i> (1) = 7.96, <i>p</i> < .01   |   |
| Sex differences        |          |     |            | .61                     | .68      |           |     |            | .88                     | .77      |            |     |            | .68                     | .07      | <i>Q</i> <sub>E</sub> (112) = 5355.83, <i>p</i> < .01<br><i>Q</i> <sub>M</sub> (3) = 3.45, <i>p</i> = .54 |   |
| Women                  | 31       | .17 | (.13, .21) |                         |          | 21        | .34 | (.26, .41) |                         |          | 8          | .07 | (.05, .10) |                         |          |   |   |
| Men                    | 30       | .16 | (.13, .20) |                         |          | 20        | .39 | (.31, .47) |                         |          | 8          | .12 | (.09, .16) |                         |          |   |   |
| Mean age               | 37       |     |            |                         | <.01     | 25        |     |            |                         | <.01     | 7          |     |            |                         |          | .05   | <i>Q</i> <sub>E</sub> (63) = 193.77, <i>p</i> < .01<br><i>Q</i> <sub>M</sub> (3) = 148.00, <i>p</i> < .01 |
| 12                     |          | .04 | (.02, .06) |                         |          |           | .13 | (.07, .22) |                         |          |            | .02 | (.01, .07) |                         |          |   |   |
| 14                     |          | .09 | (.07, .12) |                         |          |           | .23 | (.18, .30) |                         |          |            | .05 | (.03, .09) |                         |          |   |   |
| 16                     |          | .21 | (.17, .25) |                         |          |           | .39 | (.32, .46) |                         |          |            | .10 | (.06, .19) |                         |          |   |   |

Table legend. “*k*” = number of studies included, “eff” = effect size (prevalence), “95% CI” = 95% confidence interval, “*Q*” = Cochran’s Q for heterogeneity detection, “*Q*<sub>E</sub>” = within-categories statistic to test the model misspecification, “*Q*<sub>M</sub>” = between-categories statistic to test the influence of the moderator variable on the prevalence rates, “*Tau*<sup>2</sup>” = Residual heterogeneity for the levels of the inner factor, “*p*” = p-values for the test statistics.

<sup>a</sup> Prevalence estimates considering the geographical origin of samples were not compared with a significance test, but are provided for descriptive purposes only.

<sup>b</sup> Insufficient “*k*” to make comparisons.

<sup>c</sup> The context in which sexting was carried out was not specified or was not clearly defined in the rest of the studies.

<sup>d</sup> No studies were found specifying non-voluntariness or the requesting or expression of consent in the experiences of sending, receiving or forwarding sexts.



## **Sending sexts**

As indicated in Table 3, moderator analysis showed that the mean age of study participants was positively related to the prevalence of sending sexts ( $Q_M(3) = 148.00, p < .01$ ). The prevalence of sending sexts at the age of 12 was .04 (95% CI: .02, .06), at the age of 14 was .09 (95% CI: .07, .12), and at the age of 16 was .21 (95% CI: .17, .25). The same trend was also observed in receiving and forwarding experiences (Table 3). The observed prevalences and the overall mean estimate of sending sexts are depicted in Fig 2a.

**Fig 2a. Forest plot of the observed prevalences and the overall mean estimate of sending sexts.**

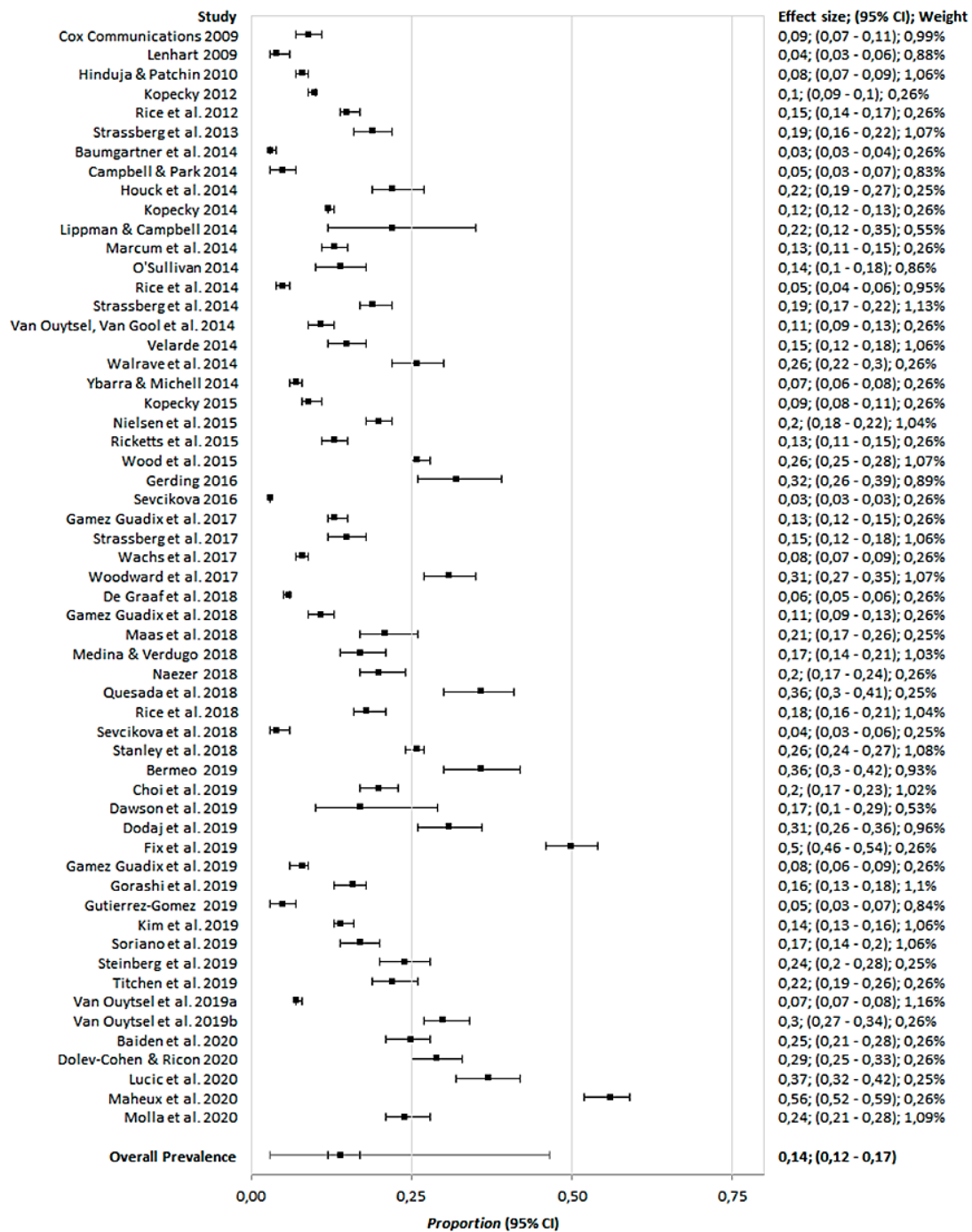


Fig 2a legend. Studies by Van Ouytsel et al. 2019a and Van Ouytsel et al. 2019b correspond to reference numbers 66 and 65 in S1 Appendix.

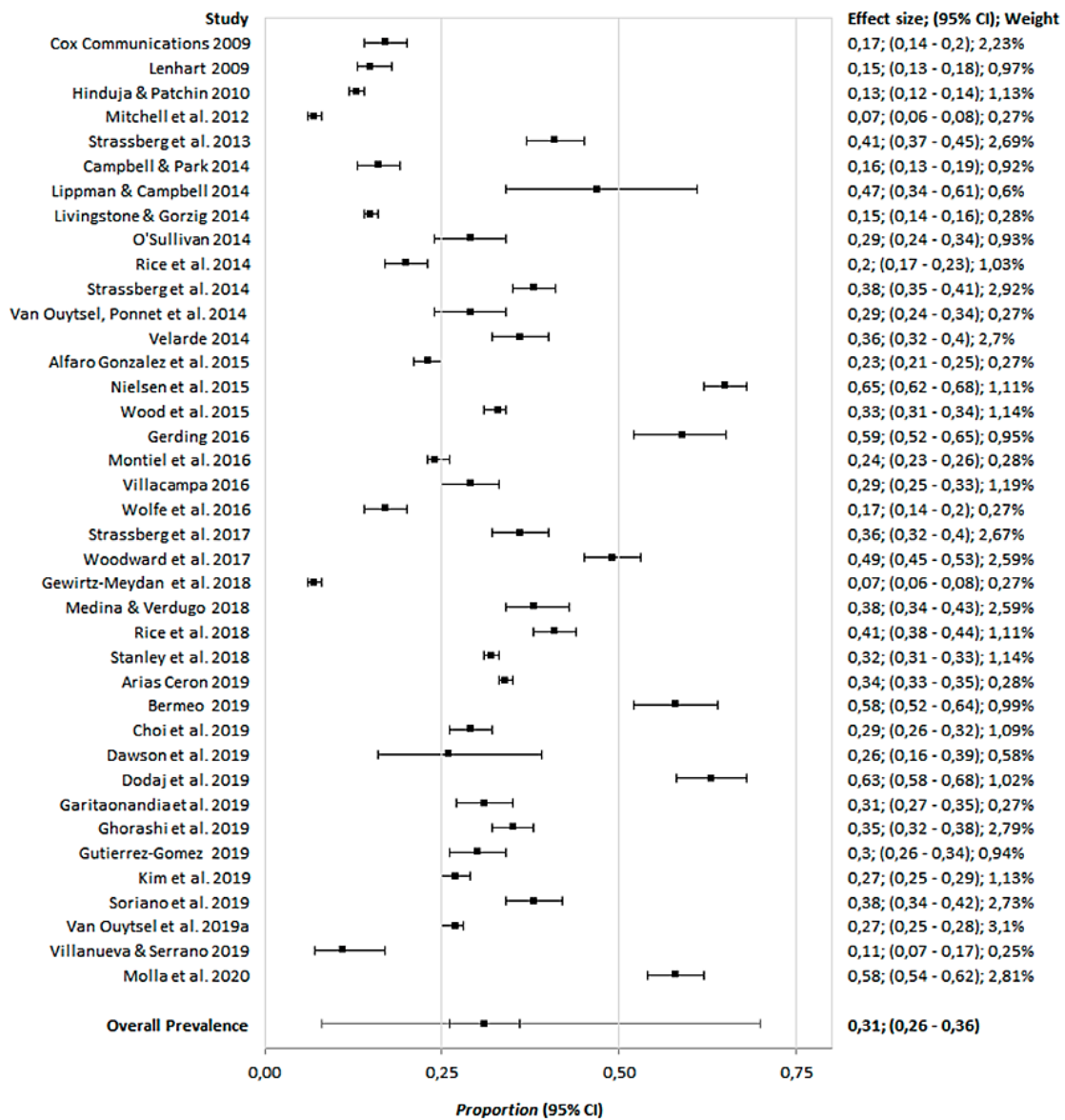
Significant differences were also identified in the types of media content transmitted ( $Q_M(2) = 366.07, p < .01$ ). The sending of text messages obtained a significantly higher global prevalence (.22; 95% CI: .18, .27) than the sending of pictures or videos (.12; 95% CI: .10, .15). Prevalence was not moderated by the type of publication, the administration procedure, the risk of bias in the measure of sexting, the timeframe of the measure of sexting, the context in which sexting was practiced, the degree of sexual explicitness of the content, the willingness of participants, their sex or the geographical origin of samples.

### **Receiving sexts**

As in sending sexts, moderator analysis revealed that the prevalence of receiving sexts increased with the sample's mean age ( $p < .01$ ). The employed administration procedure showed a statistical relationship with prevalence rates ( $Q_M(2) = 7.28, p = .03$  and  $p < .01$  for receiving sexts), with the highest prevalence rates when the studies used self-reported administration procedures (.34; 95% CI: .29, .39).

The remaining moderator variables in Table 3 did not indicate a significant relation. The observed prevalences and the overall mean estimate of receiving sexts are depicted in Fig 2b.

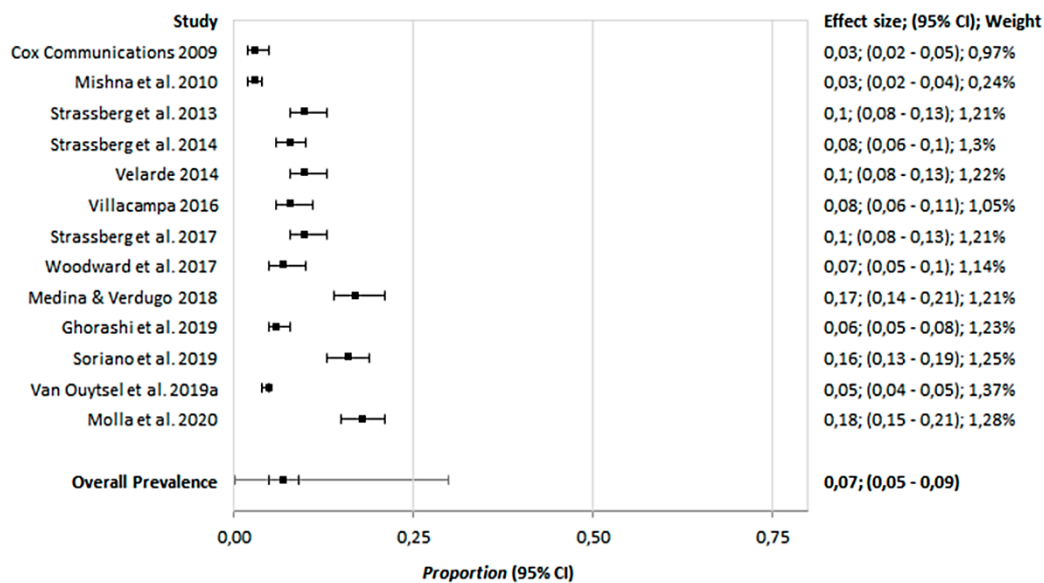
**Fig 2b. Forest plot of the observed prevalences and the overall mean estimate of receiving sexts.**



### Forwarding sexts

Moderator analyses revealed that the prevalence of forwarding sexts increased with age ( $p = .05$ ). The remaining moderator variables in Table 3 did not have a significant relation. The observed prevalences and the overall mean estimate of forwarding sexts are depicted in Fig 2c.

**Fig 2c. Forest plot of the observed prevalences and the overall mean estimate of forwarding sexts**



## Discussion

This systematic review and meta-analysis research examines the prevalence of sexting experiences via three-level, mixed-effects, meta-analysis models. In addition, it provides an updated meta-estimate of the prevalence of sexting experiences among youths, analyzing a wide range of methodological and conceptual factors susceptible to moderating the heterogeneity of results reported in the empirical literature. Regarding conceptual factors, a differentiating contribution of this research is the classification and analysis of the moderating effects on sexting prevalence of new key elements in sexting's operational definition: the degree of sexual explicitness of the content, the background context to the sexting, the willingness of participants, and the timeframe of the sexting measure.

The results obtained in this research reveal that the prevalence estimate of sending sexts is consistent with those reported in previous reviews [1,2], with overlapping confidence intervals providing good evidence of concurrent validity. The prevalence estimate of receiving sexts in this research is consistent with that reported by Madigan et al.[2], but is significantly higher than reported by Klettke et al.[1]. Lastly, the estimated prevalence of forwarding sexts also coincides with that reported by Madigan et al.[2], although our estimate is slightly lower. However, considering that the practice of sexting

is more prevalent over time, the more relevant prevalences reported in our study may be those stratified by year of data collection, especially those clustered in recent years. Indeed, in these years, the prevalence estimates of sending, receiving and forwarding sexts were significantly higher than the average prevalence estimates pooling all the studies reviewed, and also greater than the overall mean prevalence estimates reported by Klettke et al.[1] and Madigan et al.[2]. Finally, in accordance with previous reviews, our meta-analysis revealed a high dispersion in prevalence estimates that may, in part, be explained by both methodological and conceptual factors.

The low quality of our meta-analytic sample is an important aspect to highlight in our research, and this aspect has affected the estimated sexting prevalence rates. This research, indeed, identifies that sample representativeness is a significant moderator of prevalence variability, as has already been documented in previous reviews [1]. Our results show that studies with probabilistic samples gave significantly lower prevalences in all sexting experiences. The prevalence estimates of sending, receiving and forwarding sexts in probabilistic samples were significantly lower than the overall prevalences reported in our own study, and also than the overall prevalences reported by Madigan et al.[2]. Although only a small number of studies used random sampling procedures, the value of the selection bias, for example, demographic representation, significantly affects prevalence estimates. The non-representativeness of samples and other characteristics relating to the methodological quality of the studies (as discussed below) may be overestimating the true prevalences of sexting. Regarding sexting measure quality, our assessment also reveals that as many as 72% ( $n=57$ ) of the reviewed studies did not report any reliability index or evidence of validity. In this respect, results only showed statistical differences among studies classified as low versus significant measurement risk of bias regarding the forwarding of sexts. The non-difference found in the experiences of sending and receiving sexts it is not directly interpretable, since there may be compensatory effects between studies in which bias potentially increased or decreased prevalence rates. Future research should specifically address the reliability or validity of the sexting measures used. Furthermore, results that consider the timeframe of the measure of sexting suggest that responses may be subject to recall bias. Lastly, study sample sizes varied considerably (from 51 to 21372), which may limit the comparability of the studies. All such quality-related aspects reasonably warrant the wide credibility / prediction intervals obtained in our study, and imply that a wide range of values may also be obtained in future observations. On the basis of our results, we recommend that future empirical

research study sexting with representative samples, use validated instruments, report on the reliability of obtained responses, and investigate sexting over a short time frame in order to reduce recall bias. Concerning differences in results according to the data collection procedure applied, it was found that the estimated prevalence of receiving sexts varied significantly, in accordance with the hypothesis of Barrense-Dias et al.[15]. In depth analysis of these results shows that the self-reported administration procedure clearly affects the accuracy of estimates, presenting a more homogeneous estimation of prevalence of sending and receiving sexts than face-to-face and telephone interviews. However, it is problematic to compare such results on account of the fact that the employed sampling method also plays a significant role in the accuracy of prevalence estimates.

Regarding demographic factors, our results lead to the conclusion that no gender differences appear in any sexting experiences. This finding concurs with Madigan et al.[2] results. The research also suggests that the practice of sexting is more prevalent with increasing age [1,2]. This result suggests that educational measures in schools to inform pupils of the opportunities (e.g. as a sexual exploration or in order to initiate sexual relationships) and of the risks of sexting (e.g. non-consensual distribution of sexts) should be implemented mainly at early adolescent stages. Regarding conceptual factors, unlike Madigan et al.[2], our results show that the prevalence of sexting is moderated by the type of media content transmitted. Specifically, the sending of text messages obtained significantly higher global prevalence than the sending of pictures or videos. In this regard, sexting may be a gradual evolving activity that begins with the exchange of text messages and leads to the exchange of other media formats such as images or videos [15]. It is also reasonable to think that the exchange of text messages may require a lower degree of exposure and of trust between the sender and receiver compared to the exchange of images or videos [14]. Segregating the estimates based on media content type, our estimated prevalence for receiving text messages is higher than the overall prevalence estimated by Klettke et al. [1]. Future empirical studies should also consider the content of the messages in terms of the purposes for which they are sent or received (e.g., expressing sexual interest towards the recipient, describing a real or fictional erotic scene, proposing to perform cybersex or to enact live sexual relations). They also should broaden and clearly define the different types of media content exchanged, including text messages, images, videos, and, additionally, audio recordings, which can be considered media content useful to fulfilling a sexual purpose [14,37], and voice calls of a libidinous

character that can be used by individuals to excite or satisfy their own or someone else's sexual pleasure.

Another result to be highlighted is that elements such as the degree of sexual explicitness of the media content, the context in which the sexting is carried out, the willingness of participants and the timeframe of the measure of sexting were not made explicit in the majority of operational definitions reviewed, and were thus left subject to the interpretation of respondents. The lack of definition in elements such as the context and willingness of participants is worrying, because both are key indicators allowing professionals to identify and differentiate between: a) the practice of sexting as a consensual sexual expression activity in the context of a romantic relationship; and b) sexting as a result or consequence of manipulation or coercion. Clarifying these elements in the operational definition of sexting remains a priority for future research on sexting. Researchers should also ascertain whether the faces of participants are visible in the images or videos, since several studies have indicated that the majority of participants indicating sending nude and semi-nude depictions recognized having included their faces [38], and the consequences of the malicious use of pictures or videos in which one is easily identifiable or recognizable may be particularly harmful [14].

Recapitulating, this paper shows how certain conceptual and methodological choices influence prevalence estimates of sexting experiences among youths. Similar operationalizations of sexting [39] and a more detailed report of its defining elements would allow us to more accurately compare the prevalences of sexting and study the causes of its heterogeneity. In a nutshell, consensual methodological procedures must be established for use in both the fieldwork (e.g., sampling techniques, administration procedures) and analysis of sexting (e.g., actions, media content type, explicitness, temporal framework).

## **Study limitations**

This research is not without its limitations. Difficulties were encountered in extracting information from the studies regarding contextual variables to aid the characterization of sexting, including those relating to sample socio-demographic aspects [40]. Further limitations are the potential selection and measurement bias identified in many of the studies reviewed and the difficulty of synthesizing heterogeneous results on the prevalence of sexting. For example, in 10 studies, prevalence results were incalculable



due to the disaggregate form of data, for example, in terms of the channel used for transmitting the sexts (e.g., via cell phone, social network) or relationship type (e.g., peers, online friends, strangers) (see S2 Table). Studies were only selected for inclusion if they provided or facilitated the calculation of a combined estimate of prevalence of sending, receiving or forwarding sexts.

It was also not possible to carry out additional planned comparisons between certain subgroups due to a smaller number of studies assessing such moderators as the degree of sexual explicitness of the media content, the context in which the sexting is practiced, the willingness of participants or the timeframe of the measure of sexting. For this same reason, it was also not possible to carry out stratified analyses by year of data collection of the moderator effects.

Finally, another limitation of the meta-analysis is that it is inadequately representative of the entire world population. Data from developing countries, from non-occidental countries and from younger (under 12 years of age) were scarce.

## Conclusion

Our meta-analysis results suggest high mean prevalences of sending and receiving sexts involving youths in studies published between 2009 and 2020 (.14, 95% CI: .12, .17, and .31, 95% CI: .26, .36, respectively). Additionally, mean prevalences of sending, receiving and forwarding sexts increased with data collection year (e.g., .07, 95% CI: .05, .10, for sending sexts in studies collecting data in 2009, versus .16, 95% CI: .13, .20 in 2014, and .33, 95% CI: .22, .46 in 2018) and age (e.g., .04, 95% CI: .02, .06, for sending sexts at the age of 12, versus .09, 95% CI: .07, .12, at the age of 14, and .21, 95% CI: .17, .25, at the age of 16, averaging all studies reviewed).

The results also indicate difficulties in accurately determining the prevalence of sexting experiences. In this regard, the high heterogeneity of the meta-analysis results is affected by both methodological and conceptual issues. This paper's results highlight the importance of methodological aspects such as sampling techniques, as probabilistic samples helped to explain the encountered heterogeneity, and led to lower mean prevalence estimates in the global time period studied (.08, 95% CI: .06, .11; .19, 95% CI: .15, .24; and .04, 95% CI: .03, .07; for sending, receiving and forwarding sexts, respectively). Self-reported administration procedures (e.g., paper and online questionnaires) also led to more homogeneous prevalence estimates than interview

methods (e.g., face-to-face or telephone interviews). Furthermore, the prevalence of forwarding sexts varied slightly according to the timeframe of the measure. Regarding conceptual factors, media content type also moderated the prevalence of sexting, with text messages transmitted more frequently (e.g., .22, 95% CI: .18, .27, for sending sexts) than images or videos (.12, 95% CI: .10, .15), averaged across all the studies analyzed. In this sense, future efforts should carefully explore the content of the text messages exchanged, which is how the practice of sexting appears to begin. Finally, high heterogeneity in prevalence estimates together with the significant risk of bias observed in many of the synthesized studies underscore the need for greater consensus on the definition of sexting. Nevertheless, we believe that the results obtained do make a valuable contribution to the advancement of research on sexting, and provide arguments to guide new studies on the subject, proposals for more suitable definitions of sexting, and more reliable and valid measurement procedures.

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## Supporting information

**S1 Table. Search strategy used.**

| Databases  | Published all years to | Limits applied  | Alert activated              |
|--|------------------------|---|------------------------------|
| ERIC<br>Research field: (“sexting”) in ANY FIELD   |                        | No  | No                           |
| PsycINFO<br>Research field: (“sexting”) in ANY FIELD   |                        | No  | Weekly<br>Only new documents |
| Pubmed<br>Research field: (“sexting”) in ANY FIELD   | February 2020          | No  | No                           |
| Scopus<br>Research field: TITLE-ABS-KEY (sexting) AND (EXCLUDE (SUBJAREA, "BUSI") OR EXCLUDE (SUBJAREA, "ECON") OR EXCLUDE (SUBJAREA, "BIOC") OR EXCLUDE (SUBJAREA, "PHAR")) | (in all databases)     | Yes *   | Weekly<br>Only new documents |
| Web of Science<br>Research field: (“sexting”) in ANY FIELD   |                        | No  | Weekly<br>Only new documents |
| Gray literature  |                        |   |                              |
| Google Scholar<br>Research field: “sexting”, “sext”, “sexual texting” and “sexual messaging”<br>Where the words occur: anywhere in the publication                           | February 2005-2020     | No  | No                           |
|  |                        | The authors reviewed the first 100 results of each year since 2005, sorted by relevance |                              |
| Google<br>Research field: “sexting”, “sext”, “sexual texting” and “sexual messaging”   | February 2020          | No  | No                           |
|  |                        | The authors reviewed the first 250 results sorted by relevance                          |                              |

Table legend. Subject areas excluded: Business, Management and Accounting, Economics, Econometrics and Finance, Biochemistry, Genetics and Molecular Biology and Pharmacology, Toxicology and Pharmaceutics.

**S2 Table. Excluded studies.**

| N° | Study                         | Did not assess sexting prevalence | Prevalence data | Methodological information | Language | Did not meet age criteria |
|----|-------------------------------|-----------------------------------|-----------------|----------------------------|----------|---------------------------|
| 1  | Abraham 2015                  | -                                 | -               | -                          | -        | X                         |
| 2  | Adam 2019                     | -                                 | Not reported    | -                          | -        | -                         |
| 3  | Alonso & Romero 2019          | -                                 | -               | -                          | -        | X                         |
| 4  | APMTV 2009                    | -                                 | -               | -                          | -        | X                         |
| 5  | APMTV 2011                    | -                                 | -               | -                          | -        | X                         |
| 6  | APMTV 2013                    | -                                 | -               | -                          | -        | X                         |
| 7  | Atamari et al. 2017           | X                                 | -               | -                          | -        | -                         |
| 8  | Barrense-Dias et al. 2018     | -                                 | -               | -                          | -        | X                         |
| 9  | Barrense-Dias et al. 2019     | -                                 | -               | Insufficient               | -        | -                         |
| 10 | Bergmann et al. 2016          | -                                 | -               | -                          | German   | -                         |
| 11 | Boden 2017                    | -                                 | -               | -                          | -        | X                         |
| 12 | Boulat et al. 2012            | X                                 | -               | -                          | -        | -                         |
| 13 | Broaddus & Dickson-Gómez 2016 | X                                 | -               | -                          | -        | -                         |
| 14 | Buchanan 2015                 | -                                 | -               | Measure not stable         | -        | -                         |
| 15 | Burén & Lunde 2018            | -                                 | Not calculable  | -                          | -        | -                         |
| 16 | Burić et al. 2018             | -                                 | -               | -                          | Croatian | -                         |
| 17 | Casas et al. 2019             | -                                 | Not reported    | -                          | -        | -                         |
| 18 | Cheryl 2013                   | -                                 | Not calculable  | -                          | -        | -                         |
| 19 | Comartin et al. 2013          | X                                 | -               | -                          | -        | -                         |
| 20 | Cressato 2017                 | -                                 | -               | -                          | Italian  | -                         |
| 21 | Dake et al. 2012              | -                                 | -               | -                          | -        | X                         |
| 22 | Dawn 2018                     | X                                 | -               | -                          | -        | -                         |
| 23 | Dekker & Koops 2017           | -                                 | -               | -                          | German   | -                         |

*Continued*

| N° | Study                        | Did not assess sexting prevalence | Prevalence data | Methodological information | Language | Did not meet age criteria |
|----|------------------------------|-----------------------------------|-----------------|----------------------------|----------|---------------------------|
| 24 | Del Rey et al. 2019          | -                                 | Not calculable  | -                          | -        | -                         |
| 25 | Dowdell & Noel 2020          | -                                 | -               | -                          | -        | X                         |
| 26 | Dowdell et al. 2011          | -                                 | -               | Measure not stable         | -        | -                         |
| 27 | Downs et al. 2013            | -                                 | -               | Insufficient               | -        | -                         |
| 28 | Drouin & Tobin 2014          | -                                 | -               | -                          | -        | X                         |
| 29 | Drouin et al. 2015           | -                                 | -               | -                          | -        | X                         |
| 30 | Drouin et al. 2017           | -                                 | -               | -                          | -        | X                         |
| 31 | Englander & McCoy 2017       | -                                 | -               | Insufficient               | -        | -                         |
| 32 | Englander 2012               | -                                 | -               | -                          | -        | X                         |
| 33 | Enyonam 2016                 | -                                 | -               | -                          | -        | X                         |
| 34 | Eugene 2015                  | -                                 | -               | Insufficient               | -        | -                         |
| 35 | Evelyn 2018                  | -                                 | -               | -                          | -        | X                         |
| 36 | Farber et al. 2012           | X                                 | -               | -                          | -        | -                         |
| 37 | Ferguson 2011                | -                                 | -               | -                          | -        | X                         |
| 38 | Fleschler Peskin et al. 2013 | -                                 | -               | -                          | -        | X                         |
| 39 | Galovan et al. 2018          | -                                 | -               | -                          | -        | X                         |
| 40 | García-Gómez 2019            | -                                 | -               | Insufficient               | -        | -                         |
| 41 | Gerding & Stevens 2019       | -                                 | Not reported    | -                          | -        | -                         |
| 42 | Giroux 2011                  | -                                 | -               | -                          | -        | X                         |
| 43 | Gómez 2019                   | -                                 | Not reported    | -                          | -        | -                         |
| 44 | Gómez-Laguna 2018            | X                                 | -               | -                          | -        | -                         |
| 45 | González-Cabrera et al. 2019 | X                                 | -               | -                          | -        | -                         |
| 46 | Guevara-García et al. 2019   | -                                 | -               | -                          | -        | X                         |

*Continued*

| N° | Study                              | Did not assess<br>sexting prevalence | Prevalence data | Methodological information | Language | Did not meet age<br>criteria |
|----|------------------------------------|--------------------------------------|-----------------|----------------------------|----------|------------------------------|
| 47 | Hajnalka-Szende 2018               | -                                    | -               | -                          | Romanian | -                            |
| 48 | Harris et al. 2013                 | -                                    | Not calculable  | -                          | -        | -                            |
| 49 | Harrison 2011                      | X                                    | -               | -                          | -        | -                            |
| 50 | Hasinoff & Shepherd 2014           | X                                    | -               | -                          | -        | -                            |
| 51 | Hertlein et al. 2015               | X                                    | -               | -                          | -        | -                            |
| 52 | Hinduja & Patchin 2020             | -                                    | Not reported    | -                          | -        | -                            |
| 53 | Hollá 2016                         | -                                    | -               | -                          | Slovak   | -                            |
| 54 | Hollá 2017                         | -                                    | -               | -                          | Slovak   | -                            |
| 55 | Hua 2012                           | X                                    | -               | -                          | -        | -                            |
| 56 | Jonsson et al. 2014                | X                                    | -               | -                          | -        | -                            |
| 57 | Jonsson et al. 2015                | -                                    | -               | -                          | -        | X                            |
| 58 | Kernsmith et al. 2018              | X                                    | -               | -                          | -        | -                            |
| 59 | Kerstens & Stol 2014               | X                                    | -               | -                          | -        | -                            |
| 60 | Kopecký 2012                       | -                                    | Repeated        | -                          | -        | -                            |
| 61 | Le 2016                            | X                                    | -               | -                          | -        | -                            |
| 62 | Lee et al. 2015                    | -                                    | -               | -                          | -        | X                            |
| 63 | Lee et al. 2016                    | -                                    | -               | -                          | -        | X                            |
| 64 | Longobardi et al. 2020             | -                                    | Not reported    | -                          | -        | -                            |
| 65 | López Tápia & Martínez Toledo 2018 | -                                    | -               | -                          | -        | X                            |
| 66 | Lucero et al. 2014                 | X                                    | -               | -                          | -        | -                            |
| 67 | Marcos-Cuesta 2019                 | -                                    | -               | -                          | -        | X                            |
| 68 | Marengo et al. 2019                | -                                    | -               | -                          | -        | X                            |
| 69 | Marganski 2017                     | -                                    | -               | -                          | -        | X                            |
| 70 | Mark et al. 2014                   | -                                    | -               | Insufficient               | -        | -                            |

*Continued*

| N° | Study                          | Did not assess sexting prevalence | Prevalence data | Methodological information | Language | Did not meet age criteria |
|----|--------------------------------|-----------------------------------|-----------------|----------------------------|----------|---------------------------|
| 71 | Martín-Arias et al. 2013       | X                                 | -               | -                          | -        | -                         |
| 72 | Martínez-Gómez et al. 2018     | -                                 | -               | Insufficient               | -        | -                         |
| 73 | Marume et al. 2018             | -                                 | -               | -                          | -        | X                         |
| 74 | May 2012                       | X                                 | -               | -                          | -        | -                         |
| 75 | McCabe & Johnston 2014         | X                                 | -               | -                          | -        | -                         |
| 76 | McDonald et al. 2018           | -                                 | -               | Insufficient               | -        | -                         |
| 77 | McMahon 2019                   | -                                 | -               | -                          | -        | X                         |
| 78 | Medina & Ruales 2018           | -                                 | -               | -                          | -        | X                         |
| 79 | Migliorato et al. 2018         | -                                 | -               | -                          | Italian  | -                         |
| 80 | Miniguano et al. 2017          | -                                 | -               | Insufficient               | -        | -                         |
| 81 | Moran et al. 2018              | -                                 | Not reported    | -                          | -        | -                         |
| 82 | Moreira et al. 2019            | X                                 | -               | -                          | -        | -                         |
| 83 | Morelli et al. 2017            | -                                 | -               | -                          | -        | X                         |
| 84 | Murray 2014                    | -                                 | -               | -                          | -        | X                         |
| 85 | NCPTUP 2008                    | -                                 | -               | -                          | -        | X                         |
| 86 | Ndidi 2018                     | -                                 | -               | -                          | -        | X                         |
| 87 | Nguyên & Mark 2014             | X                                 | -               | -                          | -        | -                         |
| 88 | Ochoa 2018                     | -                                 | Not calculable  | -                          | -        | -                         |
| 89 | Ojeda et al. 2019              | -                                 | Not reported    | -                          | -        | -                         |
| 90 | Once & Piedra 2018             | -                                 | -               | -                          | -        | X                         |
| 91 | Oswaldo 2012                   | -                                 | Not calculable  | -                          | -        | -                         |
| 92 | Paluckaite & Matulaitiene 2017 | -                                 | Not reported    | -                          | -        | -                         |
| 93 | Patchin & Hinduja 2018         | X                                 | -               | -                          | -        | -                         |
| 94 | Patchin & Hinduja 2019         | -                                 | Not calculable  | -                          | -        | -                         |

*Continued*

| N°  | Study                           | Did not assess sexting prevalence | Prevalence data | Methodological information | Language | Did not meet age criteria |
|-----|---------------------------------|-----------------------------------|-----------------|----------------------------|----------|---------------------------|
| 95  | Pellai et al. 2015              | -                                 | -               | -                          | Italian  | -                         |
| 96  | Phippen 2009                    | X                                 | -               | -                          | -        | -                         |
| 97  | Pineda et al. 2019              | -                                 | -               | Insufficient               | -        | -                         |
| 98  | Powell et al. 2019              | -                                 | -               | -                          | -        | X                         |
| 99  | Punina 2018                     | -                                 | -               | -                          | -        | X                         |
| 100 | Reed et al. 2016 4              | X                                 | -               | -                          | -        | -                         |
| 101 | Reed et al. 2020                | -                                 | -               | -                          | -        | X                         |
| 102 | Reyns et al. 2013               | -                                 | -               | -                          | -        | X                         |
| 103 | Rial et al. 2018                | -                                 | -               | Insufficient               | -        | -                         |
| 104 | Ringrose & Harvey 2015          | X                                 | -               | -                          | -        | -                         |
| 105 | Ringrose et al. 2013            | X                                 | -               | -                          | -        | -                         |
| 106 | Rodríguez-Castro et al. 2017    | -                                 | Not reported    | -                          | -        | -                         |
| 107 | Romo et al. 2016                | -                                 | -               | Insufficient               | -        | -                         |
| 108 | Rood et al. 2015                | -                                 | -               | Insufficient               | -        | -                         |
| 109 | Rubio-Aurioles et al. 2017      | -                                 | -               | Insufficient               | -        | -                         |
| 110 | Sánchez-Jimenez et al. 2015     | X                                 | -               | -                          | -        | -                         |
| 111 | Santisteban & Gámez-Guadix 2017 | -                                 | Not reported    | -                          | -        | -                         |
| 112 | Schloms-Madlener 2013           | -                                 | -               | -                          | -        | X                         |
| 113 | Schoeps et al. 2020             | -                                 | Not reported    | -                          | -        | -                         |
| 114 | Seiler 2015                     | X                                 | -               | -                          | -        | -                         |
| 115 | Smith-Darden et al. 2017        | X                                 | -               | -                          | -        | -                         |
| 116 | Song et al. 2018                | X                                 | -               | -                          | -        | -                         |
| 117 | Spencer et al. 2015             | -                                 | -               | Insufficient               | -        | -                         |
| 118 | Speno & Aurbey 2019             | -                                 | Not reported    | -                          | -        | -                         |

*Continued*

| N°  | Study                         | Did not assess sexting prevalence | Prevalence data  | Methodological information | Language | Did not meet age criteria |
|-----|-------------------------------|-----------------------------------|------------------|----------------------------|----------|---------------------------|
| 119 | Stanley et al. 2018           | -                                 | Repeated         | -                          | -        | -                         |
| 120 | Strassberg et al. 2017        | -                                 | -                | Insufficient               | -        | -                         |
| 121 | Takemoto et al. 2017          | -                                 | -                | Insufficient               | -        | -                         |
| 122 | Teimouri et al. 2013          | -                                 | Not reported     | -                          | -        | -                         |
| 123 | Temple & Choi 2014            | -                                 | Repeated         | -                          | -        | -                         |
| 124 | Temple et al. 2012            | -                                 | -                | -                          | -        | X                         |
| 125 | Temple et al. 2014            | -                                 | Not reported     | -                          | -        | -                         |
| 126 | Thomson et al. 2018           | -                                 | -                | -                          | -        | X                         |
| 127 | Tomic et al. 2017             | -                                 | Not reported     | -                          | -        | -                         |
| 128 | Tylor et al. 2017             | -                                 | Not reported     | -                          | -        | -                         |
| 129 | Van Oosten & Vandenbosch 2020 | X                                 | -                | -                          | -        | -                         |
| 130 | Van Oosten 2017               | -                                 | -                | -                          | Dutch    | -                         |
| 131 | Van Ouytsel et al. 2016       | X                                 | -                | -                          | -        | -                         |
| 132 | Van Ouytsel et al. 2017       | -                                 | Not calculable   | -                          | -        | -                         |
| 133 | Van Ouytsel et al. 2019 20    | -                                 | Not calculable   | -                          | -        | -                         |
| 134 | Vrselja et al. 2015           | -                                 | -                | -                          | Croatian | -                         |
| 135 | Wachs et al. 2015             | -                                 | Not reported     | -                          | -        | -                         |
| 136 | Wei & Lo 2013                 | X                                 | -                | -                          | -        | -                         |
| 137 | Wei 2012                      | X                                 | -                | -                          | -        | -                         |
| 138 | Wolak et al. 2012             | -                                 | Police documents | -                          | -        | -                         |
| 139 | Wolfe et al. 2013             | -                                 | Repeated         | -                          | -        | -                         |
| 140 | Woolard 2011                  | -                                 | -                | -                          | -        | X                         |
| 141 | Wysocki & Childers 2011       | -                                 | -                | -                          | -        | X                         |
| 142 | Yépez-Tito et al. 2018        | -                                 | Not calculable   | -                          | -        | -                         |
| 143 | Zemmels & Khey 2015           | -                                 | -                | -                          | -        | X                         |
| 144 | Zsila et al. 2018             | X                                 | -                | -                          | -        | -                         |

**S3 Table. Critical appraisal of the studies.**

| N° | Study                       | Reference population   | Age description | Study design and sampling technique |                   | Quality of the measurement |                       | Response rate   |
|----|-----------------------------|------------------------|-----------------|-------------------------------------|-------------------|----------------------------|-----------------------|-----------------|
|    |                             |                        |                 | Design                              | Sampling          | Risk of bias               | Temporal framework    |                 |
| 1  | Alfaro-González et al. 2015 | Adolescents            | Yes             | Cross-sectional                     | Probabilistic     | Insufficient information   | Lifetime or undefined | na              |
| 2  | Arias Cerón et al. 2018     | Youth                  | Yes             | Cross-sectional                     | Not probabilistic | Low risk                   | Last year             | na              |
| 3  | Baiden et al. 2020          | High school students   | Not completely  | Cross-sectional                     | Probabilistic     | Significant risk           | Lifetime or undefined | na              |
| 4  | Baumgartner et al. 2014     | Adolescents            | Yes             | Cross-sectional                     | Probabilistic     | Significant risk           | Last year             | na              |
| 5  | Beckmeyer et al. 2019       | Adolescents            | Yes             | Cross-sectional                     | Probabilistic     | Significant risk           | Lifetime or undefined | 22.20%          |
| 6  | Bermeo 2019                 | Adolescents            | Yes             | Cross-sectional                     | Not probabilistic | Significant risk           | Lifetime or undefined | na              |
| 7  | Brinkley et al. 2017        | High school students   | Yes             | Longitudinal                        | Not probabilistic | Low risk                   | Four days             | na              |
| 8  | Campbell & Park 2014        | Adolescents            | Yes             | Cross-sectional                     | Probabilistic     | Significant risk           | Lifetime or undefined | 11.20% - 13.70% |
| 9  | Chaudhary et al. 2017       | Middle school students | Not completely  | Longitudinal                        | Not probabilistic | Significant risk           | Lifetime or undefined | na              |
| 10 | Choi et al. 2019            | High school students   | Not completely  | Longitudinal                        | Not probabilistic | Low risk                   | Lifetime or undefined | 62%             |
| 11 | Cleary & Najdowski 2019     | Adolescents            | Yes             | Cross-sectional                     | Not probabilistic | Significant risk           | Last year             | na              |
| 12 | Cox Communications 2009     | Adolescents            | Yes             | Cross-sectional                     | Probabilistic     | Insufficient information   | Lifetime or undefined | na              |
| 13 | Dawson et al. 2019          | Adolescents with HDHD  | Yes             | Cross-sectional                     | Not probabilistic | Low risk                   | Lifetime or undefined | 30.37%          |

*Continued*



| N° | Study                            | Reference population            | Age description | Design          | Sampling          | Risk of bias             | Temporal framework    | Response rate |
|----|----------------------------------|---------------------------------|-----------------|-----------------|-------------------|--------------------------|-----------------------|---------------|
| 14 | De Graaf et al. 2018             | Youth                           | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Last six months       | na            |
| 15 | Dodaj et al. 2019                | High school students            | Yes             | Longitudinal    | Not probabilistic | Low risk                 | Lifetime or undefined | na            |
| 16 | Dolev-Cohen & Ricon 2020         | Middle and high school students | Yes             | Cross-sectional | Not probabilistic | Significant risk         | Lifetime or undefined | na            |
| 17 | Fix et al. 2019                  | Adolescents from a correctional | No              | Cross-sectional | Not probabilistic | Insufficient information | Lifetime or undefined | na            |
| 18 | Frankel et al. 2018              | High school students            | No              | Cross-sectional | Probabilistic     | Significant risk         | Last month            | 64%           |
| 19 | Gámez-Guadix & Mateos-Pérez 2019 | Secondary students              | Yes             | Longitudinal    | Probabilistic     | Low risk                 | Last year             | na            |
| 20 | Gámez-Guadix & Santisteban 2018  | Secondary students              | Yes             | Longitudinal    | Probabilistic     | Significant risk         | Last year             | na            |
| 21 | Gámez-Guadix et al. 2017         | Adolescents                     | Yes             | Cross-sectional | Probabilistic     | Low risk                 | Last year             | na            |
| 22 | Garitaonandia et al. 2019        | Youths                          | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Last year             | na            |
| 23 | Gerding 2016                     | High school students            | Yes             | Cross-sectional | Not probabilistic | Significant risk         | Lifetime or undefined | na            |
| 24 | Gewirtz-Meydan et al. 2018       | Youth internet users            | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Lifetime or undefined | 38.10%        |
| 25 | Ghorashi et al. 2019             | High school students            | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Last six months       | na            |
| 26 | Gregg et al. 2018                | High school students            | Not completely  | Cross-sectional | Not probabilistic | Low risk                 | Lifetime or undefined | na            |
| 27 | Gutiérrez-Gómez 2019             | Adolescents                     | Yes             | Cross-sectional | Not probabilistic | Significant risk         | Lifetime or undefined | na            |
| 28 | Hinduja & Patchin 2010           | Youth                           | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Last month            | na            |

*Continued*

| N° | Study                     | Reference population            | Age description | Design          | Sampling          | Risk of bias             | Temporal framework    | Response rate      |
|----|---------------------------|---------------------------------|-----------------|-----------------|-------------------|--------------------------|-----------------------|--------------------|
| 29 | Houck et al. 2014         | Middle school students          | Yes             | Cross-sectional | Not probabilistic | Significant risk         | Last six months       | na                 |
| 30 | Kim et al. 2019           | Adolescents                     | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Last year             | na                 |
| 31 | Kopecký 2012              | Primary and secondary students  | Yes             | Cross-sectional | Not probabilistic | Significant risk         | Lifetime or undefined | na                 |
| 32 | Kopecký 2014              | Primary and secondary students  | Yes             | Cross-sectional | Not probabilistic | Insufficient information | Lifetime or undefined | na                 |
| 33 | Kopecký 2015              | Pubescent and adolescents       | Yes             | Cross-sectional | Not probabilistic | Significant risk         | Lifetime or undefined | na                 |
| 34 | Lenhart 2009              | Teens                           | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Lifetime or undefined | 11.20% - 13.70%    |
| 35 | León-Prieto et al. 2017   | High school students            | Yes             | Cross-sectional | Not probabilistic | Low risk                 | Lifetime or undefined | na                 |
| 36 | Lippman & Campbell 2014   | Adolescents                     | Yes             | Cross-sectional | Not probabilistic | Significant risk         | Lifetime or undefined | na                 |
| 37 | Livingstone & Görzig 2014 | Europe multinational            | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Last year             | 17% - 83%<br>X=42% |
| 38 | Lucić et al. 2020         | Adolescents                     | Not completely  | Cross-sectional | Not probabilistic | Low risk                 | Last six months       | na                 |
| 39 | Maas et al. 2018          | Female adolescents              | Not completely  | Cross-sectional | Not probabilistic | Low risk                 | Lifetime or undefined | na                 |
| 40 | Maheux et al. 2020        | High school students            | Not completely  | Cross-sectional | Not probabilistic | Significant risk         | Last year             | na                 |
| 41 | Marcum et al. 2014        | High school students            | Not completely  | Cross-sectional | Not probabilistic | Significant risk         | Last year             | na                 |
| 42 | Medina & Verdugo 2018     | Adolescents                     | Yes             | Cross-sectional | Not probabilistic | Low risk                 | Lifetime or undefined | 45.04%             |
| 43 | Mishna et al. 2010        | Middle and high school students | No              | Cross-sectional | Probabilistic     | Significant risk         | Last three months     | 17% - 35%          |

*Continued*

| N° | Study                     | Reference population           | Age description | Design          | Sampling          | Risk of bias             | Temporal framework    | Response rate |
|----|---------------------------|--------------------------------|-----------------|-----------------|-------------------|--------------------------|-----------------------|---------------|
| 44 | Mitchell et al. 2012      | Youth                          | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Last year             | na            |
| 45 | Molla-Esparza et al. 2020 | Secondary students             | Yes             | Cross-sectional | Not probabilistic | Significant risk         | Lifetime or undefined | na            |
| 46 | Montiel et al. 2016       | Secondary students             | Yes             | Cross-sectional | Probabilistic     | Low risk                 | Last year             | na            |
| 47 | Naezer 2018               | Youth                          | Yes             | Cross-sectional | Not probabilistic | Insufficient information | Recent experience     | na            |
| 48 | Nielsen et al. 2015       | Teenage girls                  | Yes             | Cross-sectional | Not probabilistic | Insufficient information | Lifetime or undefined | na            |
| 49 | O'Sullivan 2014           | High school students           | Yes             | Cross-sectional | Not probabilistic | Insufficient information | Lifetime or undefined | na            |
| 50 | Patrick et al. 2015       | Secondary students             | No              | Cross-sectional | Not probabilistic | Significant risk         | Lifetime or undefined | na            |
| 51 | Quesada et al. 2018       | Adolescents                    | Yes             | Cross-sectional | Not probabilistic | Low risk                 | Lifetime or undefined | na            |
| 52 | Rice et al. 2012          | High school students           | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Lifetime or undefined | 76%           |
| 53 | Rice et al. 2014          | Middle school students         | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Lifetime or undefined | 97.35%        |
| 54 | Rice et al. 2018          | High school students           | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Lifetime or undefined | 68%           |
| 55 | Ricketts et al. 2015      | High school students           | Not completely  | Cross-sectional | Not probabilistic | Significant risk         | Last year             | na            |
| 56 | Ševčíková 2016            | Europe multinational           | Yes             | Cross-sectional | Probabilistic     | Significant risk         | Last year             | na            |
| 57 | Ševčíková et al. 2018     | Primary and secondary students | Yes             | Longitudinal    | Not probabilistic | Significant risk         | Last six months       | na            |
| 58 | Soriano et al. 2019       | Adolescents                    | Yes             | Cross-sectional | Probabilistic     | Low risk                 | Lifetime or undefined | na            |

*Continued*

| N° | Study                            | Reference population | Age description | Design          | Sampling          | Risk of bias     | Temporal framework           | Response rate |
|----|----------------------------------|----------------------|-----------------|-----------------|-------------------|------------------|------------------------------|---------------|
| 59 | Stanley et al. 2018              | Europe multinational | Yes             | Cross-sectional | Not probabilistic | Significant risk | Lifetime or undefined        | na            |
| 60 | Steinberg et al. 2019            | High school students | No              | Longitudinal    | Not probabilistic | Significant risk | Lifetime or undefined        | na            |
| 61 | Strassberg et al. 2013           | High school students | No              | Cross-sectional | Not probabilistic | Significant risk | Lifetime or undefined        | 98%           |
| 62 | Strassberg et al. 2014           | High school students | No              | Cross-sectional | Not probabilistic | Significant risk | More than a year             | na            |
| 63 | Strassberg et al. 2017           | High school students | No              | Cross-sectional | Not probabilistic | Significant risk | Lifetime or undefined        | 95%           |
| 64 | Titchen et al. 2019              | Young Adolescents    | Yes             | Cross-sectional | Not probabilistic | Significant risk | Lifetime or undefined        | 93.93%        |
| 65 | V. Ouytsel et al. 2019a          | Early Adolescents    | Yes             | Cross-sectional | Not probabilistic | Significant risk | Last six months              | na            |
| 66 | V. Ouytsel et al. 2019b          | Secondary students   | Yes             | Cross-sectional | Not probabilistic | Significant risk | Last six months              | na            |
| 67 | V. Ouytsel, Ponnet et al. 2014   | Secondary students   | Yes             | Cross-sectional | Not probabilistic | Significant risk | Last six months and Lifetime | na            |
| 68 | V. Ouytsel, Van Gool et al. 2014 | Secondary students   | Yes             | Cross-sectional | Not probabilistic | Significant risk | Unclear                      | na            |
| 69 | Vanden Abeele et al. 2012        | High school students | Not completely  | Cross-sectional | Not probabilistic | Significant risk | Last two months              | na            |
| 70 | Velarde 2014                     | High school students | No              | Cross-sectional | Not probabilistic | Significant risk | Lifetime or undefined        | na            |
| 71 | Villacampa 2016                  | Secondary students   | Yes             | Cross-sectional | Not probabilistic | Significant risk | Lifetime or undefined        | na            |
| 72 | Villanueva & Serrano 2019        | Adolescents          | Yes             | Cross-sectional | Not probabilistic | Significant risk | Last month                   | na            |
| 73 | Wachs et al. 2017                | Secondary students   | Yes             | Cross-sectional | Not probabilistic | Significant risk | Last year                    | na            |

*Continued*

| N° | Study                 | Reference population       | Age description | Design          | Sampling          | Risk of bias     | Temporal framework    | Response rate |
|----|-----------------------|----------------------------|-----------------|-----------------|-------------------|------------------|-----------------------|---------------|
| 74 | Walrave et al. 2014   | Secondary students         | Yes             | Cross-sectional | Not probabilistic | Significant risk | Last two months       | na            |
| 75 | West et al. 2014      | High school students       | Yes             | Cross-sectional | Not probabilistic | Significant risk | Daily                 | na            |
| 76 | Wolfe et al. 2016     | Teenagers                  | Yes             | Cross-sectional | Probabilistic     | Significant risk | Lifetime or undefined | 47%           |
| 77 | Wood et al. 2015      | Europe multinational       | Yes             | Cross-sectional | Not probabilistic | Significant risk | Lifetime or undefined | na            |
| 78 | Woodward et al. 2017  | Rural high school students | Not completely  | Cross-sectional | Not probabilistic | Significant risk | Lifetime or undefined | 25.70%        |
| 79 | Ybarra & Michell 2014 | Adolescents                | Yes             | Cross-sectional | Probabilistic     | Significant risk | Last year             | 7%            |

Table legend. “HDHD” = attention-deficit/hyperactivity disorder, “na” = Not available, “Yes” = The study provides minimum and maximum age, “Not completely” = Provides at least minimum, maximum or average age, “No” = Does not provide any data.

**S4 A Table. Characteristics of included studies.**

| N° | Study                       | Document type (Doc), design (De),<br>sampling (Sa) and administration<br>procedure (Admin) |    |    |       |                    | Country | n, % women (W) |     | Age range:<br>minimum (Mi.),<br>maximum (Ma.)<br>and mean (Me.) |       |       | % of sending (Send),<br>receiving (Rece) and<br>forwarding (Forw) |      |  |
|----|-----------------------------|--|----|----|-------|--------------------|---------|----------------|-----|---|-------|-------|---|------|--|
|    |                             | Doc  | De | Sa | Admin | n                  |         | W (%)          | Mi. | Ma.   | Me.   | Send  | Rece  | Forw |  |
| 1  | Alfaro-González et al. 2015 | A-PR   | Cs | P  | O&Ps  | Spain              | 2412    | 47.30          | 13  | 18  | na    | na    | 22.80   | na   |  |
| 2  | Arias Cerón et al. 2018     | A-PR   | Cs | NP | Os    | Chile              | 12926   | 62.94          | 5   | 18  | 13.17 | na    | 33.80   | na   |  |
| 3  | Baiden et al. 2020          | A-PR   | Cs | P  | Ps    | Rep. of Ghana      | 576     | 53             | na  | na  | 16.10 | 24.70 | na  | na   |  |
| 4  | Baumgartner et al. 2014     | A-PR   | Cs | P  | Ps    | Multiple countries | 14946   | 50.30          | 11  | 16  | 13.49 | 3.22  | na  | na   |  |
| 5  | Beckmeyer et al. 2019       | A-PR   | Cs | P  | Os    | USA                | 600     | 52.05          | 14  | 17  | na    | na    | na  | na   |  |
| 6  | Bermeo 2019                 | MT-NPR   | Cs | NP | Ps    | Ecuador            | 259     | 56.80          | 14  | 17  | 15.75 | 35.90 | 58.30   | na   |  |
| 7  | Brinkley et al. 2017        | A-PR   | L  | NP | Mo    | USA                | 181     | 47             | 15  | 16  | na    | na    | na  | na   |  |
| 8  | Campbell & Park 2014        | A-PR   | Cs | P  | TI    | USA                | 552     | 47.60          | 12  | 17  | 14.88 | 4.50  | 15.60   | na   |  |
| 9  | Chaudhary et al. 2017       | A-PR   | L  | NP | Os    | USA                | 500     | 52.40          | na  | na  | 12.20 | na    | na  | na   |  |
| 10 | Choi et al. 2019            | A-PR   | L  | NP | na    | USA                | 894     | 55.82          | na  | na  | 17.40 | 20.11 | 29.60   | na   |  |
| 11 | Cleary & Najdowski 2019     | A-PR   | Cs | NP | Os    | USA                | 144     | 47             | 14  | 17  | 15.70 | na    | na  | na   |  |
| 12 | Cox Communications 2009     | R-NPR  | Cs | P  | Os    | USA                | 655     | 49             | 13  | 18  | na    | 9     | 17  | 3    |  |
| 13 | Dawson et al. 2019          | A-PR   | Cs | NP | Os    | USA                | 58      | 27.60          | 13  | 16  | 14.48 | 17.20 | 25.80   | na   |  |
| 14 | De Graaf et al. 2018        | A-PR   | Cs | P  | Os    | Netherlands        | 9469    | 60.21          | 12  | 17  | na    | 5.50  | na  | na   |  |
| 15 | Dodaj et al. 2019           | A-PR   | L  | NP | Ps    | Bosnia & H         | 359     | 60.17          | 15  | 17  | 16.32 | 30.92 | 62.95   | na   |  |
| 16 | Dolev-Cohen & Ricon 2020    | A-PR   | Cs | NP | Os    | Israel             | 458     | 77.95          | 12  | 18  | 15.57 | 28.80 | na  | na   |  |

*Continued*

| N° | Study                        | Doc    | De | Sa | Admin | Country            | n     | W (%) | Mi. | Ma. | Me.   | Send  | Rece  | Forw |
|----|------------------------------|--------|----|----|-------|--------------------|-------|-------|-----|-----|-------|-------|-------|------|
| 17 | Fix et al. 2019              | A-PR   | Cs | NP | PI    | USA                | 561   | 0     | na  | na  | na    | 49.91 | na    | na   |
| 18 | Frankel et al. 2018          | A-PR   | Cs | P  | Ps    | USA                | 6021  | 49.40 | na  | na  | na    | na    | na    | na   |
| 19 | Gámez-G. & Mateos-Pérez 2019 | A-PR   | L  | P  | Ps    | Spain              | 1497  | 53.20 | 12  | 14  | 13.65 | 7.60  | na    | na   |
| 20 | Gámez-G. & Santisteban 2018  | A-PR   | L  | P  | Ps    | Spain              | 1208  | 52.81 | 12  | 16  | 13.57 | 10.70 | na    | na   |
| 21 | Gámez-Guadix et al. 2017     | A-PR   | Cs | P  | Ps    | Spain              | 3223  | 49.90 | 12  | 17  | 14.06 | 13.50 | na    | na   |
| 22 | Garitaonandia et al. 2019    | A-PR   | Cs | P  | PI    | Spain              | 500   | na    | 9   | 16  | na    | na    | 31    | na   |
| 23 | Gerding 2016                 | PT-NPR | Cs | NP | Ps    | USA                | 201   | 53.23 | 14  | 17  | 16.01 | 32.30 | 58.70 | na   |
| 24 | Gewirtz-Meydan et al. 2018   | A-PR   | Cs | P  | TI    | USA                | 1560  | 50.30 | 10  | 17  | 14.20 | na    | 7.05  | na   |
| 25 | Ghorashi et al. 2019         | A-PR   | Cs | P  | Ps    | Iran               | 944   | 60.59 | 15  | 18  | 15.48 | 15.70 | 34.70 | 6.30 |
| 26 | Gregg et al. 2018            | A-PR   | Cs | NP | Ps    | USA                | 314   | 51.27 | na  | na  | 16.20 | DC    | DC    | na   |
| 27 | Gutiérrez-Gómez 2019         | DT-NPR | Cs | NP | Os    | Mexico             | 530   | 55.85 | 12  | 16  | na    | 4.53  | 30.19 | na   |
| 28 | Hinduja & Patchin 2010       | R-NPR  | Cs | P  | na    | USA                | 4365  | 49.50 | 11  | 18  | na    | 7.70  | 12.90 | na   |
| 29 | Houck et al. 2014            | A-PR   | Cs | NP | Os    | USA                | 410   | na    | 12  | 14  | na    | 22.43 | na    | na   |
| 30 | Kim et al. 2019              | A-PR   | Cs | P  | Os    | Canada             | 2537  | 48.40 | 14  | 17  | 15.42 | 14.40 | 27    | na   |
| 31 | Kopecký 2012                 | A-PR   | Cs | NP | Os    | Czech Republic     | 9353  | 47.41 | 11  | 17  | na    | 9.70  | na    | na   |
| 32 | Kopecký 2014                 | A-PR   | Cs | NP | Os    | Czech Republic     | 21372 | 55.42 | 11  | 17  | na    | 12.42 | na    | na   |
| 33 | Kopecký 2015                 | A-PR   | Cs | NP | Os    | Czech Republic     | 1237  | na    | 11  | 17  | na    | 9.31  | na    | na   |
| 34 | Lenhart 2009                 | R-NPR  | Cs | P  | TI    | USA                | 800   | 48.70 | 12  | 17  | na    | 4     | 15    | na   |
| 35 | León-Prieto et al. 2017      | A-PR   | Cs | NP | Ps    | Ecuador            | 205   | 61.95 | 15  | 17  | na    | na    | na    | na   |
| 36 | Lippman & Campbell 2014      | A-PR   | Cs | NP | Ps    | USA                | 51    | 49    | 12  | 18  | 14.55 | 21    | 48    | na   |
| 37 | Livingstone & Görzig 2014    | A-PR   | Cs | P  | O&Ps  | Multiple countries | 15619 | na    | 11  | 16  | na    | na    | 15    | na   |

*Continued*

| N° | Study                     | Doc    | De | Sa | Admin | Country            | n     | W (%) | Mi. | Ma. | Me.   | Send  | Rece  | Forw  |
|----|---------------------------|--------|----|----|-------|--------------------|-------|-------|-----|-----|-------|-------|-------|-------|
| 38 | Lucić et al. 2020         | A-PR   | Cs | NP | Os    | Croatia            | 319   | 66.10 | na  | na  | 16.50 | 36.99 | na    | na    |
| 39 | Maas et al. 2018          | A-PR   | Cs | NP | Os    | USA                | 312   | 100   | na  | na  | 15.21 | 21.20 | na    | na    |
| 40 | Maheux et al. 2020        | A-PR   | Cs | NP | Os    | USA                | 626   | 53.50 | na  | na  | 17.40 | 55.60 | na    | na    |
| 41 | Marcum et al. 2014        | A-PR   | Cs | NP | Ps    | USA                | 1617  | 49.70 | na  | na  | 15.77 | 13    | na    | na    |
| 42 | Medina & Verdugo 2018     | DT-NPR | Cs | NP | Ps    | Ecuador            | 463   | 41    | 15  | 18  | 16.04 | 17.50 | 38    | 17.10 |
| 43 | Mishna et al. 2010        | A-PR   | Cs | P  | Ps    | Canada             | 2186  | 54.70 | na  | na  | na    | na    | na    | 3     |
| 44 | Mitchell et al. 2012      | A-PR   | Cs | P  | TI    | USA                | 1560  | 50    | 10  | 17  | 14.20 | na    | 7.10  | na    |
| 45 | Molla-Esparza et al. 2020 | A-PR   | Cs | NP | Ps    | Spain              | 647   | 47.80 | 12  | 18  | 13.70 | 24.27 | 57.96 | 17.93 |
| 46 | Montiel et al. 2016       | A-PR   | Cs | P  | Ps    | Spain              | 3897  | 52.58 | 12  | 17  | 14.45 | na    | 24.40 | na    |
| 47 | Naezer 2018               | A-PR   | Cs | NP | Os    | Netherlands        | 679   | na    | 12  | 18  | na    | 20.32 | na    | na    |
| 48 | Nielsen et al. 2015       | A-PR   | Cs | NP | Os    | Finland            | 1296  | 100   | 11  | 18  | na    | 20    | 65    | na    |
| 49 | O'Sullivan 2014           | A-PR   | Cs | NP | Os    | Canada             | 269   | 66    | 13  | 17  | 17    | 13.80 | 28.60 | na    |
| 50 | Patrick et al. 2015       | A-PR   | Cs | NP | O&Ps  | Australia          | 2114  | 61.64 | na  | na  | na    | DC    | DC    | na    |
| 51 | Quesada et al. 2018       | A-PR   | Cs | NP | O&Ps  | Spain              | 303   | 51.70 | 14  | 18  | 15.35 | 35.60 | na    | na    |
| 52 | Rice et al. 2012          | A-PR   | Cs | P  | Ps    | USA                | 1839  | 48.14 | 12  | 18  | 15.32 | 15.44 | na    | na    |
| 53 | Rice et al. 2014          | A-PR   | Cs | P  | Ps    | USA                | 1173  | 48.48 | 10  | 15  | 12.30 | 4.60  | 20.10 | na    |
| 54 | Rice et al. 2018          | A-PR   | Cs | P  | Ps    | USA                | 1208  | 51.50 | 12  | 18  | 16    | 18.50 | 40.90 | na    |
| 55 | Ricketts et al. 2015      | A-PR   | Cs | NP | Ps    | USA                | 1617  | 51    | na  | 18  | 15.77 | 13    | na    | na    |
| 56 | Ševčíková 2016            | A-PR   | Cs | P  | Ps    | Multiple countries | 17016 | 50.30 | 11  | 16  | 13.55 | 3     | na    | na    |
| 57 | Ševčíková et al. 2018     | A-PR   | L  | NP | Os    | Czech Republic     | 1134  | 58.80 | 10  | 18  | 13.84 | 4.20  | na    | na    |
| 58 | Soriano et al. 2019       | A-PR   | Cs | P  | na    | Spain              | 603   | 51.08 | 12  | 17  | 14.43 | 16.75 | 38.14 | 16.09 |

*Continued*



| N° | Study                            | Doc    | De | Sa | Admin | Country            | n    | W (%) | Mi. | Ma. | Me.   | Send  | Rece  | Forw  |
|----|----------------------------------|--------|----|----|-------|--------------------|------|-------|-----|-----|-------|-------|-------|-------|
| 59 | Stanley et al. 2018              | A-PR   | Cs | NP | Ps    | Multiple countries | 4564 | na    | 14  | 17  | na    | 25.57 | 32.04 | na    |
| 60 | Steinberg et al. 2019            | A-PR   | L  | NP | Ps    | USA                | 429  | 54    | na  | na  | na    | 24    | na    | na    |
| 61 | Strassberg et al. 2013           | A-PR   | Cs | NP | Ps    | USA                | 606  | 45.87 | na  | na  | na    | 20    | 41    | 10.23 |
| 62 | Strassberg et al. 2014           | A-PR   | Cs | NP | Ps    | USA                | 1130 | 59.20 | na  | na  | na    | 19.10 | 38.20 | 7.80  |
| 63 | Strassberg et al. 2017           | A-PR   | Cs | NP | Ps    | USA                | 622  | 45.99 | na  | na  | na    | 14.79 | 36.01 | 10.13 |
| 64 | Titchen et al. 2019              | A-PR   | Cs | NP | na    | USA                | 555  | 62.70 | 14  | 17  | 15.60 | 22.34 | na    | na    |
| 65 | V. Ouytsel et al. 2019a          | A-PR   | Cs | NP | Ps    | Belgium            | 3109 | 53.50 | 12  | 15  | 13.01 | 7.40  | 26.70 | 4.50  |
| 66 | V. Ouytsel et al. 2019b          | A-PR   | Cs | NP | Ps    | Belgium            | 657  | 63.30 | 17  | 18  | 16.41 | 30.30 | na    | na    |
| 67 | V. Ouytsel, Ponnet et al. 2014   | A-PR   | Cs | NP | Ps    | Belgium            | 329  | 60.20 | 15  | 18  | 16.71 | DC    | 28.70 | na    |
| 68 | V. Ouytsel, Van Gool et al. 2014 | A-PR   | Cs | NP | Ps    | Belgium            | 1028 | 58    | 15  | 18  | 16.68 | 11.10 | na    | na    |
| 69 | Vanden Abeele et al. 2012        | A-PR   | Cs | NP | Ps    | Belgium            | 540  | 57    | na  | na  | 16.07 | na    | na    | na    |
| 70 | Velarde 2014                     | DT-NPR | Cs | NP | Ps    | USA                | 661  | 46    | na  | na  | na    | 15    | 35.80 | 10.20 |
| 71 | Villacampa 2016                  | A-PR   | Cs | NP | Ps    | Spain              | 489  | 50.10 | 14  | 18  | 15.64 | na    | 28.60 | 8.20  |
| 72 | Villanueva & Serrano 2019        | A-PR   | Cs | NP | Ps    | Spain              | 163  | 41.70 | 12  | 16  | 13.63 | na    | 11    | na    |
| 73 | Wachs et al. 2017                | A-PR   | Cs | NP | O&Ps  | Multiple countries | 1818 | 52.50 | 12  | 17  | 14.32 | 8     | na    | na    |
| 74 | Walrave et al. 2014              | A-PR   | Cs | NP | Ps    | Belgium            | 498  | 54    | 15  | 18  | na    | 26    | na    | na    |
| 75 | West et al. 2014                 | A-PR   | Cs | NP | Ps    | Peru               | 949  | 65.65 | 12  | 18  | 14.75 | na    | na    | na    |
| 76 | Wolfe et al. 2016                | A-PR   | Cs | P  | TI    | USA                | 625  | na    | 12  | 17  | na    | na    | 17    | na    |
| 77 | Wood et al. 2015                 | A-PR   | Cs | NP | Ps    | Multiple countries | 3277 | 47.33 | 14  | 17  | 15    | 26.25 | 33.62 | na    |
| 78 | Woodward et al. 2017             | A-PR   | Cs | NP | Ps    | USA                | 548  | 58.21 | na  | na  | 15.90 | 30.71 | 48.90 | 7.12  |
| 79 | Ybarra & Michell 2014            | A-PR   | Cs | P  | Os    | USA                | 3715 | 56.58 | 13  | 18  | na    | 7     | na    | na    |

Table legend. “DT-NPR” = degree thesis no peer-reviewed, “MT-NPR” = master thesis no peer-reviewed, “PT-NPR” = published thesis no peer-reviewed, “R-NPR” = report no peer-reviewed, “A-PR” = article peer-reviewed, “Cs” = cross sectional, “L” = longitudinal, “P” = probabilistic, “NP” = no probabilistic, “Os” = online survey, “Ps” = paper survey, “O&Ps” = online and paper survey, “TI” = telephone interview, “PI” = personal interview, “Mo” = Devices monitorization, “DC” = disaggregated by contents, “na” = not available, insufficient information or unclear.

**S4 B Table. Geographical origin of the samples of the studies included in the review.**

| Geographical region and countries | Sexting experiences<br>(k, %) |        |                         |        |                          |        |
|-----------------------------------|-------------------------------|--------|-------------------------|--------|--------------------------|--------|
|                                   | Sending<br>(57, 100%)         |        | Receiving<br>(39, 100%) |        | Forwarding<br>(13, 100%) |        |
| Europe                            | 23                            | 40.35% | 14                      | 35.90% | 4                        | 30.77% |
| Netherlands                       | 2                             | 3.51%  |                         |        |                          |        |
| Bosnia & H.                       | 1                             | 1.75%  | 1                       | 2.56%  |                          |        |
| Spain                             | 6                             | 10.53% | 7                       | 17.95% | 3                        | 23.08% |
| Czech Republic                    | 4                             | 7.02%  |                         |        |                          |        |
| Croatia                           | 1                             | 1.75%  |                         |        |                          |        |
| Finland                           | 1                             | 1.75%  | 1                       | 2.56%  |                          |        |
| Belgium                           | 4                             | 7.02%  | 2                       | 5.13%  | 1                        | 7.69%  |
| Multiple countries                | 4                             | 7.02%  | 3                       | 7.69%  |                          |        |
| North America                     | 28                            | 49.12% | 21                      | 53.85% | 7                        | 53.85% |
| Canada                            | 2                             | 3.51%  | 2                       | 5.13%  | 1                        | 7.69%  |
| Northern America                  | 25                            | 43.86% | 18                      | 46.15% | 6                        | 46.15% |
| Mexico                            | 1                             | 1.75%  | 1                       | 2.56%  |                          |        |

*Continued*

| Geographical region and countries | Sexting experiences   |       |                         |       |                          |       |
|-----------------------------------|-----------------------|-------|-------------------------|-------|--------------------------|-------|
|                                   | Sending<br>(57, 100%) |       | (k, %)                  |       | Forwarding<br>(13, 100%) |       |
|                                   |                       |       | Receiving<br>(39, 100%) |       |                          |       |
| South America                     | 2                     | 3.51% | 3                       | 7.69% | 1                        | 7.69% |
| Chile                             |                       |       | 1                       | 2.56% |                          |       |
| Ecuador                           | 2                     | 3.51% | 2                       | 5.13% | 1                        | 7.69% |
| Africa                            | 1                     | 1.75% |                         |       |                          |       |
| Rep. of Ghana                     | 1                     | 1.75% |                         |       |                          |       |
| Asia                              | 2                     | 3.51% | 1                       | 2.56% | 1                        | 7.69% |
| Israel                            | 1                     | 1.75% |                         |       |                          |       |
| Iran                              | 1                     | 1.75% | 1                       | 2.56% | 1                        | 7.69% |
| Not Applicable                    | 1                     | 1.75% |                         |       |                          |       |

Table legend. “k” = number of studies.

## **S1 Appendix. References included in the meta-analysis.**

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## S2 Appendix. Relevant R code and graphs.

```
#####  
###          ###  
### INDEX OF CONTENTS ###  
###          ###  
#####  
  
#- LIBRARIES AND CONSTANTS  
#--- Packages  
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#####  
##          ##  
### LIBRARIES AND CONSTANTS ###  
##          ##  
#####  
  
#Packages  
#-----  
install.packages("metafor")  
install.packages("tidyr")  
  
#Libraries  
#-----  
library(metafor)  
library(tidyr)  
  
#Constants  
#-----  
route = "C:/Users/Documents/R/Projects/"  
dec = 2  
meth = "REML"
```

```

#####
##                               ##
### READING DATA ###
##                               ##
#####

#Read Wide Format Data (Multiple study outcomes in the same data row)
#-----
datSext <- read.csv2(paste(rute, "Sexting.csv", sep = ""), header = TRUE, na.strings = "NA",
                    dec = ".")

#Transform Data to Long Format (Each outcome in a separate row)
#-----
datSextLong <- gather(datSext, Action, ESize, n_SENDING, n_RECEIV, n_FORW, factor_key = TRUE,
                    na.rm = TRUE)
#Add Effect Sizes to Data
#-----
datSextLongPLO <- escalc(measure = "PLO", xi=ESize, ni=N_SAMPLE, data = datSextLong)

#####
##                               ##
### GLOBAL MEAN PREVALENCES ESTIMATION ###
##                               ##
#####

# =====
## Three-level Linear Random-Effects Meta-Analysis using Logit Transformed Proportions ##
# =====

#Joint Model Fit for All Three Sexting Experiences
#-----
mv_PLO <- rma.mv(yi, vi, data = datSextLongPLO,
                mods = ~ Action - 1, random = ~ Action | STUDY,
                struct = "UN", method = meth, slab = paste(datSextLongPLO$STUDY))

#Proportion Estimates for each Sexting Experience, Confidence and Credibility Intervals
#-----
p_mv <- predict(mv_PLO, transf = transf.ilogit,
                newmods = rbind(c(1,0,0),c(0,1,0),c(0,0,1)),
                addx = TRUE, digits = dec, tau2.levels = c(1,2,3))

#####
##                               ##
### MODERATOR ANALYSIS ###
##                               ##
#####

# =====
## Three-level Linear Mixed-Effects Meta-Analysis using Logit Transformed Proportions ##
##                               ##
##                               Document Type as an Example of Categorical Moderator ##
# =====

#Joint Model Fit for all three Sexting Experiences
#-----
mv_PLO_doc <- rma.mv(yi, vi, data = datSextLongPLO,
                    mods = ~ Action + Action:DOC_TYPE - 1,
                    random = ~ Action | STUDY,
                    struct = "UN", method = meth, btt = c(4:6),
                    tdist=FALSE, slab = paste((datSextLongPLO$STUDY)))

#Proportion Estimates for Each Sexting Experience, Confidence and Credibility Intervals
#-----
p_mv_Doc <- predict(mv_PLO_doc, transf = transf.ilogit,
                   newmods=rbind(c(1,0,0,0,0,0),c(1,0,0,1,0,0),
                                   c(0,1,0,0,0,0),c(0,1,0,0,1,0),
                                   c(0,0,1,0,0,0),c(0,0,1,0,0,1)),
                   addx = TRUE, digits=dec, tau2.levels = c(1,1,2,2,3,3))

```



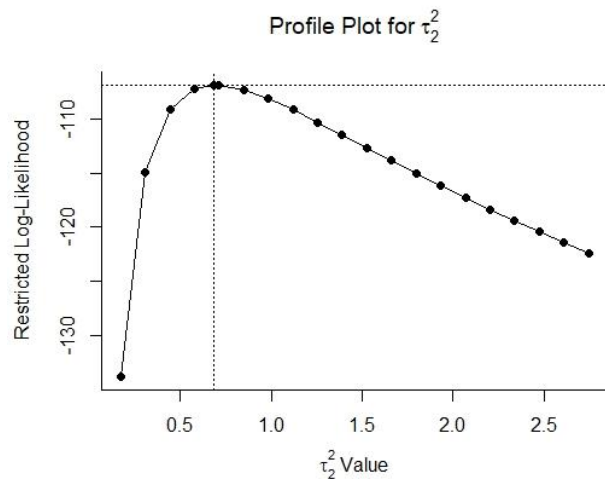
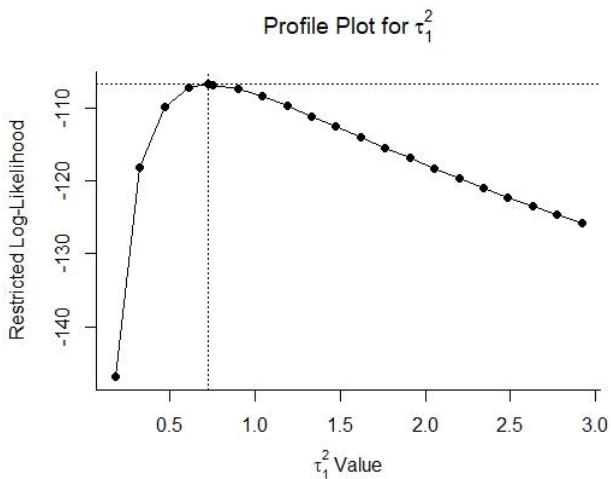
```
# =====
## Three-level Linear Mixed-Effects Meta-Analysis using Logit Transformed Proportions ##
##
## Year of data collection as an Example of Quantitative Moderator ##
# =====
```

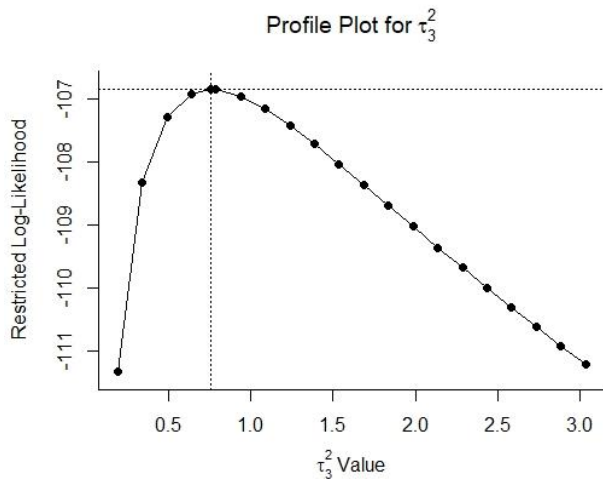
```
#Joint Model Fit for all Three Sexting Experiences
#-----
mv_PLO_Year <- rma.mv(yi, vi, data = datSextLongPLO,
  mods = ~ Action + Action:COL_YEAR - 1,
  random = ~ Action | STUDY,
  struct = "UN", method=meth, btt=c(4:6),
  tdist= FALSE, slab=paste(datSextLongPLO$STUDY))
```

```
#Proportion Estimates for each Sexting Experience, Confidence and Credibility Intervals
#-----
p_mv_Year <- predict(mv_PLO_Year,
  newmods=rbind(c(1,0,0,2009,0,0),c(1,0,0,2014,0,0),c(1,0,0,2018,0,0),
    c(0,1,0,0,2009,0),c(0,1,0,0,2014,0),c(0,1,0,0,2018,0),
    c(0,0,1,0,0,2009),c(0,0,1,0,0,2014),c(0,0,1,0,0,2018)),
  transf=transf.ilogit, addx=TRUE, digits=dec,
  tau2.levels = c(1,1,1,2,2,2,3,3,3))
```

```
#####
## ##
### DIAGNOSTIC FUNCTIONS AND GRAPHS ###
## ##
#####
#-----
```

```
#Profile Likelihood plots without moderators
#-----
par(mfrow=c(2,4))
profile.rma.mv(mv_PLO, tau2=1)
profile.rma.mv(mv_PLO, tau2=2)
profile.rma.mv(mv_PLO, tau2=3)
```



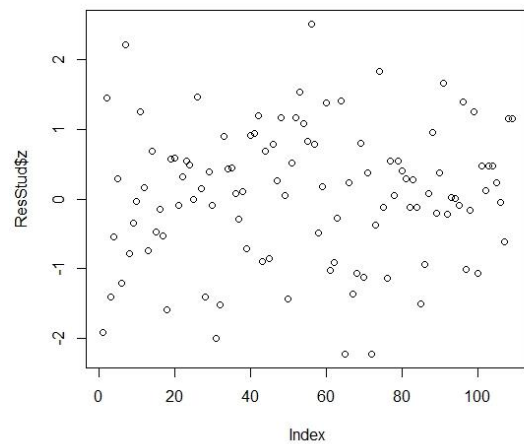
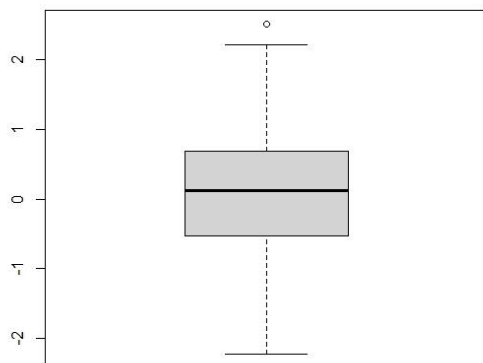


```
#Analysis of Potential Influential Studies or Observations
#-----
# Note: Studentized Residuals are residuals divided by their estimated standard errors
      (like t-statistics).
# Note: Observations with absolute values larger than 3 are considered outliers.
```

```
ResStud <- rstudent(mv_PLO)
which( abs(ResStud$z) > 3 )
which( abs(ResStud$z) > 2 )
```

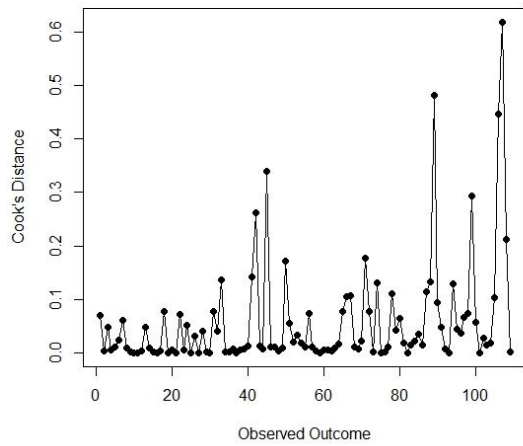
```
# Sending: 7-Fix et al. (2019), 56- Maheux et al. (2020);
# Receiving: 65-Gewirtz-Meydan et al. (2018), 72-Mitchell et al. (2012)
```

```
boxplot(ResStud$z)
plot(ResStud$z)
```



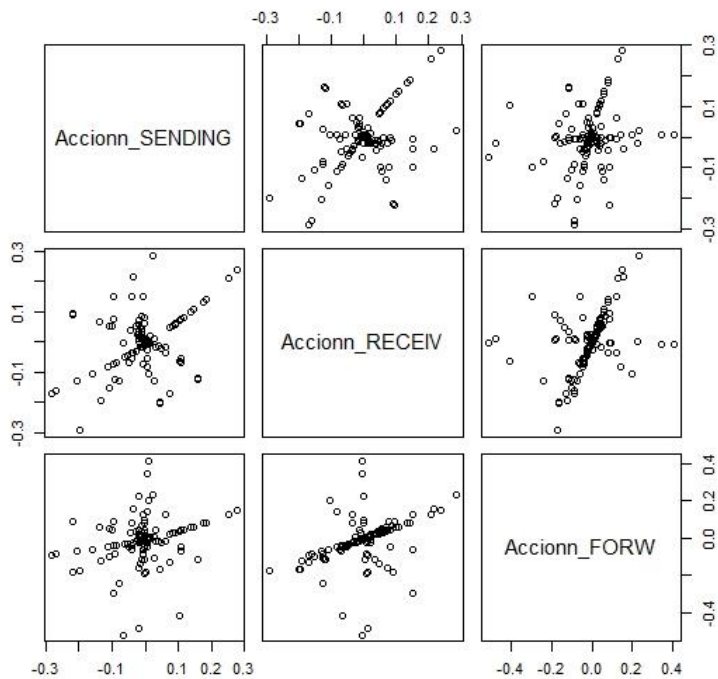
```
# Note: Cook's D measure of aggregate impact of each observation on the group of regression
      coefficients, as well as the group of fitted values.
# Note: Values larger than 4/n are considered highly influential, where "n" is the sample
      size.
```

```
CookD <- cooks.distance(mv_PLO, transf=transf.ilogit, progbar = TRUE)
which( CookD > (4/109) )
which( CookD > (4/79) )
plot(CookD, type="o", pch=19, xlab="Observed Outcome", ylab="Cook's Distance")
```

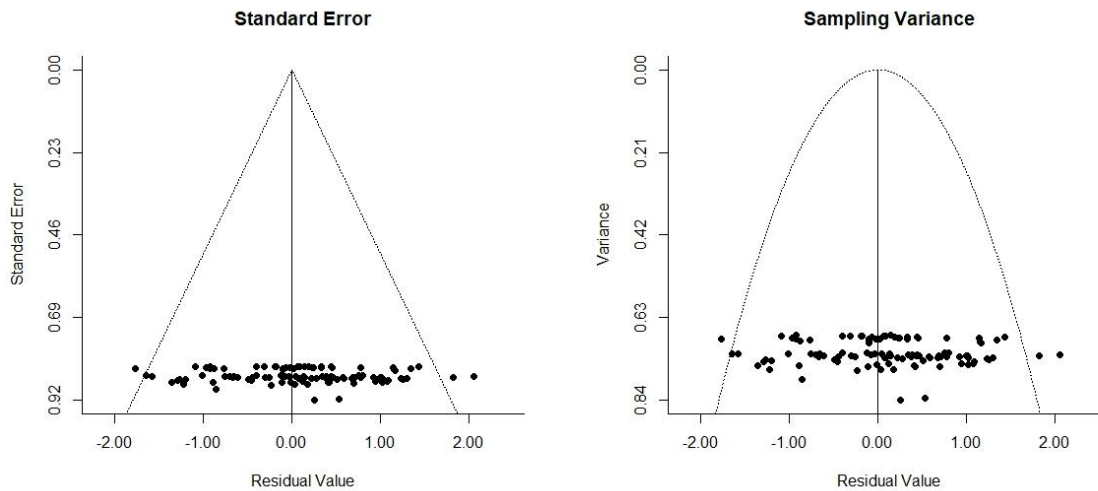


# Note: DFBetas measure of how much an observation has affected the estimate of a regression coefficient (there is one DFBETA for each regression coefficient).  
 # Note: Absolute values larger than  $2/\sqrt{n}$  are considered highly influential, where "n" is the sample size.

```
DFBetas <- dfbetas.rma.mv(mv_PLO, transf=transf.ilogit, progar = TRUE)
which( abs(DFBetas) > (2/sqrt(109)) )
which( abs(DFBetas) > (2/sqrt(79)) )
plot(DFBetas)
```



```
# #Analysis of a Potential Publication Bias
#-----
funnel(mv_PLO, back = "white", main="Standard Error", digits = dec)
funnel(mv_PLO, yaxis="vi", back = "white", main="Sampling Variance", digits = dec)
```



```
#####
##                ##
### FOREST PLOT ###
##                ##
#####
#-----
```

```
#Jointly Forest Plot for Multiple Outcomes
```

```
#-----
forest(mv_PLO, transf = transf.ilogit, comb.random = TRUE, comb.fixed = FALSE, addfit = TRUE,
       addcred = 1, showweights = TRUE, overall = TRUE, study.results = TRUE, leftcols =
       c("studlab"), rightcols = c("effect.ci"), digits = dec, digits.se = dec, digits.zval =
       dec, digits.tau2 = dec, digits.pval = dec, digits.pval.Q = dec, digits.Q = dec,
       digits.I2 = dec, digits.weight = dec, digits.mean = dec, digits.sd = dec)
```

```
# Note: Forest plots in the article were made using Excel with results from R Code.
```

### S1 Checklist. PRISMA 2009 checklist.

| Section/topic             | #  | Checklist item  | Reported on page #             |
|---------------------------|----|---|--------------------------------|
| <b>TITLE</b>              |    |   |                                |
| Title                     | 1  | Identify the report as a systematic review, meta-analysis, or both.   | 1                              |
| <b>ABSTRACT</b>           |    |   |                                |
| Structured summary        | 2  | Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number. | 2 (no protocol was registered) |
| <b>INTRODUCTION</b>       |    |   |                                |
| Rationale                 | 3  | Describe the rationale for the review in the context of what is already known.  | 3-4                            |
| Objectives                | 4  | Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).  | 4-5                            |
| <b>METHODS</b>            |    |   |                                |
| Protocol and registration | 5  | Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.   | 6                              |
| Eligibility criteria      | 6  | Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.  | 6-7                            |
| Information sources       | 7  | Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.  | 5                              |
| Search                    | 8  | Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.   | Supplementary Table 1          |
| Study selection           | 9  | State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).   | Figure 1 and page 10           |
| Data collection process   | 10 | Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.  | 6                              |

| Section/topic                      | #  | Checklist item   | Reported on page #                                      |
|------------------------------------|----|--|---|
| Data items                         | 11 | List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.  | 7   |
| Risk of bias in individual studies | 12 | Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis. | 8   |
| Summary measures                   | 13 | State the principal summary measures (e.g., risk ratio, difference in means).  | 9   |
| Synthesis of results               | 14 | Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I <sup>2</sup> ) for each meta-analysis.   | 9   |
| Risk of bias across studies        | 15 | Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).   | 8, 9, 11 and Supplementary Information S2               |
| Additional analyses                | 16 | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.   | 9 and Supplementary Information S2                      |
| <b>RESULTS</b>                     |    |  |   |
| Study selection                    | 17 | Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.  | Figure 1, Supplementary Table S2 and page 10            |
| Study characteristics              | 18 | For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.   | Supplementary Table S4 and Supplementary Information S1 |
| Risk of bias within studies        | 19 | Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).  | Table 1 and Supplementary Table ST 3                    |
| Results of individual studies      | 20 | For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.               | Figure 2a, b and c                                      |
| Synthesis of results               | 21 | Present results of each meta-analysis done, including confidence intervals and measures of consistency.  | Table 2 and Table 3                                     |
| Risk of bias across studies        | 22 | Present results of any assessment of risk of bias across studies (see Item 15).  | 11  |

| Section/topic       | #  | Checklist item   | Reported on page #                                 |
|---------------------|----|--|--|
| Additional analysis | 23 | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).  | 10-17, Table 2, 3 and Supplementary Information S2 |
| <b>DISCUSSION</b>   |    |  |  |
| Summary of evidence | 24 | Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers). | 18-22  |
| Limitations         | 25 | Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).                        | 20, 23   |
| Conclusions         | 26 | Provide a general interpretation of the results in the context of other evidence, and implications for future research.  | 23-24  |
| <b>FUNDING</b>      |    |  |  |
| Funding             | 27 | Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.   | Plos One form                                      |

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(7): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: [www.prisma-statement.org](http://www.prisma-statement.org).





### 6.3. Article 3: Development and Validation of the Adolescent Sexting Scale (A-SextS) with Spanish Sample






International Journal of  
*Environmental Research  
and Public Health*



Article

## Development and Validation of the Adolescent Sexting Scale (A-SextS) with a Spanish Sample

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# Development and Validation of the Adolescent Sexting Scale (A-SextS) with a Spanish Sample

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**Abstract:** “Sexting” is generally defined as the exchange of sexual media content via the internet. However, research on this topic has underscored the need to seek greater consensus when considering different conceptual elements that make up this definition. The aim of this study was to develop and validate an instrument for measuring sexting among adolescents, in order to cover a gap identified in the previous literature. The Adolescent Sexting Scale (A-SextS for short) was developed for validation on a sample of 579 Spanish secondary school pupils between the ages of 11 and 18. Evidence for face, content, concurrent, and criterion validity were assessed. A comprehensive set of 64 items, covering six defining characteristics of sexting (e.g., actions, recipient, media format, degree of sexual explicitness), was constructed after conducting an extensive literature review, two discussion groups, and a pilot study. Sexting prevalence rates measured by A-SextS were mostly concurrent with those found in previous studies. A-SextS subscales produced statistically significant positive associations with pornography consumption and physical sexual intercourse. The study shows that A-SextS can be an integrating instrument that facilitates a rigorous and comprehensive assessment of adolescent sexting experiences, as well as the formulation of an operationalized definition of the practice of sexting.

**Keywords:** sexting; definition; measurement; validation; adolescents



## 1. Introduction

“Sexting”, generally defined as the exchange of a message (hereinafter referred to as a “sext”) containing sexual content, produced by and commonly featuring the sender, via the communication means of the internet, has been shown to be prevalent among juveniles [1,2]. However, the paucity of theoretical explanations of consensus on this phenomenon has left an open debate about the motivations, opportunities, and risks of this practice [3]. Only a few exceptional studies have tried to relate sexting with existing psychological, social, and educative frameworks [4–6], though a growing literature supports the notion that sexting is a normative practice commonly used for sexual purposes [3,7–9]. From this perspective, sexting is understood as just another form of sexual expression in the context of contemporary sexual or romantic relations, which can, in fact, be carried out “safely” by young people when appropriate strategies are applied to reduce possible negative consequences [10]. The most common motivations for sexting cited by adolescents in the literature have been related to the initiation and/or the maintenance of incipient or established romantic relationships, whether in proximity or over long distances [3,11]. Such motivations comprised, for example, the intention to attract attention, to flirt, to develop sexual interest, or to initiate a real-life sexual experience [6,12–14]. Other less reported and understudied motivations related to social purposes, such as having fun, joking, and killing time, to identity construction, such as self-expression and body image acceptance, or to peer group influences, such as imitation or gaining acceptance [8]. Although a number of studies consider sexting as a normative sexual behavior among young people, they also acknowledge that it comes with certain risks [15,16]. A common risk is the intentional, non-consensual distribution of third-party sexual images, whose prevalence among youths has been shown to lie between 8.4 and 15.6% [2].

Adolescent sexting prevalence rates are extremely heterogeneous, and correlates are still inconclusive, especially concerning demographic variables. Nevertheless, meta-analysis has suggested a mean prevalence of sexting, in terms of sending and receiving sexts, of 14.8% (95% CI: 12.8%, 16.8%;  $I^2 = 99\%$ ) and 27.4% (95% CI: 23.1%, 31.7%;  $I^2 = 98.7\%$ ), respectively, with a high heterogeneity of results [2]. In an ongoing meta-analysis it has also been observed that such rates have been progressively increasing over the last ten years (e.g., 7%, 95% CI: 5%, 10% for sending sexts in studies collecting data in 2009, versus 16%, 95% CI: 13%, 20% in 2014, and 33%, 95% CI: 22%, 46% in 2018)

[17]. The most supported findings concerning correlates have suggested that sexting is more prevalent with increasing age [2], and is significantly related to adolescent sexual behavior, such as having actual sexual intercourse, and to other online and offline sexual experiences, such as pornography consumption [18,19]. The disparate findings in sexting research may be due to differences in how the practice has been conceptualized and measured among the various studies [2,3,20,21]. Several critical review studies on sexting have identified up to six elements constituting its definition and have revealed substantial differences in its assessment, in the actions that it entails, in the willingness to partake in it, in the recipients and audiences, in the media content transmitted, in the libidinous character of the contents, and in the timeframe of the measure [3,21]. Barrense-Dias et al. [21] highlighted that some studies considered active experiences of sexting, such as sending, asking for, or posting sexts, while others also included passive experiences, such as being asked for, or having receiving sexts. Such actions were sometimes reported separately and sometimes combined in one item. Some studies have also distinguished “primary sexting”, when a person sends their own personal sexts to others, from “secondary sexting”, which implies the further dissemination of such material without the consent of the person referenced by the sext [22,23]. Although sexting is often thought of as a voluntary practice [24,25], most studies do not specify it as such [17], nor consider the indirect pressure to exchange sexts that adolescents may feel or receive [26]. There are also differences in methods of transmission, such as using a mobile phone, a computer, email, or an unspecified method [21]. The format of and terms used to define sexts can also differ between studies [21]. While some definitions have only considered text messages, others have additionally included audio-visual content (e.g., images or videos), without analysing them separately [17]. The majority of articles have characterized sexts using very general adjectives, such as “sexy”, “sexual”, and “provocative”, while only a minority have seen them adjectivized using more precise terms such as “nude” or “wearing only underwear” [21]. Only a few studies have assessed and reported sexting considering different addressees, such as partners, acquaintances, strangers, and so on [25,27]. This deficiency in the literature can be considered especially important when dealing with adolescents, since the risks they are exposed to may vary with different sexting recipients [21,28]. Gámez-Guadix et al. [25], for example, found that the relationship between sexting and online sexual victimization (OSV) was stronger when sexts were sent to a person met only online. The purpose behind exchanging sexts in such contexts and with such recipients is an aspect that has been considered in very few studies

[29,30]. Another conceptual consideration is that the timeframe of measures used to assess sexting has varied considerably across studies, with some accounting for a month prior to surveying, and others referring to lifetime prevalences [31,32]. Lastly, the most notable methodological limitation of research on sexting is the absence of a consensus on its measurement, especially in adolescents [17].

### *1.1. Existing Validated Sexting Measures*

Several recently validated instruments have focused on assessing sexting in adults, such as the “Escala de Conductas sobre Sexting” (ESC, only available in Spanish at this time) [33] and the Sexting Behavior Scale (SBS) [34]. However, to the best of our knowledge, to date, there has only been one instrument tested among adolescents, the Intimate Images Diffusion Scale (EDIMA) [35]. EDIMA was validated on a sample of Spanish adolescents (602 adolescents aged between 12 and 19) in order to estimate the frequency of sending and distributing suggestive or provocative images or videos via mobile phones. In particular, the scale refers to four actions (sending, receiving, requesting, and re-sending) and distinguishes between three possible agents (partners, friends, and acquaintances, and strangers). The reliability score of EDIMA was found to be 0.976.

Despite efforts to advance the assessment of sexting, most of the aforementioned conceptual and methodological issues have still not been resolved. The scales employed thus far suggest that sexting occurs via mobile phones or social network sites without covering other potential technologies or platforms. Nor do they cover other possible media formats, such as audio [31,36]. Sexts have thus far only been characterized with very general adjectives, and, therefore, have been subject to the interpretation of respondents. Lastly, voluntariness has not been expressly considered, making it impossible to distinguish between fine-grained degrees of voluntariness in sexting, such as intentional sexting, unwanted but consensual sexting, and coerced sexting [17].

### *1.2. The Purpose of the Present Study*

The aim of this study was to develop and validate a new instrument for measuring sexting among adolescents that would cover the wide range of conceptual and methodological aspects mentioned above. In particular, the innovative nature of this instrument, which we have named the Adolescent Sexting Scale (A-SextS for short), lies in considering, unifying, and clarifying the variety of conceptual reference elements in the definition of sexting in terms of: a) focusing on active sexting, covering a wide range of online

behaviors, some of which have not been considered to date (e.g., posting, streaming); b) distinguishing with the same motivational framework (i.e., with amorous or sexual purpose) up to three different types of addressee; c) differentiating whether sexting occurs due to the participant's own initiative or not; d) considering as wide a range of media formats as possible (e.g., sexts, beyond text, and visual formats); e) distinguishing three degrees of sexual explicitness in sexts; and f) examining other relevant information such as whether the face of the participant appears in the images or videos sent. Furthermore, our study moves away from a conventional validation strategy towards a theory-driven approach, with a known factor structure, since sexting still cannot be considered a construct of its own embedded in a validated theoretical system, but rather simply a system of behaviors carried out via the internet. Therefore, at the current stage of research on sexting, a validation approach focused mainly on content validity, concurrent validity, and criterion validity is required. Thus, our study makes a three-fold contribution to advancing sexting research: further theoretical and empirical development, more accurate prevalence estimates, and a more complete characterization of the practice specifically among adolescents.

## **2. Method**

### *2.1. Participants*

Data for the study was obtained from a convenience sample composed of 579 adolescents (305 males and 274 females), aged 11–18 years ( $M = 13.9$  years;  $SD = 1.3$ ), from two secondary charter schools located respectively in a metropolitan and a rural area of the Autonomous Community of Valencia, in Spain. The sample included 161 (27.8%) seventh grade students, 162 (28%) eighth graders, 144 (24.9%) ninth graders, 94 (16.2%) tenth graders, and 18 (3.1%) basic vocational training students. The participants' age range distribution is presented in Table 1.



**Table 1.** Participants' age range distribution.

| <b>Total Sample <math>n = 579</math>,<br/>(<math>n</math>) %</b> |         |      |
|--|---------|------|
| Age (years)  | ( $n$ ) | %    |
| 11   | 1       | 0.2  |
| 12   | 92      | 16.9 |
| 13   | 126     | 23.2 |
| 14   | 124     | 22.8 |
| 15   | 129     | 23.7 |
| 16   | 54      | 9.9  |
| 17   | 16      | 2.9  |
| 18   | 2       | 0.4  |
| Minimum  | 11      |      |
| Maximum  | 18      |      |
| Range  | 7       |      |
| Mean ( $M$ )   | 13.9    |      |
| Standard Deviation ( $SD$ )                                      | 1.3     |      |

## 2.2. Procedure

The administrations of the schools were contacted by email in order to arrange meetings and explain the study's goals and ethical procedure. The school principal, together with the school board members, decided whether the school would participate. One of the schools decided to collaborate only in carrying out the pilot test of the scale, whereas the other two schools participated in the final data collection. Through the letter of consent, parents were also informed of the ethical procedure of the study, of the content of the questionnaire, and of their right to refuse the participation of their children, which occurred in only four cases. No agent required clarification or suggested modifying any of the questions. The data collection took place between 2nd March 2020 and 13th March 2020. The questionnaire was administered to the participating adolescents in their usual classrooms, during regular class hours, and took approximately 40 minutes. Participants received all the instructions via a video tutorial recorded by a real professional speaker, and then recorded their own responses on paper questionnaires (see Appendix 1 for the original video tutorial administered, and Supplementary Information S1 for the transcription of these instructions). The adolescents were informed that participation in this research project was entirely voluntary, and no negative consequences would result from them abandoning or not participating in it. Ultimately, no adolescent abandoned or refused to participate in the project. The present research was performed according to the Institutional Review Board (IRB) guidelines [37] and with the current Spanish laws on

the Protection of Personal Data and guarantee of digital rights (LO 3/2018 of 5 December). Participants did not receive any compensation.

### *2.3. The A-SextS Development and Validation Process*

According to the background and the purpose of the instrument, our study was carried out in two stages. In the first stage, content and face validity were addressed via three strategies: a) conducting an extensive literature review; followed by b) conducting adolescent discussion groups; and c) conducting a pilot study. The second stage was then aimed at obtaining a set of concurrent and criterion validity evidences regarding the instrument.

#### *2.3.1. Stage 1: Content and Face Validity*

Content and face validity were addressed via a review of measures applied in empirical studies on the prevalence of sexting with juvenile samples and published between 2009 and 2020. A total of 79 studies were included in our review (See Appendix 2) [17]. This extensive review of sexting measures allowed this study's authors to identify a wide range of conceptual reference elements used to constitute the operational definition of sexting. In particular, for the purpose of this study, the following data was recorded: a) measure quality (i.e., whether the study reported evidence of validity and/or reliability in the study sample or in comparable samples); b) the elements making up each definition of sexting (e.g., experiences, media formats); c) whether the study identified specific addressees or recipients; d) whether a goal or purpose for sexting was specified; e) the number of primary items used to assess sexting; f) whether a single or combined measure was used (i.e., two or more actions at a time); g) response types (e.g., dichotomous, the Likert frequency scale); and h) the number of response categories (e.g., four, five-point Likert scale). As a result, the research team created and revised an initial pool of domains and items that could be used in the discussion groups. The qualitative findings of this review have already been presented in the Introduction of this paper, and were used to generate a satisfactory conceptual framework for the practice of sexting. Quantitative findings will be reported in the following Results section.

After the extensive literature review, two discussion groups were conducted to examine content and semantic validity, characterizing some domains and clarifying certain wordings and terminologies that previous literature had defined as inconsistent and vague [23]. One discussion group consisted of 10 participants (6 females of ages 11–

12), while the other consisted of 11 participants (8 females of ages 11–12). Both discussion groups were conducted and guided by the first author in order to collect new potentially relevant items and to adapt A-SextS according to the participants' suggestions. The discussion group guide had been previously pilot-tested, and addressed the possession, use, and supervision of information and communication technologies (ICT) and social networks, the typology and characterization of social relations, aspects of sexuality and sexting, and the characterization of sexual multimedia content (see Supplementary Information S2 and S3 for further information). Semi-structured open-ended questions and multiple-choice question activities were also proposed to the participants. During the discussions, written notes were taken to allow post-event review by the authors E.L.G. and J.M.L. Each discussion lasted 60 min. The process resulted in several changes in wording of certain items and the deletion of others that were not deemed relevant or were considered uncommon. For example, certain adjectives used in some of the items specifying the explicitness of the media content were changed to improve comprehension of the items by adolescents (e.g., “sending audios of a sexual nature” was changed to “sending sexy audios”). The expression initially used to refer to sexts featuring someone else was also changed (e.g., “I have sent an image or video where other nudes appear” was changed to “I have sent a sexy image or video featuring someone else”). Certain terms were also adapted to incorporate adolescent jargon (e.g., “I have broadcast a video” was changed to “I have live-streamed video”). Items that were not deemed relevant or were considered uncommon were deleted (e.g., posting or live-streaming sexy audios, asking someone to do live broadcasts nude, in underwear, or dressed and in a sexy pose).

Finally, A-SextS' updated list of 67 questionnaire items was pilot-tested on 96 secondary school pupils. After completing the pilot-questionnaire, the adolescents were asked about the readability and comprehension of the questionnaire, initiating a brief oral discussion between the researcher and the adolescents. Written notes were taken for decision-making purposes. The pilot test provided useful insights as to how improve the instructions, appearance, and format of the questionnaire. For example, the sociodemographic questions section was moved to the end of the questionnaire to avoid a possible fatigue effect at the time of filling it in and to prevent its answers from being conditioned by having provided such information previously. The items in the questionnaire were changed from a bulleted or numbered format (e.g., “I have sent a sexy text message to: (a) my boy/girlfriend”, and so on, followed by the frequency scale for

each one) to an unnumbered format with a full text sentence. A reminder of the basic instructions in the top margin of the scale was also added to the final version. Ambiguous items were also discussed with the pupils and modified where deemed necessary. These pilot test participants were not included in the final sample. The final version of A-SextS was composed of 64 items.

### 2.3.2. Stage 2: Concurrent and Criterion Validity

Concurrent validity, which is the extent to which the results of the scale agree with other, independent external results, was examined by comparing our A-SextS' prevalences in this study's sample with prevalence estimates reported in previous meta-analytic studies or similar individual empirical studies. For this purpose, a comprehensive literature review was performed (see Supplementary Information S4 to consult the databases and search strategy used). After conducting the literature review, our prevalences were compared with the estimates of the review and meta-analytical studies on sexting prevalence carried out by Klettke et al. [20] and Madigan et al. [2]. They were also compared with the results of an ongoing meta-analysis, including studies up until February 2020, providing prevalence rates clustered by year of data collection and further exploring key elements making up the operational definition of sexting [17]. Among the available empirical literature on sexting prevalence, we found four comparable studies that included similar samples and distinguished between addresses in their instruments. The empirical studies selected were those of Burén and Lunde [38], Schloms-Madlener [39], Dolev-Cohen and Ricon [40], and Quesada et al. [41]. To compare sexting experiences not defining a specific addressee (e.g., posting), we considered the empirical studies of Gregg et al. [29], Jonsson et al. [42], Kerstens and Stol [43], and Kopecky [44].

Criterion validity was supported by relations between A-SextS and different variables in the available literature. This was the case for age, sexual activity, and pornography consumption, which have consistently been found to positively correlate with sexting [2,18,19]. Nine different subscales of A-SextS were also defined according to sexting action and addressees: sending sexts to a boy/girlfriend (SF), sending sexts to someone known in person (SK), sending sexts to someone known only on internet (SI), posting or live-streaming pictographic content (PS), asking for sexts from a boy/girlfriend (AF), asking for sexts from someone known in person (AK), asking for sexts from someone only known on the internet (AI), receiving sexts (R), and refusing to send sexts (RS).

## 2.4. Measurement

### 2.4.1. The Adolescent Sexting Scale (A-SextS)

“Sexting” is given to mean the exchange of sexy media content over the internet for an amorous or sexual purpose. This definition encompasses the existence of various different experiences (e.g., sending, receiving), addressees and audiences (e.g., partners, potential partners), media formats (e.g., texts messages, videos), degrees of explicitness (e.g., nude, semi-nude), degrees of willingness (e.g., whether or not sexting occurs due to one’s own initiative), and degrees of privacy (e.g., whether the participant shows their face or any other personally identifiable part of their body in the content). For the validation of our own Adolescent Sexting Scale (A-SextS), “sexting” was thus briefly defined to respondents, “as a term, given to mean the exchange of sexy text messages, audios, images, or videos over the internet with another person, and doing it with an amorous or sexual purpose”. A-SextS was focused on a representative range of active sexting experiences, but also included the reception of sexts as the main passive experience. A-SextS was composed of a) three synchronous experiences (audio calls with 3 items; video calls with 9 items; and live-streaming with 3 items), b) four asynchronous experiences (sending with 18 items; posting with 4 items; refusing a request to send with 3 items; and receiving with 3 items), and c) one experience that could imply both (asking to be sent with 21 items). A-SextS distinguished between four media formats (text messages, images, videos, and audios), two possible protagonists of the media content (oneself or another person), and three possible addressees (boyfriend/girlfriend, someone I know in person, and someone I only know on the internet). A-SextS, in terms of pictographic content, also distinguished between three levels of sexual explicitness (naked, in one’s underwear, and dressed and in a sexy pose). The final version of A-SextS was composed of 64 items using a 5-point Likert-scale (0 = Never to 4 = More than once a day), inquiring about sexting experiences during the 30-day period prior to taking the questionnaire. Additionally, in the case of affirmative answers, a) participants were invited to indicate, via a multiple-choice question, whether the action was done due to their own initiative or in response to a request, and b) in reference to pictographic media content, whether they showed their face in the content or not. The final version of the questionnaire (in Spanish as administered to participants, but also made available in English) is provided in the Appendix 3, while a slightly refined version is provided in Appendix 4. A summary of the items, together with response percentages, is shown in Table 2. The modular structure

of the questionnaire is then summarized graphically in Figure 1, and described in detail in Supplementary Information S5.

**Table 2.** Proportion of category frequency responses of Adolescent Sexting Scale (A-SextS) items.

| Item No. | Short-item Description  | %0    | %1    | %2   | %3   | %4   |
|----------|---|-------|-------|------|------|------|
| 1        | Sent a sexy text to boyfriend/girlfriend                                      | 68.92 | 10.59 | 7.99 | 7.64 | 4.86 |
| 2        | Sent a sexy text to someone known in person                                   | 68.23 | 16.49 | 7.99 | 4.34 | 2.95 |
| 3        | Sent a sexy text to someone known only on the internet                        | 85.04 | 9.04  | 3.48 | 1.39 | 1.04 |
| 4        | Sent a sexy audio to boyfriend/girlfriend                                     | 87.00 | 5.20  | 3.12 | 2.43 | 2.25 |
| 5        | Sent a sexy audio to someone known in person                                  | 85.76 | 7.12  | 5.38 | 1.39 | 0.35 |
| 6        | Sent a sexy audio to someone known only on the internet                       | 95.66 | 1.74  | 1.04 | 1.04 | 0.52 |
| 7        | Sent naked image/video to boyfriend/girlfriend                                | 93.75 | 2.26  | 1.74 | 1.74 | 0.52 |
| 8        | Sent naked image/video to someone known in person                             | 93.92 | 2.95  | 1.22 | 1.39 | 0.52 |
| 9        | Sent naked image/video to someone known only on the internet                  | 97.22 | 1.39  | 0.69 | 0.17 | 0.52 |
| 10       | Sent underwear image/video to boyfriend/girlfriend                            | 82.64 | 9.03  | 4.51 | 2.43 | 1.39 |
| 11       | Sent underwear image/video to someone known in person                         | 85.44 | 9.19  | 2.60 | 1.73 | 1.04 |
| 12       | Sent underwear image/video to someone known only on the internet              | 95.32 | 2.77  | 0.69 | 0.52 | 0.69 |
| 13       | Sent dressed image/video to boyfriend/girlfriend                              | 78.78 | 8.87  | 5.91 | 3.30 | 3.13 |
| 14       | Sent dressed image/video to someone known in person                           | 79.41 | 12.46 | 4.67 | 1.90 | 1.56 |
| 15       | Sent dressed image/video to someone known only on the internet                | 94.10 | 3.12  | 1.91 | 0.69 | 0.17 |
| 16       | Sent a sexy image/video of other people to boyfriend/girlfriend               | 94.63 | 3.29  | 1.56 | 0.17 | 0.35 |
| 17       | Sent a sexy image/video of other people to someone known in person            | 92.39 | 3.63  | 2.94 | 0.35 | 0.69 |
| 18       | Sent a sexy image/video of other people to someone known only on the internet | 95.32 | 2.43  | 1.39 | 0.35 | 0.52 |
| 19       | Posted a sexy text  | 72.13 | 16.72 | 5.92 | 3.66 | 1.57 |
| 20       | Posted naked image/video  | 98.26 | 1.04  | 0.17 | 0.35 | 0.17 |
| 21       | Posted underwear image/video  | 89.06 | 6.60  | 2.43 | 1.56 | 0.35 |
| 22       | Posted dressed image/video  | 76.47 | 15.40 | 5.02 | 2.42 | 0.69 |
| 23       | Streamed naked video  | 98.79 | 0.69  | 0.35 | 0.17 | 0.00 |
| 24       | Streamed underwear video  | 96.88 | 1.73  | 0.52 | 0.52 | 0.35 |
| 25       | Streamed dressed video  | 91.51 | 5.89  | 1.56 | 0.52 | 0.52 |
| 26       | Sexy voice calls with boyfriend/girlfriend                                    | 79.55 | 6.59  | 7.11 | 3.81 | 2.95 |
| 27       | Sexy voice calls with someone known in person                                 | 82.35 | 9.00  | 5.19 | 2.42 | 1.04 |
| 28       | Sexy voice calls with someone known only on the internet                      | 95.32 | 3.29  | 0.69 | 0.35 | 0.35 |
| 29       | Naked video call with boyfriend/girlfriend                                    | 94.29 | 3.11  | 1.38 | 0.87 | 0.35 |
| 30       | Naked video call with someone known in person                                 | 96.54 | 1.73  | 1.04 | 0.52 | 0.17 |

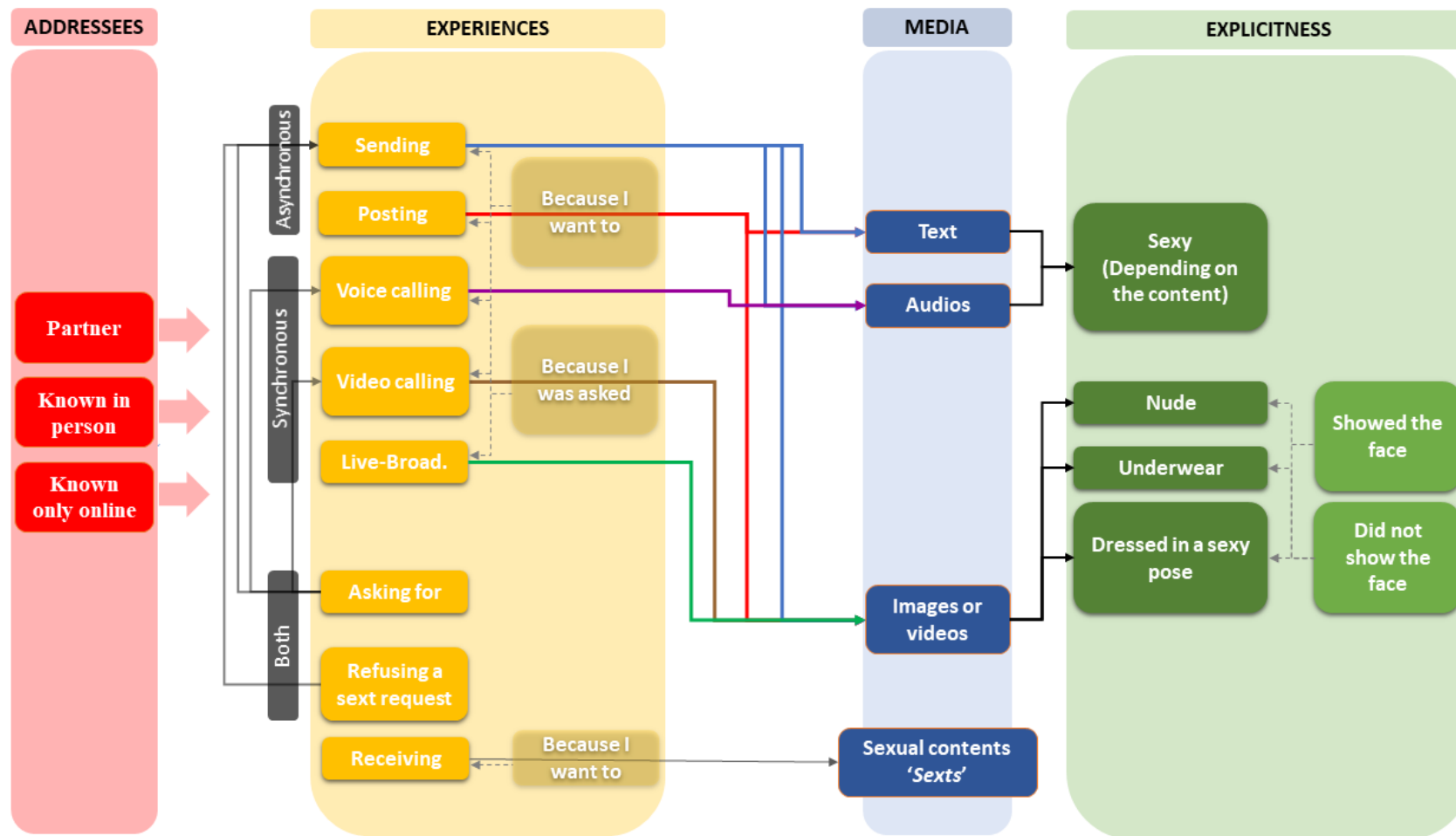
| Item No. | Short-item Description  | %0    | %1    | %2   | %3   | %4   |
|----------|---|-------|-------|------|------|------|
| 31       | Naked video call with someone known only on the internet              | 97.75 | 1.38  | 0.35 | 0.17 | 0.35 |
| 32       | Underwear video call with boyfriend/girlfriend                        | 85.27 | 6.24  | 4.68 | 2.60 | 1.21 |
| 33       | Underwear video call with someone known in person                     | 89.58 | 5.38  | 2.78 | 1.91 | 0.35 |
| 34       | Underwear video call with someone known only on the internet          | 97.23 | 1.73  | 0.35 | 0.52 | 0.17 |
| 35       | Dressed video call with boyfriend/girlfriend                          | 82.50 | 6.76  | 4.51 | 3.47 | 2.77 |
| 36       | Dressed video call with someone known in person                       | 85.42 | 8.51  | 3.12 | 2.43 | 0.52 |
| 37       | Dressed video call with someone known only on the internet            | 97.23 | 2.25  | 0.35 | 0.17 | 0.00 |
| 38       | Asked for a sexy text to boyfriend/girlfriend                         | 87.72 | 6.23  | 3.46 | 1.38 | 1.21 |
| 39       | Asked for a sexy text to someone known in person                      | 91.19 | 6.04  | 1.38 | 1.04 | 0.35 |
| 40       | Asked for a sexy text to someone known only on the internet           | 96.19 | 2.25  | 1.38 | 0.17 | 0.00 |
| 41       | Asked for a sexy audio to boyfriend/girlfriend                        | 93.23 | 3.12  | 1.91 | 1.22 | 0.52 |
| 42       | Asked for a sexy audio to someone known in person                     | 94.45 | 3.47  | 1.39 | 0.52 | 0.17 |
| 43       | Asked for a sexy audio to someone known only on the internet          | 98.79 | 0.52  | 0.35 | 0.17 | 0.17 |
| 44       | Asked for naked image/video to boyfriend/girlfriend                   | 91.36 | 4.49  | 1.90 | 1.73 | 0.52 |
| 45       | Asked for naked image/video to someone known in person                | 93.09 | 3.45  | 1.55 | 1.21 | 0.69 |
| 46       | Asked for naked image/video to someone known only on the internet     | 95.50 | 2.25  | 1.21 | 0.87 | 0.17 |
| 47       | Asked for underwear image/video to boyfriend/girlfriend               | 88.41 | 6.06  | 2.77 | 2.42 | 0.35 |
| 48       | Asked for underwear image/video to someone known in person            | 92.40 | 3.97  | 1.90 | 1.38 | 0.35 |
| 49       | Asked for underwear image/video to someone known only on the internet | 96.37 | 1.90  | 0.69 | 0.87 | 0.17 |
| 50       | Asked for dressed image/video to boyfriend/girlfriend                 | 86.98 | 6.77  | 2.60 | 2.78 | 0.87 |
| 51       | Asked for dressed image/video to someone known in person              | 91.71 | 5.18  | 1.73 | 0.86 | 0.52 |
| 52       | Asked for dressed image/video to someone known only on the internet   | 96.89 | 1.38  | 1.04 | 0.35 | 0.35 |
| 53       | Asked for a sexy voice call to boyfriend/girlfriend                   | 91.70 | 3.29  | 1.90 | 2.08 | 1.04 |
| 54       | Asked for a sexy voice call to someone known in person                | 92.06 | 4.84  | 1.38 | 1.38 | 0.35 |
| 55       | Asked for a sexy voice call to someone known only on the internet     | 97.41 | 1.21  | 0.86 | 0.35 | 0.17 |
| 56       | Asked for a sexy video call to boyfriend/girlfriend                   | 90.83 | 3.29  | 2.08 | 2.42 | 1.38 |
| 57       | Asked for a sexy video call to someone known in person                | 93.26 | 2.94  | 1.90 | 1.55 | 0.35 |
| 58       | Asked for a sexy video call to someone known only on the internet     | 97.92 | 0.35  | 0.69 | 0.87 | 0.17 |
| 59       | Refused to send sexy contents to boyfriend/girlfriend                 | 88.75 | 7.56  | 2.11 | 1.05 | 0.53 |
| 60       | Refused to send sexy contents to someone known in person              | 83.95 | 10.05 | 3.53 | 1.76 | 0.71 |
| 61       | Refused to send sexy contents to someone known only on the internet   | 84.01 | 8.44  | 3.69 | 2.11 | 1.76 |



| <b>Item No.</b> | <b>Short-item Description</b>                                   | <b>%0</b> | <b>%1</b> | <b>%2</b> | <b>%3</b> | <b>%4</b> |
|-----------------|---|-----------|-----------|-----------|-----------|-----------|
| 62              | Received a sexy content from boyfriend/girlfriend               | 74.25     | 13.05     | 6.00      | 3.70      | 3.00      |
| 63              | Received a sexy content from someone known in person            | 71.48     | 16.55     | 6.87      | 3.35      | 1.76      |
| 64              | Received a sexy content from someone known only on the internet | 80.11     | 11.97     | 3.87      | 2.64      | 1.41      |

Note: The categories, from 0 to 4, correspond to “never”, “between 1 and 3 times a month”, “between 1 and 3 times a week”, “every or almost every day”, and “several times a day”, respectively.

**Figure 1.** Graphical representation of the modular structure of A-SextS.



#### 2.4.2. Socio-Demographic Variables

Participants were asked to indicate their biological sex, age, sexual orientation, and parental cohabitation status.

#### 2.4.3. Dating Scenarios

Participants were asked to indicate whether they “like or have liked someone” and whether they “have or have had a boyfriend/girlfriend”, and, for both questions, the age of that person.

#### 2.4.4. Sexuality, Sexual Experiences, and Sexual Risk-Taking Behaviors

The questionnaire asked adolescents how they found information on sexuality, as well as whether they used mobile apps for hooking up with people, whether they watched pornography and how many times a week they did so, whether they had felt pleasure masturbating and, again, how many times a week, whether they had had sex with penetration, and whether any sexual relations had occurred without them wanting it. One additional item was used to assess how attractive they considered themselves to be. Finally, participants were asked about any perceived consequences of sexting.

### 2.5. Data Analysis

In order to assess concurrent validity, A-SextS’ single items, comprising all conceptual elements (e.g., addressee, media format, sexual explicitness), were considered the main comparison domains. When comparison was not possible due to divergences in conceptual elements constituting the sexting measurement, broader and less refined domains were considered according to the operational definition of the comparison study. Experiences and the addressees of sexting were considered as the two most basic defining elements for the comparisons. In certain studies, additional calculations were made to determine proportions and 95% confidence intervals (95% CI). Satisfactory concurrent validity was thus found to be supported by overlapping confidence intervals.

To assess criterion validity, first of all, the essential unidimensionality of each of the nine subscales was checked using different criteria: a parallel analysis with principal components, polychoric correlations, and the mean criterion [45], the number of eigenvalues higher than one, and a ratio between the first and second eigenvalue higher than 4 [46]. Item scores were summed to create an aggregated subscale, and confirmed as essentially unidimensional [46]. Furthermore, average communalities, Cronbach’s

Alpha [47], and McDonald's Omega [48] were also evaluated for each subscale. Secondly, Kendall's Tau coefficient [49], between each subscale and each criterion variable (i.e., age, pornography consumption, and physical sexual activity), was computed. Both the magnitude and statistical significance of the correlations were then assessed. Regression analyses were also conducted to examine the effect of pornography consumption and physical sexual activity on each subscale. Both variables were dichotomous (0 = have never consumed pornography/had sexual relations; 1 = have consumed pornography/had sexual relations at least once). Given the positive skewed distribution of the subscale scores, three different types of regressions were conducted: binary logistic regression, Poisson regression, and negative binomial regression. For the binary logistic regression, the subscale scores were dichotomized in either 0 (e.g., have never sent a sext to one's boyfriend/girlfriend) or 1 (e.g., have sent at least one sext to one's boyfriend/girlfriend). For the Poisson regression, the item scores were recategorized to approximate a frequency metric. The recategorized frequency scores were 0, 2, 8, 30, and 60 for each of the 5 scale categories, respectively. For instance, a score of 8 corresponded to category 2 (i.e., between 1 and 3 times a week), averaging out at 8 times a month. For the Poisson regression, the subscales reflect an aggregation of these recategorized items. For the negative binomial regression, the subscale scores reflected the sum of the item direct scores (from 0 to 4). For each of the three regression types, the effect of pornography consumption and physical sexual activity on each of the nine different subscales was assessed, and the effect of both variables was corrected by gender and age. As an example, the binary logistic regression model to examine the effect of pornography consumption (corrected by gender and age) on the (dichotomized) SF subscale was calculated as:  $\text{logit}(SF = 1) = \beta_0 + \beta_1 \text{Pornography} + \beta_2 \text{Gender} + \beta_3 \text{Age}$ . A total of 54 regression analyses (3 types  $\times$  9 subscales  $\times$  2 criterion variables) were conducted. The exponentiated regression coefficients (ExpB), as well as their 95% CI and statistical significance, were also calculated.

All analyses were performed using the statistical software R [50] and the packages "sirt" version 3.9–4 [51], "psych" version 2.0.8 [52], and "MASS" version 7.3–53 [53]. Additional analyses were performed using IBM SPSS Statistics 25 [54].

### 3. Results

#### 3.1. Evidence of Content and Face Validity

##### 3.1.1. Critical Systematic Review of Sexting Measures

Quantitative results of the 79 studies relating to sexting prevalence included in our review (see section “Stage 1” above) showed that mobile phone usage is the most referenced communication channel when asking about sexting ( $n = 28$ ). Many studies ask about sending sexts ( $n = 69$ ). Images ( $n = 74$ ) and videos ( $n = 39$ ) were the most considered media format and “sexual” ( $n = 30$ ) was the most common adjective used to characterize sexts. Most studies did not make explicit the timeframe of the measure ( $n = 45$ ). Only a minority of studies ( $n = 16$ ) considered the addressee (for those sending) or the sender (for those receiving) and only 2 studies defined the purpose of sexting among primary items. The response formats most used to assess sexting were the Likert scale ( $n = 28$ ) and dichotomic responses ( $n = 24$ ). Among studies considering the act of sending, most evaluated it via a mono-item ( $n = 34$ ). Lastly, only  $n = 21$  reported any reliability index or evidence of the validity of measures applied. See Supplementary Information S6 for more details.

##### 3.1.2. Discussion Group Results

Discussion groups characterized up to three different types of social relationships: a) friendships with daily contact, trust, and esteem, b) dating relationships, including the characteristics of friendship in addition to attraction and exclusivity, and c) relationships with people they know only on the internet, with whom they have less contact and about whom they do not know very much. The difference between a person you only know on the internet and a stranger was considered to be that the latter you do not talk regularly with, you have never talked to, or have never intended to talk to, and you do not have any information about. The discussion groups agreed that “private parts” referred to genitals and the backside as intimate parts of both boys’ and girls’ bodies, with the addition of breasts as intimate parts of girls’ bodies. The discussion groups considered that all potential actions were covered in evaluating A-SextS. On the basis of their answers, adjectives that best described a) nude pictographic contents were “naked” ( $n = 7$ ) and “showing penis/vagina, breasts, and/or backside” ( $n = 4$ ), b) semi-nude contents were “covered by underwear” ( $n = 6$ ) and “almost naked” ( $n = 5$ ), and c) neither nude nor semi-

nude were “dressed and in a sexy pose” ( $n = 13$ ) and “seductive” ( $n = 3$ ). See Supplementary Information S7 for more details.

### 3.2. Evidence of Concurrent Validity

Compared to review studies on sexting prevalence, the overall prevalence of sending sexts reported in this study (95% CI: 49.9%, 58%) was higher than that reported by Klettke et al. [20] (95% CI: 2%, 19%) and Madigan et al. [2] (95% CI: 13%, 17%), and slightly higher than the stratified estimate in studies collecting data in 2018 (95% CI: 22%, 46%) considered in our ongoing meta-analysis [17]. Our reception rate of sexts (95% CI: 43%, 71%) was also higher than that of Klettke et al. [20] (95% CI: 11.7%, 19.6%) and Madigan et al. [2] (95% CI: 23.1%, 31.7%), but was consistent with the stratified estimate in studies collecting data in 2018 (95% CI: 22%, 46%) considered in our ongoing meta-analysis [17].

Results of empirical studies with samples of Spanish adolescents, such as the estimates of Quesada et al. [41], for the voluntary sending of sexual images or videos to a partner (95% CI: 15%, 24.1%), to a friend/acquaintance (95% CI: 8%, 15.3%) and to someone only known on the internet (95% CI: 4.9%, 11%), coincide with those obtained in our study when pooling degrees of explicitness (95% CI: 20.3%, 28.6%; 14.3%, 20.4%; and 2.4%, 5.5%, respectively). The estimate for the voluntary sending of text messages with sexual content to someone only known online (95% CI: 3.2%, 8.4%) also concurs with our estimation (95% CI: 7.2%, 12%). However, when the addressee is an established partner (95% CI: 18.4%, 28.1%) or a friend/acquaintance (95% CI: 11.5%, 19.8%), our estimates are slightly higher (95% CI: 31.4%, 40.6% and 22.8%, 30%, respectively).

The prevalences reported by Schloms-Madlener [39] regarding the sending of suggestive text messages to an established partner (95% CI: 37%, 56.2%) and to someone known only online (95% CI: 11.1%, 17.5%) are consistent with those in our study (95% CI: 38.6%, 48.1%; and 12.2%, 18%). Schloms-Madlener’s [39] estimate of sending nude or semi-nude images to someone known only online (95% CI: 3.4%, 7.5%) also coincides with that reported in our study (95% CI: 6.4%, 10.9%). Our estimate is slightly higher when the addressee is an established partner (95% CI: 13.5%, 29.2%), but the intervals are close (95% CI: 32.4%, 41.8%). This is similarly the case in comparison with Dolev-Cohen and Ricon’s [40] estimate regarding the same addressee, experience, and content (95% CI: 12.3%, 18.9%). The estimated rate of asking another person to send a nude photo in the Dolev-Cohen and Ricon [40] study (95% CI: 9.5%, 15.6%) is also consistent

with our pooled estimate (95% CI: 9.4%, 14.6%), despite our measure also including video content. Our estimate does not coincide with that obtained by Dolev-Cohen and Ricon [40] when the person requested to send a nude photo is an established partner (95% CI: 3.7%, 7.9%), but is relatively close (95% CI: 9.2%, 15.5%).

In the study by Burén and Lunde [38], the prevalence of sending sexual images or videos (including webcam videos) to romantic partners (95% CI: 13.4%, 16.8%) was lower compared to the rate obtained in our sample (95% CI: 26.4%, 33.9%), whereas, when the addressee is an online friend/acquaintance (95% CI: 4.3%, 6.5%), our prevalence coincides (95% CI: 6.4%, 10.9%).

Kopecky's [44] estimate of adolescents posting sexy photos or videos partially or completely naked on the internet (95% CI: 6.3%, 9.2%) coincides with our estimate (95% CI: 9.2%, 14.5%). The prevalence of posting sexual images on the internet reported by Gregg et al. [29] (95% CI: 11.2%, 19%) is also consistent with the one obtained in our study, also considering video content (95% CI: 9.2%, 14.5%). Jonsson et al. [42] found a prevalence of adolescents posting pictures or films partially undressed of 9.8% (95% CI: 8.9%, 10.9%), which is also consistent with our estimate (95% CI: 8.6%, 13.7%).

Kerstens and Stol's [43] estimate of adolescents' exposure of breasts and/or genitals via webcam (95% CI: 1.2%, 2%) concurs with our prevalence of nude video live-streaming (95% CI: 0.6%, 2.5%). The prevalence of sexual exposure or "flashing" via webcam or mobile phone (95% CI: 13.2%, 15.6%) reported by Jonsson et al. [42] is also consistent with that reported in our study (95% CI: 8.2%, 13.2%).

To the best of our knowledge, there have been no studies measuring the outstanding sexting experience in adolescents, that is, the sending of sexy audio recordings. Thus, estimates obtained in this study could not be compared to the previous literature.

### *3.3. Evidence of Criterion Validity*

Table 3 shows essential unidimensionality results for the nine subscales. All the subscales obtained the essential unidimensionality criteria. Exceptionally, the subscale R (receiving sexts) obtained an eigenvalue ratio of 3.9, very close to the cut-off criteria set at 4. In addition, the subscales showed high average communalities ( $h^2 \geq 0.55$ ) and reliability ( $\alpha \geq 0.62$ ,  $\omega \geq 0.81$ ).

**Table 3.** Essential unidimensionality of the subscales.

| Subscale | N° Items | PA | Kaiser | $\lambda_1 / \lambda_2$ | $h^2$ | Alpha | Omega |
|----------|----------|----|--------|-------------------------|-------|-------|-------|
| SF       | 10       | 1  | 1      | 7.2                     | 0.63  | 0.88  | 0.94  |
| SK       | 10       | 1  | 1      | 7.1                     | 0.61  | 0.85  | 0.94  |
| SI       | 10       | 1  | 1      | 9.2                     | 0.72  | 0.87  | 0.96  |
| PS       | 6        | 1  | 1      | 4.5                     | 0.55  | 0.62  | 0.88  |
| AF       | 7        | 1  | 1      | 8.6                     | 0.73  | 0.89  | 0.95  |
| AK       | 7        | 1  | 1      | 9.7                     | 0.74  | 0.88  | 0.95  |
| AI       | 7        | 1  | 1      | 10.1                    | 0.75  | 0.85  | 0.95  |
| R        | 3        | 1  | 1      | 3.9                     | 0.59  | 0.73  | 0.81  |
| RS       | 3        | 1  | 1      | 5.5                     | 0.72  | 0.76  | 0.88  |

Note: SF = sending sexts to a boyfriend/girlfriend; SK = sending sexts to someone known in person; SI = sending sexts to someone known only on the internet; PS = posting or live-streaming pictographic content; AF = asking for sexts from a boyfriend/girlfriend; AK = asking for sexts from someone known in person; AI = asking for sexts from someone known only on the internet; R = receiving sexts; RS = refusing to send a requested sext; PA = parallel analysis; Kaiser = eigenvalue-higher-than-one rule;  $\lambda_1 / \lambda_2$  = ratio between the first and second eigenvalues;  $h^2$  = average communality; Alpha = Cronbach's Alpha; Omega = McDonald's Omega.

Table 4 shows Kendall's Tau coefficient between each subscale and the three criterion variables. Most of the relations were positive and statistically significant, except for age with SI and AK, and pornography consumption with PS and AK. All nine subscales obtained positive and statistically significant associations with physical sexual activity.

**Table 4.** Kendall's Tau coefficient.

| Subscale | Age      | Pornography Consumption | Sexual Intercourse |
|----------|----------|-------------------------|--------------------|
| SF       | 0.148*** | 0.160***                | 0.412***           |
| SK       | 0.153*** | 0.190***                | 0.262***           |
| SI       | 0.064    | 0.198***                | 0.197***           |
| PS       | 0.121*** | 0.056                   | 0.314***           |
| AF       | 0.099*   | 0.190***                | 0.398***           |
| AK       | 0.066    | 0.183***                | 0.270***           |
| AI       | 0.095*   | 0.146***                | 0.151***           |
| R        | 0.207*** | 0.190***                | 0.375***           |
| RS       | 0.135*** | -0.002                  | 0.241***           |

Note: \*  $p < 0.05$ ; \*\*\*  $p < 0.001$ . SF = sending sexts to a boyfriend/girlfriend; SK = sending sexts to someone known in person; SI = sending sexts to someone known only on the internet; PS = posting or live-streaming pictographic content; AF = asking for sexts from a boyfriend/girlfriend; AK = asking for sexts from someone known in person; AI = asking for sexts from someone known only on the internet; R = receiving sexts; RS = refusing to send a requested sext.



Finally, Table 5 shows the exponentiated coefficients (ExpB) resulting from the regression analyses. Both pornography consumption and physical sexual activity obtained a positive and statistically significant effect on all nine subscales, regardless of the regression type and after correcting for gender and age. Among these results, especially strong relations were found between pornography consumption and asking for sexts to someone only known online (ExpB binary logistic: 4.1; ExpB Poisson: 12.1; ExpB negative binomial: 7.3), as well as between physical sexual activity and sending sexts to one's boyfriend/girlfriend (ExpB binary logistic: 7.6; ExpB Poisson: 4.5; ExpB negative binomial: 4.1), asking for sexts from one's boyfriend/girlfriend (ExpB binary logistic: 7.6; ExpB Poisson: 9.2; ExpB negative binomial: 9.3), and asking for sexts from someone known in person (ExpB binary logistic: 4.6; ExpB Poisson: 13.6; ExpB negative binomial: 7).

**Table 5.** Regression analyses.

| Subscale | Binary Logistic Regression  |                              | Poisson Regression             |                                | Negative Binomial Regression |                              |
|----------|-----------------------------|------------------------------|--------------------------------|--------------------------------|------------------------------|------------------------------|
|          | Pornography Consumption     | Sexual Intercourse           | Pornography Consumption        | Sexual Intercourse             | Pornography Consumption      | Sexual Intercourse           |
| SF       | 2.622 ***<br>(1.610, 4.331) | 7.595 ***<br>(4.062, 15.113) | 2.021 ***<br>(1.940, 2.105)    | 4.520 ***<br>(4.348, 4.698)    | 1.759 *<br>(1.181, 2.626)    | 4.088 ***<br>(2.663, 6.422)  |
| SK       | 2.591 ***<br>(1.692, 4.013) | 3.163 ***<br>(1.896, 5.393)  | 3.429 ***<br>(3.251, 3.617)    | 4.951 ***<br>(4.715, 5.199)    | 2.125 ***<br>(1.469, 3.089)  | 3.199 ***<br>(2.092, 5.062)  |
| SI       | 3.522 ***<br>(2.069, 6.114) | 2.667 ***<br>(1.527, 4.627)  | 6.574 ***<br>(5.954, 7.268)    | 2.800 ***<br>(2.580, 3.038)    | 3.401 ***<br>(1.817, 6.474)  | 2.797 **<br>(1.386, 6.224)   |
| PS       | 1.909 **<br>(1.211, 3.042)  | 4.086 ***<br>(2.497, 6.749)  | 2.196 ***<br>(1.991, 2.422)    | 4.271 ***<br>(3.886, 4.694)    | 1.775 *<br>(1.171, 2.713)    | 3.205 ***<br>(2.068, 5.067)  |
| AF       | 3.431 ***<br>(1.987, 6.066) | 7.641 ***<br>(4.351, 13.769) | 4.372 ***<br>(4.075, 4.691)    | 9.159 ***<br>(8.576, 9.784)    | 2.893 ***<br>(1.682, 5.002)  | 9.315 ***<br>(4.940, 18.327) |
| AK       | 3.171 ***<br>(1.872, 5.470) | 4.568 ***<br>(2.668, 7.866)  | 8.285 ***<br>(7.554, 9.096)    | 13.572 ***<br>(12.482, 14.766) | 3.695 ***<br>(2.071, 6.693)  | 7.041 ***<br>(3.626, 14.824) |
| AI       | 4.103 ***<br>(1.891, 9.308) | 2.625 **<br>(1.260, 5.358)   | 12.497 ***<br>(10.523, 14.772) | 2.626 ***<br>(2.320, 2.971)    | 7.339 ***<br>(2.627, 23.074) | 3.735 *<br>(1.298, 13.674)   |
| R        | 2.737 ***<br>(1.768, 4.298) | 5.215 ***<br>(2.976, 9.577)  | 3.946 ***<br>(3.679, 4.234)    | 5.618 ***<br>(5.260, 6.000)    | 2.537 ***<br>(1.857, 3.486)  | 3.450 ***<br>(2.500, 4.815)  |
| RS       | 1.864 *<br>(1.130, 3.115)   | 2.800 ***<br>(1.667, 4.703)  | 1.548 ***<br>(1.404, 1.706)    | 3.450 ***<br>(3.139, 3.791)    | 1.728 *<br>(1.035, 2.943)    | 2.885 ***<br>(1.710, 5.000)  |

Note: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ . SF = sending sexts to a boyfriend/girlfriend; SK = sending sexts to someone known in person; SI = sending sexts to someone known only on the internet; PS = posting or live-streaming pictographic content; AF = asking for sexts from a boyfriend/girlfriend; AK = asking for sexts from someone known in person; AI = asking for sexts to someone known only on the internet; R = receiving sexts; RS = refusing to send a requested sext. The regression coefficients are shown exponentiated (ExpB). 95% confidence intervals are shown in brackets.

#### **4. Discussion**

The goal of this study was to meet the need to create a measure of sexting that integrates and clarifies a wider variety of conceptual elements constituting its definition. Furthermore, the study aimed to overcome conceptual and methodological shortcomings detected not only in previous empirical studies, but also in previous scales developed on this topic (e.g., the non-consideration of certain sexting experiences and media formats, the use of vague adjectives to describe sexts, the non-specification of certain elements, such as purpose and the temporal framework) [2,3,17,20,21,33–35]. To achieve the above goals, our Adolescent Sexting Scale (A-SextS for short) was based on multiple sources of information, including a thorough literature review, discussion groups, and a pilot study.

Regarding content and face validity, A-SextS has several notable strengths in comparison to previous measures deserving consideration. First, our instrument went a step further than others by focusing on active and primary sexting, and by considering actions that had not been taken into account to date, such as the live-streaming of content. Second, our scale also expands upon current work on sexting measures by including hitherto unconsidered media formats, beyond text message and visual formats, such as audio recordings. Third, this is one of the first measures that characterizes pictographic sexts precisely by objectively differentiating three degrees of sexual explicitness and considers relevant information such as whether the sender shows their own face in the content or not. Fourth, as several scholars have argued that the risks young people engaged in sexting are exposed to may differ according to the recipient of the content [25,38], our work distinguishes up to three different addressees. The difference between our classification of addressees and that of other authors is that a fourth type of addressee, identified as a “stranger” by Burén and Lunde [38] and Dolev-Cohen and Ricon [40], for example, was dismissed from our study after having been defined by our discussion groups as someone adolescents know nothing about, have never seen, have never spoken to, and have no intention of knowing or speaking to. Fifth, this scale also responds to exigencies detected in previous studies with regard to whether sexting occurs due to one’s own initiative or in response to a request [55], and with regard to whether the sender shows their own face or not in the pictures or videos [17]. Sixth, unlike many other studies, our instrument clearly defines a sexual or amorous purpose in the exchange of sexts and establishes a timeframe that minimizes potential recall bias by respondents.

Seventh and last, A-SextS presents a modular structure with more relevant subscales and defining elements, as used previously to develop measures on sexting and which play a major role in empirical literature on the association between sexting, online risk-taking, and online sexual victimization [25,38]. All these elements make A-SextS a comprehensive instrument comprising most of the sexting experiences and features considered in the previous literature. A-SextS can, therefore, be regarded as a more extensive and fine-grained scale for measuring a wider variety of sexting behaviors.

Regarding A-SextS' psychometric results, concurrent validity was supported in most comparisons by overlapping confidence intervals between prevalence estimates reported in this study and those reported in a recent meta-analytic study or in comparable individual empirical studies, considered as independent external indicators. The quasi or non-concurrency of certain comparisons with the results of some previous studies may be accounted for by two main reasons. The first is that adolescent sexting has both been found to increase over time and with an increasing mean age of participants in the sample [2,17]. The second is that the higher sexting rates found in this study may also be due to a wider set of experiences and features (e.g., degree of explicitness, other media formats) considered in the A-SextS questionnaire in comparison to previous sexting measures. Regarding the criterion validity of A-SextS, an analysis of Kendall's Tau coefficient and various regression analyses showed that, as expected, sexting was more prevalent among older adolescents, pornography consumers, and sexually active adolescents. This consistent relationship supports the relational-sexual nature of sexting, which is commonly used by adolescents as a legitimate way to fulfil their own sexual developmental needs. Furthermore, the congruent results between the three types of regression demonstrate more robustness in the findings and improve their interpretability. For instance, the odds of sending a sext to a boyfriend/girlfriend for a sexually active adolescent is 7.6 times that for a non-sexually active adolescent (binary logistic regression); a sexually active adolescent is expected to send 4.5 more sexts a month to their boyfriend/girlfriend than a non-sexually active adolescent (Poisson regression); and a sexually active adolescent is expected to obtain a higher score of 4.1 in the SF (sending sexts to a boyfriend/girlfriend) subscale than a non-sexually active adolescent (negative binomial regression). It should be noted that the subscales were formed on the experiences and addressees of sexting. However, the modular structure of A-SextS makes it possible to use different subscales depending on the research question of the specific study. In this respect, future studies can consider different features of sexting (e.g., addressees, degree

of explicitness) with the purpose of obtaining a finer-grained picture of the relationship between criterion variables and different sexting behaviors. It is important, however, to check that subscales used are essentially unidimensional [46].

The validation process of A-SextS was different from that applied in previous sexting measures [33,35] in which a factor analytic perspective was adopted to explore the latent structure of the scale. Penado et al. [35], for example, carried out a factorial analysis and grouped factors according to the medium through which sexts were communicated (i.e., mobile phone vs. social networks), with a correlation coefficient of 0.9 between factors. The issue with such a factorial structure is the difficulty in separating the functionalities of both media, which can overlap. The exchange of any sexts can be conducted via a social network and, in turn, via a mobile phone, and vice versa. In addition, both media cannot be considered latent variables that configure factorial structures supported by a prior theoretical framework. Our decision in changing the validation approach was based on two main motivations, which are interrelated. First, the lack of theoretical models in sexting literature makes it difficult to interpret the meaning and relationships between the resulting dimensions from a factor analysis. The formulation of a theoretical model is difficult to accomplish without an operationalized definition of the construct under study. A-SextS is intended to fill this gap by proposing an integrated sexting definition that covers several elements detected in previous review and empirical studies. Once the various sexting defining elements have been identified and repeatedly measured, a theory can be better constructed. Otherwise, we may run the risk of forcing the existence of certain latent structures, regardless of issues associated with extremely high factor correlations or a high number of unexplained cross-loadings. The modular structure of A-SextS clearly departs from the simple structure often sought in factor analysis studies. Each A-SextS item has been constructed as an indicator of a behavior relating to more than a single sexting element. Thus, instead of using the whole scale with a specified latent structure, either individual items or different subscales can be used according to the research purposes. For instance, the experiences and addressees of sexting were the selected elements in the criterion validity study, but other subscales may be constructed by focusing on different sexting defining elements. Currently, sexting measures appear to be closer to the Patient Reported Outcome Measures (PROMs) approach [56,57] than to measures guided by a theory-driven approach aimed at validating a known factor structure via a conventional strategy. Since sexting still cannot be considered as a construct of its own embedded in a validated theoretical system, PROMs could offer a potential solution

to issues of assessment and validation regarding behavioral practices lacking in satisfactory theoretical background, as is the case of sexting.

#### *4.1. Limitations and Future Research*

Certain limitations to this study and future research lines should be mentioned. First, A-SextS was designed to focus on assessing active experiences of sexting, although it also considers the reception of sexts as a passive experience. Second, all participants were selected by convenience, which means that the study's generalizability is limited. It was intended to collect data from a more heterogeneous sample in terms of age, however, the health crisis caused by Covid-19 prevented data collection at a fourth school that would have provided more sample heterogeneity. As a result, most participants were between the age of 12 and 16, with likely notable differences between them regarding the management of their own sexual intimacy, their sexual developmental needs, and their accumulated sexual experiences. Future research should apply probabilistic sampling methods to involve a wider population and to examine the characteristics of sexting by age. In addition, our discussion groups were formed by a majority of girls, which may have affected the contents of the discussion in terms of experiences and opinions on sexuality. Nonetheless, we believe this gender disparity to be inconsequential, given that the purpose of the discussion groups was limited to examining the comprehensibility and semantic validity of the scale, once the conceptualization of sexting had been properly defined. Third, the English language version of A-Sexts has not been subjected to a validation process, but is simply the product of translation by a professional linguist and native English speaker specialized in the translation of scientific and technical texts. Future lines of research should try to explore the psychometric properties of A-SextS in various different cultural contexts and at different educational stages. Fourth, A-SextS is a self-report scale, therefore answers may be influenced by social desirability and concerns about being judged, despite anonymity being clearly affirmed. Future studies should test an administration procedure in which students respond in a totally isolated scenario. Fifth, as a field research limitation and with respect to concurrent validity, we were unable to compare the prevalence estimates of some of the sexting subscales considered due to the absence of previous studies reporting the same domains. Sixth, while A-SextS conceives sexting as a practice carried out with an amorous or sexual purpose or responding to sexual objectives, our instrument does not explicitly differentiate between direct and indirect pressures, nor does it differentiate between

coercive acts that may lead adolescents to take certain actions. Future research may also focus on developing instruments to assess these distinctions in the practice of sexting.

#### *4.2. Implications*

Despite the aforementioned limitations, our results have some important implications. The scale fills a certain gap in the field by providing researchers with a homogeneous, extensive, and objective measure of sexting that considers the riskiest characteristics of this practice (e.g., showing one's face in pictographic sexts), and provides good evidence of content, concurrent, and criterion validity. Taking into account the abovementioned riskiest characteristics remains a priority in the assessment of sexting behavior, since the consequences of the malicious use of pictures or videos, such as non-consensual sharing of received, intimate content in which one is easily identifiable or recognizable, may be particularly harmful [58]. Furthermore, the modular structure of A-SextS will allow academics and teachers to combine or focus on the study of any experience of sexting, relationship type, multimedia content, explicitness, motivation, and inclusion of the participant's face in content. All the features that A-SextS covers can serve as a basis for the formulation of policies and educational measures regarding how adolescents manage sexual interactions.

### **5. Conclusions**

This study contributes to an enrichment of research on adolescent sexting, and validates an instrument with good psychometric properties for assessing this phenomenon. Furthermore, it aims to help break a vicious circle that, in our opinion, has characterized much of sexting research to date: a body of empirical results from poor quality sexting measures making it difficult to develop consensual theoretical explanations of the practice. Lastly, our Adolescent Sexting Scale (A-SextS) also has important implications for educational interventions since it considers different types of social relationships and their characteristics, and ethical issues such as voluntariness.

**Supplementary Materials:** The following are available online at <https://www.mdpi.com/1660-4601/17/21/8042/s1>, Supplementary Information S1: Transcription of the spoken instructions, Supplementary Information S2: Additional notes on the administration of the discussion groups, Supplementary Information S3: Discussion group guide, Supplementary Information S4: Information on the databases, search strategy and descriptors used to conduct concurrent validity analysis, Supplementary Information S5: Modular structure of the Adolescent Sexting Scale (A-SextS), Supplementary Information S6: Analysis of sexting measures, Supplementary Information S7: Discussion group results.

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## Supplementary Material

### S1. *Transcription of the spoken instructions*

1. (DP1) Hello, for the next few minutes I will be your instructor. So please pay attention.
2. (DP2) This is a research project about sexting.
3. (DP3) Sexting is the exchange of sexy text messages, audio files, images or videos over the internet with another person, and with an amorous or sexual intention. Sexting is done with an amorous or sexual goal in mind, for example, in order to feel pleasure, to elicit someone else's pleasure, to draw someone's attention, to attract someone, to express sexual desire or interest towards someone, to provide proof of your amorous feelings towards someone, to propose some kind of sexual relation, to find out if another person likes you or has some kind of interest in you, and so on.
4. (DP4) The questionnaire you are going to fill out is VERY SIMPLE and has a FUN answer format. (...) The questionnaire asks whether you have exchanged sexy messages of any kind WITH YOUR BOYFRIEND OR GIRLFRIEND. (...) It also asks whether if you have exchanged sexy messages of any kind WITH SOMEONE YOU KNOW IN PERSON. (...) And it also asks whether you have exchanged sexy messages of any kind WITH SOMEONE YOU ONLY KNOW ON THE INTERNET.
5. (DP5) In particular, you are asked to indicate the FREQUENCY (...) with which you have done EACH of the stated acts (...) during the LAST MONTH.
6. (DP6) The frequency scale is this:
  - ZERO indicates that you have NEVER done it.
  - ONE indicates that you have done it between one and three times PER MONTH.
  - TWO indicates that you have done it between one and three times PER WEEK.
  - THREE indicates that you have done it every day or ALMOST EVERY DAY.
  - FOUR indicates that you have done it SEVERAL TIMES A DAY.

Have you seen it? It is very easy to remember: never, between one and three times a month, between one and three times a week, every or almost every day, (...) or several times a day.

7. (DP7) If, for a statement, you have indicated 1, 2, 3 or 4, you should, as indicated by the arrow, CONTINUE TO THE RIGHT and circle THE CORRESPONDING EMOTICON!
8. (DP8) Let me explain the emoticons to you in detail.

The smiley emoticon (\*) means that you DID SHOW your face in the content. If you DID NOT SHOW your face, circle the emoticon that does not have a face (\*). If you sometimes showed your face and sometimes did not, you can circle BOTH emoticons.

The emoticon with an index finger pointing up (\*) means that you did it BECAUSE YOU WANTED TO, while the emoticon with the pleading hands (\*) indicates that you did it BECAUSE YOU WERE ASKED TO. If SOMETIMES you did it because you wanted to, and OTHER TIMES because you were asked to, you can circle BOTH emoticons. Or ... if you did it because you were asked to AND ALSO because you wanted to, you can again circle BOTH emoticons.
9. (DP9) Let's see an example together.

The first statement says "I have sent a sexy image (...) to my boyfriend or girlfriend". Since I have not done this during the last month, I'm going to circle ZERO and NOT touch any of the emoticons.

The second statement says “I have sent a sexy image (...) to someone I only know on the Internet”. Since I have done this EVERY DAY (OR ALMOST EVERY DAY), in the last month, I’m going to CIRCLE number THREE (...) AND go on to ANSWER WITH AN EMOTICON. Since I SHOWED MY FACE IN SOME PICTURES AND NOT IN OTHERS, I’m going to circle the emoticon of the smiley face and also the emoticon that has no face. Also, since I sent them BECAUSE I WAS ASKED TO, I’m going to circle the EMOTICON of the PLEADING HANDS. And so on, with EVERY ONE of the statements in the questionnaire.

10. (DP10) Ah! Remember that your participation in this research project is voluntary, and that your answers will be treated COMPLETELY ANONYMOUSLY. So do not write your NAME, SCHOOL YEAR, CLASS, SCHOOL, CITY or ANYTHING ELSE. No-one will know what you have answered.
11. (DP11) Please read the questionnaire slowly, and, if you have any questions, ask the person in charge. When you finish filling in the questionnaire, (...) fold it and leave it face down, (...) raise your hand, (...) and the person in charge will pass by with a box for you to put the questionnaire in. In this way, I can assure you your answers will be completely anonymous and confidential.

## *S2. Additional notes on the administration of the discussion groups*

Prior to holding the discussion groups, seven primary school teachers (four men and three women, one of which was a therapeutic pedagogy teacher) were asked to provide a “cognitive debriefing” on the capacities of pre-adolescents, of 10 to 13 years old, in defining, distinguishing and discussing aspects about sexuality (e.g. sex-affective orientation, interpersonal relationships, body image, conditions that characterize each person’s sex, sexual practices, development of concrete and abstract thought, etc.). The information provided also helped the authors plan the discussion group guide and select topics that the youngsters were able to discuss easily.

The focus group guide was developed, pilot-tested with a small group of 4 tweens and teens, and revised before initiating the two main discussion groups.

To start, in the two main discussion groups, the purpose of the discussion group was explained to the adolescents, and some specific terms relating to sexting were provided. During the discussion, the adolescents contributed to face validity by providing us with an informative conceptual analysis of the actions that they thought were essential, common or uncommon, and those that we may have overlooked. They also suggested how to adjectivize the sexual media content exchanged in the practice of sexting. In addition, they commented on relevant aspects for assessing sexting. To end each discussion group, they talked about the meaning and clarity of aspects of the questionnaire, including its instructions, its organization, its questions, and the corresponding answer choices, in order to make sure that the questionnaire was clear for the final sample and would achieve the goal of the research project.

### S3. Discussion group guide

#### INSTRUCTIONS

1. Sex (male or female ) and age.
2. Material: pen or pencil and a notebook.
3. Do not write your name or school year.
4. There are no right or wrong answers.
  - a. Say exactly what you think. You won't be judged in any way for it.
5. On the subject of discussion, I am not going to ask you if you have actually been involved in sexting or not. I'm not interested here. However, I do want to know how you think we should ask about sexting, whether those of us studying this phenomenon are asking the wrong questions.
6. For example, "Have you sent sexy or suggestive photos?".
7. You will see me taking notes of interesting things that you may say.
8. These notes will be completely anonymous and confidential.

#### ICT & SOCIAL MEDIA

##### \*Activity 1\* Technological devices

1. In your opinion, when someone talks about "technological devices", what do they mean?

- |                                       |                                     |   |  |
|---------------------------------------|-------------------------------------|---|--|
| <input type="checkbox"/> Mobile phone | <input type="checkbox"/> Computer   | <input type="checkbox"/> Tablet or iPad | <input type="checkbox"/> YouTube                 |
| <input type="checkbox"/> Smart watch  | <input type="checkbox"/> WhatsApp   | <input type="checkbox"/> PlayStation    | <input type="checkbox"/> Instagram               |
| <input type="checkbox"/> Facebook     | <input type="checkbox"/> Headphones | <input type="checkbox"/> Smart TV       | <input type="checkbox"/> Others: Which?<br>_____ |

2. Do you have your own mobile phone?
3. When can you say you have your own mobile phone?
4. To connect to the internet or social media, do you use devices that are yours or those of your parents?
5. How do you connect to the internet or social media from your mobile phone?
6. Do you use Wi-Fi or a mobile data connection? Do you do so at home or also in other places?
7. Have you ever brought your mobile phone to school?
8. Have you ever had your mobile phone confiscated or your internet connection taken away from you? Was that long ago?
9. Do your parents look at your mobile phone?
10. What do you use the internet and social media for?
11. Do you go online or on social media every day?
12. How many hours a day do you spend on the internet or on social media?
13. What social networks do you know about and use?
14. What do you use social media or do you think social media is for?
15. Are all the people in your social networks actual friends?

#### SEXUAL ORIENTATION

1. Do you know what it means to be asexual?
2. Do you know what it means to be homosexual?
3. Do you know what it means to be heterosexual?
4. Do you know what it means to be bisexual?
5. Do you know what it means to be pansexual?

## **TYPES OF RELATIONSHIPS**

### **Romantic relationships**

1. How do you know that you like a boy/girl? How do you realize?
2. If you like a boy/girl, does it mean you are dating?
  - a. When is it that two people are dating?
  - b. How do you call the phase when two people like each other, but still do not claim to be dating?
  - c. How do you know when two people have stopped dating?
3. Has any boy or girl of your age had a boyfriend or girlfriend? What was that relationship like?
4. Have you ever had a boyfriend or girlfriend? The same age as you?
5. At your age, can a boy or girl have more than one boyfriend or girlfriend at the same time?
6. On a sexual level, what do you think you do with a boyfriend or girlfriend?

### **Friendships**

1. So we already know what a boyfriend, girlfriend or partner is. Now, how would define a friend?
2. What characterizes a friendship?
3. What is the difference between a friendship and a romantic relationship?

### **People you know in person**

1. Consider a boy or girl you have met in person, for example, at a summer camp, who you later have conversations with over the internet, for example, via WhatsApp. Would you consider that person a friend?
2. Could that person become a friend?
3. Do you have any friends like this?

### **People you know on the internet**

1. Consider a boy or girl you have never met in person but only on the internet. Would you consider that person a friend?
2. Can a boy or girl you have met on the internet become a friend?
3. Do you have any friends like this?
4. Would you consider a person that you have met on the internet a stranger?

### **People you do not know**

1. Is someone you do not know the same as a stranger?
2. Do you consider a person you have met or with whom you have been talking on the internet a stranger?
3. What characterizes a person who is a stranger for you?
4. Is someone you have never seen or spoken to before a stranger?
5. Is there any other kind of relationship you know of that I have not mentioned?

## **WILLINGNESS & CONSENT**

1. When you send a friend a photo, whether sexy or not, do you ask them first if they want to receive it?
2. Has someone ever told you that they do not want to receive any more messages, for example, sexy or not sexy photos, or other kinds of content? Do you know or have you heard of that happening?
3. Have you ever told someone that you do not want to receive any more messages, for example, sexy or not sexy photos, or other kinds of content? Do you know or have you heard of that happening?
4. Have you ever felt pressured or coerced into sending someone a message, for example a sexy or not sexy photo, or other kind of content? Do you know or have you heard of that happening?

**SOCIAL MEDIA**

1. What can be done on social media?
2. Of all of these actions, what do you do the most?
3. Have you ever sent anyone sexy photos or videos featuring other people?

**SEXUALITY**

**\*Activity 2\* Private parts and reproductive organs**

1. What do you consider to be the reproductive or sexual organs of the human body?

- |                                 |   |  |
|---------------------------------|---|--|
| <input type="checkbox"/> Tongue | <input type="checkbox"/> Breasts or nipples | <input type="checkbox"/> Knees         |
| <input type="checkbox"/> Penis  | <input type="checkbox"/> Hair               | <input type="checkbox"/> Vagina        |
| <input type="checkbox"/> Feet   | <input type="checkbox"/> Backside           | <input type="checkbox"/> Other: Which? |
| <input type="checkbox"/> Lips   | <input type="checkbox"/> Navel              | _____                                  |

2. What do you consider as private parts of a boy's body?

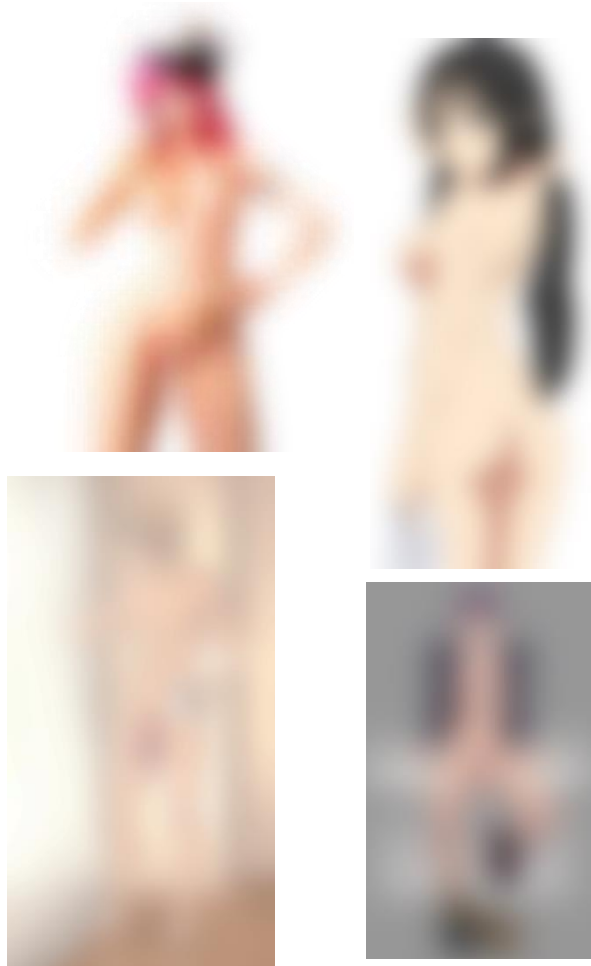
- |                                       |   |  |
|---------------------------------------|---|--|
| <input type="checkbox"/> Tongue       | <input type="checkbox"/> Breasts or nipples | <input type="checkbox"/> Knees         |
| <input type="checkbox"/> Penis/Vagina | <input type="checkbox"/> Hair               | <input type="checkbox"/> Other: Which? |
| <input type="checkbox"/> Feet         | <input type="checkbox"/> Backside           | _____                                  |
| <input type="checkbox"/> Lips         | <input type="checkbox"/> Navel              | _____                                  |

3. What do you consider as private parts of a girl's body?

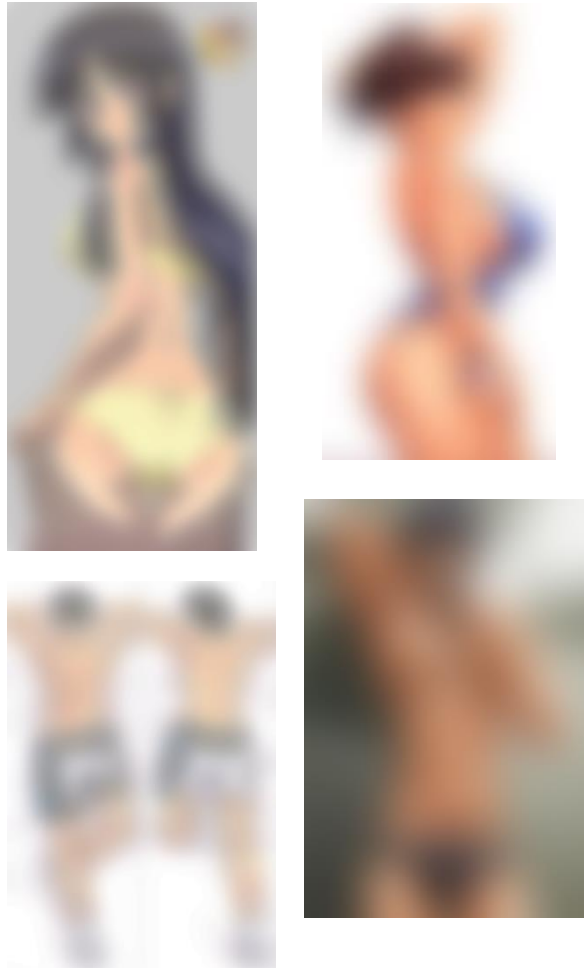
- |                                       |   |  |
|---------------------------------------|---|--|
| <input type="checkbox"/> Tongue       | <input type="checkbox"/> Breasts or nipples | <input type="checkbox"/> Knees         |
| <input type="checkbox"/> Penis/Vagina | <input type="checkbox"/> Hair               | <input type="checkbox"/> Other: Which? |
| <input type="checkbox"/> Feet         | <input type="checkbox"/> Backside           | _____                                  |
| <input type="checkbox"/> Lips         | <input type="checkbox"/> Navel              | _____                                  |

**GRAPHIC DESCRIPTION**

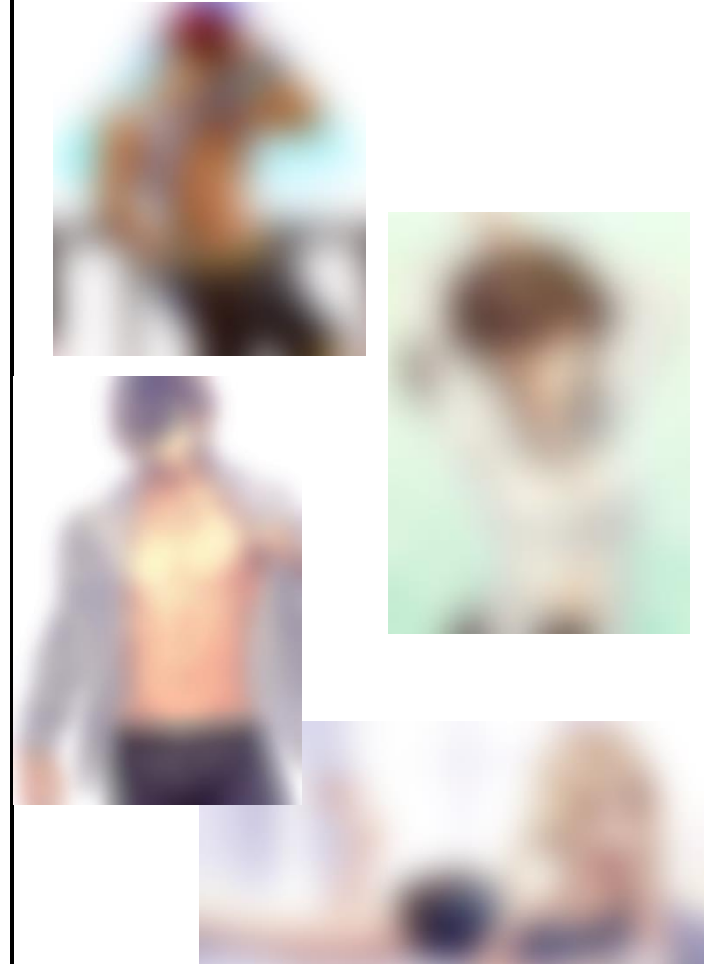
Column A



Column B



Column C



**\* Activity 3 \* Adjectivization of pictographic content**

1. What adjectives best describe the images in each column?
  - a. First: Circle the 5 adjectives that best describe the images in each column.
  - b. Second: Mark the adjective that best describes them with a 1 and that worst describes them with a 5.

|                          | COLUMN A   |                          | COLUMN B   |                          | COLUMN C   |
|--------------------------|--|--------------------------|--|--------------------------|--|
| <input type="checkbox"/> | Sexual activity  | <input type="checkbox"/> | Sexual activity  | <input type="checkbox"/> | Sexual activity  |
| <input type="checkbox"/> | Almost naked   | <input type="checkbox"/> | Almost naked   | <input type="checkbox"/> | Almost naked   |
| <input type="checkbox"/> | Covered by underwear                                       | <input type="checkbox"/> | Covered by underwear                                       | <input type="checkbox"/> | Covered by underwear                                       |
| <input type="checkbox"/> | Nude   | <input type="checkbox"/> | Nude   | <input type="checkbox"/> | Nude   |
| <input type="checkbox"/> | Erotic   | <input type="checkbox"/> | Erotic   | <input type="checkbox"/> | Erotic   |
| <input type="checkbox"/> | Explicit   | <input type="checkbox"/> | Explicit   | <input type="checkbox"/> | Explicit   |
| <input type="checkbox"/> | Inappropriate  | <input type="checkbox"/> | Inappropriate  | <input type="checkbox"/> | Inappropriate  |
| <input type="checkbox"/> | Insinuating  | <input type="checkbox"/> | Insinuating  | <input type="checkbox"/> | Insinuating  |
| <input type="checkbox"/> | Showing private parts                                      | <input type="checkbox"/> | Showing private parts                                      | <input type="checkbox"/> | Showing private parts                                      |
| <input type="checkbox"/> | Showing a penis/vagina, breasts or nipples and/or backside | <input type="checkbox"/> | Showing a penis/vagina, breasts or nipples and/or backside | <input type="checkbox"/> | Showing a penis/vagina, breasts or nipples and/or backside |
| <input type="checkbox"/> | Partially naked  | <input type="checkbox"/> | Partially naked  | <input type="checkbox"/> | Partially naked  |
| <input type="checkbox"/> | Provocative  | <input type="checkbox"/> | Provocative  | <input type="checkbox"/> | Provocative  |
| <input type="checkbox"/> | Revealing  | <input type="checkbox"/> | Revealing  | <input type="checkbox"/> | Revealing  |
| <input type="checkbox"/> | Seductive  | <input type="checkbox"/> | Seductive  | <input type="checkbox"/> | Seductive  |
| <input type="checkbox"/> | Semi-naked   | <input type="checkbox"/> | Semi-naked   | <input type="checkbox"/> | Semi-naked   |
| <input type="checkbox"/> | Sexy or sexual   | <input type="checkbox"/> | Sexy or sexual   | <input type="checkbox"/> | Sexy or sexual   |
| <input type="checkbox"/> | Suggestive   | <input type="checkbox"/> | Suggestive   | <input type="checkbox"/> | Suggestive   |
| <input type="checkbox"/> | Dressed and in a sexy pose                                 | <input type="checkbox"/> | Dressed and in a sexy pose                                 | <input type="checkbox"/> | Dressed and in a sexy pose                                 |



2. Why did you choose these adjectives to describe the images in column A, B and C?

**Activity 4\* The face**

1. What differences can you see in these two images?
2. Is it important to ask whether the person's face appears or not?



Image A



Image B

**\*Activity 5\* Contents featuring other people**

1. Which statement is best understood? Mark with a 1 the one you think is best understood and with a 5 the one you think is the worst understood.
  - I have sent a nude picture featuring another person.
  - I have sent a nude picture of a stranger.
  - I have sent a nude picture not of my own.
  - I have sent a picture in which another person appears naked.
  - I have sent a picture in which others appear naked.

**\* Activity 6 \* Discussion of the first draft of the questionnaire**

- 
- Your information will be totally CONFIDENTIAL, and neither your teachers nor your parents will have access to it, so I ask you to please be SINCERE in your answers.
  - Next, a set of actions are presented that have to do with the exchange of sexual content over the Internet with a love or sexual objective (a phenomenon called sexting). Next, a set of actions are presented that have to do with the exchange of sexual content over the Internet with a love or sexual objective (a phenomenon called sexting). Please indicate how often you have performed each of these actions in the last month (30 days).
- 0 = Never  
 1 = Between one and three times a month  
 2 = Between one and three times a week  
 3 = Every day or almost every day  
 4 = Several times a day

UP = I understand perfectly  
 NS = I am not sure if I understand perfectly  
 DU = I don't understand
-

**SENDING SEXY CONTENT OF YOURSELF:** To feel pleasure, to make him/her feel pleasure, to express desire, to show sexual interest, to get attention, to find out whether other people have a sexual interest or desire for me, to describe a sexual act, to propose having real or virtual sex, to prove feelings, etc.

- |  |    |    |    |
|--|----|----|----|
| 1. I have sent my own text message of a sexual nature.   | UP | NS | DU |
| 2. I have sent my own audio message of a sexual nature.  | UP | NS | DU |
| 3. I have sent a picture or video of my nude private parts.  | UP | NS | DU |
| 4. I have sent an image or a video of my private parts covered by underwear.   | UP | NS | DU |
| 5. I have sent an image or video of myself dressed and in a sexy pose  | UP | NS | DU |
| 6. Indicate which of the previous actions you have carried out without being entirely sure or convinced.   | UP | NS | DU |
| <input type="checkbox"/> No. 1 <input type="checkbox"/> No. 2 <input type="checkbox"/> No. 3 <input type="checkbox"/> No. 4 <input type="checkbox"/> No. 5 |    |    |    |

**SEND SEXY CONTENT OF OTHERS:** To feel pleasure, to make him/her feel pleasure, to express desire, to show sexual interest, to get attention, to find out whether other people have a sexual interest or desire for me, to describe a sexual act, to propose having real or virtual sex, to prove feelings, etc.

- |  |    |    |    |
|--|----|----|----|
| 7. I have sent a sexy text message written by another person and not by me.  | UP | NS | DU |
| 8. I have sent a sexy audio message of others that was not recorded by me.   | UP | NS | DU |
| 9. I have sent an image or video where other nudes appear.   | UP | NS | DU |
| 10. I have sent an image or video showing another person covered by underwear.   | UP | NS | DU |
| 11. I have sent an image or video where another person appears in a sexy pose.   | UP | NS | DU |
| 12. Indicate which of the previous actions you have carried out without being entirely sure or convinced.  | UP | NS | DU |
| <input type="checkbox"/> No. 7 <input type="checkbox"/> No. 8 <input type="checkbox"/> No. 9 <input type="checkbox"/> No. 10 <input type="checkbox"/> No. 11      No. 12 |    |    |    |

**POSTING SEXY CONTENT OF YOURSELF:** To feel pleasure, to make him/her feel pleasure, to express desire, to show sexual interest, to get attention, to find out whether other people have a sexual interest or desire for me, to describe a sexual act, to propose having real or virtual sex, to prove feelings, etc.

- |   |    |    |    |
|---|----|----|----|
| 13. I have posted my own sexy text message.   | UP | NS | DU |
| 14. I have posted an image or video of my nude private parts  | UP | NS | DU |
| 15. I have posted an image or video of my private parts covered by underwear  | UP | NS | DU |
| 16. I have posted an image or video of myself dressed and in a sexy pose.   | UP | NS | DU |
| 17. Indicate which of the previous actions you have carried out without being entirely sure or convinced.   | UP | NS | DU |
| <input type="checkbox"/> No. 13 <input type="checkbox"/> No. 14 <input type="checkbox"/> No. 15 <input type="checkbox"/> No. 16 <input type="checkbox"/> No. 17 |    |    |    |

**LIVE BROADCASTING OR STREAMING YOUR OWN SEXY CONTENT:** To feel pleasure, to make him/her feel pleasure, to express desire, to show sexual interest, to get attention, to find out whether other people have a sexual interest or desire for me, to describe a sexual act, to propose having real or virtual sex, to prove feelings, etc.

- |   |    |    |    |
|---|----|----|----|
| 18. I have broadcast my own sexy audio.   | UP | NS | DU |
| 19. I have broadcast a video or an image of my nude private parts.  | UP | NS | DU |
| 20. I have broadcast a video or image in which my private parts were covered by underwear.  | UP | NS | DU |
| 21. I have broadcast a video or image in which I was dressed and in a sexy pose.  | UP | NS | DU |
| 22. Indicate which of the previous actions you have carried out without being completely convinced or sure.   | UP | NS | DU |
| <input type="checkbox"/> No. 18 <input type="checkbox"/> No. 19 <input type="checkbox"/> No. 20 <input type="checkbox"/> No. 21 <input type="checkbox"/> No. 22 |    |    |    |

**SEXY VOICE CALL:** To feel pleasure, to make him/her feel pleasure, to express desire, to show sexual interest, to get attention, to find out whether other people have a sexual interest or desire for me, to describe a sexual act, to propose having real or virtual sex, to prove feelings, etc.

- |  |    |    |    |
|--|----|----|----|
| 23. I have made voice calls of a sexual nature.  | UP | NS | DU |
| 24. Check this box ( ) if you have carried out the previous action (No. 23) without being completely convinced or sure. <input type="checkbox"/> | UP | NS | DU |

**SEXY VIDEO CALL:** To feel pleasure, to make him/her feel pleasure, to express desire, to show sexual interest, to get attention, to find out whether other people have a sexual interest or desire for me, to describe a sexual act, to propose having real or virtual sex, to prove feelings, etc.

- |   |    |    |    |
|---|----|----|----|
| 25. I have made video calls in which my private parts were naked.   | UP | NS | DU |
| 26. I have made video calls in which my private parts were covered by underwear.                          | UP | NS | DU |
| 27. I have made video calls in which I was dressed and in a sexy pose.                                    | UP | NS | DU |
| 28. Indicate which of the previous actions you have carried out without being entirely sure or convinced. | UP | NS | DU |
- No. 25     
 No. 26     
 No. 27     
 No. 28

**ASKING FOR SEXY CONTENT:** To feel pleasure, to make him/her feel pleasure, to express desire, to show sexual interest, to get attention, to find out whether other people have a sexual interest or desire for me, to describe a sexual act, to propose having real or virtual sex, to prove feelings, etc.

- |   |    |    |    |
|---|----|----|----|
| 29. I have asked to be sent text messages of a sexual nature.   | UP | NS | DU |
| 30. I have asked to be sent audio messages of a sexual nature.  | UP | NS | DU |
| 31. I have asked to be sent images or videos of someone's nude private parts.                             | UP | NS | DU |
| 32. I have asked to be sent images or videos of someone's private parts covered by underwear.             | UP | NS | DU |
| 33. I have asked to be sent pictures or videos of someone dressed and in a sexy pose.                     | UP | NS | DU |
| 34. I have asked someone to live broadcast naked.   | UP | NS | DU |
| 35. I have asked someone to live broadcasts in their underwear.   | UP | NS | DU |
| 36. I have asked someone to do live broadcasts dressed and in a sexy pose.                                | UP | NS | DU |
| 37. I have asked someone to make voice calls of a sexual nature.  | UP | NS | DU |
| 38. I have asked someone to make video calls in which my private parts were naked.                        | UP | NS | DU |
| 39. I have asked someone to make video calls in which my private parts were covered by underwear.         | UP | NS | DU |
| 40. I have asked someone to make video calls in which I was dressed and in a sexy pose.                   | UP | NS | DU |
| 41. Indicate which of the previous actions you have carried out without being entirely sure or convinced. | UP | NS | DU |
- No. 29     
 No. 30     
 No. 31     
 No. 32     
 No. 33  
 No. 34     
 No. 35     
 No. 36     
 No. 37     
 No. 38  
 No. 39     
 No. 40     
 No. 41
-

S4. Information on the databases, search strategy and descriptors used to conduct concurrent validity analysis

| Databases   | Published all years to  |
|---|---|
| ERIC<br>Research field: in ANY FIELD  |   |
| PsycINFO<br>Research field: in ANY FIELD  |   |
| Pubmed<br>Research field: in ANY FIELD  | August<br>2020  |
| Scopus<br>Research field: TITLE-ABS-KEY   | (in all databases)  |
| Web of Science<br>Research field: in ANY FIELD                                  |   |
| Grey literature   |   |
| Google and Google Scholar<br>Where the words occur: anywhere in the publication | August<br>2005-2020<br>The authors reviewed the first 250 results sorted by relevance |

*Note.* Descriptors were combined with Boolean operators.

*Note.* Exact words and related words were also used in the literature search.

(continued)

Search terms

|   |   |
|---|---|
| <p>Addressee 1 → Romantic partner<br/>Boyfriend/Girlfriend<br/>Partner<br/>Committed partner<br/>Romantic relationship<br/>Lover<br/>Life partner<br/>Someone in relationship with</p>        | <p>Addressee 2 → Friend<br/>Acquaintance<br/>Met in person<br/>Know in person<br/>Met only in person<br/>Close friend<br/>Somebody you know in person</p>   |
| <p>Addressee 3 → Know online<br/>Only knew online<br/>Known through internet<br/>Met only online<br/>Had met online<br/>Met on the Internet<br/>Known from the internet<br/>Online friend</p> | <p>Sending → Sending<br/>E-mailing<br/>Messaging<br/>Forward</p>  |
| <p>Posting → Posting<br/>Uploaded<br/>Placing on<br/>Publicize<br/><i>Verb + on internet</i></p>  | <p>Live-broadcasting → Live sex video<br/>Video streaming<br/>Video chat<br/>Real time video<br/>Real time video chat<br/>Real time video application<br/>Streaming<br/>Web cam streaming<br/>Online live streaming<br/>Online sexual activity<br/>Sexual self-exposure<br/>Cybersex<br/>In live video streaming<br/>Web cam<br/>Instagram story<br/>Live-broadcasting<br/>Broadcasting<br/>In live video application<br/>Live-action video</p> |
| <p>Voice call → Voice call<br/>Phone call<br/>Telephone call</p>  | <p>Video call → Video call<br/>Video record<br/>Video file<br/>Movies<br/>Films<br/>Videotape</p>   |
| <p>Asking for → Asking for a<br/>Request a<br/>Asked someone to<br/>Asked your BF/GF to<br/>Supplicate for a<br/>Solicit<br/>Make a petition<br/>Require</p>                                  | <p>Text messages → Text<br/>Written content<br/>Reading material / content<br/>Writings<br/>Letters<br/>Words</p>   |

|              |   |                            |  |
|--------------|---|----------------------------|--|
| Image →      | Image<br>Picture<br>Pic<br>Photo<br>Photograph  | Video →                    | Video<br>Film<br>Picture<br>Movie<br>Video record  |
| Audio →      | Audio message<br>Audio<br>Audio record-ings<br>Voice record-ings<br>Audio record conversation<br>Audio clips<br>Audiotape                 | Nude →                     | Nude<br>Naked<br>Unclothed<br>Uncovered<br>Bare<br>Undressed<br>Disrobed<br>Garmentless                                      |
| Underwear →  | Lingerie<br>Undergarment<br>Skivvies<br>Underclothes<br>Underclothing<br>Underthings<br>Underpants<br>Panties<br>Boxer<br>Bra<br>G-string | Dressed →                  | Dressed<br>Clothed<br>Covered<br>Deck  |
| Population → | Juvenile<br>Adolescent<br>Teenage / Teen<br>Junior<br>Young<br>Youth<br>Childish<br>Minors  | Online sexual activities → | Online sexual activities<br>Internet sexual activities<br>Voluntary sexual exposure online<br>Sexy online self-presentations |

*Note.* In the literature search, different verb tenses and grammatical forms (e.g. singular, plural) of these terms were used.

S5. Modular structure of the Adolescent Sexting Scale (A-SextS)

1. Set of active experiences
2. In which there is an exchange of sexual representation media of varying formats and explicitness
3. Contextualized as an approximation to sexual-relational behaviour
4. Aimed at a more or less restricted audience
5. With an amorous or sexual purpose or responding to sexual objectives
6. In an approving framework (explicit or not)
7. During the last month

| Timing                      | Experience                  | Appearance             | Media                                    | Sexual explicitness  | Addressee  | Channel / Audience                |
|-----------------------------|-----------------------------|------------------------|--|--|--|-----------------------------------|
| Asynchronous <sup>Asy</sup> | Sending <sup>Se</sup>       | Own <sup>Ow</sup>      | Text <sup>Te</sup> , Audio <sup>Au</sup> | Depending on the content <sup>Dc</sup>                                   | Boy/Girl-fiend (Or prospective partner) <sup>Pa</sup><br>Boy/Girl I know personally (Friend/Ac.) <sup>Kp</sup><br>Boy/Girl I know through Internet (Online co.) <sup>Onl</sup> | Restricted audience <sup>Ra</sup> |
|                             |                             |                        | Image/Video <sup>IV</sup>                | Nude <sup>Nu</sup><br>Underwear <sup>Un</sup><br>Postural <sup>Pst</sup> |  |                                   |
|                             |                             | Non-own <sup>Now</sup> | Image/Video <sup>IV</sup>                | Nude <sup>Nu</sup><br>Underwear <sup>Un</sup><br>Postural <sup>Pst</sup> | Boy/Girl-fiend (Or prospective partner) <sup>Pa</sup><br>Boy/Girl I know personally (Friend/Ac.) <sup>Kp</sup><br>Boy/Girl I know through Internet (Online co.) <sup>Onl</sup> | Restricted audience <sup>Ra</sup> |
| Synchronous <sup>Syn</sup>  | Audio call <sup>Ac</sup>    | -                      | Audio <sup>Au</sup>                      | Depending on the content <sup>Dc</sup>                                   | Boy/Girl-fiend (Or prospective partner) <sup>Pa</sup><br>Boy/Girl I know personally (Friend/Ac.) <sup>Kp</sup><br>Boy/Girl I know through Internet (Online co.) <sup>Onl</sup> | Restricted audience <sup>Ra</sup> |
| Synchronous <sup>Syn</sup>  | Video call <sup>Vc</sup>    | -                      | Image/Video <sup>IV</sup>                | Nude <sup>Nu</sup><br>Underwear <sup>Un</sup><br>Postural <sup>Pst</sup> | Boy/Girl-fiend (Or prospective partner) <sup>Pa</sup><br>Boy/Girl I know personally (Friend/Ac.) <sup>Kp</sup><br>Boy/Girl I know through Internet (Online co.) <sup>Onl</sup> | Restricted audience <sup>Ra</sup> |
| Asynchronous <sup>Asy</sup> | Posting <sup>Po</sup>       | Own <sup>Ow</sup>      | Text <sup>Te</sup>                       | Depending on the content <sup>Dc</sup>                                   | Community or social network SN   | Wide audience <sup>Wa</sup>       |
|                             |                             |                        | Image/Video <sup>IV</sup>                | Nude <sup>Nu</sup><br>Underwear <sup>Un</sup><br>Postural <sup>Pst</sup> |  |                                   |
| Synchronous <sup>Syn</sup>  | Broadcasting <sup>Brd</sup> | -                      | Image/Video <sup>IV</sup>                | Nude <sup>Nu</sup><br>Underwear <sup>Un</sup><br>Postural <sup>Pst</sup> | Community or social network SN   | Wide audience <sup>Wa</sup>       |

(continued)

|                             |  |  |  |  |  |
|-----------------------------|--|--|--|--|--|
| Both <sup>Bth</sup>         | Asking someone for <sup>Af</sup>                   | Send me <sup>Se</sup>                  | Text <sup>Te</sup> , Audio <sup>Au</sup>     | Depending on the content <sup>Dc</sup>                                   | Boy/Girl-fiend (Or prospective partner) <sup>Pa</sup><br>Boy/Girl I know personally (Friend/Ac.) <sup>Kp</sup><br>Boy/Girl I know through Internet (Online co.) <sup>Onl</sup> |
|                             |  |  | Image/Video <sup>IV</sup>                    | Nude <sup>Nu</sup><br>Underwear <sup>Un</sup><br>Postural <sup>Pst</sup> |  |
|                             |  | Make audio calls <sup>Ac</sup> with me | Audio <sup>Au</sup>                          | Depending on the content <sup>Dc</sup>                                   | Boy/Girl-fiend (Or prospective partner) <sup>Pa</sup><br>Boy/Girl I know personally (Friend/Ac.) <sup>Kp</sup><br>Boy/Girl I know through Internet (Online co.) <sup>Onl</sup> |
|                             |  | Make video calls <sup>Vc</sup> with me | Image/Video <sup>IV</sup>                    | Depending on the content <sup>Dc</sup>                                   | Boy/Girl-fiend (Or prospective partner) <sup>Pa</sup><br>Boy/Girl I know personally (Friend/Ac.) <sup>Kp</sup><br>Boy/Girl I know through Internet (Online co.) <sup>Onl</sup> |
| Asynchronous <sup>Asy</sup> | Asking me for, but I do not want to <sup>Den</sup> | Sending <sup>Se</sup>                  | General sexual media contents <sup>Smc</sup> | Generic <sup>Ge</sup><br>Depending on the content <sup>Dc</sup>          | Boy/Girl-fiend (Or prospective partner) <sup>Pa</sup><br>Boy/Girl I know personally (Friend/Ac.) <sup>Kp</sup><br>Boy/Girl I know through Internet (Online co.) <sup>Onl</sup> |
| Asynchronous <sup>Asy</sup> | Receiving <sup>Rec</sup>                           | Receiving <sup>Rec</sup>               | General sexual media contents <sup>Smc</sup> | Generic <sup>Ge</sup><br>Depending on the content <sup>Dc</sup>          | Boy/Girl-fiend (Or prospective partner) <sup>Pa</sup><br>Boy/Girl I know personally (Friend/Ac.) <sup>Kp</sup><br>Boy/Girl I know through Internet (Online co.) <sup>Onl</sup> |

*Note.* Additional aspects included in the questionnaire were whether sexting was done on one's own initiative or in response to a request (Vo) and whether the face of participants appeared in the pictographic sexts or not (Rec).

- Example of the modular structure of the Adolescent Sexting Scale.



For example, if a researcher wanted to study adolescent **active, primary and voluntary** sexting with a partner, 18 items would be selected.

| – Items  | Experience | Media format | Explicitness | Addressee | Additional aspects |
|----------|------------|--------------|--------------|-----------|--------------------|
| – Item → | Se         | (Ow), Te     | Dc           | Pa        | + Vo               |
| – Item → | Se         | (Ow), Au     | Dc           | Pa        | + Vo               |
| – Item → | Se         | (Ow), IV     | Nu           | Pa        | + Vo (+ Rec)       |
| – Item → | Se         | (Ow), IV     | Un           | Pa        | + Vo (+ Rec)       |
| – Item → | Se         | (Ow), IV     | Pst          | Pa        | + Vo (+ Rec)       |
| – Item → | Ac         | Au           | Dc           | Pa        | + Vo               |
| – Item → | Vc         | IV           | Nu           | Pa        | + Vo (+ Rec)       |
| – Item → | Vc         | IV           | Un           | Pa        | + Vo (+ Rec)       |
| – Item → | Vc         | IV           | Pst          | Pa        | + Vo (+ Rec)       |
| – Item → | Af, Se     | Te           | Dc           | Pa        | + Vo               |
| – Item → | Af, Se     | Au           | Dc           | Pa        | + Vo               |
| – Item → | Af, Se     | IV           | Nu           | Pa        | + Vo               |
| – Item → | Af, Se     | IV           | Un           | Pa        | + Vo               |
| – Item → | Af, Se     | IV           | Pst          | Pa        | + Vo               |
| – Item → | Af, Ac     | Au           | Dc           | Pa        | + Vo               |
| – Item → | Af, Vc     | IV           | Dc           | Pa        | + Vo               |
| – Item → | Den, Se    | (Ow)Smc      | Dc           | Pa        | + Vo               |

S6. Analysis of sexting measures

A total of 79 studies  
sampling minors

| Main transmission channels considered in primary sexting items   | n=79* |
|--|-------|
| Any ICT  | 5     |
| Internet/Online  | 17    |
| Social networks / Apps   | 9     |
| Cell phone   | 29    |
| E-mail   | 9     |
| Messaging  | 11    |
| Not defined / reported   | 25    |
| Experiences considered in primary sexting items  | n=79* |
| Sending (e.g. sending, texting, e-mailing, messaging, sharing with)  | 69    |
| Receiving (e.g. receiving, seeing)   | 50    |
| Forwarding (e.g. forwarding, sharing, distributing, disseminating, diffusing)  | 16    |
| Posting (e.g. posting, sharing on, putting on, placing on)   | 15    |
| Ask for (e.g. asking for, requesting, persisting, insist in)   | 5     |
| Having a chat via web cam  | 5     |
| Other experiences: Another 10 different experiences from 15 studies  |       |
| Media content considered in primary sexting items  | n=79* |
| Text   | 36    |
| Images   | 74    |
| Videos   | 39    |
| Audios   | 1     |
| Unclear  | 2     |
| Adjectives used to characterize sexual media content in primary sexting items  | n=79* |
| Sexy   | 6     |
| Sexual   | 30    |
| Only nude/naked  | 5     |
| Only semi-nude/naked (e.g. semi-, nearly-, partially-, half-)  | 1     |
| Nude/Naked or (...)  | 27    |
| Semi-nude/naked or (...)   | 23    |
| Sexually suggestive  | 12    |
| Sexually explicit  | 14    |
| Suggestive   | 1     |
| Provocative  | 4     |
| Underwear  | 3     |
| Other adjectives: erotic, intimate, inappropriate, revealing, insinuating, sensitive, sexually toned, private, personal, seductive, etc. |       |

| Timeframe of the primary sexting items                          | n=79* |
|---|-------|
| Lifetime or not defined   | 45    |
| Last year   | 17    |
| Last six months   | 8     |
| Last month  | 3     |
| Last three months   | 1     |
| Last two months   | 2     |
| Other timeframes: Another 4 different timeframes from 4 studies |       |

Studies that set a purpose in primary sexting items (among items referring to sending or receiving sexting contents) (n=79)

|         |    |
|---------|----|
| Yes     | 2  |
| No      | 76 |
| Unclear | 1  |

Studies that set an addressee (for those sending) or sender (for those receiving) in either primary sexting items (n=78)

|     |    |
|-----|----|
| Yes | 16 |
| No  | 62 |

Response type in primary sexting items (n=79)

|                         |    |
|-------------------------|----|
| Likert frequency scale  | 28 |
| Dichotomous             | 24 |
| Single-answer polytomic | 3  |
| Monitoring conversation | 1  |
| Open-ended questions    | 1  |
| Unclear                 | 22 |

Evidence of validity and/or reliability in the study sample or in comparable samples (n=79)

|         |    |
|---------|----|
| Yes     | 15 |
| No      | 57 |
| Unclear | 7  |

Studies with at least one primary item of combined sexting (among those items referring to the experiences of sending and/or receiving). For example: sending or receiving, sending or posting, receiving or having shown. (n=78)

|     |    |
|-----|----|
| Yes | 9  |
| No  | 69 |

| Among those studies that consider the experience of sending | (n=69) |
|---|--------|
| N° of items used to asses this experience                   |        |
| 1 (Monoitem)  | 34     |
| 2   | 4      |
| 3   | 7      |
| 4   | 2      |
| 5   | 0      |
| 6   | 1      |
| Monitoring conversations                                    | 1      |
| Combined measure as a monoitem                              | 4      |
| Unclear   | 16     |
| Among those studies that consider the action of receiving   | (n=50) |
| N° of items used to asses this experience                   |        |
| 1 (Monoitem)  | 24     |
| 2   | 3      |
| 3   | 3      |
| Coding messages   | 1      |
| Combined measure as a monoitem                              | 4      |
| Unclear   | 15     |

\* One study may report more than one category/level.

## S7. Discussion group results

### Discussion Group 1 - (9:15)

| <i>Participants</i> | 4 boys and 6 girls | Age (11-12)      | Duration: 90 minutes |
|---------------------|--------------------|------------------|----------------------|
| 10                  |                    | Date: 10/01/2020 | Time: 9:15 am        |

### Discussion Group 2 - (11:30)

| <i>Participants</i> | 3 boys and 8 girls | Age (11-12)      | Duration: 90 minutes |
|---------------------|--------------------|------------------|----------------------|
| 11                  |                    | Date: 10/12/2019 | Time: 11:30 am       |

### *General information*

- Discussion group 1 took place in the multimedia room of the school.
- Discussion group 2 took place in the library of the school.

### *Provided instructions*

- The researcher introduced himself.
- The researcher presented the topic, problem and goals of the research.
- The researcher informed the participants about the anonymous and voluntary nature of the activity.
- The researcher distributed the activity material to the participants.

### *Session notes*

#### 1. Internet, ICTs and social networks

Approximately half of the participants had their own mobile phone with some form of telecommunications service provider plan. The rest used their parents' devices. All the participants agreed that their parents supervised the devices they used to a lesser or greater extent. Some of the most common parental measures were: knowing the passwords of the devices and/or social networks, sharing a profile on social media, monitoring conversations, using monitoring applications such as Family Link, and even having remote control of the device. Approximately a third of adolescents confused the term "technological devices", including as such social networks or virtual platforms. The most appropriate term to refer to them was deemed "electronic devices".

Internet access occurred mainly from within the family home and via a Wi-Fi connection. Not all participants had access to the internet every day, as this largely depended on their obligations and/or parental educational measures. On a normal or routine day, they would use the internet for between thirty and sixty minutes. The internet was used above all to view multimedia content, play games and/or search for information.

Participants were familiar with a good number of social networks (e.g. WhatsApp, Instagram, Facebook, Snapchat, TikTok, Twitter), though they tended to use the most popular among those of their age. They also knew about applications to search for romantic or sexual relationships (e.g. Tinder). Most of the adolescents had their own profile on at least one social network. They knew that it was possible to configure the privacy settings of social networks as public or private.

## 2. Types of relationships

The type of relationship they best knew how to define was friendship, characterized by daily and continued contact over time, trust, support and esteem. Dating relationships included the above characteristics in addition to attraction, both physical and because of the other's way of being, and exclusivity. One of the participants commented that a certain sense of security, protection and affection were also expected to come from a boyfriend/girlfriend. Other elements that characterized a dating relationship were feeling comfortable with the other person and wanting to spend a lot of time with them. Regarding romantic relationships, students knew how to identify when they liked a person (e.g. he/she is handsome, he/she is nice and I want to always be with him/her, I get nervous when I see him/her, etc.).

The discussion group stated that there were already dating relationships between eleven and twelve-year-olds. Most of these relationships were between pupils in the same class or school, though they could also happen outside, such as with other participants in extracurricular activities. It was noted that the boyfriends or girlfriends were not always of the same age. A dating relationship was deemed to be consolidated when one person asked another to be his/her boyfriend/girlfriend and the latter answered affirmatively. The discussion group only noted kissing among possible sexual activities in dating relationships. The phase between friendship and established romantic relationships was termed "hooking up". In conclusion, both friendship and dating were characterized by a common denominator: "personal interaction in real life" (textual words) and differentiated by a feeling of attraction or love.

Considered very different from the above types of relationships were those with people met via the internet and with people they had not met. According to almost all participants, people known exclusively via the internet could never become friends. One participant in particular did consider a young man met through an online video game team as a friend. The difference between an acquaintance on the internet and a stranger was the extent of knowledge or information possessed about that person, although the participants were fully aware that such information could be entirely made up or false. It was said that, "If you have never seen a stranger in person and never talked to him, you do not know anything about his life, and you have no intention doing so".

## 3. Sexuality

They knew how to define "homosexuality", "heterosexuality" and "bisexuality" as possible sexual orientations. Furthermore, these such terms were not considered pejorative by the participants. They believed that some students of their own age would not know the meaning of these terms. It was noted that such terms had been used in the content of teaching material during that particular school year.

They defined private parts as those parts of the body that are much more personal and that should be covered. They pointed out that there was a difference in considering the private parts of boys compared to those of girls. This difference lay in the consideration of breasts. Most of the students agreed that genitals and the backside, or bottom, were private parts of the bodies of boys. The private parts of the bodies of girls were considered to be genitals, breasts and the backside, or bottom.

## 4. Sexting

The participants did not know the term "sexting", but they did know about the actions that define it. Most of the students admitted having received sexual content via the internet, mainly photographs and videos. Regarding consent, the adolescents pointed out that it was not usual to ask whether the other person wanted to receive any particular type of content. Notice was given only on some occasions, for example, with a message saying, "I'm going to send you a photo". Nor was it considered common to tell the other person to stop sending content, except when they were copy-and-paste messages, such as Christmas greetings or other such types of messages. A couple of pupils said they had felt pressured to send content of some kind via the internet, especially via social networks and in group interactions, for example, via WhatsApp.

In sexting, understood as a type of dating dynamic, showing your face in sexy images or videos was not considered important. In this regard, the most important aspect for the participants was the showing of the private parts of the person featuring in the content, and the effect it could have on the receiver, in terms of emotion, excitement, and so on. Showing your face only became relevant when considering the consequences of any fraudulent use of this type of content. They proposed possible questions including the expressions “from the front or from the back”, “showing your whole body” and “seeing or knowing who you are”. According to them, the expressions “you are recognizable” or “seeing your face” would also be perfectly understood, but not the expression “you are identifiable”.

## 5. The scale

When evaluating the questionnaire on sexting, they considered that all potential actions were covered. However, they suggested some modifications (see below). One of the participants commented that, in reality, in no social network can a girl publish a nude photo or video because the platform itself censors such content. They recognized that you can publish images or videos with pixelated breasts, or with some element, including text, emojis or graphics, such as stars, covering the nipples. However, they admitted that, deep down, everyone knows that the person is naked in these types of images or videos. They also told the researcher about the existence of memes.

## 6. Item formulation

- Describing nude content (Column A)
  - The most frequently mentioned terms to describe this type of content were “sexy” (n=17), “naked” (n=16), “inappropriate” (n=16), “private parts” (n=15) and “showing one’s penis/vagina, breasts and/or bottom” (n=15).
  - The terms that best (ranked 1st) described this type of content were “naked” (n=7) and “showing one’s penis/vagina, breasts and/or bottom (n=4).
- Describing semi-nude contents (Column B)
  - The terms most frequently mentioned to describe this type of content were “covered by underwear” (n=16), “sexy” (n=16), “almost naked” (n=14) and “semi-naked” (n=12).
  - The terms that best (ranked 1st) described this type of content were “covered by underwear” (n=6), “almost naked” (n=5) and “semi-naked” (n=4).
- Describing non-nude sexual content (Column C)
  - The terms most frequently mentioned to describe this type of content were “dressed and in a sexy pose” (n=21), “sexy” (n=16), “provocative” (n=14) and “erotic” (n=12).
  - The term that best (ranked 1st) described this type of content were “dressed and in a sexy pose” (n=13).
- Referring to other people’s content
  - The term “featuring other people” (n=8) was that which the participants understood best (ranked 1st) when referring to content not created by themselves.

## 7. Understanding of the questionnaire items

- The instructions did not generate any confusion.
- The frequency scale did not generate any confusion.
- The items with the greatest difficulty of comprehension (<75% of positive evaluations) were: Item 1, Item 13, Item 2, Item 7, Item 18, Item 23, Item 34, Item 35, Item 36, Item 8, and Item 29. The participants explained why or what part of the item was not comprehensible.
  - The groups suggested replacing the expression “of a sexual nature” with “sexy” in these items.
  - In items referring to text and audio messages, they proposed that examples be described right next to the item. Examples indicating the purpose or type of message. See the framed text in the template.

- The groups suggested replacing “broadcasts” with “live broadcasts” or “live streaming”.
- Eliminating the item about “broadcasting audio”: They would eliminate the live broadcasting of audio, as it is something considered unusual. What was considered most common were broadcasts in video, that is an audio-visual, format.
- According to the discussion groups, “requesting someone to live broadcast”, whether naked, in underwear, and/or dressed and in a sexy pose is an unusual or infrequent action. They considered it “weird”.
- The participants commented that asking for a video call with a love or sex interest can occur among adolescents, but they questioned the possibility of making such a request detailing the desired sexual explicitness of the call, such as naked, in underwear, and/or dressed and in a sexy pose. They considered that the above aspects would rather be broached in the course of a video call.
- Other observations: In general, the adolescents had some difficulties understanding long or complex items.



## Appendix 1

Original video tutorial administered.



**LOS EMOTICONOS**

- 😊 → Enseñaba la cara
- 😄 → No enseñaba la cara
- 👉 → Lo hice porque yo quería
- 🙏

Please, click on the picture.

## Appendix 2

Studies included in the review of measures.

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### **Appendix 3**

Final version of A-SextS (in Spanish and English).

#### **Preámbulo**

Se solicita su autorización para participar en el proyecto de investigación titulado: *Sexting: Perfiles, prevalencias y desarrollo de la nueva escala de medida A-SextS*. Su objetivo es: *elaborar un instrumento de medida capaz de describir y analizar esta actividad de forma precisa*. Consiste en: *un cuestionario sencillo elaborado según criterios de calidad y adaptado a la población adolescente*. Los beneficios que se esperan de este trabajo: *se justifican por la necesidad de acercarnos a la realidad de los adolescentes en materia de relaciones sociales amorosas mediadas por la tecnología durante el transcurso de su etapa en educación secundaria*. La participación en este estudio es totalmente voluntaria, si usted no desea participar en el estudio, no habrá ninguna consecuencia negativa. En cualquier momento puede retirarse del estudio sin que ello tenga ninguna consecuencia. La respuesta es completamente anónima, por lo que no se dispondrá de ningún dato que pueda identificarle. En cualquier caso, la información se tratará de acuerdo a la Ley Orgánica 15/1999 de Protección de datos de Carácter Personal, de 6 de noviembre de 2019 (LOPD). Si tienen alguna pregunta sobre este proyecto de investigación, puede consultar en cualquier momento al investigador cuyo e-mail es: Cristian.Molla@uv.es

Si usted responde a las cuestiones que se le proponen, se entiende de forma tácita que ha comprendido el objetivo del presente estudio, que ha podido preguntar y aclarar las dudas que se le hubieran planteado inicialmente y que acepta participar en el estudio. Los investigadores le agradecen su valiosa participación en el presente estudio.

## Instrucciones

Este es un estudio sobre sexting. El sexting consiste en intercambiar mensajes de texto, audios, imágenes o videos sexys a través de internet con otra persona, y hacerlo con una intención amorosa o sexual. NO es 'sexting' enseñar todo o parte de tu cuerpo o de tu aspecto para conocer sólo la opinión de alguien, sin hacerlo con un objetivo amoroso o sexual

Se hace sexting con un objetivo amoroso o sexual, por ejemplo, para yo sentir placer, para que otro sienta placer, para llamar la atención sobre alguien, para demostrar deseo o interés sexual hacia alguien, como una prueba de amor para alguien, para saber si otras personas muestran deseo o interés sexual hacia mí, para describir un acto sexual que yo quiero hacer con alguien, para proponer tener sexo real o a través de internet, etc.

A continuación, encontrarás una serie de enunciados sobre sexting. Tu tarea consiste en rodear con un círculo (○) la frecuencia con la que has realizado cada una de estas acciones de sexting en el último mes (es decir, cuantas veces has hecho una acción concreta en los últimos 30 días). Junto con la acción que SI hayas realizado debes indicar con un círculo:

- Si enseñabas la cara *Toda o una parte* (😊), *No la enseñabas* (👁️), o ambos.
- Si lo hiciste porque *Yo quería* (👉), *Sólo porque me lo habían pedido* (🙏), o ambos.

















\*\*\*\*\*

Recuerda que tu información será totalmente **CONFIDENCIAL**. Ni los maestros ni tus padres tendrán acceso a ella. Te pido que seas lo más **SINCERO/A** posible en tus respuestas.

\*\*\*

|  | Nunca = 0                         |  |                              |                         | ¡ RECUERDA ! → CON UN OBJETIVO AMOROSO O SEXUAL                               |                                  |                       |                    | Nunca | Entre 1 y 3 veces / mes | Entre 1 y 3 veces / semana | Cada día (o casi) | Varias veces al día | Enseñaba la cara      | No enseñaba la cara   | Porque yo quería      | Porque me lo había pedido        |                             |                       |                       |                       |
|--|-----------------------------------|--|------------------------------|-------------------------|---|----------------------------------|-----------------------|--------------------|-------|-------------------------|----------------------------|-------------------|---------------------|-----------------------|-----------------------|-----------------------|----------------------------------|-----------------------------|-----------------------|-----------------------|-----------------------|
|  | Entre una y tres veces al mes = 1 | Entre una y tres veces a la semana = 2 | Cada día o casi cada día = 3 | Varias veces al día = 4 | SÓLO SI has señalado 1, 2, 3 o 4 puedes rodear tantos EMOTICONOS como quieras | 😊 Enseñaba la cara (o una parte) | 🙄 No enseñaba la cara | 👉 Porque yo quería |       |                         |                            |                   |                     |                       |                       |                       |                                  | 🙏 Porque me lo había pedido |                       |                       |                       |
| <b>EJEMPLO</b>   |                                   |  |                              |                         |   |                                  |                       |                    |       |                         |                            |                   |                     | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/>       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| He enviado una imagen o video de mi viaje a Italia <b>a mi novio/a</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   |                                  |                       |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado un mensaje de texto sexy <b>a mi novio/a</b>  | 0                                 | 1                                      | 2                            | 3                       | 4   |                                  |                       |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado un mensaje de texto sexy <b>a alguien que conozco en persona</b>  | 0                                 | 1                                      | 2                            | 3                       | 4   |                                  |                       |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado un mensaje de texto sexy <b>a alguien que sólo conozco a través de Internet</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   |                                  |                       |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado un audio sexy (p. ej. mensaje de voz) <b>a mi novio/a</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   |                                  |                       |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado un audio sexy (p. ej. mensaje de voz) <b>a alguien que conozco en persona</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   |                                  |                       |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado un audio sexy (p. ej. mensaje de voz) <b>a alguien que sólo conozco a través de Internet</b>                                | 0                                 | 1                                      | 2                            | 3                       | 4   |                                  |                       |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado una imagen o video de mis partes íntimas al desnudo <b>a mi novio/a</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado una imagen o video de mis partes íntimas al desnudo <b>a alguien que conozco en persona</b>                                 | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado una imagen o video de mis partes íntimas al desnudo <b>a alguien que sólo conozco a través de Internet</b>                  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado una imagen o video de mis partes íntimas cubiertas con ropa interior <b>a mi novio/a</b>                                    | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado una imagen o video de mis partes íntimas cubiertas con ropa interior <b>a alguien que conozco en persona</b>                | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado una imagen o video de mis partes íntimas cubiertas con ropa interior <b>a alguien que sólo conozco a través de Internet</b> | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado una imagen o video de mí mismo vestido y en una postura sexy <b>a mi novio/a</b>  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado una imagen o video de mí mismo vestido y en una postura sexy <b>a alguien que conozco en persona</b>                        | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado una imagen o video de mí mismo vestido y en una postura sexy <b>a alguien que sólo conozco a través de Internet</b>         | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado una imagen o video sexy protagonizado por otros <b>a mi novio/a</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado una imagen o video sexy protagonizado por otros <b>a alguien que conozco en persona</b>                                     | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He enviado una imagen o video sexy protagonizado por otros <b>a alguien que sólo conozco a través de Internet</b>                      | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He publicado un mensaje de texto (o comentario) sexy   | 0                                 | 1                                      | 2                            | 3                       | 4   |                                  |                       |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He publicado una imagen o video de mis partes íntimas al desnudo   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He publicado una imagen o video de mis partes íntimas cubiertas con ropa interior  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |
| He publicado una imagen o video de mí mismo vestido y en una postura sexy  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     |                    |       |                         |                            |                   |                     |                       |                       |                       |                                  |                             |                       |                       |                       |

|  | Nunca = 0                         |  |                              |                         | ¡ RECUERDA ! → CON UN OBJETIVO AMOROSO O SEXUAL                               |                                  |                       |                    | Nunca | Entre 1 y 3 veces / mes | Entre 1 y 3 veces / semana | Cada día (o casi) | Varias veces al día | Enseñaba la cara | No enseñaba la cara | Porque yo quería | Porque me lo había pedido |
|--|-----------------------------------|--|------------------------------|-------------------------|---|----------------------------------|-----------------------|--------------------|-------|-------------------------|----------------------------|-------------------|---------------------|------------------|---------------------|------------------|---------------------------|
|  | Entre una y tres veces al mes = 1 | Entre una y tres veces a la semana = 2 | Cada día o casi cada día = 3 | Varias veces al día = 4 | SÓLO SI has señalado 1, 2, 3 o 4 puedes rodear tantos EMOTICONOS como quieras | 😊 Enseñaba la cara (o una parte) | 🙈 No enseñaba la cara | 👉 Porque yo quería |       |                         |                            |                   |                     |                  |                     |                  |                           |
| He realizado <i>directos</i> (vídeos en directo) en el que mis partes íntimas estaban al desnudo   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙈                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He realizado <i>directos</i> (vídeos en directo) en el que mis partes íntimas estaban cubiertas con ropa interior                                      | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙈                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He realizado <i>directos</i> (vídeos en directo) en el que estaba vestido y en una postura sexy  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙈                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He realizado llamadas de voz sexys (p.ej. llamadas telefónicas) <b>con mi novio/a</b>  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                |                       |                    | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He realizado llamadas de voz sexys (p.ej. llamadas telefónicas) <b>con alguien que conozco en persona</b>  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                |                       |                    | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He realizado llamadas de voz sexys (p.ej. llamadas telefónicas) <b>con alguien que sólo conozco a través de Internet</b>                               | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                |                       |                    | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con mi novio/a</b> he realizado vídeo-llamadas en las que mis partes íntimas estaban al desnudo   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙈                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con alguien que conozco en persona</b> he realizado vídeo-llamadas en las que mis partes íntimas estaban al desnudo                                 | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙈                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con alguien que sólo conozco a través de Internet</b> he realizado vídeo-llamadas en las que mis partes íntimas estaban al desnudo                  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙈                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con mi novio/a</b> he realizado vídeo-llamadas en las que mis partes íntimas estaban cubiertas con ropa interior                                    | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙈                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con alguien que conozco en persona</b> he realizado vídeo-llamadas en las que mis partes íntimas estaban cubiertas con ropa interior                | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙈                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con alguien que sólo conozco a través de Internet</b> he realizado vídeo-llamadas en las que mis partes íntimas estaban cubiertas con ropa interior | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙈                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con mi novio/a</b> he realizado vídeo-llamadas en las que estaba vestido y en una postura sexy  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙈                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con alguien que conozco en persona</b> he realizado vídeo-llamadas en las que estaba vestido y en una postura sexy                                  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙈                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con alguien que sólo conozco a través de Internet</b> he realizado vídeo-llamadas en las que estaba vestido y en una postura sexy                   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙈                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido a <b>mi novio/a</b> que me envíe mensajes de texto sexys   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                |                       |                    | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que conozco en persona</b> que me envíe mensajes de texto sexys   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                |                       |                    | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que sólo conozco a través de Internet</b> que me envíe mensajes de texto sexys  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                |                       |                    | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido a <b>mi novio/a</b> que me envíe audios sexys (p. ej. mensaje de voz)  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                |                       |                    | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que conozco en persona</b> que me envíe audios sexys (p. ej. mensaje de voz)  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                |                       |                    | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que sólo conozco a través de Internet</b> que me envíe audios sexys (p. ej. mensaje de voz)                                     | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                |                       |                    | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido a <b>mi novio/a</b> que me envíe imágenes o vídeos de sus partes íntimas al desnudo  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                |                       |                    | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que conozco en persona</b> que me envíe imágenes o vídeos de sus partes íntimas al desnudo                                      | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                |                       |                    | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que sólo conozco a través de Internet</b> que me envíe imágenes o vídeos de sus partes íntimas al desnudo                       | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                |                       |                    | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |

| <p>Nunca = 0</p> <p>Entre una y tres veces al mes = 1</p> <p>Entre una y tres veces a la semana = 2</p> <p>Cada día o casi cada día = 3</p> <p>Varias veces al día = 4</p> |  | <p>¡ RECUERDA ! → CON UN OBJETIVO AMOROSO O SEXUAL</p> <p>SÓLO SI</p> <p>has señalado 1, 2, 3 o 4</p> <p>puedes rodear tantos</p> <p>EMOTICONOS como quieras</p> |  | <p> Enseñaba la cara (o una parte)</p> <p> No enseñaba la cara</p> <p> Porque yo quería</p> <p> Porque me lo había pedido</p> |         | Nunca   | Entre 1 y 3 veces / mes   | Entre 1 y 3 veces / semana  | Cada día (o casi)   | Varias veces al día | Enseñaba la cara | No enseñaba la cara | Porque yo quería | Porque me lo había pedido |
|--|--|--|--|---|---------|---|---|---|---|---------------------|------------------|---------------------|------------------|---------------------------|
| He pedido a <b>mi novio/a</b> que me envíe imágenes o vídeos de sus partes íntimas cubiertas con ropa interior   |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que conozco en persona</b> que me envíe imágenes o vídeos de sus partes íntimas cubiertas con ropa interior   |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que sólo conozco a través de Internet</b> que me envíe imágenes o vídeos de sus partes íntimas cubiertas con ropa interior                          |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| He pedido a <b>mi novio/a</b> que me envíe imágenes o vídeos vestido y en una postura sexy   |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que conozco en persona</b> que me envíe imágenes o vídeos vestido y en una postura sexy   |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que sólo conozco a través de Internet</b> que me envíe imágenes o vídeos vestido y en una postura sexy  |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| He pedido a <b>mi novio/a</b> hacer llamadas de voz sexys (p.ej. llamadas telefónicas)   |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que conozco en persona</b> hacer llamadas de voz sexys (p.ej. llamadas telefónicas)   |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que sólo conozco a través de Internet</b> hacer llamadas de voz sexys (p.ej. llamadas telefónicas)  |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| He pedido a <b>mi novio/a</b> hacer vídeo-llamadas sexys   |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que conozco en persona</b> hacer vídeo-llamadas sexys   |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| He pedido a <b>alguien que sólo conozco a través de Internet</b> hacer vídeo-llamadas sexys  |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| <b>Mi novio/a</b> me ha pedido que le envíe contenidos sexys propios de algún tipo, pero no se los he querido enviar   |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| <b>Alguien que conozco en persona</b> me ha pedido que le envíe contenidos sexys propios de algún tipo, pero no se los he querido enviar                                   |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| <b>Alguien que sólo conozco a través de Internet</b> me ha pedido que le envíe contenidos sexys propios de algún tipo, pero no se los he querido enviar                    |  |  |  | 0   | 1 2 3 4 |   |   |   |   |                     |                  |                     |                  |                           |
| He recibido contenidos sexys de algún tipo <b>de mi novio/a</b>  |  |  |  | 0   | 1 2 3 4 |  |  |  |  |                     |                  |                     |                  |                           |
| He recibido contenidos sexys de algún tipo <b>de alguien que conozco en persona</b>  |  |  |  | 0   | 1 2 3 4 |  |  |  |  |                     |                  |                     |                  |                           |
| He recibido contenidos sexys de algún tipo <b>de alguien que sólo conozco a través de Internet</b>   |  |  |  | 0   | 1 2 3 4 |  |  |  |  |                     |                  |                     |                  |                           |

PREGUNTAS SOCIODEMOGRÁFICAS

1. Soy

- Chico  
 Chica

3. Mis padres viven

- Juntos  
 Separados  
 Otro: \_\_\_\_\_

2. Edad

4. Orientación sexual (Sentir atracción por...)

- Me gustan los chicos  
 Me gustan las chicas  
 Me gustan los chicos y las chicas  
 Otro: \_\_\_\_\_

5. El chico/a que me gusta/ba es o era ...

- Más de tres años menor que yo  
 De uno a tres años menor que yo  
 De mi edad  
 De uno a tres años mayor que yo  
 Más de tres años mayor que yo  
 Todavía no me ha gustado nadie

6. ¿Tienes novio o novia?

- En este momento SI  
 NO, pero antes sí he tenido  
 NO, todavía no he tenido novio/a

7. Tu novio/a es o era ...

- Más de tres años menor que yo  
 De uno a tres años menor que yo  
 De mi edad  
 De uno a tres años mayor que yo  
 Más de tres años mayor que yo  
 Otro: \_\_\_\_\_

8. ¿Cómo te informas sobre sexualidad?

(Puedes señalar más de una casilla)

- Mis padres  
 Hermano/a  
 Otros familiares: \_\_\_\_\_  
 Amigos/as  
 Novio/a  
 Escuela  
 Internet  
 Libros, revistas, etc.  
 Otros: \_\_\_\_\_

9. Indica si:

- ¿Utilizas aplicaciones móviles específicas para ligar? (p.ej. Tinder)  No o  Si
- ¿Ves porno?  No o  Si ▶ ¿Cuántas veces a la semana? \_\_\_\_\_ veces
- ¿Has sentido placer masturbándote?  No o  Si ▶ ¿Veces por semana? \_\_\_\_\_ veces
- ¿Has mantenido alguna relación sexual con penetración?  No o  Si
- ¿Has mantenido alguna relación sexual sin realmente quererlo?  No o  Si
- ¿Te consideras atractivo/a? Señala sólo una casilla.  
 Nada  Poco  Bastante  Mucho

10. Cuando alguien intercambia contenidos sexys, ¿Crees que...?

(Puedes señalar más de una casilla)

- Puede causar que hablen mal de mí o me rechacen  
 Puede que enseñen mis mensajes/fotos/audios/vídeos sexys a otros  
 Puedo tener problemas con la justicia en el futuro  
 Puedo tener problemas para encontrar trabajo en el futuro  
 Puedo sentirme mal en un futuro por haberlo hecho  
 Que otra/s persona/s contacten conmigo sin yo hacer nada  
 Que otra/s persona/s me envíen contenidos sexys sin yo quererlo  
 Que utilice/n el contenido sexy para chantajearme, obligarme, ...  
 Otros problemas: \_\_\_\_\_

## Preamble

Your consent is required to participate in the research project entitled: *“Sexting among adolescents: Profiles, prevalences and the development of the new A-SextS measurement scale”*. Its goal is: *To develop a measuring instrument capable of accurately describing and analysing sexting*. It consists of: *A simple questionnaire prepared according to quality criteria and adapted for an adolescent population*. Expected outcomes: *A deeper understanding of adolescent amorous social relations mediated by technology during the period of secondary education*. Participation in this research project is entirely voluntary, and no negative consequences will result from your not participating. You can withdraw from the research project at any time without any consequence. Your answers will be treated anonymously, meaning that none of the data recorded will be identifiable with you personally. In any case, the data will be treated in accordance with Spanish Organic Law 15/1999 of the 6th of November 2019 on the Protection of Personal Data (Ley Orgánica 15/1999 de Protección de Datos de Carácter Personal, “LOPD”). If you have any questions about this research project, you can consult, at any time, the research contact whose e-mail is: Cristian.Molla@uv.es





If you answer any of the questions proposed in this questionnaire, it shall be tacitly acknowledged that you have understood the goal of this research project, that you have been able to ask and clarify any doubts that you have had, and that you agree to your participation in the research project. The researchers thank you for your valuable participation in this research project.

## Instructions

This is a research project on sexting. 'Sexting', as a term, is given to mean the exchange of sexy text messages, audios, images or videos over the internet with another person, and doing it with an amorous or sexual purpose. It is NOT given to mean showing all or part of your body or your appearance merely in order to know someone's opinion, without doing so with an amorous or sexual purpose.

Therefore, you might partake in sexting, for example, in order to feel personal pleasure, to elicit someone else's pleasure, to draw someone's attention to you, to express sexual desire or interest towards someone, to provide proof of your amorous feelings towards someone, to seek confirmation of someone's sexual desire or interest towards you, to describe a sexual act that you want to perform with someone, to propose having real or virtual sex, etc.

Below, you will find a series of statements about sexting. Your task is to circle (○) the frequency with which you have performed the indicated sexting action in the last month, i.e. how many times you have done it in the last 30 days. Next to the action that you have performed, indicate with a circle:

- If you have shown part or the whole of your face () , if you have not shown it () , or both.
- If you did it because you wanted to () , only because you had been asked to () , or both.





\*\*\*\*\*

Remember that the information you provide will be treated in **TOTAL CONFIDENTIALITY**. Neither your teachers nor your parents will have any access to it. Please be as **SINCERE** as possible in your answers.

\*\*\*\*



| Never = 0  |   | <b>REMEMBER! → WITH AN AMOROUS OR SEXUAL PURPOSE</b> |                                  |   |   |       |                               |                              |                               |                     |                 |                     |                     |                        |
|--|---|--|----------------------------------|---|---|-------|-------------------------------|------------------------------|-------------------------------|---------------------|-----------------|---------------------|---------------------|------------------------|
| Between one and three times a month = 1  | <b>ONLY IF</b><br>you have marked 1, 2, 3 or 4,<br><b>you can</b> circle as many<br>EMOTICONS as you want |  | Showing a part or all of my face |   |   | Never | Between 1 and 3 times a month | Between 1 and 3 times a week | Every day or almost every day | Several times a day | Showing my face | Not showing my face | Because I wanted to | Because I was asked to |
| Between one and three times a week = 2   |   |  | Not showing my face              |   |   |       |                               |                              |                               |                     |                 |                     |                     |                        |
| Every day or almost every day = 3  |   |  | Because I wanted to              |   |   |       |                               |                              |                               |                     |                 |                     |                     |                        |
| Several times a day = 4  |   |  | Because I was asked to           |   |   |       |                               |                              |                               |                     |                 |                     |                     |                        |
| <b>EXAMPLE</b>   |   |  |                                  |   |   |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent an image or video of my trip to Italy to <b>my boyfriend/girlfriend</b>                                  |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent a sexy text message to <b>my boyfriend/girlfriend</b>  |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent a sexy text message to <b>someone I know in person</b>   |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent a sexy text message to <b>someone I only know on the internet</b>  |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent a sexy audio (e.g. voice message) to <b>my boyfriend/girlfriend</b>                                      |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent a sexy audio (e.g. voice message) to <b>someone I know in person</b>                                     |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent a sexy audio (e.g. voice message) to <b>someone I only know on the internet</b>                          |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent an image or video of my naked private parts to <b>my boyfriend/girlfriend</b>                            |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent an image or video of my naked private parts to <b>someone I know in person</b>                           |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent an image or video of my naked private parts to <b>someone I only know on the internet</b>                |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent an image or video of my private parts covered by underwear to <b>my boyfriend/girlfriend</b>             |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent an image or video of my private parts covered by underwear to <b>someone I know in person</b>            |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent an image or video of my private parts covered by underwear to <b>someone I only know on the internet</b> |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent an image or video of myself dressed and in a sexy pose to <b>my boyfriend/girlfriend</b>                 |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent an image or video of myself dressed and in a sexy pose to <b>someone I know in person</b>                |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent an image or video of myself dressed and in a sexy pose to <b>someone I only know on the internet</b>     |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent a sexy image or video featuring someone else to <b>my boyfriend/girlfriend</b>                           |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent a sexy image or video featuring someone else to <b>someone I know in person</b>                          |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have sent a sexy image or video featuring someone else to <b>someone I only know on the internet</b>               |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have posted a sexy text message or comment   |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have posted an image or video of my naked private parts  |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have posted an image or video of my private parts covered by underwear   |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |
| I have posted an image or video of myself dressed and in a sexy pose   |   | 0  | 1                                | 2 | 3 | 4     |                               |                              |                               |                     |                 |                     |                     |                        |

|   | Never = 0                               |  |                                   |                         | REMEMBER! → WITH AN AMOROUS OR SEXUAL PURPOSE                              |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
|---|---|--|-----------------------------------|-------------------------|--|--|---|---|--|-------|-------------------------------|------------------------------|-------------------------------|---------------------|-----------------|---------------------|---------------------|------------------------|
|   | Between one and three times a month = 1 | Between one and three times a week = 2 | Every day or almost every day = 3 | Several times a day = 4 | ONLY IF you have marked 1, 2, 3 or 4, circle as many EMOTICONS as you want |  Showing a part or all of my face |  Not showing my face |  Because I wanted to |  Because I was asked to | Never | Between 1 and 3 times a month | Between 1 and 3 times a week | Every day or almost every day | Several times a day | Showing my face | Not showing my face | Because I wanted to | Because I was asked to |
| I have made live-streamed video of my naked private parts   | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have live-streamed video of my private parts covered by underwear   | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have live-streamed video of myself dressed and in a sexy pose   | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have made sexy voice calls (e.g. phone calls) with <b>my boyfriend/girlfriend</b>                                     | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have made sexy voice calls (e.g. phone calls) with <b>someone I know in person</b>                                    | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have made sexy voice calls (e.g. phone calls) with <b>someone I only know on the internet</b>                         | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have made video calls with <b>my boyfriend/girlfriend</b> featuring my naked private parts                            | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have made video calls with <b>someone I know in person</b> featuring my naked private parts                           | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have made video calls with <b>someone I only know on the internet</b> featuring my naked private parts                | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have made video calls with <b>my boyfriend/girlfriend</b> featuring my private parts covered by underwear             | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have made video calls with <b>someone I know in person</b> featuring my private parts covered by underwear            | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have made video calls with <b>someone I only know on the internet</b> featuring my private parts covered by underwear | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have made video calls with <b>my boyfriend/girlfriend</b> featuring myself dressed and in a sexy pose                 | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have made video calls with <b>someone I know in person</b> featuring myself dressed and in a sexy pose                | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have made video calls with <b>someone I only know on the internet</b> featuring myself dressed and in a sexy pose     | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have asked <b>my boyfriend/girlfriend</b> to send me sexy text messages   | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have asked <b>someone I know in person</b> to send me sexy text messages  | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have asked <b>someone I only know on the internet</b> to send me sexy text messages                                   | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have asked <b>my boyfriend/girlfriend</b> to send me sexy audios (e.g. voice messages)                                | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have asked <b>someone I know in person</b> to send me sexy audios (e.g. voice messages)                               | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have asked <b>someone I only know on the internet</b> to send me sexy audios (e.g. voice messages)                    | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have asked <b>my boyfriend/girlfriend</b> to send me images or videos of their naked private parts                    | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have asked <b>someone I know in person</b> to send me images or videos of their naked private parts                   | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |
| I have asked <b>someone I only know on the internet</b> to send me images or videos of their naked private parts        | 0                                       | 1                                      | 2                                 | 3                       | 4  |  |   |   |  |       |                               |                              |                               |                     |                 |                     |                     |                        |

Never = 0

**REMEMBER! → WITH AN AMOROUS OR SEXUAL PURPOSE**

|   |  |                                  |
|---|--|----------------------------------|
| Between one and three times a month = 1 | <p><b>ONLY IF</b><br/> you have marked 1, 2, 3 or 4,<br/> <b>you can</b> circle as many<br/> EMOTICONS as you want</p> | Showing a part or all of my face |
| Between one and three times a week = 2  |  | Not showing my face              |
| Every day or almost every day = 3       |  | Because I wanted to              |
| Several times a day = 4                 |  | Because I was asked to           |

Never

Between 1 and 3 times a month

Between 1 and 3 times a week

Every day or almost every day

Several times a days

Showing my face

Not showing my face

Because I wanted to

Because I was asked to

|   |   |   |   |   |   |
|---|---|---|---|---|---|
| I have asked <b>my boyfriend/girlfriend</b> to send me images or videos of their private parts covered by underwear             | 0 | 1 | 2 | 3 | 4 |
| I have asked <b>someone I know in person</b> to send me pictures or videos of their private parts covered by underwear          | 0 | 1 | 2 | 3 | 4 |
| I have asked <b>someone I only know on the internet</b> to send me images or videos of their private parts covered by underwear | 0 | 1 | 2 | 3 | 4 |
| I have asked <b>my boyfriend/girlfriend</b> to send me images or videos of them dressed and in a sexy pose                      | 0 | 1 | 2 | 3 | 4 |
| I have asked <b>someone I know in person</b> to send me images or videos of them dressed and in a sexy pose                     | 0 | 1 | 2 | 3 | 4 |
| I have asked <b>someone I only know on the internet</b> to send me images or videos of them dressed and in a sexy pose          | 0 | 1 | 2 | 3 | 4 |
| I have asked <b>my boyfriend/girlfriend</b> to make a sexy voice call (e.g. phone call) with me                                 | 0 | 1 | 2 | 3 | 4 |
| I have asked <b>someone I know in person</b> to make a sexy voice call (e.g. phone call) with me                                | 0 | 1 | 2 | 3 | 4 |
| I have asked <b>someone I only know over the internet</b> to make a sexy voice call (e.g. phone call) with me                   | 0 | 1 | 2 | 3 | 4 |
| I have asked <b>my boyfriend/girlfriend</b> to make a sexy video call with me   | 0 | 1 | 2 | 3 | 4 |
| I have asked <b>someone I know in person</b> to make a sexy video call with me  | 0 | 1 | 2 | 3 | 4 |
| I have asked <b>someone I only know on the internet</b> to make a sexy video call with me                                       | 0 | 1 | 2 | 3 | 4 |
| <b>My boyfriend/girlfriend</b> has asked me to send them sexy content of some kind, but I didn't want to                        | 0 | 1 | 2 | 3 | 4 |
| <b>Someone I know in person</b> has asked me to send them some kind of sexy content, but I didn't want to                       | 0 | 1 | 2 | 3 | 4 |
| <b>Someone I only know on the internet</b> has asked me to send them sexy content of some kind, but I didn't want to            | 0 | 1 | 2 | 3 | 4 |
| I have received sexy content of some kind from <b>my boyfriend/girlfriend</b>   | 0 | 1 | 2 | 3 | 4 |
| I have received sexy content of some kind from <b>someone I know in person</b>  | 0 | 1 | 2 | 3 | 4 |
| I have received sexy content of some kind from <b>someone I only know on the internet</b>                                       | 0 | 1 | 2 | 3 | 4 |

|   |  |  |  |
|---|--|--|--|
| → |  |  |  |
| → |  |  |  |
| → |  |  |  |

**SOCIO-DEMOGRAPHIC QUESTIONS**

**1. I am**

- Male  
 Female

**3. My parents live**

- Together  
 Are separated  
 Other: \_\_\_\_\_

**4. Sexual orientation (attracted to)**

- I like boys  
 I like girls  
 I like boys and girls  
 Other: \_\_\_\_\_

**5. The boy/girl I like(d) is/was**

- More than 3 years younger than me  
 1 to 3 years younger than me  
 My age  
 1 to 3 years older than me  
 More than 3 years older than me  
 There hasn't been anyone I have liked

**6. Do you have boyfriend or girlfriend?**

- Right now, YES  
 NO, but I had one before  
 NO, I have not had a boyfriend/girlfriend yet

**7. Your boyfriend/girlfriend is/was**

- More than 3 years younger than me  
 1 to 3 years younger than me  
 My age  
 1 to 3 years older than me  
 More than 3 years older than me  
 Other: \_\_\_\_\_

**2. Age**

**8. How do you find out about sexuality?**

(You can check more than one box)

- My parents  
 Brother/sister  
 Other family: \_\_\_\_\_  
 Friends  
 Boyfriend/girlfriend  
 School  
 Internet  
 Books, magazines, etc.  
 Other: \_\_\_\_\_

**9. Please indicate if:**

- Do you use a mobile application for hooking up? (e.g. Tinder) No  or Yes   
 Do you watch porn? No  or Yes  ▶ How many times a week? \_\_\_\_\_ times  
 Have you felt pleasure masturbating? No  or Yes  ▶ Times per week? \_\_\_\_\_ times  
 Have you had penetrative sex? No  or Yes   
 Have you had sexual relations without really wanting it? No  or Yes   
 Do you consider yourself attractive? Check only one box.  
**Not at all**  **A little**  **Quite a lot**  **A lot**

**10. When you exchange sexy content, do you think ... ?**

(You can check more than one box)

- It can cause people to speak ill of me or reject me  
 My sexy messages/photos/audios/videos might be shown to others  
 I may have trouble with the law in the future  
 I may have trouble finding a job in the future  
 I may feel bad in the future for having done it  
 Other people may contact with me without me doing anything  
 Other people may send me sexy content without me wanting it  
 It may be used to blackmail me or force me to do something  
 It may lead to other problems: \_\_\_\_\_

#### **Appendix 4**

Refined version of A-SextS (in Spanish and English).

Note: We present a more appropriate wording of questions 4, 8, 9 and 10 of the socio-demographic section, since questions with closed-answers should consider all possible answer choices.

#### **Preámbulo**

Se solicita su autorización para participar en el proyecto de investigación titulado: *Sexting: Perfiles, prevalencias y desarrollo de la nueva escala de medida A-SextS*. Su objetivo es: *elaborar un instrumento de medida capaz de describir y analizar esta actividad de forma precisa*. Consiste en: *un cuestionario sencillo elaborado según criterios de calidad y adaptado a la población adolescente*. Los beneficios que se esperan de este trabajo: *se justifican por la necesidad de acercarnos a la realidad de los adolescentes en materia de relaciones sociales amorosas mediadas por la tecnología durante el transcurso de su etapa en educación secundaria*. La participación en este estudio es totalmente voluntaria, si usted no desea participar en el estudio, no habrá ninguna consecuencia negativa. En cualquier momento puede retirarse del estudio sin que ello tenga ninguna consecuencia. La respuesta es completamente anónima, por lo que no se dispondrá de ningún dato que pueda identificarle. En cualquier caso, la información se tratará de acuerdo a la Ley Orgánica 15/1999 de Protección de datos de Carácter Personal, de 6 de noviembre de 2019 (LOPD). Si tienen alguna pregunta sobre este proyecto de investigación, puede consultar en cualquier momento al investigador cuyo e-mail es: Cristian.Molla@uv.es

Si usted responde a las cuestiones que se le proponen, se entiende de forma tácita que ha comprendido el objetivo del presente estudio, que ha podido preguntar y aclarar las dudas que se le hubieran planteado inicialmente y que acepta participar en el estudio. Los investigadores le agradecen su valiosa participación en el presente estudio.

## Instrucciones

Este es un estudio sobre sexting. El sexting consiste en intercambiar mensajes de texto, audios, imágenes o videos sexys a través de internet con otra persona, y hacerlo con una intención amorosa o sexual. NO es 'sexting' enseñar todo o parte de tu cuerpo o de tu aspecto para conocer sólo la opinión de alguien, sin hacerlo con un objetivo amoroso o sexual

Se hace sexting con un objetivo amoroso o sexual, por ejemplo, para yo sentir placer, para que otro sienta placer, para llamar la atención sobre alguien, para demostrar deseo o interés sexual hacia alguien, como una prueba de amor para alguien, para saber si otras personas muestran deseo o interés sexual hacia mí, para describir un acto sexual que yo quiero hacer con alguien, para proponer tener sexo real o a través de internet, etc.

A continuación, encontrarás una serie de enunciados sobre sexting. Tu tarea consiste en rodear con un círculo (○) la frecuencia con la que has realizado cada una de estas acciones de sexting en el último mes (es decir, cuantas veces has hecho una acción concreta en los últimos 30 días). Junto con la acción que SI hayas realizado debes indicar con un círculo:

- Si enseñabas la cara *Toda o una parte* (😊), *No la enseñabas* (👁️), o ambos.
- Si lo hiciste porque *Yo quería* (👉), *Sólo porque me lo habían pedido* (🙏), o ambos.

\*\*\*\*\*

Recuerda que tu información será totalmente **CONFIDENCIAL**. Ni los maestros ni tus padres tendrán acceso a ella. Te pido que seas lo más **SINCERO/A** posible en tus respuestas.

\*\*\*

|  | Nunca = 0                         |  |                              |                         | ¡ RECUERDA ! → CON UN OBJETIVO AMOROSO O SEXUAL                               |                                |                     |                  | Nunca | Entre 1 y 3 veces / mes | Entre 1 y 3 veces / semana | Cada día (o casi) | Varias veces al día | Enseñaba la cara | No enseñaba la cara | Porque yo quería | Porque me lo había pedido |                           |   |   |
|--|-----------------------------------|--|------------------------------|-------------------------|---|--------------------------------|---------------------|------------------|-------|-------------------------|----------------------------|-------------------|---------------------|------------------|---------------------|------------------|---------------------------|---------------------------|---|---|
|  | Entre una y tres veces al mes = 1 | Entre una y tres veces a la semana = 2 | Cada día o casi cada día = 3 | Varias veces al día = 4 | SÓLO SI has señalado 1, 2, 3 o 4 puedes rodear tantos EMOTICONOS como quieras | Enseñaba la cara (o una parte) | No enseñaba la cara | Porque yo quería |       |                         |                            |                   |                     |                  |                     |                  |                           | Porque me lo había pedido |   |   |
| <b>EJEMPLO</b>   |                                   |  |                              |                         |   |                                |                     |                  |       |                         |                            |                   |                     |                  |                     |                  |                           |                           |   |   |
| He enviado una imagen o video de mi viaje a Italia <b>a mi novio/a</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado un mensaje de texto sexy <b>a mi novio/a</b>  | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado un mensaje de texto sexy <b>a alguien que conozco en persona</b>  | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado un mensaje de texto sexy <b>a alguien que sólo conozco a través de Internet</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado un audio sexy (p. ej. mensaje de voz) <b>a mi novio/a</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado un audio sexy (p. ej. mensaje de voz) <b>a alguien que conozco en persona</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado un audio sexy (p. ej. mensaje de voz) <b>a alguien que sólo conozco a través de Internet</b>                                | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado una imagen o video de mis partes íntimas al desnudo <b>a mi novio/a</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado una imagen o video de mis partes íntimas al desnudo <b>a alguien que conozco en persona</b>                                 | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado una imagen o video de mis partes íntimas al desnudo <b>a alguien que sólo conozco a través de Internet</b>                  | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado una imagen o video de mis partes íntimas cubiertas con ropa interior <b>a mi novio/a</b>                                    | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado una imagen o video de mis partes íntimas cubiertas con ropa interior <b>a alguien que conozco en persona</b>                | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado una imagen o video de mis partes íntimas cubiertas con ropa interior <b>a alguien que sólo conozco a través de Internet</b> | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado una imagen o video de mí mismo vestido y en una postura sexy <b>a mi novio/a</b>  | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado una imagen o video de mí mismo vestido y en una postura sexy <b>a alguien que conozco en persona</b>                        | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado una imagen o video de mí mismo vestido y en una postura sexy <b>a alguien que sólo conozco a través de Internet</b>         | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado una imagen o video sexy protagonizado por otros <b>a mi novio/a</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado una imagen o video sexy protagonizado por otros <b>a alguien que conozco en persona</b>                                     | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He enviado una imagen o video sexy protagonizado por otros <b>a alguien que sólo conozco a través de Internet</b>                      | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He publicado un mensaje de texto (o comentario) sexy   | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He publicado una imagen o video de mis partes íntimas al desnudo   | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He publicado una imagen o video de mis partes íntimas cubiertas con ropa interior  | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |
| He publicado una imagen o video de mí mismo vestido y en una postura sexy  | 0                                 | 1                                      | 2                            | 3                       | 4   | 0                              | 1                   | 2                | 3     | 4                       | 0                          | 1                 | 2                   | 3                | 4                   | 0                | 1                         | 2                         | 3 | 4 |

|  | Nunca = 0                         |  |                              |                         | ¡ RECUERDA ! → CON UN OBJETIVO AMOROSO O SEXUAL                               |                                  |                       |                    | Nunca | Entre 1 y 3 veces / mes | Entre 1 y 3 veces / semana | Cada día (o casi) | Varias veces al día | Enseñaba la cara | No enseñaba la cara | Porque yo quería | Porque me lo había pedido |
|--|-----------------------------------|--|------------------------------|-------------------------|---|----------------------------------|-----------------------|--------------------|-------|-------------------------|----------------------------|-------------------|---------------------|------------------|---------------------|------------------|---------------------------|
|  | Entre una y tres veces al mes = 1 | Entre una y tres veces a la semana = 2 | Cada día o casi cada día = 3 | Varias veces al día = 4 | SÓLO SI has señalado 1, 2, 3 o 4 puedes rodear tantos EMOTICONOS como quieras | 😊 Enseñaba la cara (o una parte) | 🙊 No enseñaba la cara | 👉 Porque yo quería |       |                         |                            |                   |                     |                  |                     |                  |                           |
| He realizado <i>directos</i> (vídeos en directo) en el que mis partes íntimas estaban al desnudo   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He realizado <i>directos</i> (vídeos en directo) en el que mis partes íntimas estaban cubiertas con ropa interior                                      | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He realizado <i>directos</i> (vídeos en directo) en el que estaba vestido y en una postura sexy  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He realizado llamadas de voz sexys (p.ej. llamadas telefónicas) <b>con mi novio/a</b>  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He realizado llamadas de voz sexys (p.ej. llamadas telefónicas) <b>con alguien que conozco en persona</b>  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He realizado llamadas de voz sexys (p.ej. llamadas telefónicas) <b>con alguien que sólo conozco a través de Internet</b>                               | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con mi novio/a</b> he realizado vídeo-llamadas en las que mis partes íntimas estaban al desnudo   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con alguien que conozco en persona</b> he realizado vídeo-llamadas en las que mis partes íntimas estaban al desnudo                                 | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con alguien que sólo conozco a través de Internet</b> he realizado vídeo-llamadas en las que mis partes íntimas estaban al desnudo                  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con mi novio/a</b> he realizado vídeo-llamadas en las que mis partes íntimas estaban cubiertas con ropa interior                                    | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con alguien que conozco en persona</b> he realizado vídeo-llamadas en las que mis partes íntimas estaban cubiertas con ropa interior                | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con alguien que sólo conozco a través de Internet</b> he realizado vídeo-llamadas en las que mis partes íntimas estaban cubiertas con ropa interior | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con mi novio/a</b> he realizado vídeo-llamadas en las que estaba vestido y en una postura sexy  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con alguien que conozco en persona</b> he realizado vídeo-llamadas en las que estaba vestido y en una postura sexy                                  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| <b>Con alguien que sólo conozco a través de Internet</b> he realizado vídeo-llamadas en las que estaba vestido y en una postura sexy                   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido <b>a mi novio/a</b> que me envíe mensajes de texto sexys   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido <b>a alguien que conozco en persona</b> que me envíe mensajes de texto sexys   | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido <b>a alguien que sólo conozco a través de Internet</b> que me envíe mensajes de texto sexys  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido <b>a mi novio/a</b> que me envíe audios sexys (p. ej. mensaje de voz)  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido <b>a alguien que conozco en persona</b> que me envíe audios sexys (p. ej. mensaje de voz)  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido <b>a alguien que sólo conozco a través de Internet</b> que me envíe audios sexys (p. ej. mensaje de voz)                                     | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido <b>a mi novio/a</b> que me envíe imágenes o vídeos de sus partes íntimas al desnudo  | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido <b>a alguien que conozco en persona</b> que me envíe imágenes o vídeos de sus partes íntimas al desnudo                                      | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |
| He pedido <b>a alguien que sólo conozco a través de Internet</b> que me envíe imágenes o vídeos de sus partes íntimas al desnudo                       | 0                                 | 1                                      | 2                            | 3                       | 4   | →                                | 😊                     | 🙊                  | 👉     | 🙏                       |                            |                   |                     |                  |                     |                  |                           |



|   | Nunca = 0                         |  |                              |                         |   | ¡ RECUERDA ! → CON UN OBJETIVO AMOROSO O SEXUAL |                     |                  |                           |       |                         |                            |                   |                     |                  |                     |                  |                           |
|---|-----------------------------------|--|------------------------------|-------------------------|---|---|---------------------|------------------|---------------------------|-------|-------------------------|----------------------------|-------------------|---------------------|------------------|---------------------|------------------|---------------------------|
|   | Entre una y tres veces al mes = 1 | Entre una y tres veces a la semana = 2 | Cada día o casi cada día = 3 | Varias veces al día = 4 | SÓLO SI has señalado 1, 2, 3 o 4 puedes rodear tantos EMOTICONOS como quieras | Enseñaba la cara (o una parte)                  | No enseñaba la cara | Porque yo quería | Porque me lo había pedido | Nunca | Entre 1 y 3 veces / mes | Entre 1 y 3 veces / semana | Cada día (o casi) | Varias veces al día | Enseñaba la cara | No enseñaba la cara | Porque yo quería | Porque me lo había pedido |
| He pedido a <b>mi novio/a</b> que me envíe imágenes o vídeos de sus partes íntimas cubiertas con ropa interior  | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| He pedido a <b>alguien que conozco en persona</b> que me envíe imágenes o vídeos de sus partes íntimas cubiertas con ropa interior                      | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| He pedido a <b>alguien que sólo conozco a través de Internet</b> que me envíe imágenes o vídeos de sus partes íntimas cubiertas con ropa interior       | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| He pedido a <b>mi novio/a</b> que me envíe imágenes o vídeos vestido y en una postura sexy  | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| He pedido a <b>alguien que conozco en persona</b> que me envíe imágenes o vídeos vestido y en una postura sexy  | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| He pedido a <b>alguien que sólo conozco a través de Internet</b> que me envíe imágenes o vídeos vestido y en una postura sexy                           | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| He pedido a <b>mi novio/a</b> hacer llamadas de voz sexys (p.ej. llamadas telefónicas)  | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| He pedido a <b>alguien que conozco en persona</b> hacer llamadas de voz sexys (p.ej. llamadas telefónicas)  | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| He pedido a <b>alguien que sólo conozco a través de Internet</b> hacer llamadas de voz sexys (p.ej. llamadas telefónicas)                               | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| He pedido a <b>mi novio/a</b> hacer vídeo-llamadas sexys  | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| He pedido a <b>alguien que conozco en persona</b> hacer vídeo-llamadas sexys  | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| He pedido a <b>alguien que sólo conozco a través de Internet</b> hacer vídeo-llamadas sexys   | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| <b>Mi novio/a</b> me ha pedido que le envíe contenidos sexys propios de algún tipo, pero no se los he querido enviar                                    | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| <b>Alguien que conozco en persona</b> me ha pedido que le envíe contenidos sexys propios de algún tipo, pero no se los he querido enviar                | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| <b>Alguien que sólo conozco a través de Internet</b> me ha pedido que le envíe contenidos sexys propios de algún tipo, pero no se los he querido enviar | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   |                  |                     |                  |                           |
| He recibido contenidos sexys de algún tipo <b>de mi novio/a</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   | →                | →                   | →                | →                         |
| He recibido contenidos sexys de algún tipo <b>de alguien que conozco en persona</b>   | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   | →                | →                   | →                | →                         |
| He recibido contenidos sexys de algún tipo <b>de alguien que sólo conozco a través de Internet</b>  | 0                                 | 1                                      | 2                            | 3                       | 4   |   |                     |                  |                           | 0     | 1                       | 2                          | 3                 | 4                   | →                | →                   | →                | →                         |

**PREGUNTAS SOCIODEMOGRÁFICAS**

**1. Soy**

- Chico  
 Chica

**3. Mis padres viven**

- Juntos  
 Separados  
 Otro: \_\_\_\_\_

**4. Orientación sexual** (Sentir atracción por...)

- Me gustan los chicos  
 Me gustan las chicas  
 Me gustan los chicos y las chicas  
 Otro: \_\_\_\_\_  
 No lo sé / No me ha gustado nadie

**5. El chico/a que me gusta/ba es o era ...**

- Más de tres años menor que yo  
 De uno a tres años menor que yo  
 De mi edad  
 De uno a tres años mayor que yo  
 Más de tres años mayor que yo  
 Todavía no me ha gustado nadie

**6. ¿Tienes novio o novia?**

- En este momento SI  
 NO, pero antes sí he tenido  
 NO, todavía no he tenido novio/a

**7. Tu novio/a es o era ...**

- Más de tres años menor que yo  
 De uno a tres años menor que yo  
 De mi edad  
 De uno a tres años mayor que yo  
 Más de tres años mayor que yo  
 Otro: \_\_\_\_\_

**2. Edad**

**8. ¿Cómo te informas sobre sexualidad?**

(Puedes señalar más de una casilla)

- Mis padres  
 Hermano/a  
 Otros familiares: \_\_\_\_\_  
 Amigos/as  
 Novio/a  
 Escuela  
 Internet  
 Libros, revistas, etc.  
 Otros: \_\_\_\_\_  
 No me informo / No contesto

**9. Indica si:**

- ¿Utilizas aplicaciones móviles específicas para ligar? (p.ej. Tinder)  No o  Si
- ¿Ves porno?  No o  Si ▶ **¿Cuántas veces a la semana?** \_\_\_\_\_ veces
- ¿Has sentido placer masturbándote?  No o  Si ▶ **¿Veces por semana?** \_\_\_\_\_ veces
- ¿Has mantenido alguna relación sexual con penetración?  No o  Si
- ¿Has mantenido alguna relación sexual sin realmente quererlo?  No o  Si
- ¿Te consideras atractivo/a? Señala sólo una casilla.  
 Nada  Poco  Bastante  Mucho

**10. Cuando alguien intercambia contenidos sexys, ¿Crees que...?**

(Puedes señalar más de una casilla)

- Puede causar que hablen mal de mí o me rechacen  
 Puede que enseñen mis mensajes/fotos/audios/vídeos sexys a otros  
 Puedo tener problemas con la justicia en el futuro  
 Puedo tener problemas para encontrar trabajo en el futuro  
 Puedo sentirme mal en un futuro por haberlo hecho  
 Que otra/s persona/s contacten conmigo sin yo hacer nada  
 Que otra/s persona/s me envíen contenidos sexys sin yo quererlo  
 Que utilice/n el contenido sexy para chantajearme, obligarme, ...  
 Otros problemas: \_\_\_\_\_  
 Puede que no haya ningún problema o consecuencia

## Preamble

Your consent is required to participate in the research project entitled: *“Sexting among adolescents: Profiles, prevalences and the development of the new A-SextS measurement scale”*. Its goal is: *To develop a measuring instrument capable of accurately describing and analysing sexting*. It consists of: *A simple questionnaire prepared according to quality criteria and adapted for an adolescent population*. Expected outcomes: *A deeper understanding of adolescent amorous social relations mediated by technology during the period of secondary education*. Participation in this research project is entirely voluntary, and no negative consequences will result from your not participating. You can withdraw from the research project at any time without any consequence. Your answers will be treated anonymously, meaning that none of the data recorded will be identifiable with you personally. In any case, the data will be treated in accordance with Spanish Organic Law 15/1999 of the 6th of November 2019 on the Protection of Personal Data (Ley Orgánica 15/1999 de Protección de Datos de Carácter Personal, “LOPD”). If you have any questions about this research project, you can consult, at any time, the research contact whose e-mail is: Cristian.Molla@uv.es





If you answer any of the questions proposed in this questionnaire, it shall be tacitly acknowledged that you have understood the goal of this research project, that you have been able to ask and clarify any doubts that you have had, and that you agree to your participation in the research project. The researchers thank you for your valuable participation in this research project.

## Instructions

This is a research project on sexting. 'Sexting', as a term, is given to mean the exchange of sexy text messages, audios, images or videos over the internet with another person, and doing it with an amorous or sexual purpose. It is NOT given to mean showing all or part of your body or your appearance merely in order to know someone's opinion, without doing so with an amorous or sexual purpose.

Therefore, you might partake in sexting, for example, in order to feel personal pleasure, to elicit someone else's pleasure, to draw someone's attention to you, to express sexual desire or interest towards someone, to provide proof of your amorous feelings towards someone, to seek confirmation of someone's sexual desire or interest towards you, to describe a sexual act that you want to perform with someone, to propose having real or virtual sex, etc.

Below, you will find a series of statements about sexting. Your task is to circle (○) the frequency with which you have performed the indicated sexting action in the last month, i.e. how many times you have done it in the last 30 days. Next to the action that you have performed, indicate with a circle:
























































































- If you have shown part or the whole of your face () , if you have not shown it () , or both.
- If you did it because you wanted to () , only because you had been asked to () , or both.

\*\*\*\*\*

Remember that the information you provide will be treated in **TOTAL CONFIDENTIALITY**. Neither your teachers nor your parents will have any access to it. Please be as **SINCERE** as possible in your answers.

\*\*\*\*

|  | REMEMBER! → WITH AN AMOROUS OR SEXUAL PURPOSE |  |  |                                   | Showing my face         | Not showing my face              | Because I wanted to | Because I was asked to |                        |
|--|---|--|--|-----------------------------------|-------------------------|----------------------------------|---------------------|------------------------|------------------------|
|  | Never = 0                                     | Between one and three times a month = 1  | Between one and three times a week = 2 | Every day or almost every day = 3 |                         |                                  |                     |                        |                        |
|  | Never = 0                                     | Between one and three times a month = 1  | Between one and three times a week = 2 | Every day or almost every day = 3 | Several times a day = 4 |                                  |                     |                        |                        |
|  |   | ONLY IF you have marked 1, 2, 3 or 4, you can circle as many EMOTICONS as you want |  |                                   |                         |                                  |                     |                        |                        |
|  |   |  |  |                                   |                         | Showing a part or all of my face | Not showing my face | Because I wanted to    | Because I was asked to |
|  |   |  |  |                                   |                         |                                  |                     |                        |                        |
| <b>EXAMPLE</b>   |   |  |  |                                   |                         |                                  |                     |                        |                        |
| I have sent an image or video of my trip to Italy to <b>my boyfriend/girlfriend</b>                                  | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent a sexy text message to <b>my boyfriend/girlfriend</b>  | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent a sexy text message to <b>someone I know in person</b>   | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent a sexy text message to <b>someone I only know on the internet</b>  | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent a sexy audio (e.g. voice message) to <b>my boyfriend/girlfriend</b>                                      | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent a sexy audio (e.g. voice message) to <b>someone I know in person</b>                                     | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent a sexy audio (e.g. voice message) to <b>someone I only know on the internet</b>                          | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent an image or video of my naked private parts to <b>my boyfriend/girlfriend</b>                            | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent an image or video of my naked private parts to <b>someone I know in person</b>                           | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent an image or video of my naked private parts to <b>someone I only know on the internet</b>                | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent an image or video of my private parts covered by underwear to <b>my boyfriend/girlfriend</b>             | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent an image or video of my private parts covered by underwear to <b>someone I know in person</b>            | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent an image or video of my private parts covered by underwear to <b>someone I only know on the internet</b> | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent an image or video of myself dressed and in a sexy pose to <b>my boyfriend/girlfriend</b>                 | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent an image or video of myself dressed and in a sexy pose to <b>someone I know in person</b>                | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent an image or video of myself dressed and in a sexy pose to <b>someone I only know on the internet</b>     | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent a sexy image or video featuring someone else to <b>my boyfriend/girlfriend</b>                           | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent a sexy image or video featuring someone else to <b>someone I know in person</b>                          | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have sent a sexy image or video featuring someone else to <b>someone I only know on the internet</b>               | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have posted a sexy text message or comment   | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have posted an image or video of my naked private parts  | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have posted an image or video of my private parts covered by underwear   | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |
| I have posted an image or video of myself dressed and in a sexy pose   | 0   | 1  | 2                                      | 3                                 | 4                       |                                  |                     |                        |                        |

|   | Never = 0                               |  |                                   |                               | REMEMBER! → WITH AN AMOROUS OR SEXUAL PURPOSE                              |  |   |   | Showing my face   | Not showing my face   | Because I wanted to | Because I was asked to |
|---|---|--|-----------------------------------|-------------------------------|--|--|---|---|---|---|---------------------|------------------------|
|   | Between one and three times a month = 1 | Between one and three times a week = 2 | Every day or almost every day = 3 | Several times a day = 4       | ONLY IF you have marked 1, 2, 3 or 4, circle as many EMOTICONS as you want |  Showing a part or all of my face |  Not showing my face |  Because I wanted to |   |   |                     |                        |
|   | Never                                   | Between 1 and 3 times a month          | Between 1 and 3 times a week      | Every day or almost every day | Several times a day  |  |   |   |   |   |                     |                        |
| I have made live-streamed video of my naked private parts   | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |                      |                      |    |    |                     |                        |
| I have live-streamed video of my private parts covered by underwear   | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |                      |                      |    |    |                     |                        |
| I have live-streamed video of myself dressed and in a sexy pose   | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |                      |                      |    |    |                     |                        |
| I have made sexy voice calls (e.g. phone calls) with <b>my boyfriend/girlfriend</b>                                     | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |   |                      |    |    |                     |                        |
| I have made sexy voice calls (e.g. phone calls) with <b>someone I know in person</b>                                    | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |   |                      |    |    |                     |                        |
| I have made sexy voice calls (e.g. phone calls) with <b>someone I only know on the internet</b>                         | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |   |                      |    |    |                     |                        |
| I have made video calls with <b>my boyfriend/girlfriend</b> featuring my naked private parts                            | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |                      |                      |    |    |                     |                        |
| I have made video calls with <b>someone I know in person</b> featuring my naked private parts                           | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |                      |                      |    |    |                     |                        |
| I have made video calls with <b>someone I only know on the internet</b> featuring my naked private parts                | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |                      |                      |    |    |                     |                        |
| I have made video calls with <b>my boyfriend/girlfriend</b> featuring my private parts covered by underwear             | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |                      |                      |    |    |                     |                        |
| I have made video calls with <b>someone I know in person</b> featuring my private parts covered by underwear            | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |                      |                      |    |    |                     |                        |
| I have made video calls with <b>someone I only know on the internet</b> featuring my private parts covered by underwear | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |                      |                      |    |    |                     |                        |
| I have made video calls with <b>my boyfriend/girlfriend</b> featuring myself dressed and in a sexy pose                 | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |                     |                     |   |   |                     |                        |
| I have made video calls with <b>someone I know in person</b> featuring myself dressed and in a sexy pose                | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |                    |                    |  |  |                     |                        |
| I have made video calls with <b>someone I only know on the internet</b> featuring myself dressed and in a sexy pose     | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |                    |                    |  |  |                     |                        |
| I have asked <b>my boyfriend/girlfriend</b> to send me sexy text messages   | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |   |                    |  |  |                     |                        |
| I have asked <b>someone I know in person</b> to send me sexy text messages  | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |   |                    |  |  |                     |                        |
| I have asked <b>someone I only know on the internet</b> to send me sexy text messages                                   | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |   |                    |  |  |                     |                        |
| I have asked <b>my boyfriend/girlfriend</b> to send me sexy audios (e.g. voice messages)                                | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |   |                    |  |  |                     |                        |
| I have asked <b>someone I know in person</b> to send me sexy audios (e.g. voice messages)                               | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |   |                    |  |  |                     |                        |
| I have asked <b>someone I only know on the internet</b> to send me sexy audios (e.g. voice messages)                    | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |   |                    |  |  |                     |                        |
| I have asked <b>my boyfriend/girlfriend</b> to send me images or videos of their naked private parts                    | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |   |                    |  |  |                     |                        |
| I have asked <b>someone I know in person</b> to send me images or videos of their naked private parts                   | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |   |                    |  |  |                     |                        |
| I have asked <b>someone I only know on the internet</b> to send me images or videos of their naked private parts        | 0                                       | 1                                      | 2                                 | 3                             | 4  | →  |   |                    |  |  |                     |                        |

Never = 0

**REMEMBER! → WITH AN AMOROUS OR SEXUAL PURPOSE**

Between one and three times a month = 1

Between one and three times a week = 2

Every day or almost every day = 3

Several times a day = 4

**ONLY IF**  
you have marked 1, 2, 3 or 4,  
**you can circle as many**  
**EMOTICONS as you want**



Showing a part or all of my face



Not showing my face



Because I wanted to



Because I was asked to

|   | Never | Between 1 and 3 times a month | Between 1 and 3 times a week | Every day or almost every day | Several times a days | Showing my face | Not showing my face | Because I wanted to | Because I was asked to |
|---|-------|-------------------------------|------------------------------|-------------------------------|----------------------|-----------------|---------------------|---------------------|------------------------|
| I have asked <b>my boyfriend/girlfriend</b> to send me images or videos of their private parts covered by underwear             | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| I have asked <b>someone I know in person</b> to send me pictures or videos of their private parts covered by underwear          | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| I have asked <b>someone I only know on the internet</b> to send me images or videos of their private parts covered by underwear | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| I have asked <b>my boyfriend/girlfriend</b> to send me images or videos of them dressed and in a sexy pose                      | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| I have asked <b>someone I know in person</b> to send me images or videos of them dressed and in a sexy pose                     | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| I have asked <b>someone I only know on the internet</b> to send me images or videos of them dressed and in a sexy pose          | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| I have asked <b>my boyfriend/girlfriend</b> to make a sexy voice call (e.g. phone call) with me                                 | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| I have asked <b>someone I know in person</b> to make a sexy voice call (e.g. phone call) with me                                | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| I have asked <b>someone I only know over the internet</b> to make a sexy voice call (e.g. phone call) with me                   | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| I have asked <b>my boyfriend/girlfriend</b> to make a sexy video call with me   | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| I have asked <b>someone I know in person</b> to make a sexy video call with me  | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| I have asked <b>someone I only know on the internet</b> to make a sexy video call with me                                       | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| <b>My boyfriend/girlfriend</b> has asked me to send them sexy content of some kind, but I didn't want to                        | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| <b>Someone I know in person</b> has asked me to send them some kind of sexy content, but I didn't want to                       | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| <b>Someone I only know on the internet</b> has asked me to send them sexy content of some kind, but I didn't want to            | 0     | 1                             | 2                            | 3                             | 4                    |                 |                     |                     |                        |
| I have received sexy content of some kind from <b>my boyfriend/girlfriend</b>   | 0     | 1                             | 2                            | 3                             | 4                    | →               | →                   | →                   | →                      |
| I have received sexy content of some kind from <b>someone I know in person</b>  | 0     | 1                             | 2                            | 3                             | 4                    | →               | →                   | →                   | →                      |
| I have received sexy content of some kind from <b>someone I only know on the internet</b>                                       | 0     | 1                             | 2                            | 3                             | 4                    | →               | →                   | →                   | →                      |

**SOCIO-DEMOGRAPHIC QUESTIONS**

**1. I am**

- Male
- Female

**3. My parents live**

- Together
- Are separated
- Other: \_\_\_\_\_

**4. Sexual orientation (attracted to)**

- I like boys
- I like girls
- I like boys and girls
- Other: \_\_\_\_\_
- I don't know / There hasn't been anyone I have liked

**5. The boy/girl I like(d) is/was**

- More than 3 years younger than me
- 1 to 3 years younger than me
- My age
- 1 to 3 years older than me
- More than 3 years older than me
- There hasn't been anyone I have liked

**6. Do you have boyfriend or girlfriend?**

- Right now, YES
- NO, but I had one before
- NO, I have not had a boyfriend/girlfriend yet

**7. Your boyfriend/girlfriend is/was**

- More than 3 years younger than me
- 1 to 3 years younger than me
- My age
- 1 to 3 years older than me
- More than 3 years older than me
- Other: \_\_\_\_\_

**2. Age**

**8. How do you find out about sexuality?**

(You can check more than one box)

- My parents
- Brother/sister
- Other family: \_\_\_\_\_
- Friends
- Boyfriend/girlfriend
- School
- Internet
- Books, magazines, etc.
- Other: \_\_\_\_\_
- I am not informed / No answer

**9. Please indicate if:**

- Do you use a mobile application for hooking up? (e.g. Tinder) No  or Yes
- Do you watch porn? No  or Yes  ▶ How many times a week? \_\_\_\_\_ times
- Have you felt pleasure masturbating? No  or Yes  ▶ Times per week? \_\_\_\_\_ times
- Have you had penetrative sex? No  or Yes
- Have you had sexual relations without really wanting it? No  or Yes
- Do you consider yourself attractive? Check only one box.
- Not at all  A little  Quite a lot  A lot

**10. When you exchange sexy content, do you think ... ?**

(You can check more than one box)

- It can cause people to speak ill of me or reject me
- My sexy messages/photos/audios/videos might be shown to others
- I may have trouble with the law in the future
- I may have trouble finding a job in the future
- I may feel bad in the future for having done it
- Other people may contact with me without me doing anything
- Other people may send me sexy content without me wanting it
- It may be used to blackmail me or force me to do something
- It may lead to other problems: \_\_\_\_\_
- It will not lead to any problems or consequences



### Additional Appendix 1

(Not included in the published article)

#### The Adolescent Sexting Scale (A-SextS)

| Subscales   | N° Items | Alpha | Omega | Items                               |
|---|----------|-------|-------|-------------------------------------|
| Sending sexts to a boy/girlfriend (SF)                        | 10       | .88   | .94   | 1, 4, 7, 10, 13, 16, 26, 29, 32, 35 |
| Sending sexts to someone known in person (SK)                 | 10       | .85   | .94   | 2, 5, 8, 11, 14, 17, 27, 30, 33, 36 |
| Sending sexts to someone known only on internet (SI)          | 10       | .87   | .96   | 3, 6, 9, 12, 15, 18, 28, 31, 34, 37 |
| Posting or live-streaming pictographic content (PS)           | 6        | .62   | .88   | 20, 21, 22, 23, 24, 25              |
| Asking for sexts from a boy/girlfriend (AF)                   | 7        | .89   | .95   | 38, 41, 44, 47, 50, 53, 56          |
| Asking for sexts from someone known in person (AK)            | 7        | .88   | .95   | 39, 42, 45, 48, 51, 54, 57          |
| Asking for sexts from someone only known on the internet (AI) | 7        | .85   | .95   | 40, 43, 46, 49, 52, 55, 58          |
| Refusing to send sexts (RS)                                   | 3        | .76   | .88   | 59, 60, 61                          |
| Receiving sexts (R)   | 3        | .73   | .81   | 62, 63, 64                          |

Note. The PS subscale refers exclusively to pictographic content, as it does not include item 19.

## Additional Appendix 2

(Not included in the published article)

Relevant R Code

```
#-----  
# Essential unidimensionality  
#-----  
  
dat.E <- DB.C.N[,which(substr(names(DB.C.N), 1, 1) %in% c("E", "x"))]  
dat.PD <- DB.C.N[,which(substr(names(DB.C.N), 1, 1) %in% c("P", "D"))]  
dat.S <- DB.C.N[,which(substr(names(DB.C.N), 1, 1) %in% c("S"))] # SOLICITAR  
  
# Nine blocks  
dat.E.N <- dat.E[novio != 0, which(substr(names(dat.E), 3, 3) %in% c("N"))]  
allNA <- which(apply(dat.E.N, 1, function(x) all(is.na(x))))  
dat.E.N <- dat.E.N[-allNA,]  
dat.E.P <- dat.E[,which(substr(names(dat.E), 3, 3) %in% c("P"))]  
dat.E.I <- dat.E[,which(substr(names(dat.E), 3, 3) %in% c("I"))]  
dat.PD.V <- dat.PD[,which(substr(names(dat.PD), 2, 2) %in% c("I", "x"))]  
dat.S.N <- dat.S[novio != 0, which(substr(names(dat.S), 3, 3) %in% c("N"))]  
dat.S.N <- dat.S.N[-allNA,]  
dat.S.P <- dat.S[,which(substr(names(dat.S), 3, 3) %in% c("P"))]  
dat.S.I <- dat.S[,which(substr(names(dat.S), 3, 3) %in% c("I"))]  
dat.R <- DB.C.N[,which(substr(names(DB.C.N), 1, 1) %in% c("R"))]  
dat.N <- DB.C.N[,which(substr(names(DB.C.N), 1, 1) %in% c("N"))]  
  
# Parallel analysis (Principal Component Analysis)  
PA.E.N <- PA.resample(dat.E.N, fa = "pc")  
PA.E.P <- PA.resample(dat.E.P, fa = "pc")  
PA.E.I <- PA.resample(dat.E.I, fa = "pc")  
PA.PD.V <- PA.resample(dat.PD.V, fa = "pc")  
PA.S.N <- PA.resample(dat.S.N, fa = "pc")  
PA.S.P <- PA.resample(dat.S.P, fa = "pc")  
PA.S.I <- PA.resample(dat.S.I, fa = "pc")  
PA.R <- PA.resample(dat.R, fa = "pc")  
PA.N <- PA.resample(dat.N, fa = "pc")  
  
# Unidimensional factor analysis  
fa.E.N <- fa(dat.E.N, nfactors = 1, fm = "uls", cor = "poly")  
fa.E.P <- fa(dat.E.P, nfactors = 1, fm = "uls", cor = "poly")  
fa.E.I <- fa(dat.E.I, nfactors = 1, fm = "uls", cor = "poly")  
fa.PD.V <- fa(dat.PD.V, nfactors = 1, fm = "uls", cor = "poly")  
fa.S.N <- fa(dat.S.N, nfactors = 1, fm = "uls", cor = "poly")  
fa.S.P <- fa(dat.S.P, nfactors = 1, fm = "uls", cor = "poly")  
fa.S.I <- fa(dat.S.I, nfactors = 1, fm = "uls", cor = "poly")  
fa.R <- fa(dat.R, nfactors = 1, fm = "uls", cor = "poly")  
fa.N <- fa(dat.N, nfactors = 1, fm = "uls", cor = "poly")
```

```

# Essential unidimensionality' results
J <- c(ncol(dat.E.N), ncol(dat.E.P), ncol(dat.E.I), ncol(dat.PD.V), ncol(dat.S.N),
ncol(dat.S.P), ncol(dat.S.I), ncol(dat.R), ncol(dat.N))
PA <- c(PA.E.N$factor$pc.p.m, PA.E.P$factor$pc.p.m, PA.E.I$factor$pc.p.m,
PA.PD.V$factor$pc.p.m, PA.S.N$factor$pc.p.m, PA.S.P$factor$pc.p.m,
PA.S.I$factor$pc.p.m, PA.R$factor$pc.p.m, PA.N$factor$pc.p.m)
KGC <- c(sum(PA.E.N$eigen.matrix[2,] > 1), sum(PA.E.P$eigen.matrix[2,] > 1),
sum(PA.E.I$eigen.matrix[2,] > 1), sum(PA.PD.V$eigen.matrix[2,] > 1),
sum(PA.S.N$eigen.matrix[2,] > 1), sum(PA.S.P$eigen.matrix[2,] > 1),
sum(PA.S.I$eigen.matrix[2,] > 1), sum(PA.R$eigen.matrix[2,] > 1),
sum(PA.N$eigen.matrix[2,] > 1))

ratio.eigen <- round(c(round(PA.E.N$eigen.matrix[2,1] / PA.E.N$eigen.matrix[2,2], 2),
round(PA.E.P$eigen.matrix[2,1] / PA.E.P$eigen.matrix[2,2], 2),
round(PA.E.I$eigen.matrix[2,1] / PA.E.I$eigen.matrix[2,2], 2),
round(PA.PD.V$eigen.matrix[2,1] / PA.PD.V$eigen.matrix[2,2], 2),
round(PA.S.N$eigen.matrix[2,1] / PA.S.N$eigen.matrix[2,2], 2),
round(PA.S.P$eigen.matrix[2,1] / PA.S.P$eigen.matrix[2,2], 2),
round(PA.S.I$eigen.matrix[2,1] / PA.S.I$eigen.matrix[2,2], 2),
round(PA.R$eigen.matrix[2,1] / PA.R$eigen.matrix[2,2], 2), round(PA.N$eigen.matrix[2,1]
/ PA.N$eigen.matrix[2,2], 2)), 1)

h2 <- c(round(mean(fa.E.N$communalities), 2), round(mean(fa.E.P$communalities), 2),
round(mean(fa.E.I$communalities), 2), round(mean(fa.PD.V$communalities), 2),
round(mean(fa.S.N$communalities), 2), round(mean(fa.S.P$communalities), 2),
round(mean(fa.S.I$communalities), 2), round(mean(fa.R$communalities), 2),
round(mean(fa.N$communalities), 2))

a <- as.numeric(c(round(psych::alpha(dat.E.N)$total[1], 2),
round(psych::alpha(dat.E.P)$total[1], 2), round(psych::alpha(dat.E.I)$total[1], 2),
round(psych::alpha(dat.PD.V)$total[1], 2), round(psych::alpha(dat.S.N)$total[1], 2),
round(psych::alpha(dat.S.P)$total[1], 2), round(psych::alpha(dat.S.I)$total[1], 2),
round(psych::alpha(dat.R)$total[1], 2), round(psych::alpha(dat.N)$total[1], 2)))

w <- as.numeric(c(round(omega(dat.E.N, 1, poly = T)$omega.tot, 2), round(omega(dat.E.P,
1, poly = T)$omega.tot, 2), round(omega(dat.E.I, 1, poly = T)$omega.tot, 2),
round(omega(dat.PD.V, 1, poly = T)$omega.tot, 2), round(omega(dat.S.N, 1, poly =
T)$omega.tot, 2), round(omega(dat.S.P, 1, poly = T)$omega.tot, 2), round(omega(dat.S.I,
1, poly = T)$omega.tot, 2), round(omega(dat.R, 1, poly = T)$omega.tot, 2),
round(omega(dat.N, 1, poly = T)$omega.tot, 2)))

unidim.res <- data.frame(items = J, PA, KGC, ratio.eigen, h2, alpha = a, omega = w,
row.names = c("E.N", "E.P", "E.I", "PD.V", "S.N", "S.P", "S.I", "R", "N"))
unidim.res

```

```

# Pearson, Spearman and Kendall correlations
pearson.cor <- pearson.p <- spearman.cor <- spearman.p <- kendall.cor <- kendall.p <-
matrix(NA, nrow = length(Bnames), ncol = length(Cnames), dimnames = list(Bnames,
Cnames))
for(b in Bnames){
  if("B.E.N" %in% b | "B.S.N" %in% b){
    M.dat.crit <- as.matrix(dat.crit.N)
  } else {
    M.dat.crit <- as.matrix(dat.crit)
  }
  for(c in Cnames){
    tmp <- cor.test(M.dat.crit[,b], M.dat.crit[,c], method = "pearson")
    pearson.cor[b, c] <- round(tmp$estimate, 3)
    pearson.p[b, c] <- round(tmp$p.value, 4)

    tmp <- cor.test(M.dat.crit[,b], M.dat.crit[,c], method = "spearman")
    spearman.cor[b, c] <- round(tmp$estimate, 3)
    spearman.p[b, c] <- round(tmp$p.value, 4)

    tmp <- cor.test(M.dat.crit[,b], M.dat.crit[,c], method = "kendall")
    kendall.cor[b, c] <- round(tmp$estimate, 3)
    kendall.p[b, c] <- round(tmp$p.value, 4)
  }
}
pearson.cor
pearson.p

spearman.cor
spearman.p

kendall.cor
kendall.p

#-----
# Regressions
#-----

Bnames <- c("B.E.N", "B.E.P", "B.E.I", "B.PD.V", "B.S.N", "B.S.P", "B.S.I", "B.R",
"B.N")
Cnames <- c("edad", "porno", "mast", "sexo", "consec", "attract", "genero")

Msexo <- c("sexo", "edad", "genero")
Mporno <- c("porno", "edad", "genero")

logbinR <- list(B.E.N = list(), B.E.P = list(), B.E.I = list(), B.PD.V = list(), B.S.N =
list(), B.S.P = list(), B.S.I = list(), B.R = list(), B.N = list())
fit.res <- poissonR <- nbR <- logbinR
for(b in Bnames){
  if("B.E.N" %in% b | "B.S.N" %in% b){
    M.dat.crit <- as.matrix(dat.crit.N)
    M.dat.crit.poisson <- as.matrix(dat.crit.N.poisson)
  } else {
    M.dat.crit <- as.matrix(dat.crit)
    M.dat.crit.poisson <- as.matrix(dat.crit.poisson)
  }
}

```

```

# Binary Logistic Regression
dic.M.dat.crit <- ifelse(M.dat.crit[,b] > 0, 1, 0)

logbin.sexo <- glm(dic.M.dat.crit ~ M.dat.crit[,Msexo], family = "binomial")
summ.logbin.sexo <- summary(logbin.sexo)
CI.logbin.sexo <- confint(logbin.sexo)
logbinR[[b]][["sexo"]] <- cbind(summ.logbin.sexo$coefficients, CI.logbin.sexo)

logbin.porno <- glm(dic.M.dat.crit ~ M.dat.crit[,Mporno], family = "binomial")
summ.logbin.porno <- summary(logbin.porno)
CI.logbin.porno <- confint(logbin.porno)
logbinR[[b]][["porno"]] <- cbind(summ.logbin.porno$coefficients, CI.logbin.porno)

# Poisson Regression
poisson.sexo <- glm(M.dat.crit.poisson[,paste0(b, ".poisson")] ~
M.dat.crit.poisson[,Msexo], family = "poisson")
summ.poisson.sexo <- summary(poisson.sexo)
CI.poisson.sexo <- confint(poisson.sexo)
poissonR[[b]][["sexo"]] <- cbind(summ.poisson.sexo$coefficients, CI.poisson.sexo)

poisson.porno <- glm(M.dat.crit.poisson[,paste0(b, ".poisson")] ~
M.dat.crit.poisson[,Mporno], family = "poisson")
summ.poisson.porno <- summary(poisson.porno)
CI.poisson.porno <- confint(poisson.porno)
poissonR[[b]][["porno"]] <- cbind(summ.poisson.porno$coefficients, CI.poisson.porno)

# Negative binomial regression
nb.sexo <- glm.nb(M.dat.crit[,b] ~ M.dat.crit[,Msexo], dat.crit)
summ.nb.sexo <- summary(nb.sexo)
CI.nb.sexo <- confint(nb.sexo)
nbR[[b]][["sexo"]] <- cbind(summ.nb.sexo$coefficients, CI.nb.sexo)

nb.porno <- glm.nb(M.dat.crit[,b] ~ M.dat.crit[,Mporno], dat.crit)
summ.nb.porno <- summary(nb.porno)
CI.nb.porno <- confint(nb.porno)
nbR[[b]][["porno"]] <- cbind(summ.nb.porno$coefficients, CI.nb.porno)

# Models fit
aic.sexo <- c(AIC(logbin.sexo), AIC(poisson.sexo), AIC(nb.sexo))
bic.sexo <- c(BIC(logbin.sexo), BIC(poisson.sexo), BIC(nb.sexo))
fit.sexo <- matrix(c(aic.sexo, bic.sexo), nrow = 2, ncol = 3, byrow = T, dimnames =
list(c("AIC", "BIC"), c("logbin", "poisson", "nb")))
fit.res[[b]][["sexo"]] <- fit.sexo

aic.porno <- c(AIC(logbin.porno), AIC(poisson.porno), AIC(nb.porno))
bic.porno <- c(BIC(logbin.porno), BIC(poisson.porno), BIC(nb.porno))
fit.porno <- matrix(c(aic.porno, bic.porno), nrow = 2, ncol = 3, byrow = T, dimnames =
list(c("AIC", "BIC"), c("logbin", "poisson", "nb")))
fit.res[[b]][["porno"]] <- fit.porno
}

```

```

# Results
logbinR.coef <- logbinR.coef.exp <- logbinR.p <- logbinR.se <- logbinR.lowCI <-
logbinR.upCI <- matrix(NA, nrow = 9, ncol = 2, dimnames = list(Bnames, c("sexo",
"porno")))
for(b in Bnames){
  tmp.sexo <- logbinR[[b]]$sexo[2,]
  tmp.porno <- logbinR[[b]]$porno[2,]
  logbinR.coef[b, "sexo"] <- round(tmp.sexo[1], 3)
  logbinR.coef[b, "porno"] <- round(tmp.porno[1], 3)
  logbinR.coef.exp[b, "sexo"] <- round(exp(tmp.sexo[1]), 3)
  logbinR.coef.exp[b, "porno"] <- round(exp(tmp.porno[1]), 3)
  logbinR.p[b, "sexo"] <- round(tmp.sexo[4], 5)
  logbinR.p[b, "porno"] <- round(tmp.porno[4], 5)
  logbinR.se[b, "sexo"] <- round(tmp.sexo[2], 3)
  logbinR.se[b, "porno"] <- round(tmp.porno[2], 3)
  logbinR.lowCI[b, "sexo"] <- round(exp(tmp.sexo[5]), 3)
  logbinR.lowCI[b, "porno"] <- round(exp(tmp.porno[5]), 3)
  logbinR.upCI[b, "sexo"] <- round(exp(tmp.sexo[6]), 3)
  logbinR.upCI[b, "porno"] <- round(exp(tmp.porno[6]), 3)
}
logbinR.coef
logbinR.coef.exp
logbinR.se
logbinR.p
logbinR.lowCI
logbinR.upCI
ifelse(logbinR.p < 0.001, logbinR.coef.exp, NA)
ifelse(logbinR.p >= 0.001 & logbinR.p < 0.01, logbinR.coef.exp, NA)
ifelse(logbinR.p >= 0.01 & logbinR.p < 0.05, logbinR.coef.exp, NA)

poissonR.coef <- poissonR.coef.exp <- poissonR.p <- poissonR.se <- poissonR.lowCI <-
poissonR.upCI <- matrix(NA, nrow = 9, ncol = 2, dimnames = list(Bnames, c("sexo",
"porno")))
for(b in Bnames){
  tmp.sexo <- poissonR[[b]]$sexo[2,]
  tmp.porno <- poissonR[[b]]$porno[2,]
  poissonR.coef[b, "sexo"] <- round(tmp.sexo[1], 3)
  poissonR.coef[b, "porno"] <- round(tmp.porno[1], 3)
  poissonR.coef.exp[b, "sexo"] <- round(exp(tmp.sexo[1]), 3)
  poissonR.coef.exp[b, "porno"] <- round(exp(tmp.porno[1]), 3)
  poissonR.p[b, "sexo"] <- round(tmp.sexo[4], 5)
  poissonR.p[b, "porno"] <- round(tmp.porno[4], 5)
  poissonR.se[b, "sexo"] <- round(tmp.sexo[2], 3)
  poissonR.se[b, "porno"] <- round(tmp.porno[2], 3)
  poissonR.lowCI[b, "sexo"] <- round(exp(tmp.sexo[5]), 3)
  poissonR.lowCI[b, "porno"] <- round(exp(tmp.porno[5]), 3)
  poissonR.upCI[b, "sexo"] <- round(exp(tmp.sexo[6]), 3)
  poissonR.upCI[b, "porno"] <- round(exp(tmp.porno[6]), 3)
}
poissonR.coef
poissonR.coef.exp
poissonR.se
poissonR.p
poissonR.lowCI
poissonR.upCI
ifelse(poissonR.p < 0.001, poissonR.coef.exp, NA)
ifelse(poissonR.p >= 0.001 & poissonR.p < 0.01, poissonR.coef.exp, NA)
ifelse(poissonR.p >= 0.01 & poissonR.p < 0.05, poissonR.coef.exp, NA)

```

```

nbR.coef <- nbR.coef.exp <- nbR.p <- nbR.se <- nbR.lowCI <- nbR.upCI <- matrix(NA, nrow
= 9, ncol = 2, dimnames = list(Bnames, c("sexo", "porno")))
for(b in Bnames){
  tmp.sexo <- nbR[[b]]$sexo[2,]
  tmp.porno <- nbR[[b]]$porno[2,]
  nbR.coef[b, "sexo"] <- round(tmp.sexo[1], 3)
  nbR.coef[b, "porno"] <- round(tmp.porno[1], 3)
  nbR.coef.exp[b, "sexo"] <- round(exp(tmp.sexo[1]), 3)
  nbR.coef.exp[b, "porno"] <- round(exp(tmp.porno[1]), 3)
  nbR.p[b, "sexo"] <- round(tmp.sexo[4], 5)
  nbR.p[b, "porno"] <- round(tmp.porno[4], 5)
  nbR.se[b, "sexo"] <- round(tmp.sexo[2], 3)
  nbR.se[b, "porno"] <- round(tmp.porno[2], 3)
  nbR.lowCI[b, "sexo"] <- round(exp(tmp.sexo[5]), 3)
  nbR.lowCI[b, "porno"] <- round(exp(tmp.porno[5]), 3)
  nbR.upCI[b, "sexo"] <- round(exp(tmp.sexo[6]), 3)
  nbR.upCI[b, "porno"] <- round(exp(tmp.porno[6]), 3)
}
nbR.coef
nbR.coef.exp
nbR.se
nbR.p
nbR.lowCI
nbR.upCI
ifelse(nbR.p < 0.001, nbR.coef.exp, NA)
ifelse(nbR.p >= 0.001 & nbR.p < 0.01, nbR.coef.exp, NA)
ifelse(nbR.p >= 0.01 & nbR.p < 0.05, nbR.coef.exp, NA)

```





## 7. Resumen ampliado en español

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### INTRODUCCIÓN

Internet ha configurado un nuevo contexto de comunicación cambiando la forma en que los adolescentes interactúan y establecen sus relaciones interpersonales más íntimas. El uso de dispositivos electrónicos y aplicaciones móviles permite a los adolescentes llevar a cabo sus propias actividades de exploración y expresión sexual (Döring, 2014). El sexting es una de estas actividades sexuales, por medio de la cual los adolescentes intercambian contenidos multimedia sexuales personales (Madigan et al., 2018). Este término ha sido utilizado comúnmente para referirse a las experiencias de envío, recepción o reenvío de mensajes sexuales (en adelante, "sext") a través de Internet (Klettke et al., 2014). Sin embargo, estudios de revisión crítica sobre el tema destacan la variedad de formas en cómo el sexting ha sido definido y evaluado en investigaciones empíricas, dando como resultado cifras de prevalencia muy dispares entre sí (Barrense-Dias et al., 2017; Cooper et al., 2016; Klettke et al., 2014; Kosenko et al., 2017; Madigan et al., 2018).

La participación de los adolescentes en el sexting puede resultar positiva en aspectos relacionados con su sexualidad, en la medida en que les facilita explorar nuevas formas de comunicación. Sin embargo, también puede exponerles a riesgos que no sepan reconocer por carecer todavía de la madurez suficiente que les prevenga de consecuencias indeseables (Gámez-Guadix & De Santisteban, 2018; Houck et al., 2014). En esta línea, la investigación sobre sexting en adolescentes distingue dos discursos claramente diferenciados (Cooper et al., 2016). Así como unos investigadores apoyan la idea de que el sexting es sólo una forma más de expresión sexual ubicada en el contexto sexual y romántico contemporáneo (Cooper et al., 2016; Döring, 2014), otros alertan sobre sus posibles riesgos y consecuencias (Gassó et al., 2019; Kernsmith et al., 2018). Sin duda, la falta de explicación teórica sobre el sexting y sobre los procesos que conducen a su práctica, ha avivado el debate. En este sentido, son pocos los estudios que relacionan el sexting con procesos psicológicos, sociales y/o educativos (De Wolf, 2020; van Ouytsel et al., 2019), y cada vez parece haber un mayor consenso en considerar el sexting como una práctica normalizada utilizada con fines sexuales (Burkett, 2015; Döring, 2014).

Visto así, la práctica del sexting permite a muchos adolescentes, incluso a aquellos menos preparados, iniciar nuevas relaciones afectivas o sexuales sin necesidad de interactuar cara a cara con otras personas.

Las motivaciones más empleadas por los adolescentes para justificar su implicación en conductas de sexting se relacionan con el inicio y/o el mantenimiento de relaciones románticas incipientes o establecidas, ya sea de forma próxima o a distancia (Cooper et al., 2016; van Ouytsel et al., 2019; Walker et al., 2013). El sexting también puede ser considerado un indicador de desarrollo sexual adolescente, tanto en términos de disponibilidad como de voluntariedad a la hora de involucrarse en actividades de experimentación sexual. De hecho, diversos estudios empíricos y meta-analíticos relacionan el sexting con un aumento de la actividad sexual en adolescentes (Handschuh et al., 2019; Mori et al., 2019); de otro lado, existen estudios que destacan los múltiples riesgos que entraña su práctica (Gassó et al., 2019; Kernsmith et al., 2018). El principal riesgo parece ser la difusión no consentida de imágenes o videos sexuales privados. El uso malintencionado de estos contenidos puede dar lugar a diferentes formas de cibervictimización, incluyendo la violencia en el noviazgo, la sextorsión, el cyberbullying o el grooming (Medrano et al., 2018; Van Ouytsel et al., 2019; Wolak et al., 2018). Asimismo, algunas investigaciones han relacionado la práctica de sexting con desórdenes emocionales, como estrés, ansiedad, depresión, así como con intentos e ideaciones suicidas (Medrano et al., 2018; Mori et al., 2019).

El auge del sexting entre los adolescentes ha dado lugar a una proliferación de estudios sobre su prevalencia, sin embargo, todavía no hay cifras suficientemente precisas. Un meta-análisis reciente estima que la prevalencia media de envío y recepción de sexts en adolescentes es de 14.8% (IC 95%: 12.8, 16.8) y 27.4% (IC 95%: 23.1, 31.7), respectivamente, con una alta variabilidad en las estimaciones ( $I^2=98\%$  a  $99\%$ , respectivamente). La difusión no consentida de sexts se estima entre un 8.4% y un 15.6%. Los estudios sobre sexting en adolescentes también se han centrado en analizar los principales correlatos demográficos, como el sexo y la edad, pero con resultados poco concluyentes: los datos más sólidos sostienen que el sexting es más frecuente con la edad, y que aquellos que lo practican tienen una mayor probabilidad de involucrarse en relaciones coitales (Handschuh et al., 2019; Madigan et al., 2018). El uso frecuente de dispositivos electrónicos y redes sociales también han pronosticado el sexting adolescente en algunos estudios (Baumgartner et al., 2012, 2014). Por contra, las evidencias empíricas

sobre relaciones con variables familiares y escolares son todavía demasiado escasas como para establecer conclusiones de cierta solidez al respecto.

Esta variabilidad en las tasas de prevalencia y esta poca solidez en los resultados sobre los correlatos del sexting se deben principalmente a deficiencias conceptuales y metodológicas en los estudios (Barrense-Dias et al., 2017; Klettke et al., 2014). Una razón importante es la falta de consenso sobre una definición operativa de sexting y sus elementos conceptuales de referencia (Barrense-Dias et al., 2017). En cuanto a los **correlatos**, las definiciones de sexting difieren en varios aspectos importantes, como las acciones del propio adolescente, el canal de transmisión de los sexts, los distintos tipos de contenido multimedia, el grado de explicitud sexual, el marco temporal de la medida, y la voluntariedad y/o el contexto en que se practica. Si bien, algunos estudios analizan experiencias “activas” de sexting (por ejemplo, enviar), otros incluyen también experiencias “pasivas” (por ejemplo, recibir) (Barrense-Dias et al., 2017). Algunos estudios distinguen el "sexting primario" o envío de contenidos sexuales propios, del "sexting secundario", que implica la difusión de dicho material sin el consentimiento de la persona protagonista del sext (Calvert, 2009). Otras diferencias se refieren a los canales de transmisión, como ordenadores, teléfonos móviles o, incluso, la no especificación de canal alguno (es decir, a través de Internet) (Barrense-Dias et al., 2017). Si bien hay definiciones de sexting que sólo consideran mensajes de texto, otras incluyen contenido audiovisual (p. ej., imágenes, videos), pero caracterizándolos con adjetivos muy generales, como "sexy", "sexual" o "provocativo" (Barrense-Dias et al., 2019). Otro aspecto importante es la imprecisión en el marco temporal de las medidas de sexting: mientras que unos estudios preguntan por experiencias de sexting en el mes anterior a la encuesta, otros se refieren a prevalencias de vida (Dolev-Cohen & Ricon, 2020; Frankel et al., 2018). Tampoco hay muchos estudios que evalúen experiencias de sexting contemplando diferentes destinatarios, como pareja, amigos o desconocidos (Burén & Lunde, 2018; Dolev-Cohen & Ricon, 2020). Este aspecto es especialmente relevante al tratar con la población adolescente, pues los riesgos a los que pueden verse expuestos varían de forma importante según el destinatario: aunque en varios estudios se presupone el carácter voluntario del sexting, en la mayoría de los informes no se especifica este carácter; tampoco se consideran las presiones directas y/o indirectas que los adolescentes pueden recibir de dichos destinatarios (Gámez-Guadix et al., 2017; Lippman & Campbell, 2014). Por último, la pregunta sobre cuál es el objetivo de participar en experiencias de sexting se ha especificado en muy pocos estudios (Gregg et al., 2018; Houck et al., 2014).

Las tasas de prevalencia de sexting entre adolescentes varían también en función de aspectos metodológicos de los estudios, como los objetivos de investigación, las técnicas de muestreo, los instrumentos y procedimientos administrados, entre otros (Cooper et al., 2016; Klettke et al., 2014; Kosenko et al., 2014; al., 2017). La limitación más notable es la ausencia de consenso sobre la medida del sexting y la variedad de estrategias metodológicas empleadas para evaluarlo. Hasta donde sabemos, solo existe un instrumento validado en muestras de adolescentes cuyo objetivo sea la medida del sexting: la Escala de Difusión de Imágenes Íntimas (EDIMA) (Penado et al., 2019). Sin embargo, EDIMA no cubre las deficiencias conceptuales y metodológicas mencionadas anteriormente. Este instrumento, y otros ítems individuales aplicados en algunos estudios empíricos, sugieren que el sexting sucede sobre todo a través de teléfonos móviles o redes sociales, sin cubrir otras posibles tecnologías o plataformas. Tampoco contemplan otros posibles formatos multimedia, como grabaciones de audios, por ejemplo (Hertlein & Twist, 2017). Igualmente, los sexts han sido adjetivados con términos muy generales y difusos, quedando sujetos a la interpretación particular de los encuestados. Tampoco se ha considerado la voluntariedad de forma explícita, lo que impide distinguir entre grados de voluntariedad, como el sexting voluntario, el sexting no deseado pero consensuado y/o el sexting coercitivo.

En definitiva, la investigación sobre sexting en adolescentes necesita superar estas numerosas limitaciones conceptuales y metodológicas para poder ofrecer a investigadores y profesionales cifras de prevalencia confiables, calculadas a partir de la inclusión de elementos definitorios de referencia imprescindibles. Ello posibilitará examinar cómo estos elementos definitorios y otros aspectos metodológicos moderan la prevalencia de sexting. Igualmente, es preciso desarrollar y validar un instrumento de medida del sexting que cubra las deficiencias detectadas en la literatura previa. En un intento de superar las carencias expuestas, esta Tesis Doctoral se propuso alcanzar tres objetivos secuenciados.

El primer objetivo fue examinar la prevalencia de sexting en una muestra de estudiantes españoles de educación secundaria. Los propósitos específicos fueron: analizar la prevalencia del sexting, diferenciando los elementos definitorios de referencia, e identificar factores explicativos relacionados con variables sociodemográficas, familiares, educativas, y de posesión y uso de TICS y redes sociales.

El segundo objetivo fue realizar una revisión sistemática y un meta-análisis para evaluar la prevalencia de sexting en adolescentes. Dada la gran variabilidad encontrada en estudios empíricos y de revisión sobre la prevalencia de sexting, se consideró

prioritario examinar los elementos conceptuales y metodológicos susceptibles de moderar dicha variabilidad.

El tercer y último objetivo fue desarrollar y validar un instrumento de medida de sexting en adolescentes dirigido a superar las deficiencias conceptuales y metodológicas detectadas, no solo en estudios empíricos y de revisión previos, sino también en pequeños instrumentos, escalas y reactivos.

## **METODOLOGÍA**

### **Artículo 1**

En respuesta al primer objetivo se realizó un estudio empírico transversal de carácter exploratorio. Para la recolección de los datos se empleó un cuestionario en papel, administrado en las propias aulas. La selección de los participantes se realizó a partir de un muestreo no probabilístico accidental. Todos los participantes dieron su consentimiento y fueron informados del carácter voluntario y anónimo del estudio.

La muestra fue de 647 adolescentes de ambos sexos (52.20% chicos), con edades comprendidas entre los 11 y los 18 años de edad, procedentes de dos centros de Enseñanza Secundaria Obligatoria de carácter concertado y dos de carácter público, localizados en una región del sur de la provincia de Valencia. Se utilizó un cuestionario diseñado para profundizar en el análisis de la prevalencia de sexting, compuesto por 23 preguntas orientadas a cubrir los elementos definatorios de referencia, parcialmente considerados o totalmente ignorados en la literatura previa. El cuestionario incluyó preguntas directas sobre: las tres principales experiencias de sexting (envío, recepción y reenvío de sexts); el formato multimedia (textos, imágenes, videos, grabaciones de audio y enlaces); el perfil de quien protagonizaba los sexts, y el canal de transmisión. El cuestionario también registró: variables sociodemográficas (sexo, edad); variables familiares (composición familiar, situación laboral familiar); escolares (nivel educativo, ser nuevo en la escuela, repetir curso); la posesión y uso de dispositivos tecnológicos; la participación en redes sociales, y la publicación de archivos en las ellas.

Se calcularon estadísticos descriptivos y se aplicaron pruebas *ji*-cuadrado para probar la asociación entre variables dicotómicas. La estimación del tamaño del efecto se calculó como la diferencia de proporciones (IC del 95%). Se construyeron modelos de regresión logística binaria para analizar el efecto de las variables predictoras evaluadas. Se examinaron los valores atípicos e influyentes y se comprobaron los supuestos de

normalidad, homocedasticidad e interdependencia. Los análisis estadísticos se llevaron a cabo con el programa SPSS versión 25.0.

## Artículo 2

Para lograr el segundo objetivo, se llevó a cabo una revisión sistemática y un meta-análisis siguiendo las directrices marcadas en la declaración PRISMA (siglas en inglés de Preferred Reported Items for Systematic Reviews and Meta-Analysis). Para la búsqueda de registros se consultaron las bases de datos electrónicas ERIC, PsycINFO, MEDLINE, Scopus, Web of Science, y fuentes de literatura gris. Se incluyeron estudios empíricos originales sobre prevalencia de sexting en adolescentes con edad máxima de 18 años, publicados hasta febrero de 2020, escritos en inglés y en español. Se registraron los resultados de todos los estudios que reportaron tasas de prevalencia de envío, recepción o reenvío de sexts. Se evaluó el riesgo de sesgo y se examinó su efecto sobre las estimaciones de prevalencia. Fueron codificados y analizados potenciales moderadores metodológicos (p. ej., técnicas de muestreo, procedimientos de administración utilizados) y conceptuales (p. ej., grado de explicitud sexual de los sexts, el contexto en el que se practica sexting, la voluntariedad o el marco temporal de la medida).

Se realizó un meta-análisis de efectos mixtos de tres niveles para estimar la prevalencia de sexting, presentando las estimaciones con los intervalos de confianza (IC del 95%) y los intervalos de credibilidad (CR del 95%). Esta estrategia de análisis consideró la dependencia entre los tamaños del efecto reportados en un mismo estudio, especialmente apropiado en estudios sobre prevalencia de sexting. La heterogeneidad estadística se evaluó utilizando los coeficientes  $Q$  y  $Tau^2$ . La heterogeneidad entre estudios también se examinó de acuerdo con la prueba  $Q$  de Cochran (moderadores categóricos) y meta-regresiones (moderadores cuantitativos). Se realizó un análisis de los componentes de la varianza, de los posibles estudios / resultados periféricos e influyentes y del sesgo de publicación. Los análisis estadísticos se realizaron con el paquete Metafor (versión 2.4-0) para R.

## Artículo 3

Con respecto al tercer objetivo, se diseñó la Escala de Sexting para Adolescentes (A-SextS, en inglés). La escala se validó en una muestra de 579 adolescentes (52,68% chicos), de 11 a 18 años, procedentes de dos centros de Enseñanza Secundaria Obligatoria ubicados, respectivamente, en una zona metropolitana y rural de la Comunidad Valenciana.

La recogida de datos se llevó a cabo entre el 2 y el 13 de marzo de 2020. La escala se administró a los participantes en sus aulas habituales y durante un periodo regular de clase. Los participantes recibieron todas las instrucciones a través de un video tutorial grabado por un locutor profesional. Posteriormente, los adolescentes registraron sus respuestas en cuestionarios con formato de papel. La participación de los estudiantes fue voluntaria y anónima, y el registro de las respuestas duró, aproximadamente, 40 minutos.

Este estudio se llevó a cabo en dos etapas. En la primera etapa, se estudiaron la validez de contenido y la validez aparente a través de tres estrategias: (a) una revisión comprensiva de la literatura; (b) grupos de discusión de adolescentes, y (c) un estudio piloto. La segunda etapa tuvo como objetivo obtener un conjunto de evidencias de validez concurrente y de validez de criterio de la escala. La validez de contenido y aparente se obtuvieron mediante el análisis de medidas aplicadas en estudios empíricos sobre prevalencia de sexting en muestras de adolescentes, obtenidas en nuestro trabajo de revisión anterior (artículo 2). Después de esta revisión, se llevaron a cabo dos grupos de discusión buscando delimitar la validez de contenido y aparente, así como la caracterización de algunos dominios y cuestiones terminológicas sobre el sexting que la literatura previa había considerado como inconsistentes y vagos. Tanto la revisión de la literatura como los grupos de discusión proporcionaron información útil sobre cómo cubrir las deficiencias conceptuales detectadas en estudios anteriores sobre sexting adolescente. Finalmente, una lista actualizada de 67 ítems se sometió a una prueba piloto con 96 estudiantes de educación secundaria, para detectar posibles incorrecciones, realizar los ajustes necesarios, replantear la adecuación o no de los reactivos iniciales, así como una redacción más ajustada de los ítems evaluados.

Para evaluar la validez concurrente se compararon las estimaciones de prevalencias de nuestra escala con las estimaciones de prevalencia reportadas en estudios empíricos y/o meta-analíticos anteriores. La validez de criterio fue evaluada verificando la relación entre las estimaciones de nuestra escala y diferentes variables que la literatura previa ha identificado como directamente relacionadas. Este es el caso de la edad, la actividad sexual y el consumo de pornografía.

Para evaluar la validez de criterio, en primer lugar, se comprobó el supuesto de unidimensionalidad esencial de cada subescala mediante diferentes criterios: un análisis paralelo con componentes principales y correlaciones policóricas, tomando como criterio medio un número de autovalores superior a uno y una ratio superior a cuatro entre el primer y el segundo autovalor. Además, para evaluar la confiabilidad de cada subescala

se utilizó Alfa de Cronbach y Omega de McDonald. En segundo lugar, se calcularon los coeficientes de correlación Tau de Kendall entre cada subescala y cada una de las variables criterio. Se evaluaron la magnitud y la significación estadística de las correlaciones. Por último, debido a la distribución asimétrica de las puntuaciones obtenidas en cada subescala, se realizaron tres tipos de regresiones (logística binaria, de Poisson y binomial negativa) con el objetivo de analizar el efecto de las variables consumo de pornografía y actividad sexual en cada subescala. Los análisis se realizaron utilizando el programa estadístico R.

## RESULTADOS

Los tres artículos que conforman la Tesis Doctoral están firmados por el doctorando como primer autor, y han sido previamente: 1) evaluados por pares, 2) aceptados, y 3) publicados en inglés y exclusivamente en revistas especializadas de alto impacto, debidamente indexadas y pertenecientes a primeros cuartiles (Q1 y Q2) de acuerdo con los índices JCR (Journal Citation Reports, año 2019) y SJR (Scimago Journal Rank, año 2019). Los resultados obtenidos en esta Tesis Doctoral han dado lugar a los siguientes artículos:

1. Molla-Esparza, C., López-González, E., y Losilla, J. M. (2021). Sexting Prevalence and Socio-Demographic Correlates in Spanish Secondary School Students. *Sexuality Research and Social Policy*, 18, 97-111. <https://doi.org/10.1007/s13178-020-00434-0>
  - a. Factor de impacto ISI-JCR (2019): 2.405 (2019); 5-Años Factor de Impacto ISI-JCR (2019): 2.269 (edición SSCI). La revista *Sexuality Research and Social Policy* actualmente ocupa el puesto 21/108 (Q1, Primer cuartil) en el área de “Ciencias sociales, interdisciplinario” (edición SSCI).
  - b. Factor de impacto SJR (2019): 1.091. La revista *Sexuality Research and Social Policy* se sitúa en el Primer cuartil (Q1) en el área “Estudios de género”, Primer cuartil (Q1) en el área de “Salud (Ciencias sociales)”, y Primer cuartil (Q1) en la categoría de “Sociología y Ciencias políticas”.
  - c. La revista *Sexuality Research and Social Policy* es una revista internacional que publica investigaciones empíricas originales sobre



sobre temas relacionados con la sexualidad, tanto trabajos teóricos como metodológicos, así como sus implicaciones en el establecimiento de políticas y acciones a nivel internacional sobre educación sexual, salud sexual y derechos sexuales de las diversas comunidades.

2. Molla-Esparza, C., Losilla, J. M., y López-González, E. (2020). Prevalence of Sending, Receiving and Forwarding Sexts among Youth: A Three-Level Meta-Analysis. *PLoS ONE* 15(12): e0243653. <https://doi.org/10.1371/journal.pone.0243653>
  - a. Factor de Impacto ISI-JCR: 2.740 (2019); 5-Años Factor de Impacto: 3.227 (2019) (edición SCIE). La revista PLoS ONE actualmente ocupa el puesto 27/71 (Q2, Segundo cuartil) en el área “Ciencias multidisciplinares”.
  - b. Factor de impacto SJR (2019): 1.023. La revista PLoS ONE se sitúa en el Primer cuartil (Q1) en el área “Multidisciplinar”.
  - c. La revista PLoS One es una revista científica de acceso abierto que publica investigaciones de carácter multidisciplinar e interdisciplinar. Esta revista acepta investigaciones en más de doscientas áreas temáticas sobre Ciencias sociales y humanidades, ingeniería o medicina. Las investigaciones publicadas son valoradas principalmente en función de su calidad técnica.
  
3. Molla-Esparza, C., Nájera, P., López-González, E., y Losilla, J.-M. (2020). Development and Validation of the Adolescent Sexting Scale (A-SextS) with a Spanish Sample. *International Journal of Environmental Research and Public Health*, 17(21), 8042. <https://doi.org/10.3390/ijerph17218042>
  - a. Factor de Impacto ISI-JCR: 2.849 (2019); 5-Años Factor de Impacto: 3.127 (2019) (edición SSCI). La revista International Journal of Environmental Research and Public Health actualmente ocupa el puesto 32/171 (Q1, Primer cuartil) en el área de "Salud pública, ambiental y ocupacional" (edición SSCI).
  - b. Factor de Impacto SJR (2019): 0.739. La revista International Journal of Environmental Research and Public Health se sitúa en el Segundo cuartil (Q2) en el área de "Salud pública, ambiental y ocupacional".

- c. La revista *International Journal of Environmental Research and Public Health* es una revista interdisciplinaria de acceso abierto. Cubre las áreas de Ciencias e Ingeniería ambiental, Salud pública, Salud ambiental, Higiene ocupacional, Investigación en Salud económica y Salud global. Esta revista publicará en 2021 un número especial monográfico sobre sexting en el que se incluirá nuestro estudio.

## CONCLUSIONES

Consideramos que esta Tesis Doctoral contribuye a enriquecer el conocimiento sobre la práctica de sexting en adolescentes.

El primer estudio amplió la investigación previa sobre el tema, al profundizar en algunos elementos de referencia que definen el sexting: las experiencias de sexting, los formatos multimedia, el perfil de los protagonistas de los contenidos que se emplean en el sexting y su canal de transmisión. Al incorporar estos aspectos, el estudio logró superar varias deficiencias conceptuales detectadas en investigaciones empíricas previas, que sólo atendían en parte a algunos elementos o, sencillamente, no los contemplaban. Además, en este estudio se examinó el potencial predictivo sobre la conducta de sexting de variables sociodemográficas, familiares, educativas y de uso de dispositivos de comunicación tecnológica y redes sociales, delimitando así el perfil sociodemográfico de los adolescentes involucrados. Los resultados confirmaron que el sexting es una práctica común entre los estudiantes españoles de educación secundaria. Los sexts en formato de imagen y video fueron los más intercambiados, recibidos principalmente a través de canales privados, protagonizados en su mayoría por adolescentes del sexo opuesto y conocidos personalmente por los encuestados. Los resultados también indicaron que casi una quinta parte de la muestra había reenviado un sext, y que los sexts recibidos exclusivamente a través de canales grupales estaban protagonizados por adolescentes del mismo sexo que el receptor. Estos resultados sugieren que, en ocasiones, el sexting está lejos de ser una práctica sexual consensuada y privada entre dos personas.

En cuanto al perfil sociodemográfico, familiar y educativo de los adolescentes involucrados en experiencias de sexting, se encontró que aquellos que habían enviado sexts tenían más probabilidades de haber repetido curso, participar en un mayor número de redes sociales y utilizarlas con mayor frecuencia. Ciertos subgrupos de estudiantes, incluidos los chicos, los adolescentes más mayores, los que viven en una familia

monoparental, los que informaron del uso de un mayor número de redes sociales y los que dedicaron más tiempo al uso de dispositivos tecnológicos y de redes sociales, fueron significativamente más propensos a recibir sexts. Aquellos que informaron haber reenviado sexts tenían una probabilidad mayor de ser chicos, de edades avanzadas, usar un mayor número de redes sociales y tener bajas expectativas de rendimiento en la asignatura de matemáticas.

El segundo estudio de la tesis proporcionó una meta-estimación actualizada de la prevalencia de sexting en adolescentes. Una contribución diferencial de este estudio fue la clasificación y análisis de factores metodológicos y conceptuales susceptibles de moderar la heterogeneidad de resultados encontrada en la literatura empírica previa sobre prevalencia de sexting. Nuestro meta-análisis reveló una alta prevalencia de envío y recepción de sexts en estudios con muestras de adolescentes publicados entre 2009 y 2020. Además, las prevalencias medias de envío, recepción y reenvío de sexts aumentaron con el año de recolección de datos de cada estudio y la edad media de las muestras.

Los resultados también subrayan la dificultad de establecer con precisión la prevalencia de cada una de las experiencias de sexting consideradas. En este sentido, la alta heterogeneidad en las estimaciones se vio afectada por cuestiones metodológicas y conceptuales. La baja calidad metodológica de los estudios incluidos en nuestro meta-análisis fue uno de los aspectos más importantes a destacar en esta investigación, pues influyó notablemente en las estimaciones de prevalencia de sexting. Los resultados del estudio también destacan la importancia de otros aspectos metodológicos, en especial las técnicas de muestreo empleadas en los estudios empíricos. En este sentido, las muestras probabilísticas ayudaron a explicar la heterogeneidad encontrada y reportaron prevalencias medias significativamente más bajas. Los procedimientos de administración auto-informados también llevaron a estimaciones de prevalencia más homogéneas. Además, la prevalencia del **envío** de sexts varió según el marco temporal de referencia. En cuanto a los factores conceptuales, el formato multimedia de los sexts moderó la prevalencia de sexting: los sexts de mensajes de texto se intercambian con mayor frecuencia que las imágenes o los videos. En definitiva, consideramos que operacionalizaciones similares de sexting y un reporte más detallado de sus elementos conceptuales de referencia, posibilitarán, en futuras investigaciones, comparar de forma más exhaustiva las prevalencias del sexting y delimitar posibles explicaciones de su heterogeneidad.

En el tercer y último estudio se diseñó y validó la Escala de Sexting para Adolescentes (A-SextS), un instrumento claro, de calidad, útil y muy mejorado respecto a instrumentos e intentos de medición previos. Creemos que la escala A-SextS cubre las deficiencias conceptuales y metodológicas identificadas, no solo en los estudios empírico y meta-analítico incluidos en la tesis (artículo 1 y artículo 2), sino también en otros estudios empíricos, de revisión y escalas anteriores. La estructura modular del instrumento permite que investigadores y profesionales interesados en el tema combinen y/o focalizarse en el registro de determinados dominios del sexting de su interés, incluido el tipo de relación entre emisor y receptor, el contenido multimedia, la explicitud de los contenidos y el grado de voluntariedad. Además, el instrumento considera un aspecto bastante arriesgado del sexting, como mostrar la cara en los sexts, lo que resulta claramente novedoso respecto a medidas previas. Por último, la escala se ha diseñado con propiedades psicométricas adecuadas (evidencias de validez de contenido, concurrente y de criterio). En nuestra opinión, la A-SextS rompe un círculo vicioso que ha caracterizado hasta el momento gran parte de la literatura sobre sexting: un conjunto de resultados empíricos derivados de medidas de sexting de calidad cuestionable, que dificultaban el establecimiento de explicaciones teóricas de consenso sobre esta práctica.

A partir de los resultados obtenidos en este compendio de estudios, planteamos varias líneas de trabajo en cada uno de los artículos, a fin de continuar nuestra investigación. También se proponen algunas orientaciones para la implementación de medidas educativas sobre el tema. Nuestro próximo paso será explorar más a fondo el perfil demográfico de los adolescentes involucrados en experiencias de sexting, utilizando la escala A-SextS. Con el uso de esta escala esperamos obtener estimaciones de prevalencia más precisas, una caracterización más completa de los adolescentes y una mejor descripción del perfil de los adolescentes involucrados en esta práctica. Es de esperar también que la proliferación de estudios empíricos que empleen una medida estandarizada, como la que aporta la escala A-SextS, contribuya positivamente al establecimiento de una definición operacionalizada y consensuada de la práctica de sexting.

\* Ver apartado 5. Referencias



