Universidade do Minho
Escola de Psicologia

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Dark Triad, sexting and online grooming: Malevolent side of online sexual activity in young adults

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STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

Braga, 4 de junho de 2024

Mariana Fernandes Costa

Resumo

Os jovens adultos praticam frequentemente atividades sexuais *online* (OSA) através das tecnologias da informação e da comunicação (ICT) para manter relações íntimas e explorar a sexualidade. As atividades de OSA, como o *sexting* e o *grooming online*, aumentaram significativamente com a utilização generalizada das TIC, expondo os jovens ao risco de violência *online*. Neste estudo, pretendemos caraterizar a prevalência do *sexting* e do *grooming online* entre jovens adultos portugueses e examinar a sua potencial associação com traços de personalidade. A amostra incluiu 329 participantes (*M*dade=20.83; *SD*=1.992). 94.8% das mulheres admitiram ter praticado pelo menos um ato de *sexting*, e 84.4% das mulheres referiram ter praticado pelo menos um ato de *grooming online*. 85.5% dos homens admitiram ter-se envolvido em pelo menos um ato de *sexting* e em pelo menos um ato de *grooming online*. Também encontrámos uma correlação positiva entre o *sexting* e o *grooming online*. Níveis mais elevados de maquiavelismo e narcisismo estão significativa e positivamente correlacionados com a experiência de *sexting* e de *grooming online*. Por outro lado, níveis elevados de psicopatia não estão correlacionados com o *sexting* e o *grooming online*. Estes resultados enfatizam a importância de abordar o *sexting* não consensual e o *grooming online* como questões sociais e de saúde, realçando a necessidade de intervenções para prevenir e lidar com estas formas de abuso.

Palavras-chave: atividade sexual *online* (OSA), *sexting*, *grooming online*, personalidade, Tríade Negra

Abstract

Young adults frequently engage in Online Sexual Activities (OSA) via Information and Communication Technologies (ICT) to maintain intimate relationships and explore sexuality. OSA activities like sexting and online grooming have increased significantly with the widespread use of ICT, exposing young people to the risk of online violence. In this study, we aim to characterize the prevalence of sexting and online grooming among young Portuguese adults and examine their potential association with personality traits. The sample included 329 participants (*M*age=20.83; *SD*=1.992). 94.8% of the women admitted to engaging in at least one act of sexting, and 84.4% of the women reported involving in at least one act of online grooming. 85.5% of the men admitted to engaging in at least one act of sexting and at least one act of online grooming. We also found a positive correlation between sexting and online grooming. Higher levels of Machiavellianism and narcissism are significant and positively correlated with sexting and online grooming experience. Conversely, high levels of psychopathy are not correlated with sexting and online grooming. These findings emphasize the importance of addressing non-consensual sexting and online grooming as health and social issues, highlighting the need for interventions to prevent and deal with these forms of abuse.

Key Words: online sexual activity (OSA), sexting, online grooming, personality, Dark Triad

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List of abbreviations

ICT - Information and Communication Technologies

OSA - Online Sexual Activities

GAM - General Aggression Model

CICS - The Cyberbullying Inventory for College Students

D12 – Dirty Dozen

Introduction

Sexting

Information and Communication Technologies (ICT) can be used to maintain online sexual activities (OSA), form an intimate relationship, as well to explore sexuality (Hernández et al., 2021). OSA can include cybersex, sexting, viewing pornography, and online grooming, among others.

Sexting ("sex" + "texting") is defined as the sharing of personal text messages containing sexually erotic content, sexually attractive, provocative, erotic (sext) or nude photographs or videos through the use of ICT (Mori et al., 2020). In the present study, consensual sexting behaviors can include sending, receiving, and reciprocal sexting, while the examined non-consensual sexting is understood as these behaviors without permission. Therefore, it should be noted that the act of sending can be considered a form of sexual expression while receiving, particularly when unsolicited or unwanted, can be considered harassment (Mori et al., 2020). For the purpose of this study, we discriminate this behavior between erotic and pornographic sexting. Erotic sexting, which involves sending appealing, erotic, and sexually suggestive images, and pornographic sexting, is characterized by the dissemination of explicit nude or partially clothed visual materials (Gámez-Guadix & Mateos-Pérez, 2019).

The emergence and diffusion of the Internet and smartphones in interpersonal communication, including sexual communication, has increased considerably in the past years. Being sexting a form of sexual communication, it is crucial to investigate the incidence of this phenomenon in order to classify its significance in contemporary sexuality and relationships. Sexting is reportedly growing more common among young people, with a recent study by Resett et al. (2022) involving a sample of adolescents between the ages of 11 and 18, found out that 12% of the participants engaged in sexting practices. The most common methods were sending sexually explicit textual messages and images, which were followed by recordings (Resett et al., 2022). Another study by Hernández et al. (2021), involving a sample of adolescents between the ages of 12 and 16, discovered that approximately one in three adolescents were identified as being at risk of engaging in erotic sexting (27.2% of boys, 26.2% of girls), whereas a smaller proportion of adolescents were observed to be at risk of pornographic sexting (15.5% of boys, 7.5% of girls). This is in line with a meta-analysis by Madigan et al. (2018) reported that 14.8% of teenagers send sext and 27.4% receive. It should be noted that this behavior continues to be high in adults, as reported by a meta-analysis developed by Mori et al. (2020), that found out that on average, 38% of emerging adults reported sending a sext, 42% reported receiving a sext, and 48% reported engaging in reciprocal sexting.

Unlike the well-researched impact of in-person sexual behavior, the consequences of sexting are not extensively studied. Sexting can be both a protective and a risky factor, depending on its use (Tamari, 2021). According to the literature, sexting activities are linked to self-reported good outcomes, such feeling joyful, enthusiastic, or aroused or having more chances for sex (Dir et al., 2013). Moreover, sexting behavior has been linked to negative outcomes such as depression, low self-esteem, and loneliness (Hernández & Mateo, 2018), as well as association with other risky behaviors like smoking, substance use, alcohol abuse, and aggressive behavior both online and offline (Temple et al., 2014).

Online Grooming

Another form of online sexual behavior is online grooming. The inducement of children and adolescents via the Internet, primarily through social networks or chats, is increasingly being addressed as online grooming (Branca et al., 2016). Therefore, it can be considered as a relationship of trust between a minor and an adult who uses ICT to seduce and abuse minors for sexual purposes, which can be seen as a preparatory stage for sexual abuse (Hernández et al., 2021). While the phenomenon of grooming has historical roots, its online format is more recent, with the internet facilitating the process, allowing offenders to be selective with respect to the type of victim (Branca et al., 2016). In online grooming, the perpetrators can maintain daily and private contact with children, which would be virtually impossible in the real world unless the individual was a family member or caretaker of the child. It is worth mentioning that the solicitation of minors for sexual purposes (i.e. grooming) is criminalized in Portugal under Article 176-A, being a crime of a public nature. Additionally, Portugal is one of the countries that signed the Lanzarote Convention, which was created to fill the existing gap regarding the protection of children against sexual exploitation and sexual abuse. Although, this article was only added to the Portuguese Penal Code in 2015, by article 3 of Law nº 103/2015.

One of the few studies carried out in Portugal, with children/teenagers, between 11 and 16 years old, concluded that 20.5% of the participants have been victims of at least one situation that constitutes the phenomenon of online grooming (Branca et al., 2016). A Spanish study by Hernández et al. (2021) involving a sample of adolescents between the ages of 12 and 16, found out a higher percentage of girls (29.8%) were identified as being at greater risk of grooming victimization compared to boys (26.9%). Another study (Lourenço & Manita, 2021), conducted in Portugal, carried out with adult individuals reports that 14.8% of respondents claimed to have been approached online for sexual purposes before the age of 18.

The moment in which one receives a sexual proposal leads to more pronounced feelings of anxiety, fear, and disturbance (Lourenço & Manita, 2021). Furthermore, Branca et al., (2016) found that most of the participants report feeling insecure and/or frightened. In addition, victims of this process have higher levels of social isolation, depression, and suicide (Hernández & Mateo, 2018). On the other hand, abusers have interpersonal difficulties, low levels of affection, lack of assertiveness and empathy (Hernández & Mateo, 2018).

The dynamics of online grooming relationships can vary considerably, which is why identifying sexual grooming strategies that occur specifically on the Internet can be a difficult task. In this way, O'Connell (2003) outlined and identified a series of stages in the online grooming process, such as the phases of (1) friendship and (2) relationship-forming stages, (3) risk assessment, (4) exclusivity stage, (5) sexual stage, (6) fantasy re-enactment stage, and (7) damage limitation. A while afterward, Williams et al. (2013) describe three primary topics in the grooming process, which are consistent with the ones pointed out by O'Connell (2003): relationship building, sexual content, and assessment. In the initial phase (1), the offender focuses on forming a friendship with the child, taking varying amounts of time. In the subsequent phase (2), an extension of the friendship-forming stage occurs, where the adult tries gathering information about them. These phases serve a dual purpose: gaining insight into the child's life and identifying potential vulnerabilities. Moving to the next phase (3), the conversation shifts to the abuser asking about the location of the child's computer and the number of other users. This indicates an attempt to assess the risk of detection by the child's parents or guardians and to avoid getting caught. Following the risk assessment in phase (4), the goal is to build an exclusive, confidant-like relationship with the child. This phase can be precarious, due to the possibility that the children might establish emotional ties with the abuser. Throughout these stages, the offender continuously solicits feedback from the child to assess the level of trust. Advancing to phase (5), the sexual stage is introduced with seemingly innocent questions like "have you ever been kissed?" or "do you ever touch yourself?". This stage appears harmless as the adult has established a deep sense of trust. In the subsequent phase (6), fantasy enactment occurs as the adult engages the child in the enactment of a sexual fantasy, typically by describing a specific scenario. Online grooming encounters may involve "damage limitation" exercises (7), where the adult or adolescent with a sexual interest in children provides positive encouragement and high praise to reduce the risk of the child disclosing online activities out of fear (O'Connell, 2003).

Explaining OSA: Theoretical Perspectives

The behaviors mentioned above exhibit significant reciprocity, often manifesting as responses to provocations or abusive actions initiated by others. Although sending sexts and engaging in online grooming represent distinct risks within the realm of eroticism, they share psychological correlations (Hernández et al., 2021). This aligns with several theoretical frameworks, such the General Aggression Model (GAM) (Anderson & Bushman, 2002), this model serves as a comprehensive, integrative model for comprehending human aggression, with applications across various domains (Allen et al., 2018). This model encompasses (1) inputs from both individuals and their environments; (2) cognitive, affective, and arousal pathways through which these inputs exert influence; and (3) outcomes stemming from underlying appraisal and decision-making processes (Anderson & Bushman, 2002). Proximal situational factors play a role in increasing the likelihood of aggression by influencing current internal states. Thus, elements such as social rejection, provocation, and exposure to violent media can elevate the propensity for aggressive responses (Calvete et al., 2023). Additionally, both online sexual interactions with adults and sexting behaviors with peers and partners are strongly correlated with prior instances of adult sexual solicitations (Calvete et al., 2021; Gámez-Guadix et al., 2018; Gámez-Guadix & Mateos-Pérez, 2019). This correlation is significant, aligning with the GAM's proposition (Anderson & Bushman, 2002), showing high reciprocity between victimization and the perpetration of risky behaviors (Calvett, 2022).

Online sexual abuse assessment measures

With the increased use of ICT's for engaging in online sexual activities, forming intimate relationships, and exploring sexuality, there has been a growing need and interest in the development of assessment instruments.

Concerning sexting, notable instruments include “The Sexting scale” (Hernández & Mateo, 2018) and “The Sexting Behaviors Scale” (Dir, 2012). The sexting scale evaluates the frequency and prevalence of erotic and pornographic sexting behaviors, demonstrating good internal consistency with a Cronbach's alpha of .86. While widely used in the Spanish context (Hernández et al., 2021; Tamarit et al., 2021).

Conversely, few instruments assess grooming, such as the “Sexual Grooming Model of Child Sexual Abusers” (Winters et al., 2020), the “Questionnaire for Online Sexual Solicitation and Interaction of Minors with Adults” (Gámez-Guadix et al., 2018), and “The Grooming Scale” (Hernández & Mateo, 2018). The present study aims to validate “The Grooming Scale” for the Portuguese context. This self-report assesses others' exhibitionism, personal exhibitionist performance, and requests a minor may receive from an adult up to the point of grooming. The scale presents an alpha de Cronbach alpha .86,

therefore having a good internal consistency. After its development, it has not been used much outside the Spanish context.

Dark personality

The commonly used model of malevolent personality traits is the Dark Triad of Personality, which encompasses three types of subclinical personalities: Machiavellianism, narcissism, and psychopathy. These characteristics may be seen as unfavorable or undesirable, yet they still lie within the spectrum of normal human behavior (Paulhus & Williams, 2002). Machiavellianism is a personality trait essentially defined by three aspects: manipulation, callous affect, and strategic orientation (Jones & Paulhus, 2014). Individuals with the trait of Machiavellianism manipulate and strategically plan their actions in (Jones & Paulhus, 2014). Narcissism is characterized by exaggerated self-esteem, individualistic and grandiose perspectives, and a high sense of dominance and superiority (Paulhus & Williams, 2002). Narcissistic individuals engage in self-promotion behavior, which is oriented toward the need for ego enhancement and strengthening. Additionally, their goals are guided by the grandiosity identity they possess (Jones & Paulhus, 2014). The psychopathy trait is considered the most aversive construct of the Dark Triad, characterized by a pattern of insensitivity, impulsivity, lack of empathy, malevolence, and disinhibition (Paulhus & Williams, 2002). Therefore, psychopathic individuals demonstrate destructive patterns of interpersonal behavior and use manipulative and engaging techniques (Rodrigues et al., 2020), as well as poor decision-making and failure to inhibit antisocial impulses (Jones & Paulhus, 2014).

The Role of Dark Personality in OSA

Previous research has shown that a variety of personality traits are important factors contributing to sexual-erotic online behavior, some of them have even studied the Dark Triad as predictors of sexting and grooming in adolescents (Resett et al., 2022). Although the specific relationship of Dark Triad with sexting and grooming among young adults has been scarcely studied.

Recent research pointed out how the antisocial side of personality —the Dark Triad— relates to perpetrating and being victimized by Online Sexual Victimization (OSV) behaviors (Pineda et al., 2023). Some studies (i.e., Clancy et al., 2021; Pineda et al., 2023) found positive associations between the three traits comprising the Dark Triad (i.e., Machiavellianism, narcissism, and psychopathy) and the behavior of sexting. Few studies examined the relationship between personality factors and online grooming itself. Although, as mentioned, sending sexts and online grooming are both independent erotic risks, they are psychologically related (Hernández et al., 2021). Hernández and Mateo (2018) have shown a positive

association between these two online sexual behaviors, highlighting that the process of grooming often involves sexting activities such as the sending and receiving of text messages and pictures with insinuating and erotic content. Furthermore, Resett et al. (2022) have proposed a model for predicting sexting and online grooming based on dark personality traits and emotional problems. They detected that high levels of dark personality, lower levels of anxiety, and high depression scores were the significant predictors (Resett et al., 2022). Their study revealed that high levels of dark personality traits, lower levels of anxiety, and high scores on depression were significant predictors of sexting behavior. However, neither anxiety nor dark personality traits were found to be predictors of online grooming behavior. Rather, higher levels of sexting behavior and depression scores explained the variance in online grooming behavior (Resett et al., 2022). In addition, a clear relationship exists between sexual narcissism and sexual lack of empathy, both of which contribute to OSA including sexting and online grooming victimization (Liu & Zheng, 2020).

The research on personality traits and their correlation with OSA has yielded varied insights. More specifically, while Pineda et al. (2023) concluded that psychopathy exhibits limited predictive efficacy in both perpetration and victimization of OSV, the broader literature reveals inconsistency regarding the association of this trait with OSV (Clancy et al., 2019). In contrast, Casale and Banchi's (2020) meta-analysis brought to light a positive link between narcissism and specific online activities, encompassing frequent photo uploads and engagement in sexting. Furthermore, the sharing of explicit content and involvement in suggestive messaging is positively linked to both Machiavellian and narcissistic components within the Dark Triad, as expounded upon by (Clancy et al., 2019, 2020; March & Wagstaff, 2017) .

Expanding on these insights, March & Wagstaff (2017) the study explores further, revealing that individuals with heightened Machiavellian traits not only take part in frequent sexting but are also more inclined to transmit unsolicited explicit images. Hence, the trait most indicative of sending such unsolicited images seems intricately linked to the strategic manipulation of others and situations, distinguishing itself from the distinct characteristics of narcissistic, psychopathic, and sadistic traits associated with admiration, callousness, and the enjoyment of inflicting suffering, respectively (Book et al., 2015; Buckels et al., 2013; Lilienfeld et al., 2014).

Present study

While the relationship between personality traits and sexual online behavior has been established (Casale & Banchi, 2020; Clancy et al., 2019; Morelli et al., 2016; Pineda et al., 2023), the association between the Dark Triad and the behavior of sexting and online grooming has been scarcely studied.

Additionally, there is a lack of validated instruments assessing sexting and grooming for the Portuguese population. Given the scarcity of research on this topic in Portugal, this study aims to characterize the prevalence of sexting and online grooming and their potential association with personality traits. Specifically, to: i) validate and describe the psychometric characteristics of The Sexting scale and The Grooming Scale for the Portuguese population; ii) examine the relationship between sexting experience and Dark Triad personality characteristics; iii) examine the relationship between online grooming experience and Dark Triad personality characteristics.

Based on existing literature, the following hypotheses were proposed: i) The Sexting scale and The Grooming Scale instruments present adequate internal consistency and divergent and convergent validity; ii) Positive correlation between sexting and online grooming; iii) Higher levels of Machiavellianism and narcissism are significant and positively correlated with sexting experience and online grooming experience; iv) Higher levels of psychopathy are not correlated with sexting experience and online grooming experience.

Methods

This is an exploratory quantitative study, with participant recruitment conducted in various locations but the data were collected at a single moment, resulting in a single research group. A cross-sectional correlational design was employed, and data were obtained through an online questionnaire. Considering the study's objectives, participants were selected conveniently, meeting the specified criteria: being aged between 18 years and 25 years. This sample was collected by making the survey available on an online platform and sharing it across different social networks.

Participants

The initial sample of this study consisted of 364 participants, 35 of whom were excluded because they did not meet the inclusion criteria for the sample, namely being between 18 and 25 years old and having Portuguese or dual nationality. The sample of the present study included a sample of 329 young adult Portuguese participants, 269 females (81.8%) and 55 male (16.7%) aged between 18 years and 25 years (M = 20.83, SD = 1.992). In which 323 (98.2%) had Portuguese nationality and 6 (1.8%) had dual nationality (Portuguese and other). (Table 1)

Table 1

Sociodemographic characterization of the sample

Baseline characteristic	*n*	*%*
Gender		
Female	269	81.8
Male	55	16.7
Nationality		
Portuguese	323	98.2
Dual Nationality	6	1.8

Instruments

Sociodemographic questionnaire – It was developed to collect information on variables such as age, gender, and nationality.

Sexting – The Sexting scale (Hernández & Mateo, 2018) is a scale that the present study aims to validate for the Portuguese population. It is a 13-item self-report scale with a bifactorial structure, the first factor is designated as erotic sexting, and the second factor is designated as pornographic sexting. Responses are based on a 4-point Likert scale from 1 (never or nothing) to 4 (always or a lot). The scale presents a Cronbach's alpha .86, therefore having a good internal consistency.

Online Grooming – The Grooming Scale (Hernández & Mateo, 2018) is a scale that the present study aims study aims to validate for the Portuguese population. It is a 13-item self-report that assesses the exhibitionism of others, the personal exhibitionist performance, and the requests that a minor may receive from an adult up to the point of grooming. Each item was scored on a 4-point Likert scale from 1 (never or nothing) to 4 (always or a lot). The scale presents a Cronbach's alpha .86, therefore having a good internal consistency.

Cyberbullying – The Cyberbullying Inventory for College Students (CICS) (Francisco et al., 2015) is an inventory of the type and degree of involvement in cyberbullying. The instrument has 4 scales but in the present study, only two were applied (scale for victims and scale for aggressors), consisting thus of 18 items. The Scale for Victims presents a Cronbach's alpha .96 and the Scale for Aggressors presents a Cronbach alpha .98, therefore having a good internal consistency. In our study, the alpha was .88 on Scale for Victims and .78 on Scale for Aggressors.

Dark Triad – The Dirty Dozen (D12)(Macedo et al., 2017) is an instrument that assesses the presence of the traits of the Dark Triad constellation. D12 is a 12-item self-report, and responses can be 1 (strongly disagree) to 5 (strongly agree). The instrument has a Cronbach's alpha of .72 and therefore having a satisfactory internal consistency. The items are divided by the three traits, with four items indicating each trait. In our study the alpha was .81.

Procedure

Authorization was requested from the authors of the original scales for their translation. Subsequently, the project was submitted to the Ethics Commission for Social and Human Sciences Research of the University of Minho (CEICSH 130/2023). To adapt the "Escala de Sexting" and "Escala de Grooming" to the Portuguese population, and as proposed by Hill and Hill (2005), the scales were translated and back-translated, respecting the structure of the original scales and the order of the items in the originals versions. The instruments were first translated by one of the bilingual researchers and then back-translated by a bilingual professional with expertise in the field of psychology. The lexical and semantic aspects of the instruments were also checked and the final Portuguese version of the "Escala de Sexting" and "Escala de Grooming Online" was created. The data collection began on January 6th and ended on February 23rd, was carried out online using the Qualtrics tool, and the questionnaire was shared on social media.

Before filling in the questionnaire, a brief description of the study's objectives was given, as well as the inclusion criteria (aged 18-25 years old). Confidentiality was also stressed, as well as the anonymity of the data, the voluntary nature of the involvement, and the option to withdraw from the study. In addition, an informed consent form was presented, and participants could only proceed once they had signed it.

Participants who completed and accepted the informed consent then completed a brief sociodemographic questionnaire, followed by the instruments. In addition, at the end of completing all the instruments, participants were provided with support lines in case they felt any discomfort (e.g., *SOS Voz Amiga and Conversa Amiga*).

Data analysis

Data analysis was performed using the statistical software SPSS Statistics 29.0. Descriptive statistics (means, standard deviation, and frequencies) were used to characterize the sample. Subsequently, the sample was tested for normality and a distribution was found that does not follow the normal model according to the Kruskal–Wallis test (Martins, 2011).

Procedures were carried out to ensure strict control of all the measures obtained, by studying the internal consistency coefficients of all the scales and sub-scales, through the results of Cronbach's alpha, with values equal to or greater than .70 being considered acceptable (Marôco & Garcia-Marques, 2006).

Exploratory factor analysis (EFA) was used to study the construct validity of the instruments, followed by confirmatory factor analysis (CFA) of the sexting scale. Association tests were also carried out to verify divergent and convergent validity. For convergent validity, the sexting scale was compared to the narcissism factor of the D12, and for divergent validity, was compared to the psychopathy factor of the D12. The grooming scale, for convergent validity, was compared to the cyberbullying victims scale and the cyberbullying aggressors scale, and for divergent validity, was compared to the psychopathy factor of the D12.

Prevalence analyses of sexting and online grooming were also carried out and these variables were coded. Up to a total value of 13, both variables were coded with the presence of no behavior (no), and total values from 14 upwards were coded with at least the presence of one behavior (yes). To test hypotheses ii), iii), and iv) of this study, Spearman's correlation coefficients were used.

Results

Internal consistency

In the sample of the present study, a Cronbach's alpha value of .86 (N=329) was obtained for the sexting scale, specifically .87, .84, and .79 for the erotic sexting, pornographic sexting, and romantic sexting subscales, respectively, indicating good internal consistency (Marôco & Garcia-Marques, 2006), with a mean of 20.76 (SD=5.34) for the total scale. For the online grooming scale, the Cronbach's alpha value obtained was .86, indicating good internal consistency (Marôco & Garcia-Marques, 2006), with a mean of 17.90 (SD=5.83) for the total scale.

Exploratory factor analysis - Sexting scale

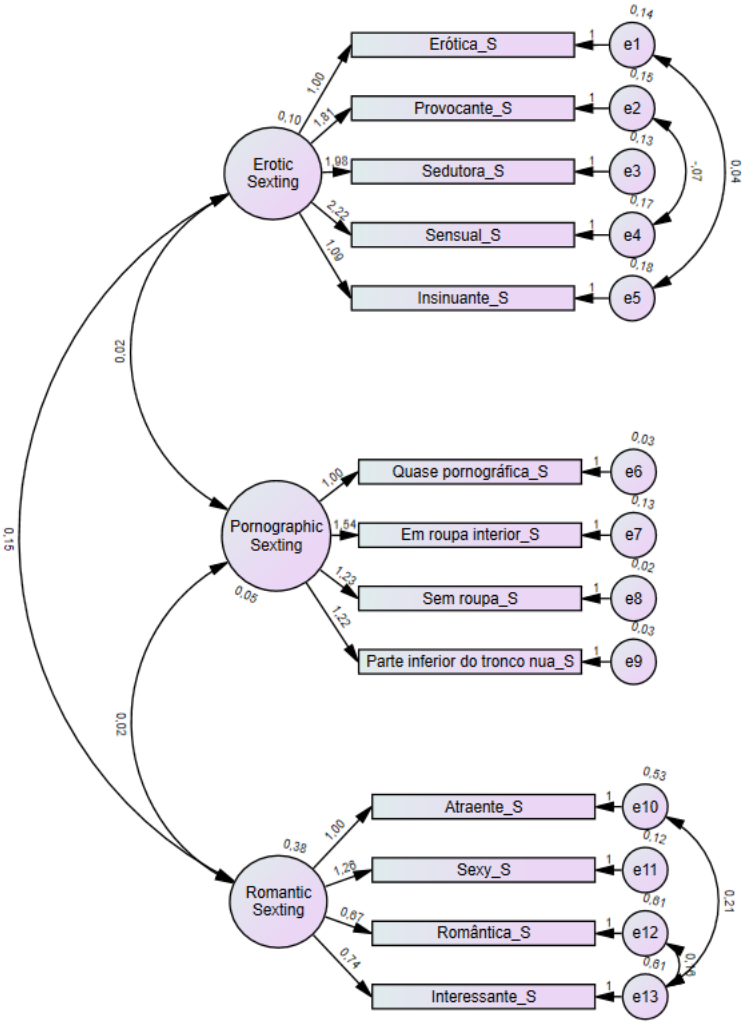
The KMO measure yielded a value of .86, indicating a good fit of the sample for principal component analysis, ensuring its feasibility, while Bartlett's test of sphericity returned a statistically significant value (χ^2=2257.94, p<.001), demonstrating that the intercorrelation matrix is significantly different from the identity matrix regarding the sexting scale.

In our study, three factors emerged for the sexting scale, five items emerged in factor one, four in factor two, and four in factor three. The first factor explained 39.54% of the variance, the second factor

explained 19.29%, and the third factor explained 9.73%. Cumulatively, the three factors explained 68.56% of the variance. Therefore, despite the original scale having only two factors, we proceeded with the three factors, naming them: erotic sexting (factor one), pornographic sexting (factor two), and romantic sexting (factor three).

Figure 1

Factor weights and correlations between factors of the sexting scale



Confirmatory factor analysis – Sexting scale

A CFA was conducted to find a model that better fit the data. Initial analyses confirmed that the assumption of multivariate normality was met (Ku_{mul}=4.375 < 10) (Kline, 2005), using the maximum likelihood method. Subsequently, a chi-square test was performed (χ2=168.40, p< .000). The model is depicted in Figure 1 and comprises three major factors. We then proceeded to analyze the Goodness-of-Fit Index (GFI), Normed Fit Index (NFI), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root

Mean Square Error of Approximation (RMSEA) values to assess the model fit. Covariances between errors were introduced (see Figure 1) to achieve a better fit to the data, as the RMSEA values were above .1, which is considered unacceptable (Marôco, 2014). After these adjustments, the GFI, NFI, CFI, TLI, and RMSEA values were .930, .927, .950, .933, and .076, respectively, indicating acceptable fit (values above .90 for GFI, NFI, CFI, and TLI, and between .05 and .10 for RMSEA) (Marôco, 2014).

In Figure 1, the correlations between factors are displayed, showing positive correlations of .28 between factors one and two, .77 between factors one and three, and .17 between factors two and three. Additionally, the standardized factor loadings of the respective factors are presented.

Validity study of the sexting scale

Due to the lack of normality of the sample, spearman's correlations were carried out to assess convergent validity. The total score of the sexting scale was significantly and positively correlated with the score of the narcissism factor of the D12 (see Table 2).

Concerning the divergent validity of the sexting scale, spearman´s correlations were performed between its total and the psychopathy factor of the D12 (see Table 2). The results show no significant correlation between the sexting scale and the psychopathy factor, thus showing that the measured constructs are independent.

Table 2

Convergent and discriminant validity of the sexting scale

Instruments	r_s
Narcissism	.354**
Psychopathy	.026

*Note. **p < .01*

Exploratory factor analysis - Online grooming scale

The KMO measure yielded a value of .87, indicating a good fit of the sample for principal component analysis, ensuring its adequacy. Additionally, Bartlett's test of sphericity resulted in a statistically significant value (χ^2=18114.60, p<.001), indicating that the intercorrelation matrix is significantly different from the identity matrix concerning the online grooming scale.

In our study of the online grooming scale, the first and only factor explained only 41.13% of the variance, which is consistent with the original scale.

Validity study of the Online grooming scale

Regardless of the sample's lack of normality, Spearman's correlations were carried out to assess convergent validity. The total score of the online grooming scale was significantly and positively correlated with the score of the cyberbullying victims scale and the cyberbullying aggressors scale (see Table 3).

Concerning the divergent validity of the online grooming scale, Spearman correlations were performed between its total and the Psychopathy factor of the D12 (see Table 3). The results show no significant correlation between the online grooming scale and the Psychopathy factor, thus showing that the measured constructs are independent.

Table 3

Convergent and discriminant validity of the online grooming scale

Instruments	r_s
Cyberbullying - Victims	.504**
Cyberbullying - Aggressors	.390**
Psychopathy	.068

Note. $^{**}p < .01$

Sexting and online grooming prevalence

Of all the participants who completed the study 255 (94.8%) of the women admitted to engaging in at least one behavior of sexting, and 227 (84.4%) of the women reported involving in at least one behavior of online grooming. 47 (85.5%) of the men admitted to engaging in at least one behavior of sexting, and 47 (85.5%) of the men reported involving in at least one behavior of online grooming. The type of sexting in which both genders were more involved was romantic sexting, with 255 (94.8%) of the women and 46 (83.4%) of the men admitting to engaging in at least one act of romantic sexting (see Table 4).

Association between sexting, online grooming and the Dark Triad

Table 5 describes the bivariate analyses conducted to examine the relationship between the variables: sexting, online grooming, narcissism, psychopathy, and Machiavellianism. The results obtained reveal positive and significant correlations among all study variables, except for the psychopathy variable (see Table 5).

Table 4

Prevalence of sexting and online grooming

		Gender			
		Female		Male	
		n	*%*	*n*	*%*
Sexting	No	14	5.2	8	14.5
	Yes	255	94.8	47	85.5
Erotic Sexting	No	144	42.4	29	52.7
	Yes	155	57.5	26	47.3
Pornographic Sexting	No	255	83.6	43	78.2
	Yes	44	16.4	12	21.8
Romantic Sexting	No	14	5.2	9	16.4
	Yes	255	94.8	46	83.4
Online Grooming	No	42	15.6	8	14.5
	Yes	227	84.4	47	85.5

Table 5

Association between sexting, online grooming, and the Dark Triad

	1	2	3	4	5
1.Sexting	_				
2.Online Grooming	.416**	_			
3. Narcissism	.354**	.261**	_		
4. Machiavellianism	.198**	.285**	.478**	_	
5.Psychopathy	.026	.068	.054	.385**	_

Note. $^{**}p < .01$

Discussion

The main objective of this study was to characterize the prevalence of sexting and online grooming and their potential association with personality traits. More specifically, to validate and describe the psychometric characteristics of the sexting scale and the grooming scale for the Portuguese population. In addition to contributing to the increase of available tools for studying sexting and online grooming within the Portuguese context, this study proves to be very useful in characterizing these phenomena. Consequently, it will support the development of prevention policies in this area.

The EFA carried out in this study was based on its equivalent by Hernández & Mateo (2018). Based on the results of our study, we can conclude that the sexting scale has a predominantly homogeneous structure, resulting in three distinct factors. The scale's alpha (.86) is broadly acceptable allowing us to claim that this scale comes close to meeting the required fidelity criteria. The three factors that emerged in our study explain a greater percentage of the variance than the two factors found in the original study. The CFA was then carried out to confirm the factor structure of the underlying theoretical model observed in the EFA. Thus, a three-factor model was used: erotic, pornographic, and romantic sexting, which were significantly correlated with each other. In this study, the covariance between the errors was calculated to obtain a better fit of the model to the data. The third factor that emerged was romantic sexting, which includes items such as "I choose photos to post on social media where I see myself as attractive", and "I choose photos to post on social media where I see myself as romantic". The current normalization and romanticization of social networks in relationships can explain the emergence of this factor. In romantic or sexual interactions between young people, sexting is regarded as a normal and consenting form of sexual expression and intimacy display, as well a typical behavior that could be regarded by society as an indication of closeness (Barroso et al., 2021; Mori et al., 2020).

Concerning analyzing the convergent validity of the sexting scale, this was carried out by comparing it with a factor that analyzes the presence of narcissism. Statistically significant correlations were obtained between the narcissism factor and the sexting scale, which means that as the presence of narcissistic traits increases, so do sexting behaviors. Furthermore, the results support the discriminant validity demonstrated by the non-significant associations between the sexting scale and the psychopathy factor. Other studies (Liu & Zheng, 2020; Pineda et al., 2023; Resett et al., 2022) provides evidence for both associations.

Regarding the online grooming scale, the EFA carried out in this study was based on its equivalent by Hernández & Mateo (2018). Based on the results of our study, we can conclude that the online

grooming scale has a mostly homogeneous structure, giving rise to only one factor, as in the original study. The scale's alpha (.86) is broadly acceptable, allowing us to claim that this scale comes close to meeting the required fidelity criteria. The factor that emerged in this study explains a low variance, although it is higher than the one carried out by Hernández and Mateo (2018).

With regard to analyzing the convergent validity of the online grooming scale, this was carried out by comparing it with the score of the cyberbullying victim's scale and the cyberbullying aggressor's scale. It was obtained a positive and statistically significant correlation in both cases, which means that as the presence of behaviors of cyberbullying and victimization by cyberbullying increases, so do online grooming behaviors. Furthermore, the results support the discriminant validity demonstrated by the non-significant associations between the online grooming scale and the psychopathy factor. The literature provides evidence for both associations (Hernández & Mateo, 2018; Pineda et al., 2023). In fact, a study that investigated the risk factors of online grooming victim's states that cyberbullying is one of them (Hernández & Mateo, 2018; Pineda et al., 2023).

In conclusion, these results corroborate the first hypothesis of the study, which is that the sexting scale and the online grooming scale have acceptable internal consistency, convergent and discriminant validity values (Marôco, 2014). However, due to the low percentage of variance explained by the online grooming scale, the use of this instrument to analyze the presence of online grooming may be compromised. On the other hand, the very acceptable EFA and CFA values of the sexting scale support the use of this instrument to analyze sexting behavior (Marôco, 2014). The use of this instrument has benefits, as it has the potential to assess not only erotic and pornographic sexting but also sexting linked to the type of relationships adopted by young people today (romantic) - further studies are needed.

The analysis of the prevalence of at least one sexting behavior resulted in rates of 94.8% and 14.5% for womens and mens, respectively. These findings surpass the prevalence of sexting behaviors reported in other studies (Hernández et al., 2021; Madigan et al., 2018; Resett et al., 2022). The discrepancies between the prevalences can be explained by the sample characteristics and the specificities of the instruments used in each study. The most prevalent type of sexting in our sample was romantic sexting, strengthening the hypothesis of its use and normalization in relationships as a form of online sexual behavior and relationship-building (Barroso et al., 2021; Mori et al., 2020). This is somewhat worrying considering the important role ICT plays in young people's lives today and how they interact with it. In addition, since our study was conducted retrospectively, asking participants to recall their experiences before the age of 18 may also have an influence.

The prevalence of engaging in at least one online grooming behavior was assessed, and rates for women and men were 84.4% and 85.5%, respectively. Despite the paucity of research on the topic in Portugal, it becomes evident from these data that the prevalence of online grooming behaviors is higher than what other studies found (Branca et al., 2016; Lourenço & Manita, 2021). The rate of online grooming behavior acquired is also higher than those found in terms of international prevalence rates (Hernández et al., 2021). The features of the instruments employed in each study as well as the characteristics of the samples can be used to explain the differences in prevalences. Furthermore, the retrospective nature of our study, which involved asking participants to recollect their experiences before turning 18, might have an impact.

This study also aimed to analyze the association between sexting and online grooming. As expected, a statistically significant and positive correlation was found between sexting and online grooming. This means that as the presence of sexting behaviors increases, so does the involvement in online grooming behaviors, corroborating the study's second hypothesis. This result has also been shown by other studies (Hernández et al., 2021; Resett et al., 2022; Schoeps et al., 2020), and it was pointed out that sending and receiving texts and photos with suggestive and sensual content are examples of sexting behaviors that are frequently involved in the grooming process. This shows that sexting and online grooming are psychologically related (Hernández et al., 2021).

With regard to the third hypothesis, the associations between sexting and online grooming behaviors and the Dark Triad personality traits were analyzed. The results show, as expected, the existence of a positive correlation between the narcissism trait and sexting and online grooming behaviors, this being the strongest correlation between the online behaviors studied and the Dark Triad personality traits. In addition, the results show a positive correlation (although weak) between the trait of Machiavellianism and sexting and online grooming behaviors. This means that as the presence of narcissistic and Machiavellianism traits increases, so do sexting behaviors and online grooming behaviors. Our findings support the third hypothesis of this study and are in line with other studies (Clancy et al., 2019, 2020; March & Wagstaff, 2017). Indeed, Casale & Banchi (2020) meta-analysis has demonstrated a favorable correlation between narcissism and some internet behaviors, such as frequent photo uploads and sexting. This could be explained by the fact that sexting and online grooming are OSA, and that narcissistic people use OSA frequently to satisfy their need for idealized companions and images (Liu & Zheng, 2020). Furthermore, narcissism has been linked favorably to social media use and internet addiction (Pantic et al., 2017; Wang et al., 2012). This can mean that narcissists might use the internet

more frequently and have a more experience with it. It should be noted that, given the scale used to assess sexting behavior, and more specifically the prevalence of romantic sexting, the quantity of likes now serves as a secondary form of reward when someone feels positively affected emotionally. In fact, teenagers nowadays are generally less empathetic and more self-conscious about how they might appear (Gnambs & Appel, 2018).

Our results also corroborate the fourth hypothesis, showing, as expected, no correlation between the psychopathy trait and sexting and online grooming behaviors. The literature shows inconsistency regarding the association of this trait with OSA (Clancy et al., 2019). More particularly, Pineda et al. (2023) concluded that psychopathy exhibits limited predictive efficacy in sexual-erotic behavior. This can be explained by the fact that OSA, like sexting and behaviors that can lead to online grooming, is a new normal sexual activity rather than a problematic conduct (Velezmoro et al., 2012).

It is worth emphasizing that this study has some limitations that should be considered to better contextualize its results and implications. Firstly, we would highlight the characteristics of the sample, the preponderance of females, and the limited age range, which prevents the results from being generalized to all national cases. Furthermore, the use of self-report questionnaires, as well as the fact that our study was conducted retrospectively, asking participants to recall their experiences when they were children and young people, in itself presents some limitations. A potential response bias on the part of the participants, due to the influence of social pleasantness or possible memory biases, could compromise the validity and reliability of the data. Future studies should include more men in their sample to promote knowledge in this field, as well as include participants of older ages to guarantee the generalizability of the results. Furthermore, it is recommended that future studies incorporate multiple sources of data, such as behavioral observations or third-party reports, to complement self-report measures. In addition, the development of longitudinal studies is suggested for a more in-depth understanding of the phenomenon of sexting and online grooming and the personality characteristics that underlie online sexual risk behavior. These longitudinal studies allow for an analysis over time, providing a more complete view of the associations. In this way, it would be possible to capture the evolution of these phenomena over time and provide valuable insights for more effective interventions and prevention policies. Finally, due to the weaker results obtained with the online grooming scale, we recommend using it as a complement to other scales that specifically assess victimization and prediction of this online behavior.

Conclusion

This study tries to characterize the prevalence of sexting and online grooming and their potential association with personality traits. This study provided a significant contribution to a deeper understanding of the topic of problematic ICT use, namely sexting and online grooming behaviors. More specifically, it made it possible to analyze the prevalence of sexting and online grooming behaviors, as well as to investigate the association of Dark Triad personality traits with these problems. It also validated two instruments, the sexting scale, and the online grooming scale, for the Portuguese population.

Despite the limitations mentioned above, this study contributes with the prevalence of sexting and online grooming among young adults in Portugal, informing preventive and intervention strategies addressing internet-related risks. Additionally, it is hoped that this research will encourage further investigations into these phenomena within the Portuguese context.

In order to prevent non-consensual sexting, as well as online grooming behavior, it is crucial to develop campaigns, awareness-raising initiatives and programs that alert the population to the issues of online violence and online sexual behavior. The programs should reach the widest and earliest possible target audience. To be effective, in addition to targeting interventions directly at children and young people, these programs must include initiatives aimed at parents, offenders, and Internet-based technology-related companies, to make sure that online spaces are secure (Calvete et al., 2022, 2023).

It is important to note that there is a gap in Portugal in terms of the existence of intervention and prevention programs in the area of online sexual behavior, which aim to intervene directly with both victims and perpetrators. It is, therefore, necessary to promote the implementation of intervention programs that focus on direct care and support for both victims and perpetrators of this type of behavior. As well as the development of prevention initiatives aimed at effectively combating online risks. These programs must be developed and adapted according to the specific cultural and social characteristics of the Portuguese context, in order to meet the needs and demands of the local population. In fact, and as mentioned by Chorpita (2019) comprehensive strategy to deter violent and risky online conduct likely needs a range of treatment options, such as interventions with different durations, structures, and levels of intensity.

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Anexo 1 – Parecer da Comissão de Ética

Universidade do Minho

Conselho de Ética

Comissão de Ética para a Investigação em Ciências Sociais e Humanas (CEICSH)

Identificação do documento: CEICSH 130/2023

Título do projeto: *Dark Triad, sexting, and online grooming: Malevolent side of online sexual activity in young adults*

Equipa de Investigação: Mariana Fernandes Costa (IR), Mestrado em Psicologia da Justiça, Escola de Psicologia, Universidade do Minho; Sónia Maria Martins (orientadora), Centro de Investigação em Psicologia (CIPsi), Escola de Psicologia, Universidade do Minho

PARECER

A Comissão de Ética para a Investigação em Ciências Sociais e Humanas (CEICSH) analisou o processo relativo ao projeto de investigação acima identificado, intitulado *Dark Triad, sexting, and online grooming: Malevolent side of online sexual activity in young adults.*

Os documentos apresentados revelam que o projeto obedece aos requisitos exigidos para as boas práticas na investigação com humanos, em conformidade com as normas nacionais e internacionais que regulam a investigação em Ciências Sociais e Humanas.

Face ao exposto, a Comissão de Ética para a Investigação em Ciências Sociais e Humanas (CEICSH) nada tem a opor à realização do projeto nos termos apresentados no Formulário de Identificação e Caracterização do Projeto, que se anexa, emitindo o seu parecer favorável, que foi aprovado por unanimidade pelos seus membros.

O Presidente da CEICSH

Assinado por: EMANUEL PEDRO VIANA BARBAS DE ALBUQUERQUE
Num. de Identificação: 07089799
Data: 2023.11.10 17:12:08 +0000

(Emanuel Pedro Viana Barbas Albuquerque)

Anexo: Formulário de identificação e caracterização do projeto