Technology-Facilitated Sexual Violence Perpetration and Victimization Among Adolescents: A Network Analysis

Manuel Gámez-Guadix[1,3] · Miguel A. Sorrel[2] · Jone Martínez-Bacaicoa[1]

Abstract

Introduction The present study sought to analyze the relationships between different forms of technology-facilitated sexual violence (TFSV) perpetration and victimization, including gender- and sexuality-based harassment, digital sexual harassment, and image-based sexual abuse (IBSA), which includes both sextortion and non-consensual pornography.

Methods The sample was composed of 1682 adolescents (865 girls; Mage = 13.90, SDage = 1.26) who completed self-report measures from November 2019 to March 2020. We conducted network analyses to analyze the relationships among different forms of TFSV perpetration and victimization.

Results Overall, girls had higher victimization scores, whereas boys had higher scores in the perpetration of several forms of TFSV. Gender- and sexuality-based victimization formed a cluster with digital sexual harassment victimization, while sextortion and nonconsensual pornography victimization formed a differentiated cluster. Forms of IBSA victimization and digital sexual harassment victimization were strongly associated with their perpetration counterparts for boys, but this was not the case for girls.

Conclusions The results revealed that the different forms of victimization and perpetration appear to be related and suggest that TFSV is a gendered form of abuse.

Policy Implications Findings from the present study suggest that preventive programs in schools and communities should be holistic and address various forms of TFSV.

Technology-facilitated sexual violence (TFSV) refers to the range of sexual and gender-based harmful behaviors carried out through information and communication technologies (Henry & Powell, 2018). TFSV is a prevalent phenomenon (Powell & Henry, 2019; Salerno-Ferraro et al., 2021; Snaychuk & O'Neill, 2020) and is

especially frequent among youth (Gámez-Guadix et al., 2015; Powell & Henry, 2019). According to the available empirical evidence, TFSV is a serious social problem that can cause victims to experience numerous negative consequences, such as feelings of loneliness, isolation, anxious and depressive symptoms, self-injurious behaviors, and suicidal thoughts (Bates, 2017; Champion et al., 2021; Eaton & McGlynn, 2020; Patel & Roesch, 2020). TFSV behaviors have been found to be more consistently perpetrated against women and sexual minorities and to be more harmful to these populations (e.g., Gámez-Guadix & Incera, 2021; Gámez-Guadix et al., 2022). Four different forms of TFSV have previously been identified in the literature (Henry & Powell, 2018; Patel & Roesch, 2020): gender- and/or sexuality-based harassment, digital sexual harassment, sextortion, and nonconsensual pornography. To our knowledge, however, there is no information about how victimization

✉ Manuel Gámez-Guadix
manuel.gamez@uam.es

1 Department of Health and Clinical Psychology, Faculty of Psychology, Autonomous University of Madrid, Madrid, Spain

2 Department of Social Psychology and Methodology, Faculty of Psychology, Autonomous University of Madrid, Madrid, Spain

3 Biological and Health Psychology Department, Faculty of Psychology, Autonomous University of Madrid, Madrid 28049, Spain

and the perpetration of different modalities of TFSV are interrelated. Hence, the aim of this study was to expand previous research by examining the occurrence and interrelation of different forms of TFSV among adolescents.

Types of Technology-Facilitated Sexual Violence

Gender- and/or sexuality-based harassment refers to any type of unwelcome and offensive behavior motivated by someone's gender or sexual orientation (Powell et al., 2020a, b). Forms of gender- and/or sexuality-based harassment include unwelcome or degrading comments or allusions relating to someone's gender or sexual orientation and aggressions motivated by the manifestation of behaviors discordant with assigned gender roles (Henry & Powell, 2018). Some specific examples of this type of harassment include excluding someone from an online group because of their sexuality or gender identity, or making sexist or homophobic comments. Although discrimination based on gender and discrimination based on sexual orientation have often been related (Barak, 2005), the dimension of "gender- and/ or sexuality-based harassment" can contain differentiated forms of gender identity harassment, gender role harassment, and sexual orientation harassment (Henry & Powell, 2018). Existing evidence indicates that both gender- and sexuality-based harassment are perpetrated mainly by men (Powell & Henry, 2019). Although research on this dimension is scarce, some studies have found gender differences in the nature of the victimization experienced, with women experiencing gender-based harassment to a greater extent (Powell & Henry, 2019) and men experiencing more attacks related to their sexuality and masculinity (Citron, 2014; Powell & Henry, 2019).

Digital sexual harassment refers to unwelcome attitudes and behaviors that convey sexual intent or desire and that are expressed using various technological means (Barak, 2005; Henry & Powell, 2018). Some examples of this type of harassment include making unwelcome comments about sexual organs, making unsolicited statements of sexual interest, sending unsolicited pictures of a sexual nature, and asking questions about a person's intimate or sexual life. Previous studies have indicated that digital sexual harassment is committed primarily by men and directed predominantly toward women (Campbell et al., 2021; Pew Research Center, 2021). Digital sexual harassment could be related to gender and sexual harassment. For example, it could be more likely that someone will make unwanted sexual approaches when women or sexual minorities are perceived as "easy" or "promiscuous" (Walker & Sleath, 2017). These biases could lead offenders to attempt sexual advances (for example, through questions or comments) even after the recipient has rejected them.

Finally, both sextortion and non-consensual pornography have been conceptualized as part of a larger continuum of image-based sexual abuse (IBSA) in which explicit or intimate images are used as a means of influencing or harming someone (Henry & Powell, 2015; McGlynn et al., 2017; O'Malley & Holt, 2020). *Sextortion* refers to a threat that sexual images will be distributed without consent, and it is engaged in by perpetrators with the aim of procuring further images, sexual interactions, goods, or other benefits (Patchin & Hinduja, 2020). Sexual images involving sextortion might initially be created and sent voluntarily by the victim but may later be used to threaten the victim (Wolak et al., 2018). *Non-consensual pornography* (often mistakenly called "revenge porn") involves the unauthorized distribution or publication of images of a sexual nature (Citron & Franks, 2014). As in sextortion, while sexual images may have been sent voluntarily by the victim, they may be subsequently distributed by the offender.

Throughout the literature, there are inconsistencies regarding gender differences in IBSA experiences. Some studies have found similar victimization rates between men and women (), whereas others have identified men as the primary victims (Patchin & Hinduja, 2020; Walker & Sleath, 2017). However, Ruvalcaba and Eaton (2020) found higher rates of nonconsensual pornography victimization among women. Regarding perpetration, some data have indicated that men are the main perpetrators (Patchin & Hinduja, 2020), while other studies have not found differences in perpetration rates of nonconsensual pornography (Clancy et al., 2019; Van Ouytsel et al., 2019).

Relationships Among Forms of Technology-Facilitated Sexual Violence

Although research on TFSV has increased rapidly in recent decades, it is a relatively new field that still needs to be advanced in several ways. For example, most research has studied TFSV victimization and perpetration separately (Gámez-Guadix et al., 2015; Powell & Henry, 2019); thus, little is known about the interrelationship between these two dimensions of TFSV. The association between offending and victimization, also known as the victim–offender overlap, is a well-documented phenomenon (Beckley, 2018; Berg & Mulford, 2020) that has been widely studied in fields related to digital violence, such as cyberbullying (e.g., Ramos Salazar, 2021). This relationship has also been identified in some TFSV studies. For example, in a study with adolescents and adults conducted by Powell et al. (2019), it was found that having been a victim of any form of IBSA increased the likelihood of being a perpetrator. Similarly, Patchin and Hinduja (2020) found that men who threatened to disseminate images with sexual content were more likely to have previously been victims of threats themselves. More recently, it was found

that undergrad students who had been victims of nonconsensual dissemination were more likely to disseminate others' personal images (Karasavva & Forth, 2021).

Also, the available research indicates that different forms of TFSV can co-occur (Hamby et al., 2018; Powell & Henry, 2019; Snaychuk & O'Neill, 2020); however, the number of studies providing data on the specific relationships between the different forms of TFSV is very limited. Recently, Taylor et al. (2021) assessed different forms of online and offline violence (mainly sexual harassment and sexuality-based harassment) using latent class analysis among youth 12–21 years old and identified four victimization profiles: (a) the *low sexual harassment* profile, which has a near-zero probability of suffering sexual harassment victimization; (b) the *high sexual harassment* profile, which has a higher risk of experiencing all forms of violence assessed in the study; (c) the *verbal sexual harassment* profile, which has a higher risk of suffering unwanted sexual comments and requests; and (d) the *sexual orientation harassment* profile, which has a higher risk of receiving unwelcome sexual comments and insults relating to their sexuality. The relationship between being a victim of unwanted sexual attention and being a victim of sexuality-based harassment among adolescents was also reported by Gámez-Guadix and Íncera (2021). In their study, a relationship was found between digital sexual harassment victimization and other forms of TFSV, such as sextortion and nonconsensual pornography.

Research regarding the relationships between the different forms of perpetration is even more limited. Ybarra and Petras (2021) analyzed how specific forms of offline sexual violence perpetration can be grouped together, and they identified three groups using latent class analysis with a sample of youth aged 13–25 years: a non-perpetrators group; a group that engaged primarily in sexual harassment but not necessarily online sexual harassment (e.g., spreading sexual rumors or writing sexual messages about someone in a public place); and a multiple perpetration group in which offenders engaged in most of the forms of violence under study (i.e., sexual assault, attempted rape, rape, and coercive sex). They also found that many individuals transitioned from one group to another. This could indicate that some forms of perpetration act as "gateways" to other forms of violence.

The Present Study

The first objective of the present study was to analyze the differences between girls and boys regarding each form of TFSV, both in terms of perpetration and victimization. The second objective was to analyze the relationships between different forms of TFSV victimization and perpetration, including gender- and/or sexuality-based harassment, digital

sexual harassment, sextortion, and nonconsensual pornography. To this end, we estimated a network model to jointly analyze these variables. Variables in a network model are categorized into "nodes," and the interactions between nodes are represented by "edges." Under the substantive interpretation of these models, a construct is represented as a constellation of indicators that, in turn, form a complex system whereby the appearance of one indicator can lead to the activation of others (Borsboom, 2017). These models have been applied to multiple psychological constructs, such as depression (Fried et al., 2016), posttraumatic stress disorder (Bryant et al., 2017), and reflective functioning (Morosan et al., 2020). We hypothesized that the network analysis model would allow us to discern the structure of TFSV. We opted for the network analysis approach because it allowed us to easily interpret the relationships among the variables under study (with indicators of network-level connectivity and importance for each variable) and to introduce the gender variable and explore whether it affected the estimated connections.

Methods

Participants

The initial sample was composed of 1819 participants aged 12–18 years. However, 137 participants were excluded because they did not complete any of the study measures. Thus, the final sample consisted of 1682 adolescents, each of whom responded to all measures in the study ($M_{age} = 13.90$, $SD = 1.26$). Of these, 865 were girls, 816 were boys, and 1 did not indicate their gender. Three adolescents self-identified as non-binary but were not included in the final sample, as they did not complete any of the study measures. The majority of adolescents (90.6%) identified as heterosexual, while 5.2% were bisexual, 1.7% were gay or lesbian, 1.1% indicated that they were unsure, and 0.4% were asexual. Regarding birthplace, 87.8% of the participants were born in Spain, while 8.9% were born in Latin American countries, 1.7% in Asian countries, 1.1% in European countries, 0.4% in African countries, and 0.1% in North America. Regarding the marital status of participants' parents, approximately 72.5% were married or living together, 12.6% were divorced, 10.4% were separated, 2.9% were single parents, and 1.6% were widowed.

Measures

Due to the absence of measures to multidimensionally assess TFSV among adolescents, we developed a series of scales to tap into different forms of TFSV based on previous approximations of these constructs (Barak, 2005; Gámez-Guadix et al., 2015; Henry & Powell, 2018; Powell & Henry, 2019).

These measures have previously shown adequate psychometric properties, including factor validity and reliability among adolescents (Gámez-Guadix & Incera, 2021; Gámez-Guadix et al., 2022). Given that the general dimensions of TFSV include more specific subtypes, we separated these dimensions into specific variables that allowed us to examine them in more detail. Thus, the set of subscales for evaluating gender- and sexuality-based harassment (gender harassment, gender role harassment, and sexual orientation harassment), digital sexual harassment, and image-based sexual abuse (including both sextortion and nonconsensual pornography) are described below.

Gender Harassment

This scale assessed the presence of harassment based on the victim's gender. For the purposes of comparison, parallel versions of the perpetration scales were developed for girls and boys. Each scale included four items: "You insulted someone because she/he was a girl/boy"; "You made fun of someone because she/he was a girl/boy"; "You have humiliated, belittled, or made someone feel inferior because she/he was a girl/boy"; and "You have discriminated against or excluded someone in an online group, forum, or chat because she/he was a girl/boy." To measure victimization, the participants responded to a scale based on their gender, with items parallel to those used for perpetration (e.g., "You have been humiliated, belittled, or made to feel inferior for being a girl/boy"). All victimization items were tailored to suit adolescents who self-identified as non-binary, although this is not reflected in the present analyses. Participants were asked to indicate how many times these forms of aggression occurred during the last 12 months using the following scale: 0 = Never, 1 = 1 or 2 times, 2 = 3 or 4 times, and 3 = 5 times or more. Thus, each participant answered 12 items: perpetration against girls (4 items), perpetration against boys (4 items), and victimization (4 items).

Gender-Role Harassment

This scale assessed perpetration or victimization due to gender roles that were discordant with the participant's sex. We developed parallel versions to measure perpetration directed against girls (4 items) and against boys (4 items). Items related to perpetration included the following: "You have insulted a girl/boy for looking 'too masculine' or doing 'boy things'/ 'too feminine' or doing 'girl things'"; "You have made fun of a girl/boy for looking 'too masculine' or doing 'boy things'/ 'too feminine' or doing 'girl things'"; "You have humiliated, belittled, or made a boy/girl feel inferior for appearing 'too masculine' or doing 'boy things'/ 'too feminine' or doing 'girl things'"; and "You have discriminated against or excluded a girl/boy in an online group, forum, or chat for appearing 'too masculine' or doing 'boy things'/ 'too feminine' or doing 'girl things'." For victimization, participants responded according to their gender (4 items; e.g., "Someone has made fun of you for appearing 'too masculine' or doing 'boy things'/ 'too feminine' or doing 'girl things'"). The response alternatives (regarding the last 12 months) were as follows: 0 = Never, 1 = 1 or 2 times, 2 = 3 or 4 times, 3 = 5 times or more.

Sexual Orientation Harassment

This scale assessed whether the participants had perpetrated or been the victim of any type of harassment due to sexual orientation. The perpetration items were: "You have insulted someone because of his/her sexual orientation"; "You have made fun of someone because of his/her sexual orientation"; "You have humiliated, belittled, or made someone feel inferior because of his/her sexual orientation"; and "You have discriminated against or excluded someone in an online group, forum, or chat because of his/her sexual orientation." The victimization scale included four items parallel to the perpetration scale (e.g., "Someone has insulted you because of your sexual orientation"). The response scale was as follows (regarding the last 12 months): 0 = Never, 1 = 1 or 2 times, 2 = 3 or 4 times, and 3 = 5 times or more.

Digital Sexual Harassment

This scale measured the frequency of both perpetration (3 items) and victimization (3 items) related to unwanted online sexual approaches (e.g., sexual comments, sexual questions, or insisting on sexual interactions). The related items included the following: "You have made sexual comments to someone that have made her/him feel bad"; "You have asked someone sexual questions that have made her/him feel bad"; and "You have insisted that someone send sexual photos or videos or answer sexual questions that have made her/him feel bad." Participants were given the following response alternatives (regarding the last 12 months): 0 = Never, 1 = 1 or 2 times, 2 = 3 or 4 times, and 3 = 5 times or more.

Sextortion

This scale measured the presence of threats to show, post, or send a sexual photo or video of someone using the Internet. Parallel items were included for perpetration (3 items) and victimization (3 items). The items were: "You have threatened someone with showing a sexual image of her/him to another person"; "You have threatened someone with posting a sexual image of her/him on the internet"; and "You have threatened someone with forwarding a sexual image of her/him." The response scale (regarding the last 12 months) was as follows: 0 = Never, 1 = 1 or 2 times, 2 = 3 or 4 times, and 3 = 5 times or more.

Nonconsensual Pornography

This scale assessed the frequency with which someone had shown, posted, or forwarded sexual photos or videos online without the victim's consent. Parallel versions were prepared for perpetration (3 items) and victimization (3 items). The items included in the scale were: "You have shown someone a sexual image (photos or videos) of another person without their consent"; "You have posted a sexual image (photos or videos) of another person on the internet without their consent"; and "You have forwarded a sexual image (photos or videos) of another person without their consent." Participants were asked to report the frequency with which they engaged in these behaviors during the last 12 months: 0 = Never, 1 = 1 or 2 times, 2 = 3 or 4 times, and 3 = 5 times or more.

Procedure

A total of 37 schools in a region of central Spain were randomly selected the official list of schools of that region to participate in the study. Ten of these schools agreed to participate in the study. Other schools showed interest in participating but did not end up participating due to the possibility of scheduling the data collection. Among the schools that declined, the predominant reason given was that they did not want to overburden their students with additional tasks and/ or that they were already participating in similar studies. The period of data collection was from November 2019 to March 2020. After obtaining consent from the school directors, a letter was sent to the parents of the children in each school to request their explicit consent regarding the participation of their children in the study. Approximately 65% of the parents returned the signed authorization form allowing their children to participate in the study. The adolescents were also given an informed consent document that provided information about the study and the treatment of their personal data. Two participants declined to participate and were not included in the study. Participants who did not speak Spanish and who had special needs were also not included in the study due to the impossibility of completing the survey. Prior to starting the study, each adolescent was provided with a document informing them that their participation was voluntary and that their responses were confidential. This document was read and signed by the adolescents before starting the study, and it ensured that no individual data were disclosed to any person or by any means. The participants were told that they could choose not to answer the questions and that their participation could be discontinued at any time and for any reason without consequences. The participants completed the questionnaire on an individual basis and were encouraged to ask questions if they had trouble answering any of the items. The questionnaire took approximately 30–40 min to complete. After completing the questionnaire, the participants received written information about community counseling resources and how to contact the researchers. This study was part of a larger research project on the online sexual abuse of minors, which was reviewed and approved by the Ethics Committee of the Autonomous University of Madrid. This study followed the ethical standards and norms of the Declaration of Helsinki.

Data Analyses

All statistical analyses were conducted using R (R Core Team, 2020). The code and supplementary files can be found at https://osf.io/uy3bp/. The first step of the analysis consisted of describing the measures according to certain descriptive statistics (mean, standard deviation, skewness, kurtosis, and Cronbach's alpha) and the relationships between the measures and sociodemographic data, such as gender (Mann–Whitney U test) and age (Spearman correlation). The rank biserial coefficient (*rankbis*) was computed to evaluate the effect size for comparisons across genders. Following previous literature, we considered *rankbis* ≃ 0.10, *rankbis* ≃ 0.30, and *rankbis* ≃ 0.50 as small, medium, and large effects, respectively (Cohen, 1988). The psych package (Revelle, 2020) was used for these analyses.

The next step of the analysis was to estimate the network models using the qgraph package (Epskamp et al., 2012). To facilitate the interpretation of the structure, we chose to represent the network of partial correlations, where each coefficient indicates the relationship between two variables, controlling for the influence of the other variables (Epskamp & Fried, 2018). That is, the relationships estimated in the network were non-directional. In the reported plot, we differentiated between edges (magnitude of the association) and nodes (variables). To eliminate some potentially spurious edges, we applied the graphical least absolute shrinkage and selection operator regularization method (Friedman et al., 2008), which is a regularization method that shrinks small partial correlations to zero. This procedure requires establishing a penalty parameter (i.e., the extended Bayesian information criterion; Chen & Chen, 2008). We chose to use the value 0.5, which is the default value in the qgraph package. To facilitate network interpretation, additional analyses were conducted. First, the Spinglass detection algorithm available in the igraph package (Csardi & Nepusz, 2006) was used to detect clusters of variables within the network (i.e., sets of nodes that have greater connections within the community than with the rest of the network). This procedure has a random component. Therefore, a random seed was set, and 100 solutions were extracted and examined to determine the most frequent dimensionality and the most consistent output according to the theoretical expectation. On the other hand, node strength and expected influence were calculated

as measures of centrality. Node strength indicates the sum of the edges between a node and all other nodes to which the node is connected. To assess whether the differences in edge magnitude and node strength could be considered statistically relevant, the bootstrapped centrality difference test (Epskamp et al., 2018) was employed. Node-expected influence operates in the same way as node strength but considers the negative or positive sign of the edges (Robinaugh et al., 2016). These indicators were obtained using the centrality-Plot function in the qgraph package.

Network analyses were performed on the complete sample and on the sample segmented by gender (i.e., boys and girls). In all cases, the first step was to evaluate the accuracy of the edges and centrality indices by drawing bootstrapped confidence intervals and case-dropping subset methods, respectively, using a nonparametric procedure with 1000 bootstraps in the bootnet package (Epskamp et al., 2018). To quantify the stability of centrality indices using these bootstrapped samples, we considered the correlation stability coefficient, which indicates the maximum proportion of cases that can be dropped while still retaining a correlation of about 0.70 between the order of the centrality index in the subsample and the order in the total sample. Epskamp et al. (2018) proposed that this coefficient should not be below 0.25 and should ideally be above 0.50. Nonetheless, as the

authors themselves pointed out, these cut-off points are arbitrary and should not be taken as definitive guides. For that reason, we also examined whether the most salient nodes in centrality tended to rank first in the subsamples, based on the understanding that this is a measure of stability that is more in line with the interpretation that can be made of these salient nodes. Using a network comparison test (Van Borkulo et al., 2017), we further verified whether the solutions segmented by gender differed significantly in terms of network structure and network global strength.

Results

Table 1 shows the descriptive statistics and the results of the comparisons by gender and age. For three perpetration variables (i.e., gender harassment perpetration against females, gender role harassment perpetration against males, and sexual orientation harassment perpetration), there were significantly higher scores in the male group, although the effect sizes were small. Regarding victimization variables, statistically significant differences were found for all variables except sextortion victimization, and higher means were found in the female group. The effect sizes in this case were somewhat larger compared to those obtained for perpetration

Table 1 Descriptive statistics and sex and age comparisons

|	Total (N=1673)				Female (N=861)		Male (N=811)		Sex differences				
	M	SD	Sk	Kr	M	SD	M	SD	U test	p value	rankbis	r_{age}[a]	α
GHPF	0.021	0.125	8.827	98.483	0.011	0.075	0.031	0.161	340,639.5	<.001	−0.035	**0.100*****	0.571
GRPF	0.025	0.122	7.305	73.684	0.020	0.099	0.031	0.142	349,705	0.430	−0.009	**0.131*****	0.633
GHPM	0.032	0.160	7.588	72.095	0.022	0.096	0.042	0.207	351,947	0.813	−0.003	**0.115*****	0.647
GRPM	0.044	0.194	6.632	55.095	0.029	0.129	0.061	0.244	340,572	0.010	−0.035	**0.136*****	0.749
SOHP	0.031	0.179	8.972	100.707	0.020	0.141	0.043	0.212	342,413	0.007	−0.030	**0.139*****	0.789
DSHP	0.025	0.143	7.916	77.187	0.022	0.128	0.028	0.158	351,078	0.598	−0.005	**0.134*****	0.614
SP	0.008	0.123	20.682	465.281	0.006	0.108	0.009	0.137	352,361.5	0.688	−0.002	0.054*	0.933
NCPP	0.033	0.181	7.541	66.976	0.033	0.165	0.034	0.197	354,817	0.616	0.005	**0.163*****	0.646
GHV	0.135	0.400	4.068	19.120	0.209	0.477	0.057	0.277	416,839.5	<.001	**0.181**	**0.179*****	0.848
GRHV	0.085	0.333	5.373	32.827	0.134	0.428	0.032	0.170	389,727.5	<.001	**0.104**	0.096***	0.879
SOHV	0.036	0.191	7.827	75.012	0.054	0.246	0.017	0.102	367,384	<.001	0.041	**0.101*****	0.818
DSHV	0.228	0.538	2.959	9.165	0.371	0.679	0.076	0.250	436,968.5	<.001	**0.238**	**0.293*****	0.836
SV	0.023	0.182	11.513	158.353	0.032	0.218	0.014	0.135	357,890	0.074	0.014	0.094***	0.910
NCPV	0.027	0.174	8.949	95.590	0.040	0.220	0.013	0.105	362,379.5	0.003	0.027	**0.108*****	0.758

M mean, *SD* standard deviation, *Sk* skewness, *Kr* kurtosis, r_{age}[a] Spearman correlation, *U* test Mann–Whitney *U* Test, *rankbis* rank-biserial correlation (nonparametric effect size; .10: small, .30: medium, .50: large), */**/***, correspond to significant correlations at the 95/99/99.9% confidence level, *α* Cronbach alpha. Effect sizes and correlations higher than 0.10 are shown in boldface. *GHPF* gender harassment perpetration against females, *GRPF* gender role harassment perpetration against females, *GHPM* gender harassment perpetration against males, *GRPM* gender role harassment perpetration against males, *SOHP* sexual orientation harassment perpetration, *DSHP* digital sexual harassment perpetration, *SP* sextortion perpetration, *NCPP* non-consensual pornography perpetration, *GHV* gender harassment victimization, *GRHV* gender role harassment victimization, *SOHV* sexual orientation harassment victimization, *DSHV* digital sexual harassment victimization, *SV* sextortion victimization, *NCPV* non-consensual pornography victimization

but were still relatively small. With respect to the age variable, a significant and positive relationship was found in all cases. Internal consistency values can be considered reasonably large given the small number of items that make up these variables (3–4 items). Descriptive statistics at the item level are provided in the supplementary file repository.

We then proceeded to estimate the network models. The Pearson and partial correlation matrices for the full group and for each gender group are provided in the supplementary online materials. The network structure is represented in Fig. 1. The number of nodes in the networks was the same (i.e., 14). The bootstrap confidence regions for the weights of the edges mostly overlapped (shown in Fig. 2), indicating that the edges were estimated with adequate stability. By comparing the estimated networks, we found that the network in which the highest number of connections was estimated was the network using the complete sample (57), followed by the network that only included males (54) and, finally, the network that only included females (49). That is, the density (i.e., estimated connections/possible connections) was higher for the complete sample (0.626) than for the subsamples of males (0.593) and females (0.538). There were no differences in the diameters of the three networks. Specifically, the maximum degree of separation in the three networks was relatively

small in the three cases (2). For the complete sample, four clusters of variables were identified. Victimization was broken down into two clusters: V1 (sextortion and non-consensual pornography) and V2 (digital sexual harassment and gender- and sexuality-based harassment). Likewise, perpetration was broken down into two clusters: P1 (gender harassment perpetration against females and gender harassment perpetration against males) and P2 (all others). With respect to males, three clusters were identified: the two victimization clusters identified above, but with the exception that sextortion perpetration and nonconsensual pornography perpetration were included in V1 and digital sexual harassment perpetration in V2, and a third cluster comprising the other perpetration variables. With respect to females, five clusters were identified, including the two victimization clusters mentioned above, and three perpetration clusters: P1 (gender harassment perpetration against both females and males); a second cluster including sexual orientation harassment, digital sexual harassment, and sextortion (P2); and a third cluster including non-consensual pornography and gender-role harassment against both females and males (P3).

The average value of the connections was very similar in the male and female subsamples, with values of 0.074 and 0.073, respectively. The network comparison test showed
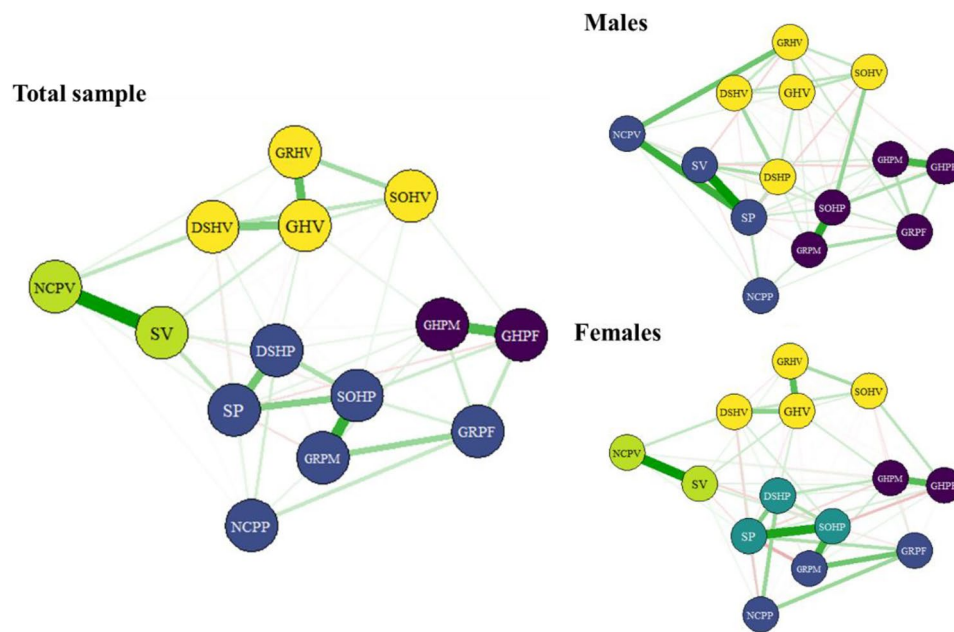
Fig. 1 Estimated network of 14 TFSV variables. Perpetration variables are represented by the darker nodes (GHPF, GRPF, GHPM, GRPM, SOHP, DSHP, SP, and NCPP), and victimization variables are represented by the lighter nodes (GHV, GRHV, SOHV, DSHV, SV, and NCPV). The color code represents the clusters detected by the Spinglass community detection algorithm. GHPF, gender harassment perpetration against females; GRPF, gender role harassment perpetration against females; GHPM, gender harassment perpetration against males; GRPM, gender role harassment perpetration against males; SOHP, sexual orientation harassment perpetration; DSHP, digital sexual harassment perpetration; SP, sextortion perpetration; NCPP, non-consensual pornography perpetration; GHV, gender harassment victimization; GRHV, gender role harassment victimization; SOHV, sexual orientation harassment victimization; DSHV, digital sexual harassment victimization; SV, sextortion victimization; NCPV, non-consensual pornography victimization

Fig. 2 Bootstrap 95% confidence intervals for estimated edge weights for the network shown in Fig. 1. The edge weights, with each horizontal line representing one edge, are represented by the red line, and the 95% confidence intervals are represented by the gray area. The bootstrap mean is represented by the black line
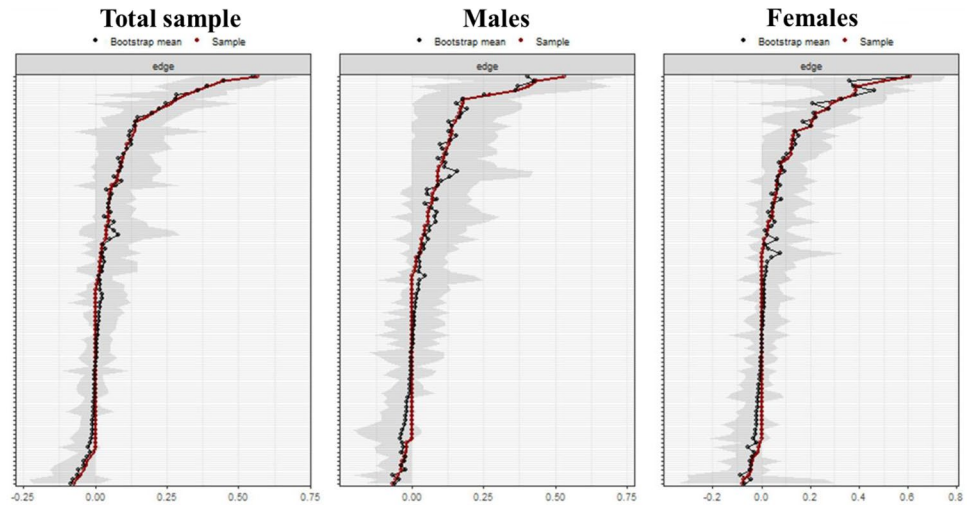
significant differences between the networks for males and females, as revealed by the results of both network structure invariance tests ($p = .01$), although the global strength invariance test was not significant ($p = .79$). This indicates that the overall level of connectivity (i.e., the weighted absolute sum of all network edges) was equivalent between males and females, although the edges differed between the two networks. In the case of the total sample and for the female sample, the largest edge was the one connecting the nonconsensual pornography victimization and sextortion victimization nodes, with values of 0.57 and 0.63 for the total sample and female sample, respectively. In the case of boys, the largest edge was the one connecting the sextortion perpetration and sextortion victimization nodes, which had a value of 0.54. Taking the total sample as a reference point, other large connections included gender role harassment perpetration and sexual orientation harassment perpetration; gender harassment perpetration against females and against males; gender harassment victimization and gender role harassment victimization; digital sexual harassment and sextortion perpetration; and gender harassment victimization and digital sexual victimization. The bootstrap difference test revealed that these three connections differed significantly from almost all the other edges.

The standardized centrality index of node strength and the expected influence results are shown in Fig. 3. The result of the node-dropping bootstrap technique is summarized by the correlation stability coefficient for the total sample. This produced values of 0.21 and 0.28 for the strength and expected influence indices, respectively. As can be seen in Figs. 1 and 2, these two centrality indexes present very similar patterns. We also assessed whether the most salient nodes (e.g., sexual orientation harassment perpetration) typically ranked as the most salient node in the bootstrap analysis, which was indeed the case. Considering the 1000 bootstrap samples, the third quartile for both sexual orientation harassment perpetration strength and expected influence was 2,

indicating that in at least 75% of the extracted samples, the node was the first or second most salient. Similarly, this analysis indicated that nonconsensual pornography was consistently the least salient node. Turning the attention to Fig. 3, the nodes with the highest centrality were sexual orientation harassment perpetration (ExpectedInfluence$_{total}$ = 1.87; ExpectedInfluence$_{male}$ = 1.93; ExpectedInfluence$_{female}$ = 1.14), sextortion victimization (ExpectedInfluence$_{total}$ = 1.16; ExpectedInfluence$_{female}$ = 0.83), sextortion perpetration (ExpectedInfluence$_{male}$ = 0.89), and digital sexual harassment perpetration (ExpectedInfluence$_{total}$ = 1.12; ExpectedInfluence$_{male}$ = 1.00; ExpectedInfluence$_{female}$ = 1.79).

Discussion

Sexual violence is a serious social problem that has been investigated for decades. Our study focused on the occurrence and interrelation of the different forms of TFSV perpetration and victimization, which constitute lesser-known and scarcely investigated forms of sexual violence. Our results support the interrelationships between different forms of TFSV, including gender- and sexuality-based harassment, digital sexual harassment, sextortion, and nonconsensual pornography perpetration and victimization.

The mean scores for all sexual victimization variables, except sextortion, were higher for females. However, the mean perpetration scores were significantly higher for males in three of the eight forms of TFSV, mainly those relating to gender and sexual harassment. These results indicate that although males can also be victims of sexual harassment and women can also be perpetrators, TFSV is a gendered phenomenon rather than gender-neutral phenomenon. In this regard, the gender role socialization that children undergo emphasizes the relevance of gender expectations and the consequences (e.g., being harassed) they may face for any incongruence between their behavior and assigned gender
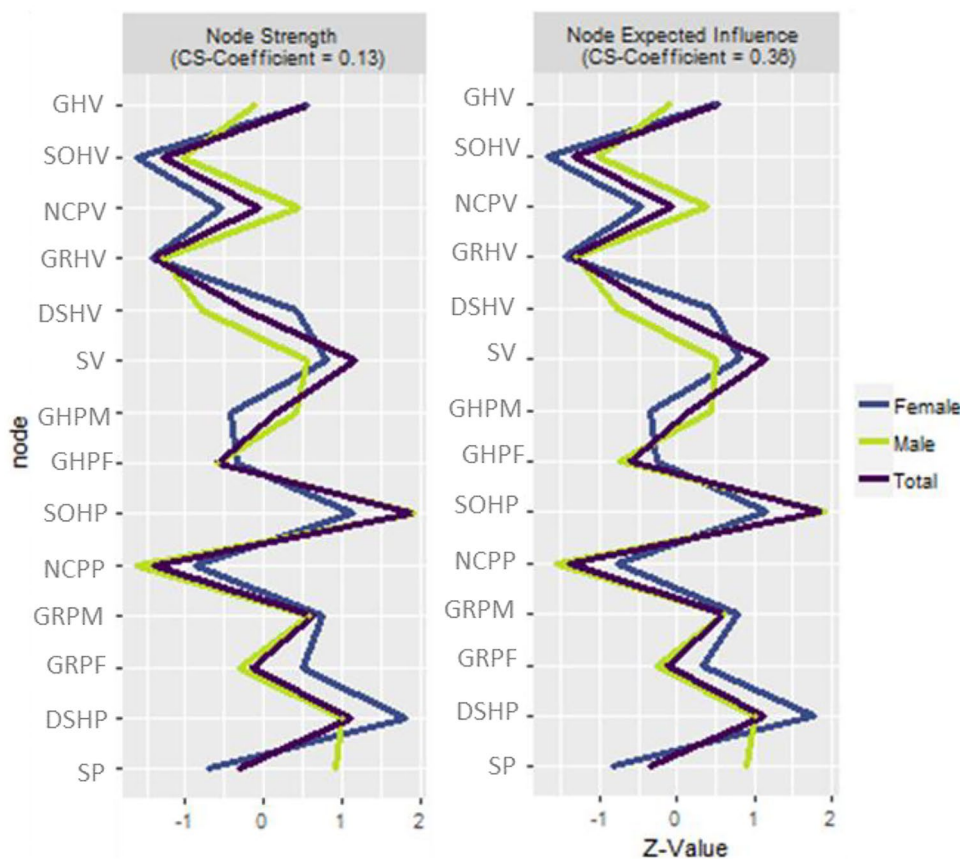
Fig. 3 Centrality measures for the estimated network. CS-Coefficient: correlation stability coefficient indicating the percentage of cases in the total sample that can be dropped while retaining a correlation of about 0.7 between the order of the centrality index in the subsampled data network and the order of the centrality index in the full data network. Note that z scores are provided instead of raw centrality indices to allow for easier comparisons. GHPF, gender harassment perpetration against females; GRPF, gender role harassment perpetration against females; GHPM, gender harassment perpetration against males; GRPM, gender role harassment perpetration against males; SOHP, sexual orientation harassment perpetration; DSHP, digital sexual harassment perpetration; SP, sextortion perpetration; NCPP, non-consensual pornography perpetration; GHV, gender harassment victimization; GRHV, gender role harassment victimization; SOHV, sexual orientation harassment victimization; DSHV, digital sexual harassment victimization; SV, sextortion victimization; NCPV, non-consensual pornography victimization

roles. These findings are consistent with abundant prior research finding that women are more commonly victims of sexual abuse of any kind and that men are more often perpetrators (e.g., Pereda et al., 2009; Schulz et al., 2016). Sexual and gender education is essential to eradicate sexual violence, which in part can be explained by traditional roles and discrimination against women, which also occurs in digital environments.

The network analyses demonstrated the high interrelatedness of different forms of victimization. For the entire sample, the forms of gender- and sexuality-based victimization formed a cluster with digital sexual harassment victimization. Furthermore, sextortion and nonconsensual pornography victimization also showed high interrelationships, forming a differentiated cluster. This pattern was similar when we looked at men and women separately. In both cases, there appeared to be two distinctive victimization profiles. The

first profile, which includes victimization in both digital sexual harassment and gender- and sexuality-based harassment, could be related to gender or sexual stereotypes regarding femininity or masculinity. The second profile (i.e., sextortion and non-consensual pornography) is in line with the conceptualization of IBSA, which includes both the threat and dissemination of sexual images (Henry & Powell, 2015). These results indicate that threats of distributing sexual content may tend to materialize in the actual dissemination of images.

In the case of males, more intercorrelations were observed between victimization and perpetration than in females. While victimization and perpetration were relatively isolated in the case of females, higher digital sexual harassment victimization was related to higher digital sexual harassment perpetration for males. Moreover, sextortion and nonconsensual pornography victimization were more

clustered with sextortion perpetration for males. These results suggest a more reciprocal pattern in TFSV in males compared to females. This profile of reciprocal perpetration and victimization among males is congruent with other forms of abuse (e.g., cyberbullying, dating violence, and cyberdating abuse) in which perpetration and victimization appear to be related (e.g., Walters & Espelage, 2018). One possible interpretation of these results is that a higher frequency of perpetration by males may lead to higher rates of victimization because victims may respond in self-defense to their aggressors, increasing the probability that aggressors will also become victims. Moreover, the greater tendency among males to engage in sensation-seeking and risk-taking (Cross et al., 2013) could increase the likelihood that they will choose to access certain Internet sites or applications (e.g., sex and dating apps, or violent videogames) through which males are more likely to perpetrate and, at the same time, be victims of various forms of sexual harassment. Future longitudinal studies should analyze the temporal order of the forms of TFSV perpetration and victimization among men.

The network model also demonstrated substantial interrelationships between the different types of perpetration. In the case of females, three clusters were identified. First, a close relationship was observed between the perpetration of gender harassment against males and gender harassment against females. A second cluster was formed by digital sexual harassment perpetration, sextortion perpetration, and sexual orientation harassment perpetration. The third cluster comprised the three remaining forms of perpetration: nonconsensual pornography perpetration, gender role harassment perpetration against males, and gender role harassment perpetration against females. It is necessary to point out that the women showed a heterogeneous grouping of different forms of perpetration, which could indicate that female sexual offenders have a more complex profile than their male counterparts. Traditionally, the sexual abuse carried out by women has been less investigated and largely unknown compared to that of male sexual offenders (Gámez-Guadix et al., 2011; Russell et al., 2017). Future studies should delve into the profiles of women who perpetrate TFSV.

Males, however, had three specific perpetration clusters. The first cluster was related to gender, gender roles, and sexual orientation harassment perpetration. The second cluster involved the perpetration of sextortion and nonconsensual pornography. Third, digital sexual harassment appeared in isolation from other forms of perpetration. As previously mentioned, in the case of males, the clusters of sextortion/non-consensual dissemination and digital sexual harassment (to a lesser degree) appeared to be closely associated with their victimization counterparts. Like the perpetration profile of females, the strongest interrelationships were among sexual orientation harassment perpetration, gender role

harassment perpetration toward males, and forms of gender-related perpetration against males and females. Rigid gender roles, which have been associated with greater levels of aggression (Monteiro & Moleiro, 2021) and anti-LGTBIQ attitudes (Gámez-Guadix & Incera, 2021) may help explain this pattern of relationships.

When indicators of centrality (i.e., variables that had stronger connections with the rest of the variables) were examined, we found that three of the four variables with the highest centrality values were different forms of perpetration: sexual orientation harassment, sextortion, and digital sexual harassment. This finding could indicate that perpetrating certain forms of TFSV increases the likelihood of perpetrating or being a victim of other forms of TFSV. In other words, perpetrators of one form of TFSV are more likely to engage in other forms of TFSV and, in turn, become victims. This finding is congruent with previous studies that have indicated that some forms of perpetration could act as "gateways" to other forms of violence and victimization (Ybarra & Petras, 2021).

Limitations

Some limitations should be considered when interpreting the results of this study. First, although a large sample was obtained, it is important to note that our sample may not be representative of all adolescents. Furthermore, only those children whose parents actively consented to study participation completed the measures (approximately two-thirds of the total population). Therefore, caution is recommended when generalizing these results. Future studies should replicate these results using different samples of adolescents. Importantly, it should be noted that when the database was segmented by gender, the sample size was reduced to 885–929 cases. Thus, one might expect the stability of the centrality indices to be lower compared to the centrality indices that reflect the complete database. Only three adolescents self-identified as non-binary, precluding the qualitative analyses of these data. Future in-depth qualitative studies should analyze the specific ways in which gender and sexual minorities experience TFSV. Moreover, the results are based on self-reported data, which could have introduced bias into the responses due to self-presentation concerns (e.g., social desirability bias), especially given the highly sensitive nature of the topic. For example, although participants were informed that their responses were completely anonymous, some participants might have been reluctant to admit that they have committed/engaged in some types of online sexual violence. Finally, it is important to keep in mind that this is a cross-sectional study; thus, caution should be exercised when establishing causal relationships between variables. That is, the present study reveals patterns of association

rather than cause–effect relationships. Future longitudinal studies should clarify the temporal order of these variables.

Conclusion

To our knowledge, this is the first study to examine the relationships between multiple forms of online TFSV, including both perpetration and victimization. The results show a consistent pattern of victimization based on gender-related sexual abuse and digital sexual harassment, as well as between sextortion and non-consensual pornography. Overall, perpetration among boys was consistent with the main typologies of gender- and sexuality-based harassment perpetration, digital sexual harassment, and sextortion/non-consensual distribution perpetration. Digital sexual harassment and IBSA perpetration, in turn, were highly related to victimization. Perpetration among girls, however, showed a more heterogeneous pattern of relationships between different components of TFSV, which may reflect the complexity of the sexual and gender harassment carried out by female perpetrators. Future studies should further examine the motivations for perpetrating the different forms of TFSV, such as the reasons for engaging in sextortion (e.g., procuring further images) or nonconsensual pornography (e.g., revenge or increasing the status of the offender), and gender differences in TFSV.

In conclusion, this study revealed that the different forms of TFSV victimization and perpetration appear to be related. At the social policy level, initiatives informed by empirical evidence are necessary to prevent and intervene in TFSV. Thus, preventive programs in schools and communities should be holistic and address different forms of TFSV. Interventions involving TFSV aggressors should explicitly assess the possibility that perpetrators have a history of prior victimization while considering other risk factors. Future studies should analyze the relationship between offline sexual harassment and online sexual harassment, as well as their common and differential predictors. Moreover, TFSV should be routinely included in offline sexual harassment prevention and information campaigns. Prevention programs for online problems, such as cyberbullying or online child grooming, should be especially sensitive to various forms of TFSV. Although both boys and girls can be victims or perpetrators of TFSV, girls were found to be more likely to be victims, and boys were found to be more likely to be perpetrators. Thus, risk factors for perpetration (e.g., rigid gender roles and attitudes that support rape myths) should be especially well addressed among men. This research project underscores the need to advance the study and prevention of the different forms of TFSV, which have often remained hidden behind screens.

Declarations

References

Barak, A. (2005). Sexual harassment on the Internet. *Social Science Computer Review, 23*(1), 77–92. https://doi.org/10.1177/0894439304271540

Bates, S. (2017). Revenge porn and mental health: A qualitative analysis of the mental health effects of revenge porn on female survivors. *Feminist Criminology, 12*(1), 22–42. https://doi.org/10.1177/1557085116654565

Beckley, A. L., Caspi, A., Arseneault, L., Barnes, J., Fisher, H. L., Harrington, H., & Wertz, J. (2018). The developmental nature of the victim-offender overlap. *Journal of Developmental and Life-Course Criminology, 4*, 24–49. https://doi.org/10.1007/s40865-017-0068-3

Berg, M. T., & Mulford, C. F. (2020). Reappraising and redirecting research on the victim–offender overlap. *Trauma, Violence, & Abuse, 21*(1), 16–30. https://doi.org/10.1177/1524838017735925

Borsboom, D. (2017). A network theory of mental disorders. *World Psychiatry, 16*(1), 5–13. https://doi.org/10.1002/wps.20375

Bryant, R. A., Creamer, M., O'Donnell, M., Forbes, D., McFarlane, A. C., Silove, D., & Hadzi-Pavlovic, D. (2017). Acute and chronic posttraumatic stress symptoms in the emergence of posttraumatic stress disorder: A network analysis. *JAMA Psychiatry, 74*(2), 135–142. https://doi.org/10.1001/jamapsychiatry.2016.3470

Campbell, J. C., Sabri, B., Budhathoki, C., Kaufman, M. R., Alhusen, J., & Decker, M. R. (2021). Unwanted sexual acts among university students: Correlates of victimization and perpetration.

Journal of Interpersonal Violence, *36*(1–2), np504–np526. https://doi.org/10.1177/0886260517734221

Champion, A., Oswald, F., & Pedersen, C. L. (2021). Technology-facilitated sexual violence and suicide risk: A serial mediation model investigating bullying, depression, perceived burdensomeness, and thwarted belongingness. *The Canadian Journal of Human Sexuality, 30*(1), 125–141. https://doi.org/10.3138/cjhs.2020-0044

Chen, J., & Chen, Z. (2008). Extended Bayesian information criteria for model selection with large model spaces. *Biometrika, 95*(3), 759–771. https://doi.org/10.1093/biomet/asn034

Citron, D. K. (2014). *Hate crimes in cyberspace*. Harvard University Press. https://doi.org/10.4159/harvard.9780674735613

Citron, D. K., & Franks, M. A. (2014). Criminalizing revenge porn. *Wake Forest Law Review, 49*, 345–391.

Clancy, E. M., Klettke, B., & Hallford, D. J. (2019). The dark side of sexting - Factors predicting the dissemination of sexts. *Computers in Human Behavior, 92*, 266–272. https://doi.org/10.1016/j.chb.2018.11.023

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). 12 Lawrence Erlbaum Associates Inc.

Cross, C. P., Cyrenne, D.-L.M., & Brown, G. R. (2013). Sex differences in sensation-seeking: A meta-analysis. *Scientific Reports, 3*(1), 2486. https://doi.org/10.1038/srep02486

Csardi, G., & Nepusz, T. (2006). The igraph software package for complex network research. *InterJournal, Complex Systems, 1695*(5), 1–9.

Eaton, A. A. & McGlynn, C. (2020). The psychology of nonconsensual porn: Understanding and addressing a growing form of sexual violence. *Policy Insights from the Behavioral and Brain Sciences, 7*(2), 190–197. https://doi.org/10.1177/2F2372732220941534

Epskamp, S., & Fried, E. I. (2018). A tutorial on regularized partial correlation networks. *Psychological Methods, 23*(4), 617–634. https://doi.org/10.1037/met0000167

Epskamp, S., Borsboom, D., & Fried, E. I. (2018). Estimating psychological networks and their accuracy: A tutorial paper. *Behavior Research Methods, 50*(1), 195–212. https://doi.org/10.3758/s13428-017-0862-1

Epskamp, S., Cramer, A. O., Waldorp, L. J., Schmittmann, V. D., & Borsboom, D. (2012). qgraph: Network visualizations of relationships in psychometric data. *Journal of Statistical Software*, *48*, 1–18. https://doi.org/10.18637/jss.v048.i04

Fried, E. I., Epskamp, S., Nesse, R. M., Tuerlinckx, F., & Borsboom, D. (2016). What are 'good'depression symptoms? Comparing the centrality of DSM and non-DSM symptoms of depression in a network analysis. *Journal of Affective Disorders, 189*, 314–320. https://doi.org/10.1016/j.jad.2015.09.005

Friedman, J., Hastie, T., & Tibshirani, R. (2008). Sparse inverse covariance estimation with the graphical lasso. *Biostatistics, 9*(3), 432–441. https://doi.org/10.1093/biostatistics/kxm045

Gámez-Guadix, M., Almendros, C., Borrajo, E., & Calvete, E. (2015). Prevalence and association of sexting and online sexual victimization among Spanish adults. *Sexuality Research and Social Policy, 12*(2), 145–154. https://doi.org/10.1007/s13178-015-0186-9

Gámez-Guadix, M., & Incera, D. (2021). Homophobia is online: Sexual victimization and risks on the internet and mental health among bisexual, homosexual, pansexual, asexual, and queer adolescents. *Computers in Human Behavior, 119*. https://doi.org/10.1016/j.chb.2021.106728

Gámez-Guadix, M., Mateos-Pérez, E., Wachs, S., Wright, M., Martínez, J., & Íncera, D. (2022). Assessing image-based sexual abuse: Measurement, prevalence, and temporal stability of sextortion and nonconsensual sexting ("revenge porn") among adolescents. *Journal of Adolescence, 94*(5), 789–799. https://doi.org/10.1002/jad.12064

Gámez-Guadix, M., Straus, M. A., & Hershberger, S. L. (2011). Childhood and adolescent victimization and perpetration of sexual coercion by male and female university students. *Deviant Behavior, 32*(8), 712–742. https://doi.org/10.1080/01639625.2010.514213

Hamby, S., Blount, Z., Smith, A., Jones, L., Mitchell, K., & Taylor, E. (2018). Digital poly-victimization: The increasing importance of online crime and harassment to the burden of victimization. *Journal of Trauma & Dissociation, 19*(3), 382–398. https://doi.org/10.1080/15299732.2018.1441357

Henry, N., & Powell, A. (2015). Beyond the 'sext': Technology-facilitated sexual violence and harassment against adult women. *Australian & New Zealand Journal of Criminology, 48*(1), 104–118. https://doi.org/10.1177/0004865814524218

Henry, N., & Powell, A. (2018). Technology-facilitated sexual violence: a literature review of empirical research. *Trauma, Violence, & Abuse, 19*(2), 195–208. https://doi.org/10.1177/1524838016650189

Karasavva, V., & Forth, A. (2021). Personality, attitudinal, and demographic predictors of non-consensual dissemination of intimate images. *Journal of Interpersonal Violence*. https://doi.org/10.1177/08862605211043586

McGlynn, C., Rackley, E., & Houghton, R. (2017). Beyond 'revenge porn': The continuum of image-based sexual abuse. *Feminist Legal Studies, 25*(1), 25–46. https://doi.org/10.1007/s10691-017-9343-2

Monteiro, C., & Moleiro, C. (2021). Gender roles and representations of sexual abuse: How are asymmetrical gender attitudes related to the legitimation of sexual abuse of children and youth?. *Vulnerable Children and Youth Studies 17*(4), 300–307. https://doi.org/10.1080/17450128.2021.1984621

Morosan, L., Fonseca-Pedrero, E., & Debbané, M. (2020). Network analysis of reflective functioning and conduct problems during adolescence. *Psychology of Violence, 10*(3), 300–311. https://doi.org/10.1037/vio0000258

O'Malley, R. L., & Holt, K. M. (2020). Cyber sextortion: An exploratory analysis of different perpetrators engaging in a similar crime. *Journal of Interpersonal Violence*. https://doi.org/10.1177/0886260520909186

Patchin, J. W., & Hinduja, S. (2020). Sextortion among adolescents: Results from a national survey of U.S. youth. *Sexual Abuse*, *32*(1), 30–54. https://doi.org/10.1177/1079063218800469

Patel, U., & Roesch, R. (2020). The prevalence of technology-facilitated sexual violence: A meta-analysis and systematic review. *Trauma, Violence, & Abuse*. https://doi.org/10.1177/1524838020958057

Pereda, N., Guilera, G., Forns, M., & Gómez-Benito, J. (2009). The prevalence of child sexual abuse in community and student samples: A meta-analysis. *Clinical Psychology Review, 29*(4), 328–338. https://doi.org/10.1016/j.cpr.2009.02.007

Pew Research Center. (2021). *The state of online harassment*. Washington, DC: US Pew Research Center. Retrieved May 12, 2022, from https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2021/01/PI_2021.01.13_Online-Harassment_FINAL.pdf

Powell, A., & Henry, N. (2019). Technology-facilitated sexual violence victimization: Results from an online survey of Australian adults. *Journal of Interpersonal Violence, 34*(17), 3637–3665. https://doi.org/10.1177/0886260516672055

Powell, A., Henry, N., Flynn, A., & Scott, A. J. (2019). Image-based sexual abuse: The extent, nature, and predictors of perpetration in a community sample of Australian residents. *Computers in Human Behavior*, *92*, 393–402. https://doi.org/10.1016/j.chb.2018.11.009 https://doi.org/10.1016/j.chb.2018.11.009

Powell, A., Scott, A. J., Flynn, A., & Henry, N. (2020a). Image-based sexual abuse: An international study of victims and perpetrators. Summary Report. Melbourne: RMIT University. https://doi.org/10.13140/RG.2.2.35166.59209

Powell, A., Scott, A. J., & Henry, N. (2020b). Digital harassment and abuse: Experiences of sexuality and gender minority adults.

European Journal of Criminology, 17(2), 199–223. https://doi.org/10.1177/1477370818788006

R Core Team. (2020). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL. Retrieved May 12, 2022, from https://www.R-project.org/

Ramos Salazar, L. (2021). Cyberbullying victimization as a predictor of cyberbullying perpetration, body image dissatisfaction, healthy eating and dieting behaviors, and life satisfaction. *Journal of Interpersonal Violence, 36*(1–2), 354–380. https://doi.org/10.1177/0886260517725737

Revelle, W. (2020). psych: Procedures for personality and psychological research, R package version 2.1.3. Retrieved May 12, 2022, from https://CRAN.R-project.org/package=psych

Robinaugh, D. J., Millner, A. J., & McNally, R. J. (2016). Identifying highly influential nodes in the complicated grief network. *Journal of Abnormal Psychology, 125*(6), 747–757. https://doi.org/10.1037/abn0000181

Russell, T. D., Doan, C. M., & King, A. R. (2017). Sexually violent women: The PID-5, everyday sadism, and adversarial sexual attitudes predict female sexual aggression and coercion against male victims. *Personality and Individual Differences, 111*, 242–249. https://doi.org/10.1016/j.paid.2017.02.019

Ruvalcaba, Y., & Eaton, A. A. (2020). Nonconsensual pornography among U.S. adults: A sexual scripts framework on victimization, perpetration, and health correlates for women and men. *Psychology of Violence, 10*(1), 68–78. https://doi.org/10.1037/vio0000233

Salerno-Ferraro, A. C., Erentzen, C., & Schuller, R. A. (2021). Young women's experiences with technology-facilitated sexual violence from male strangers. *Journal of Interpersonal Violence.* https://doi.org/10.1177/08862605211030018

Schulz, A., Bergen, E., Schuhmann, P., Hoyer, J., & Santtila, P. (2016). Online sexual solicitation of minors: How often and between whom does it occur? *Journal of Research in Crime and Delinquency, 53*(2), 165–188. https://doi.org/10.1177/0022427815599426

Snaychuk, L. A., & O'Neill, M. L. (2020). Technology-facilitated sexual violence: Prevalence, risk, and resiliency in undergraduate students. *Journal of Aggression, Maltreatment & Trauma, 29*(8), 984–999. https://doi.org/10.1080/10926771.2019.1710636

Taylor, B. G., Liu, W., & Mumford, E. A. (2021). Profiles of youth in-person and online sexual harassment victimization. *Journal of Interpersonal Violence, 36*(13–14), 6769–6796. https://doi.org/10.1177/0886260518820673

Van Borkulo, C. D., Boschloo, L., Kossakowski, J. J., Tio, P., Schoevers, R. A., Borsboom, D., & Waldorp, L. (2017). *Comparing network structures on three aspects: A permutation test.* Retrieved May 12, 2022, from https://www.researchgate.net/publication314750838_Comparing_network_structures_on_three_aspects_A_permutation_test

Van Ouytsel, J., Walrave, M., & Ponnet, K. (2019). An exploratory study of sexting behaviors among heterosexual and sexual minority early adolescents. *Journal of Adolescent Health, 65*(5), 621–626. https://doi.org/10.1016/j.jadohealth.2019.06.003

Walker, K., & Sleath, E. (2017). A systematic review of the current knowledge regarding revenge pornography and non-consensual sharing of sexually explicit media. *Aggression and Violent Behavior, 36*, 9–24. https://doi.org/10.1016/j.avb.2017.06.010

Walters, G. D., & Espelage, D. L. (2018). From victim to victimizer: Hostility, anger, and depression as mediators of the bullying victimization–bullying perpetration association. *Journal of School Psychology, 68*, 73–83. https://doi.org/10.1016/j.jsp.2017.12.003

Wolak, J., Finkelhor, D., Walsh, W., & Treitman, L. (2018). Sextortion of minors: Characteristics and dynamics. *Journal of Adolescent Health, 62*(1), 72–79. https://doi.org/10.1016/j.jadohealth.2017.08.014

Ybarra, M. L., & Petras, H. (2021). Groups of sexual violence perpetration in a national sample of youth 13–25 years of age. *Prevention Science, 22*(2), 205–215. https://doi.org/10.1007/s11121-020-01172-w