**Universidade do Minho**
Escola de Psicologia

Arminda Maria Mendes Vale

# Technology-facilitated dating abuse among adolescents: Victims, perpetrators, and bystanders

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Technology-facilitated dating abuse among adolescents:
Victims, perpetrators, and bystanders

Arminda Maria Mendes Vale

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**Universidade do Minho**
Escola de Psicologia

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# Technology-facilitated dating abuse among adolescents: Victims, perpetrators, and bystanders

Doctoral Thesis
PhD in Applied Psychology

Work supervised by
**Professor Marlene Matos**

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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.

# TECHNOLOGY-FACILITATED DATING ABUSE AMONG ADOLESCENTS: VICTIMS, PERPETRATORS, AND BYSTANDERS


## Abstract

Technology-facilitated dating abuse (TFDA), including its sexual forms (TFSDA), among adolescents, has received limited scientific and social attention. This thesis includes four empirical studies based on a school-based sample ($N$ = 1,855; aged 12–18) and a scoping review ($N$ = 6 studies). In Chapters I and II, the Technology-Facilitated Abuse in Relationships Scale (TAR) and the Scale for Reactive Bystander Opportunity Detection in TFSDA were validated for use in Portugal, demonstrating good psychometric properties. Prevalence rates for victimization (11.9%), perpetration (9.4%), and dual involvement (34.5%) were concerning. Cisgender girls were more often victim-perpetrators of monitoring/control behaviors, and adolescents aged 14–16 were more often victims of sexual coercion. TFDA was negatively associated with self-esteem and health-related quality of life and positively related to in-person dating violence. Image-based sexual harassment/abuse was the most frequently detected abusive typology by bystanders, with lower detection levels among cisgender girls and higher levels among older adolescents. Victims and victim-perpetrators of TFSDA detected more intervention opportunities. In Chapter III it was confirmed that the Theory of Planned Behavior is an effective model for predicting bystanders' intentions to help victims of TFSDA. Identifying as a cisgender girl and exhibiting higher levels of empathy were positively associated with favorable attitudes and subjective norms toward helping, greater perceived control over helping, and increased intentions to help. TFDA victimization was positively associated with attitudes but negatively associated with subjective norms and perceived behavioral control. In Chapter IV four bystander classes were identified — *Victim-centered helpers*, *Passive bystanders*, *Comprehensive helpers*, and *Inconsistent bystanders* — distinguished by intra-individual factors, event characteristics, and intervention outcomes. In Chapter V it was found that, in the assessment of victims of technology-facilitated sexual abuse, forensic interviews that present victims with digital evidence of the abuse harmed both the quality of the testimony and the recovery process. Risk and trauma assessments tended to overlook this type of abuse, except when it was disclosed by the victim or flagged by child protection services. The discussion summarizes key findings, implications, limitations, and future directions.



*Keywords:* Adolescents; Bystanders; Perpetrators; Technology-facilitated dating abuse; Victims

# ABUSO NO NAMORO FACILITADO PELO USO DAS TECNOLOGIAS ENTRE ADOLESCENTES: VÍTIMAS, PERPETRADORES E OBSERVADORES


## Resumo

O abuso no namoro facilitado pelo uso das tecnologias (technology-facilitated dating abuse, TFDA), incluindo as suas formas sexuais (technology-facilitated sexual dating abuse, TFSDA), entre os adolescentes, tem recebido limitada atenção científica e social. Esta tese inclui quatro estudos empíricos com uma amostra escolar (*N* = 1,855; 12-18 anos) e uma scoping review (*N* = 6 estudos). Nos Capítulos I e II foram validadas para Portugal a *Technology-Facilitated Abuse in Relationships Scale (TAR)* e a *Scale for Reactive Bystander Opportunity Detection in TFSDA*, ambas com boas qualidades psicométricas. As taxas de vitimação (11.9%), perpetração (9.4%) e duplo envolvimento (34.5%) eram preocupantes. As raparigas cisgénero foram mais vítimas-perpetradoras de monitorização/controlo e os adolescentes com 14-16 anos foram mais vítimas de coerção sexual. O TFDA associou-se negativamente com a autoestima e qualidade de vida relacionada com a saúde e positivamente com a violência no namoro presencial. O assédio/abuso sexual baseado em imagens foi a tipologia abusiva mais detetada pelos observadores, com níveis de deteção mais reduzidos entre raparigas cisgénero e mais elevados entre adolescentes mais velhos. Vítimas e vítimas-perpetradores de TFSDA detetaram mais oportunidades de intervenção. No Capítulo III confirmou-se que a Teoria do Comportamento Planeado é um modelo eficaz para prever a intenção dos observadores prestarem apoio a vítimas de TFSDA. Identificar-se como rapariga cisgénero e apresentar níveis elevados de empatia associou-se positivamente a atitudes e normas subjetivas favoráveis em relação a prestar apoio, à perceção de maior controlo sobre prestar apoio e intenções acrescidas de prestar apoio. A vitimação por TFDA associou-se positivamente com as atitudes, mas negativamente com as normas subjetivas e com o controlo comportamental percebido. No Capítulo IV identificaram-se quatro perfis de observadores — *Ajudantes centrados na vítima*, *Observadores passivos*, *Ajudantes abrangentes* e *Observadores inconsistentes* — que se distinguiram quanto a fatores intra-individuais, características do evento e consequências da intervenção. No Capítulo V constatou-se que, na avaliação de vítimas de abuso sexual facilitado pela tecnologia, as entrevistas forenses que expõem às vítimas as provas digitais do abuso prejudicavam tanto a qualidade do testemunho como o processo de recuperação. As avaliações de risco e de trauma tendiam a ignorar este tipo de abuso, exceto quando este era revelado pela própria vítima ou sinalizado por entidades de proteção de crianças/jovens. A discussão resume os principais resultados, implicações, limitações e direções futuras.



*Palavras-chave:* Abuso no namoro facilitado pelo uso das tecnologias; Adolescentes; Observadores; Perpetradores; Vítimas

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## LIST OF KEY TERMS

Key terms are defined below in alphabetical order. Key constructs will be further operationalized in subsequent chapters.

### Adolescents

Adolescence is a transitional period between childhood and adulthood, during which significant biological, cognitive, psychological, and social changes occur (Steinberg & Morris, 2001). The World Health Organization (WHO, n.d.) defines adolescents as individuals aged 10 to 19, whereas the United Nations (UN, n.d.) defines youth as those aged 15 to 24. The term "adolescents" is used to refer to individuals aged 12 to 18 reflecting an age range during which most adolescents begin to explore dating relationships (Connolly et al., 2013) and aligning with the typical ages of students enrolled in 7th to 12th grades, from which the dissertation sample was drawn (Direção Geral de Educação [General Directorate of Education; DGE], n.d.).

### Bystander

The term "bystander" is used to refer to adolescents who witness abuse – either in person or online – or become aware of its occurrence and who can intervene. They are neither victims in need of help nor perpetrators of the abuse (Banyard, 2015).

### Dating relationships

The terms "dating relationships", "girlfriend and boyfriend", and "current or former (dating) partner" are used interchangeably to refer to "two or more people in an emotionally and/or physically intimate relationship. The relationship may or may not be sexual. It may be casual or serious, short-term or long-term, straight, gay, monogamous, or open. Among young people, terms used to describe these kinds of relationships include boyfriend, girlfriend, going out, hanging out, hooking up, seeing each other, friends with benefits, and unofficially dating" (Brown & Hegarty, 2021, p. 4).

### Information and communication technologies/Digital devices

The terms "information and communication technologies" and "digital devices" are used interchangeably to refer to "any type of modern-day technology used to interact with other people. Examples include (but are not limited to) mobile phones, smartphones, computers, tablets, laptops, notepads, internet, social media, GPS devices, software, and apps" (Brown & Hegarty, 2021, p. 4).

### In-person/Offline

The terms "in-person" and "offline" are used interchangeably to refer to face-to-face interactions. For instance, in-person dating violence refers to abusive behaviors – including physical,

psychological, sexual, or stalking – used against a dating partner during face-to-face interactions (Centers for Disease Control and Prevention, 2025).

**Perpetrator**

The term "perpetrator" is used to refer to adolescents who engage in abusive behaviors toward someone with whom they have, or have had, a dating relationship. Although alternative terms, such as "individuals who used" – have been recommended to avoid stigmatizing these individuals (Ellyson et al., 2021), the term "perpetrator" is retained for brevity and readability, without any intention of labelling or passing judgment.

**Technology-facilitated dating abuse**

Rocha-Silva et al. (2021), in a systematic review of 126 studies examining constructs and behavioral dimensions, identified up to 42 terms used to describe technology-facilitated dating abuse, including, for instance, cyber dating abuse (Zweig et al., 2014), digital dating abuse (Reed et al., 2017), cyber dating violence (Stonard, 2020), cyber intimate partner victimization (Fernet et al., 2019), electronic dating aggression (Thulin et al., 2022), online dating violence (Morelli et al., 2016), and technology-facilitated abuse in relationships (Brown & Hegarty, 2021). The term "technology-facilitated dating abuse" was selected based on the core elements of the construct: 1) technology – a broad, flexible, and future-oriented term, often associated with progress and innovation, and it remains the most commonly used term in recent publications (Koukopoulos et al., 2025); 2) facilitated – highlighting the role of the perpetrator rather than attributing agency to the technology itself (Koukopoulos et al., 2025); 3) dating – referring to behaviors that occur within the context of a current or former dating relationship; and 4) abuse – capturing more than isolated incidents, with a consideration of intention, context, and the consequences (Geffner, 2016). Therefore, the term is used to refer to a range of abusive and harmful technology-facilitated behaviors in dating relationships (Brown & Hegarty, 2021).

**Technology-facilitated sexual abuse**

The term "technology-facilitated sexual abuse" is used to refer to a spectrum of sexually based harms, such as nonconsensual image taking and misuse, forced image recruitment, threatened sharing, unwanted online sexual talk, questions, and act requests, voluntary older partner, commercial talk, images, or other sexual online activity, without limiting the context to dating relationships (Finkelhor et al., 2022, 2023).

**Technology-facilitated sexual dating abuse**

The term "technology-facilitated sexual dating abuse" is used to refer to sexual pressure/coercion, and image-based sexual harassment/abuse occurring within the context of dating relationships (e.g., Brown & Hegarty, 2021; Ellyson et al., 2021; Reed et al., 2017; Ringrose et al., 2022).

**Victim**

The term 'victim' is used to refer to adolescents who have experienced abusive behaviors from someone with whom they have, or have had, a dating relationship – except in Chapters IV and V, where, in some instances, it applies regardless of dating context. Although alternative terms, such as "individuals who experienced" – have been recommended to avoid stigmatizing these individuals (Ellyson et al., 2021), the term "victim" is retained for brevity and readability, without any intention of labeling or passing judgment.

## LIST OF ABBREVIATIONS

aBIC – adjusted Bayesian Information Criterion

AI – Artificial Intelligence

AIC – Akaike Information Criterion

APAV – Associação Portuguesa de Apoio à Vítima [Portuguese Victim Support Association]

APsi – Associação de Psicologia da Universidade do Minho [Psychology Association of the University of Minho]

AVE – Average Variance Extracted

AvePP – Average Posterior Probabilities

BES-A – Basic Empathy Scale—Short Version

BIC – Bayesian Information Criterion

CAC – Child Advocacy Center

CADRI/CADRI-P – Conflict in Adolescent Dating Relationships Inventory

CAIC – Akaike's Information Criterion

CARPA – Abuse in Teen Relationships Scale

CDAQ – Cyber Dating Abuse Questionnaire

CEICSH - Comissão de Ética para a Investigação em Ciências Sociais e Humanas [Ethics Committee for Research in Social and Human Sciences]

CFA – Confirmatory Factor Analysis

CFI – Comparative Fit Index

CITC – Corrected Item-Total Correlations

COSMIN – COnsensus-based Standards for the selection of health Measurement Instruments Guidelines

CR – Composite reliability

CSAIO – Child Sexual Abuse Images Online

DF – Degrees of Freedom

DGE – Direção Geral de Educação [General Directorate of Education]

DPO – Departamento de Proteção de Dados [Data Protection Department]

EFA – Exploratory Factor Analysis

H – Humiliation

H – Hypothesis

HBSC – Health Behavior in School-aged Children

HRQoL – Health-related quality of life

HTMT – Heterotrait-Monotrait Ratio of Correlations

ICT – Information and communication technologies

Internet-related CSA – Internet-related child sexual abuse

ITC – International Test Commission

IWF – Internet Watch Foundation

KMO – Kaiser–Meyer–Olkin-test

Ku – Kurtosis

LCA – Latent Class Analysis

M – Mean

MC – Monitoring/Control

MICE – Multivariate Imputation by Chained Equations

MIIC – Mean Inter-Item Correlations

MLM – Maximum Likelihood Estimation

MLR – Maximum Likelihood Estimation with Robust (Huber-White) Standard Errors

MMAT – Mixed Methods Appraisal Tool

NCMEC – National Centre for Missing & Exploited Children

NICHD – National Institute for Child Health and Human Development Protocol

OSS – Online Sexual Solicitation

poLCA – Polytomous Variable Latent Class Analysis

PRISMA – Preferred Reporting Items for Systematic Reviews and Meta-Analyses

PSP – Polícia de Segurança Pública [Public Security Police]

Q – Question

RMSEA – Root Mean Square Error of Approximation

RQ – Research question

RSES – Rosenberg Self-Esteem Scale

S-B$\chi^2$ – Satorra-Bentler chi-square test

SC – Sexual Coercion

SD – Standard Deviation

SE – Standard Error

SE – Sexual Exploitation

SEM – Structural Equation Model

SK – Skewness

SMBB – Situational Model of Bystander Behavior

SRMR – Standardized Root Mean Square Residual

T – Threats

TA-CSA – Technology-Assisted Child Sexual Abuse

TAR – Technology-Facilitated Abuse in Relationships Scale

TF-CBT – Trauma Focused-Cognitive Behavioral Therapy

TFDA – Technology-Facilitated Dating Abuse

TFSA – Technology-Facilitated Sexual Abuse

TFSDA – Technology-Facilitated Sexual Dating Abuse

TLI – Tucker-Lewis Index

TPB – Theory of Planned Behavior

U – Mann-Whitney test

UK – United Kingdom

U.S. – United States of America

UMAR – União de Mulheres Alternativa e Resposta [Alternative and Answer Women's Union]

VIM – Visualization and Imputation of Missing Values

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## PUBLICATIONS LIST OF THE THESIS

This dissertation presents five chapters developed throughout the PhD research project.

### CHAPTER I

Vale, M. & Matos, M. (under review). Technology-facilitated abuse in relationships (TAR): Psychometric properties of victimization and perpetration among Portuguese adolescents. Manuscript submitted for publication. *Journal of Interpersonal Violence* (IF 2.6; Q1)

### CHAPTER II

Vale, M., Hines, D., & Matos, M. (under review). Validation of a scale for reactive bystander opportunity detection in technology-facilitated sexual dating abuse among Portuguese adolescents. Manuscript submitted for publication. *Cyberpsychology, Behavior, and Social Networking* (IF 4.2; Q1)

### CHAPTER III

Vale, M., Hines, D., & Matos, M. (under review). Adolescents' bystander intentions to help victims of technology-facilitated sexual dating abuse: The Theory of Planned Behavior. Manuscript submitted for publication. *Child Abuse & Neglect.* (IF 3.4; Q1)

### CHAPTER IV

Vale, M., Hines, D., & Matos, M. (under review). Adolescent bystanders in technology-facilitated sexual dating abuse: A latent class analysis. Manuscript submitted for publication. *Computers in Human Behavior* (IF 9.0; Q1)

### CHAPTER V

Vale, M., Gomes, J. P., & Matos, M. (2024). Forensic psychological procedures in cases of technology-facilitated sexual abuse among adolescents: A scoping review. *Behavioral Sciences & the Law*, *42*(4), 313-337. https://doi.org/10.1002/bsl.2658 (IF 1; Q2)

## ADDITIONAL PUBLICATION

An additional theoretical chapter developed within the scope of this research, though not included in the present thesis, was published in:

Vale, M., Pereira, F., & Matos, M. (2021). Ciberabuso nas relações de intimidade dos adolescentes: Um diálogo entre a psicologia e a criminologia [Cyber dating abuse among adolescents: A dialogue between psychology and criminology]. In I. S. Guedes & M. A. Gomes (Eds.), *Cibercriminalidade: Novos desafios, ofensas e soluções* (pp. 119–133). Pactor – Edições de Ciências Sociais, Forenses e da Educação.

# INTRODUCTION

## 1. From victimology to cyber victimology

In the mid-1940s, around the end of the Second World War, Victimology emerged as a field of study, with Hans von Hentig and Benjamin Mendelsohn pioneering early work on victims (Mawby & Walklate, 1994; Spalek, 2006). Since then, various victimological frameworks have developed. Positivist victimology focuses on the victim's role in their victimization, feminist victimology brought attention to violence against women and gendered power dynamics, and radical victimology addresses structural and systemic causes of victimization. In the 1980s-1990s, critical victimology began promoting more inclusive perspectives, emphasizing the sense of human agency and victims' rights to support (Mawby & Walklate, 1994; Spalek, 2006). This evolution marked a shift from theoretical victimology, concerned with the causes of victimization, to applied victimology, which emphasizes responses and protecting victims' rights (Fatah, 2000). Today, with the widespread access to and use of information and communication technologies (ICT), a new subfield has emerged – cyber victimology – defined as *"the study of the causation of victimisation, patterns of victimisation and victimhood, the impact of victimisation, and the treatment of victims of cyber-crime*s" (Halder, 2021, p. 7). Situated within this framework – "applied cyber victimology" – this dissertation focuses on technology-facilitated dating abuse (TFDA) among adolescents.

## 2. Technology-facilitated dating abuse

### 2.1. Definition

Globally, ICT are an integral part of adolescents' lives – often referred to as "Digital Natives" (Prensky, 2001) or "Generation Z" (born 1997-2012; Dimock, 2019). Consistent with this trend, nearly all U.S. adolescents have access at home to a smartphone (95%), desktop or laptop computer (88%), gaming console (83%), or a tablet computer (70%; Pew Research Center; Faverio & Sidoti, 2024; $N$ = 1,391; ages 13-17). Similar usage patterns have been reported in Europe (EU Kids Online; Smahel et al., 2020; $N$ = 25,101; aged 9-16). Specifically in Portugal, most adolescents up to age 15 had internet access at home (99.1%; Instituto Nacional de Estatística [Statistical National Institute], 2024; $N$ = 8,547 households). Fully 87% of adolescents logged on via smartphones, 41% via computers, and 25% via tablets (EU Kids Online Portugal; Ponte & Batista, 2019; $N$ = 1974, aged 9-16). On a typical day, a considerable proportion of adolescents reported spending two or more hours per day on TikTok (43.1%), WhatsApp (38.8%), and Instagram (37.1%; Health Behavior in School-aged Children [HBSC] Portugal; Gaspar et al., 2022; $N$ = 4,055; ages 11–15). Amid this digital immersion, ICT mediate adolescents' development of identity, intimacy, and sexuality (Borca et al., 2015; Eleuteri et al., 2017),

serving as attractive contexts in which to search for, meet, date, sext with, or even break up with a dating partner (Lenhart et al., 2015; Tienda, 2022; Vaterlaus et al., 2018), while simultaneously increasing the risk of victimization and/or perpetration of technology-facilitated dating abuse (TFDA).

Ambiguity around the terms exists (Rocha-Silva et al., 2021). Still, TFDA is commonly used to refer to a range of abusive and harmful technology-facilitated behaviors in dating relationships (Brown & Hegarty, 2021). Rodriguez-de-Arriba et al. (2021) classify these behaviors into two broad typologies: non-sexual and sexual forms. Non-sexual forms include verbal/emotional abuse (e.g., insults, humiliations, and threats; Reed et al., 2017; Rodriguez-de-Arriba et al., 2021; Sánchez-Jiménez et al., 2023), relational abuse (e.g., manipulation of the victim's social network; Barter et al., 2017; Rodriguez-de-Arriba et al., 2021), and monitoring/control (e.g., control over passwords, activities, and interactions; Brown & Hegarty, 2021; Rodriguez-de-Arriba et al., 2021). Sexual forms include sexual pressure/coercion (e.g., forced sexual conversations and activities) and image-based sexual harassment/abuse (e.g., unwanted requests of nude/sexual content, non-consensual creation, distribution, or threats to distribute nude/sexual content; Brown & Hegarty, 2021; Ellyson et al., 2021; Reed et al., 2017; Ringrose et al., 2022; Sánchez-Jiménez et al., 2023; Stonard, 2021; Zweig et al., 2013). These behaviors may be perpetrated through everyday digital devices (e.g., text messaging, phone calls) and more sophisticated ones (e.g., GPS tracking applications, generative AI; Brown & Hegarty, 2018; Fernet et al., 2019; Koukopoulos et al., 2025); occur across various types and stages of dating relationships, from early courtship to post-breakup (Brown & Hegarty, 2021; Fernet et al., 2019); and manifest in both private and public settings – for example, through persistent surveillance in private and through public acts such as sharing intimate images in group chats or tagging a partner in degrading posts (Fernet et al., 2019).

There is growing consensus that TFDA constitutes a distinct form of abuse (Peskin et al., 2017), rather than merely a subset of in-person psychological abuse, as initially proposed (e.g., Korchmaros et al., 2013). TFDA involves unique, technology-specific dynamics that set it apart, including image-based sexual harassment/abuse that relies on digital devices, constant accessibility that allows perpetrators to exert power and control beyond temporal and spatial boundaries (Afrouz & Vassos, 2024; Fernet et al., 2019), and the potential for wide public exposure and humiliation (Fernet et al., 2019; Zweig et al., 2014). Victims can find it challenging to identify the abuse, and the permanence of digital content – for example, through the re-reading of abusive messages – heightens the risk of revictimization (Hellevik et al., 2019). Moreover, the impersonal nature of online interactions – lacking physical and social cues – can lower perpetrators' behavioral inhibitions and contribute to de-

individuation, facilitating disinhibited and aggressive behavior (i.e., online disinhibition effect; Suler, 2004). Collectively, these features may create a qualitatively different experience for the victim (Zweig et al., 2014) and reduce the victim's capacity to escape from such abuse (Afrouz & Vassos, 2024). As a result, the consequences are far-reaching, encompassing emotional and mental health difficulties (e.g., low self-esteem, depressive mood, emotional overwhelm, psychological distress, reduced quality of life), risky behaviors (e.g., substance use), self-restricting behaviors (e.g., social isolation), and self-harming behaviors (e.g., suicide attempts; Afrouz & Vassos, 2024; Hellevik et al., 2019; Torp Løkkeberg et al., 2024). These outcomes further highlight the urgent need to properly measure, understand, and prevent this phenomenon in order to disrupt its progressive cycle of violence.

## 2.2. Measurement

Sound and comprehensive measurement is the starting point for advancing knowledge of TFDA. Recent systematic reviews have identified 22 and 30 international instruments (Brown & Hegarty, 2018; Rodríguez-Domínguez et al., 2020; Martínez-Soto & Ibabe, 2022). According to COSMIN (COnsensus-based Standards for the selection of health Measurement INstruments) guidelines – which aim to improve the selection of outcome measurement instruments in research and practice, three of these international instruments stand out for their strong methodological and psychometric qualities: the Cyber Dating Abuse Questionnaire (CDAQ), the Abuse in Teen Relationships Scale (CARPA), and the Technology-Facilitated Abuse in Relationships Scale (TAR; Martínez-Soto & Ibabe, 2022).

While the CDAQ has been validated in Portugal and other countries, it focuses on adults aged 18–30 and on victimization and perpetration of direct aggression and monitoring/control (Borrajo et al., 2015; Caridade & Braga, 2019). CARPA, designed for Spanish adolescents aged 11–18, assesses only direct online aggression and online control (Calvete et al., 2021). In contrast, TAR, administered to Australian youth aged 16–24 (Brown & Hegarty, 2021), offers several strengths: a) it was developed using a theory-driven approach and ensured face and content validity; b) adopts a holistic definition of key constructs, such digital devices and dating relationships; c) it address multiple forms of abuse – humiliation, monitoring/control, sexual coercion, and threats (Brown & Hegarty, 2021) – and notably includes a sexual form, a commonly overlooked, yet prevalent form associated with emotional distress (Brown et al., 2021; Reed et al., 2017; Rocha-Silva et al., 2021); d) acknowledges the bidirectional nature of the phenomenon, challenging traditional paradigms in victimology and criminology that dichotomize individuals as victims or perpetrators (Jennings et al., 2012); e) finally, its development included exploratory factor analysis, which identified the factor structure of victimization, explaining

53.4% of the total of variance, with strong internal consistency (Cronbach's alphas: 0.80–0.88; Brown & Hegarty, 2021).

In Portugal, assessments of TFDA among adolescents often rely on ad hoc items developed for specific studies (União de Mulheres Alternativa e Resposta [Alternative and Response Women's Union] UMAR, 2025) or on a 7-item subscale of the Portuguese version of the Conflict in Adolescent Dating Relationships Inventory (CADRI-P), which primarily captures insults and monitoring/control behaviors during an argument (Lucas et al., 2017). Given these limitations, adapting and validating the TAR scale in the Portuguese context is essential to ensure a comprehensive and psychometrically robust assessment of TFDA among adolescents, thus advancing national research efforts.

## 2.3. Prevalence rates

Worldwide, TFDA affects a significant proportion of adolescents; however, reported rates vary widely due to conceptual and methodological differences – some of which were discussed above – including terminology, definitions, measures, samples, and timeframes, which hinder cross-study comparisons (Brown & Hegarty, 2018; Caridade et al., 2019; Fernet et al., 2019; Li et al., 2023; Stonard et al., 2014). Stonard et al. (2014), in a systematic review of 12 adolescent studies conducted in the USA and UK between 2007 and 2013, reported victimization rates ranging from 12% to 56% and perpetration rates from 12% to 54%. Nearly a decade later, scientific interest in the topic and its representation in the European context increased. Li et al. (2023), in a meta-analysis of 25 adolescent studies conducted in the U.S., Canada, and Europe between 2013 and 2021, reported an overall prevalence of 36.9% for victimization (range: 7–76%) and 24% for perpetration (range: 8–58%). Victim-perpetrator roles overlapped in 8.6% to 48.9% of cases across studies (Ellyson et al., 2021, *N* = 696, aged 16-22; Stonard, 2021, *N* = 277, aged 12-18; Zweig et al., 2013, *N* = 3,745, grades 7-12). In Portugal, the most recent national data on dating violence indicated that 19.8% of participants reported victimization through social networking sites (UMAR, 2025; *N* = 4,493, aged 12-22), and that support was provided to 66 victims of dating violence up to the age of 17, although the type of violence was not specified (Associação Portuguesa de Apoio à Vítima [Portuguese Victim Support Association] APAV, 2025; *N* = 1,023 victims, ages up to 17-65+).

## 2.4. Socio-ecological correlates

Research on TFDA remains primarily descriptive and atheoretical (Van Ouytsel, 2018; Zavala & Muniz, 2025). However, when theoretical frameworks are applied to explain TFDA among adolescents,

they often draw on individual-level psychological theories – such as attachment theory[1] (Bowlby, 1979; Hazan & Shaver, 1987; Reed et al., 2016); criminological theories – such as lifestyle-routine activities theory[2] (Cohen & Felson, 1979; Van Ouytsel, 2018), and target congruence theory[3] (Finkelhor & Asdigian, 1996; Zavala & Muniz, 2025); and intergenerational transmission theories – such as social learning theory[4] (Akers & Jennings, 2009; Bandura, 1977; Van Ouytsel et al., 2020). While each of these perspectives offers valuable insights, socio-ecological models offer a more holistic perspective by accounting for risk and protective factors (or correlates, or related variables in cross-sectional studies) across multiple levels – individual, interpersonal, community, and societal – which may interact to influence the likelihood of (re)victimization (Bronfenbrenner & Morris, 1998; Caridade & Braga, 2020).

Analysis of some of these factors revealed several key findings. Concerning to sex/gender, non-sexual forms of TFDA show inconsistent gender patterns, whereas sexual forms predominantly involve cisgender girls as victims and cisgender boys as perpetrators (e.g., Brown et al., 2021; Ellyson et al., 2021; Reed et al., 2017; Stonard, 2021; Zweig et al., 2013). Concerning age, TFDA victimization and perpetration tend to increase until age 16, after which they begin to decline (e.g., Ellyson et al., 2021; Thulin et al., 2022). TFDA victimization has been shown over time to be linked to a lower health-related quality of life (HRQoL; Ortega-Barón et al., 2022), which reflects how adolescents perceive their physical, emotional, mental, and social well-being and functioning (Ravens-Sieberer & the European KIDSCREEN Group, 2006). Additionally, TFDA victimization and perpetration have been linked to various forms of in-person dating violence, including physical, psychological, and sexual forms (e.g., Rodríguez-deArriba et al., 2024). These findings underscore the need to expand research to more diverse adolescent populations and cultural contexts to build a more comprehensive and inclusive understanding of TFDA.

[1] Attachment theory posits that, based on the nature of the caregiver-infant relationships, secure and insecure attachment styles emerge (Bowlby, 1979), which later influence how individuals perceive and respond to dating partners. Romantic attachment insecurity is typically conceptualized along two dimensions: anxious and avoidant (Hazan & Shaver, 1987). Reed et al. (2016; $N$ = 703, aged 13-19) found that higher levels of attachment anxiety were linked to perpetration of electronic intrusion.

[2] Lifestyle-routine activities theory considers that victimization occurs in the convergence in time and space of three elements: exposure or proximity to motivated perpetrators, attractive targets, and absence of capable guardianship (Cohen & Felson, 1979). Van Ouytsel et al. (2018; $N$ = 466, aged 16-22) found that the amount of social networking site use, engagement in online risk behavior, the length of the dating relationship, and engagement in sexting with the dating partner were linked to victimization of monitoring/control behaviors.

[3] Target congruence theory explains that victimization risk should not be considered an aspect of routine activities but rather victim's characteristics that align with the needs and motivations of perpetrators: the target's vulnerability, gratifiability, and antagonism. Zavala and Muniz (2025; $N$ = 2,250, 7th-12th grades) found that depression and drug use (target vulnerability), engaging in sexual behaviors online (target gratifiability), and hostility and manipulation/fear tactics (target antagonism) were linked to TFDA victimization.

[4] Social learning theory suggests that individuals are more likely to engage in aggressive behaviors when they are learned through social interactions. This learning occurs through four key processes: imitation, differential association, differential reinforcement, and favorable definitions (Akers & Jennings, 2009; Bandura, 1977). Van Ouytsel et al. (2020 $N$ = 466, aged 16-22) found that the peer social norms, the endorsement of gender stereotypes, and witnessing intrusive controlling behaviors by the father were linked to perpetration of monitoring/control behaviors.

## 2.5. Tertiary prevention

Primary prevention focuses on strategies directed at the general population to prevent the issue from arising in the first place. Secondary prevention targets at-risk groups, aiming to reduce specific risk factors and prevent the escalation of potential problems. Tertiary prevention occurs after violence has already occurred and is oriented toward intervention, seeking to minimize the impact and prevent recurrence (Centers for Disease Control and Prevention, 2004).

This dissertation centers on tertiary prevention, examining two critical post-abuse responses – bystander intervention and forensic psychological procedures – with particular emphasis on sexually abusive behaviors. The analysis of bystander intervention centers on TFSDA, where, in some cases, bystanders are not merely witnesses but a structural precondition – for example, in the non-consensual sharing of sexual images, which typically involves a sender, a consensual receiver, and a third-party viewer (Harder et al., 2021). In contrast, forensic psychological procedures are examined within the broader category of TFSA, regardless of whether the perpetrator is a dating partner, as these interventions are generally applied across a wide range of victimization scenarios.

### 2.5.1. Bystander intervention

According to Banyard (2015), bystander intervention is grounded in the understanding that interpersonal violence is not merely an individual issue and that prevention efforts should not be limited to potential victims or perpetrators. Instead, it frames violence as a community-level problem, emphasizing the role of all individuals in contributing to its prevention. This approach promotes collective efficacy and a shared sense of responsibility, alongside the knowledge, skills, and confidence needed to help and challenge social norms. Ultimately, by learning how to intervene effectively, bystanders may internalize new attitudes and actions that help reduce their risk of victimization or perpetration.

Reflecting this perspective, a range of theoretical frameworks has been applied to study bystander intervention. Casey et al. (2017) proposed the Situational Cognitive Model of Adolescent Bystander Behavior, which integrates the original Situational Model of Bystander Behavior (SMBB; Latané & Darley, 1969, 1970) and the Theory of Planned Behavior (Ajzen & Schmidt, 2020) to explain bystander behavior in dating violence and bullying. In addition, Banyard (2015) introduced the Bystander Action Coils Model, further extending these frameworks to account for the dynamic and ecological factors influencing bystander behavior in sexual and intimate partner violence.

The following subsections integrate these frameworks to examine bystander opportunity, intention, and behavior in the context of TFSDA.

#### 2.5.1.1. Bystander detection of opportunities to intervene

Early measures of bystander intervention often relied on laboratory-based experiments in which confederates simulated emergency scenarios, and experimenters recorded whether participants chose to intervene (McMahon et al., 2017; Mennicke et al., 2023). However, this approach was eventually abandoned due to its limited capacity to capture the complexity of real-life experiences, prompting a shift toward self-report methods (McMahon et al., 2017; Mennicke et al., 2023). Despite this progress, a key methodological challenge remains: adequately accounting for the opportunity to intervene (Mennicke et al., 2023).

The SMBB (Latané & Darley, 1969, 1970) outlines a five-step decision-making process involved in helping, beginning with noticing the situation – now often conceptualized as opportunity detection (Waterman et al., 2020) – followed by interpreting the situation as requiring intervention, assuming responsibility to intervene, knowing how to intervene, and ultimately intervening. However, most validated measures related to interpersonal violence ask participants how often they engaged in specific bystander behaviors without first establishing whether they had encountered a situation where intervention was possible. This limitation makes it difficult to distinguish between the absence of opportunity and the decision not to intervene (McMahon et al., 2017; Mennicke et al., 2023).

Although some U.S. instruments have addressed this issue in the context of sexual and dating violence (e.g., Waterman et al., 2020) and peer sexual violence (e.g., Banyard et al., 2022), none have focused specifically on TFSDA. This highlights the need for validated measures tailored to digital contexts. In this regard, the TAR scale – particularly its sexual abuse items – may offer a useful foundation for initiating analysis of bystander opportunity in TFSDA and for subsequently exploring bystander intentions and behaviors.

#### 2.5.1.2. Bystander intention

The SMBB (Latané & Darley, 1969, 1970) outlines a five-step decision-making process involved in helping but overlooks cognitive factors that influence how individuals move through these stages (Casey et al., 2017; DesMet et al., 2016) – a gap addressed by the TPB ( Ajzen & Schmidt, 2020).

According to the TPB, intentions – reflecting a person's motivation or readiness to act – are shaped by three key constructs: attitudes, subjective norms, and perceived behavioral control, which

together predict behavior (Ajzen & Schmidt, 2020). Attitudes encompass affective and cognitive evaluations of a behavior and its potential outcomes. Subjective norms refer to perceived social expectations and include descriptive norms (perceptions of how commonly others engage in a behavior) and injunctive norms (perceptions of what behaviors others believe should be performed). Perceived behavioral control reflects an individual's confidence and perceived ability to carry out the behavior (Ajzen & Schmidt, 2020).

While the TPB has been widely applied to bystander behavior, several gaps remain. Most TPB studies are U.S.-based (e.g., Branscum et al., 2022; Casey et al., 2017; Hayashi & Tahmasbi, 2022; Lemay et al., 2017), with a predominant focus on college-aged populations (e.g., Branscum et al., 2022; Brehmner, 2023; Hayashi & Tahmasbi, 2022; Lemay et al., 2017). Additionally, these studies have primarily addressed contexts such as dating violence (Casey et al., 2017; Lemay et al., 2017), sexual assault (Branscum et al., 2022), non-consensual forwarding of sexts (Maes et al., 2024), and (cyber)bullying (Brehmer, 2023; Casey et al., 2017; DeSmet et al., 2016; Hayashi & Tahmasbi, 2022) and often include individual-level variables to enhance the TPB's explanatory power (e.g., sex/gender, empathy, and prior experiences of victimization; DeSmet et al., 2016; Hayashi & Tahmasbi, 2022). However, none of these applications have explicitly focused on TFSDA, thereby limiting our understanding of the cognitive factors that shape adolescents' intentions to intervene in this emerging form of abuse.

#### 2.5.1.3. Bystander behavior

Bystanders may adopt various roles in response to violence: passive/outsiders (who do nothing), helpers/actionists/defenders (who help victims), and assistants/reinforcers (who join in, e.g., Banyard et al., 2015, 2020, 2021; Pöyhönen et al., 2012). These roles are typically identified using theoretical or variable-centered approaches that assign individuals to discrete groups; in contrast, person-centered approaches – such as Latent Class Analysis (LCA) – allow for identifying subgroups based on shared behavioral patterns (Weller et al., 2020). While it has been applied in (cyber)bullying research (e.g., Schultze-Krumbholz et al., 2018; Waasdorp & Bradshaw, 2018), its application to TFDA remains absent, hindering the development of skill-building interventions tailored to the characteristics and needs of distinct bystander classes. To help guide such targeted efforts, Banyard's (2015) Bystander Action Coils Model offers a useful framework. This model conceptualizes bystander behavior as a non-linear and ecologically informed process. It highlights four interconnected "coils" of action: (1) individual decision-making, (2) contextual factors, (3) characteristics of the event, and (4) the perceived

consequences of bystander intervention. These coils can help interpret differences across bystander classes and inform more tailored prevention strategies.

### 2.5.2. Forensic psychological procedures

Technology-facilitated sexual abuse (TFSA) refers to a spectrum of sexually based harms – including nonconsensual image taking and misuse, forced image recruitment, threatened sharing, unwanted online sexual talk, questions, and act requests, voluntary older partner, commercial talk, images, or other sexual online activity – that may or may not be perpetrated by a dating partner (Finkelhor et al., 2022, 2023).

Managing such cases may require referral to children's services. In these instances, adolescents are often subject to forensic psychological assessment procedures to inform future legal proceedings. These procedures typically involve forensic interviews, which aim to collect and record adolescents' testimonies about their victimization experiences (Fernandes et al., 2023; Peixoto & Ribeiro, 2020), and forensic psychological assessments, which evaluate the adolescent's psychological development, capacity to provide credible testimony, overall well-being and functioning, family adjustment, and potential risk and protective factors (Machado et al., 2011; Peixoto & Ribeiro, 2020). Although insights into the application of such procedures can be drawn from the broader field of offline child sexual abuse (e.g., Fernandes et al., 2023), the technological nature of TFSA introduces unique characteristics, manifestations, and implications that warrant focused and differentiated analysis.

## 3. The present dissertation

Internationally and in Europe, the increasing scientific recognition of TFDA as prevalent and consequential (e.g., Afrouz & Vassos, 2024; Caridade et al., 2019; Fernet et al., 2019; Li et al., 2023; Rocha-Silva et al., 2021; Rodriguez-de-Arriba et al., 2021; Torp Løkkeberg et al., 2024, for reviews), along with a set of conventions and guidelines – including, but not limited to the Convention on the Elimination of All Forms of Discrimination against Women, the Istanbul Convention, the Convention on the Rights of the Child, the Lanzarote Convention, Directive 2012/29/EU of the European Parliament and Council, Recommendation CM/Rec(2018)7 of the Committee of Ministers - Guidelines to respect, protect and fulfil the rights of the child in the digital environment, the European Strategy for Victims' Rights 2020–2025, the European Strategy for Gender Equality 2020–2025, the European Strategy for the Rights of the Child, the European Child Guarantee – underscore the urgent need to expand scientific knowledge and develop evidence-based responses to this form of violence.

In Portugal some legislative and policy measures have been introduced to address TFDA. TFDA falls under Article 152 of the Portuguese Penal Code, which typifies the crime of domestic violence. Certain forms were further specified in the 46th amendment through Law No. 44/2018 of August 9, introducing an aggravating circumstance for the online dissemination of personal data – namely, image or video – related to the victim's private life, without their consent. More recently, the Assembly of the Republic approved measures to prevent and combat image-based sexual abuse, including a recommendation for a national prevalence study and specialized support services for victims. In addition, the Child Guarantee Action Plan 2022-2030 and the Strategy for the Rights of Children and Youth 2025–2035 have identified digital safety and promoting a culture of non-violence as strategic priorities. In parallel, awareness-raising initiatives and campaigns have been launched—some within school settings—by organizations such as APAV, the Safe Internet Center, and MiudosSegurosNa.Net. For instance, during the 2023/2024 school year, 11,408 awareness-raising sessions were conducted, reaching 615,739 students and addressing a range of topics, including internet use and dating violence (Polícia de Segurança Pública [Public Security Police; PSP], 2024). However, no data is currently available on these interventions' effectiveness or long-term impact.

As a contribution to these ongoing efforts, this dissertation aims to advance scientific knowledge on TFDA – a field with some international gaps and still in its early stages in Portugal – by addressing three interconnected research priorities intended to offer applied insights to inform a comprehensive prevention agenda: 1) From the measurement to the correlates of victimization and perpetration; 2) Bystander intervention; and 3) Forensic psychological procedures. To operationalize the first two research priorities, four cross-sectional studies were developed with a school-based sample of 1,855 adolescents (aged 12–18) enrolled in grades 7–12 across 25 schools in northern and central Portugal, who completed an online questionnaire and subsequently participated in an awareness-raising session on the topic, between February and May 2023 (Chapters I, II, III, and IV). A scoping review was conducted in April 2023 to address the third research priority, identifying six eligible peer-reviewed studies published between 2013 and 2022 (Chapter V). These chapters and their aims are described in detail below and illustrated in Figure 1.

1) From the measurement to the correlates of victimization and perpetration

Chapter I, based on data from 859 Portuguese adolescents who had dated in the past 12 months (48.9% cisgender boys; $M_{age}$ = 15.27, $SD$ = 1.68), aimed to: 1) analyze the psychometric properties of the Technology-Facilitated Abuse in Relationships Scale (TAR), recognized as one of the

most reliable measures in this field; 2) estimate prevalence rates of victimization and perpetration; and 3) explore initial associations with gender, age, self-esteem, HRQoL – physical and psychological well-being, autonomy and parent relations, peers and social support, and the school environment – and in-person dating victimization and perpetration.

2) Bystander intervention

Chapter II, based on data from 1,604 Portuguese adolescents (51.4% cisgender boys; $M_{age}$ = 14.92, SD = 1.73), aimed to: 1) analyze the psychometric properties of the Scale for Reactive Bystander Opportunity Detection in TFSDA, adapting items related to sexual abusive behaviors from the TAR scale (Brown & Hegarty, 2021), previously validated in Chapter I; 2) estimate the frequency of detected opportunities in situations of sexual coercion and image-based sexual harassment/abuse; and 3) examine associations between opportunity detection and gender, age, and personal experiences of TFSDA victimization and/or perpetration.

Of note, this chapter laid the groundwork for the following two chapters: distinguishing between adolescents who had not yet detected opportunities to intervene in TFSDA – but might do so in the future, as examined through bystander intentions – and those who had already detected such opportunities, enabling the analysis of actual bystander behavior.

Chapter III, based on 1,235 adolescents (53.2% cisgender boys; $M_{age}$ = 14.88, SD = 1.72), who had neither witnessed nor had knowledge of TFSDA in the past 12 months, aimed to test the utility of the TPB framework – attitudes toward helping, subjective norms toward helping (from parents, friends, teachers, and community members), and perceived behavioral control toward helping – while also considering the (in)direct effects of gender, empathy, and personal experiences of TFDA victimization.

Chapter IV, based on 322 adolescents (54.7% cisgender girls; $M_{age}$ = 15.17, $SD$ = 1.65), who witnessed or had knowledge of TFSDA in the past 12 months, aimed to: 1) identify distinct classes of bystanders reacting to TFSDA using a latent class analysis; and 2) it further examined whether intra-individual factors (i.e., bystander gender, age, sexual orientation, experiences of technology-facilitated sexual victimization [TFDA victimization, sextortion, and grooming], empathy, recognition of TFSDA as inappropriate or requiring intervention, and proactive actionism), event-related characteristics (i.e., victim and perpetrator gender, relationships to the bystander, perceived responsibility and emotions toward the victim and perpetrator), and outcomes of intervention (i.e., bystander positive feelings) varied across the identified classes.

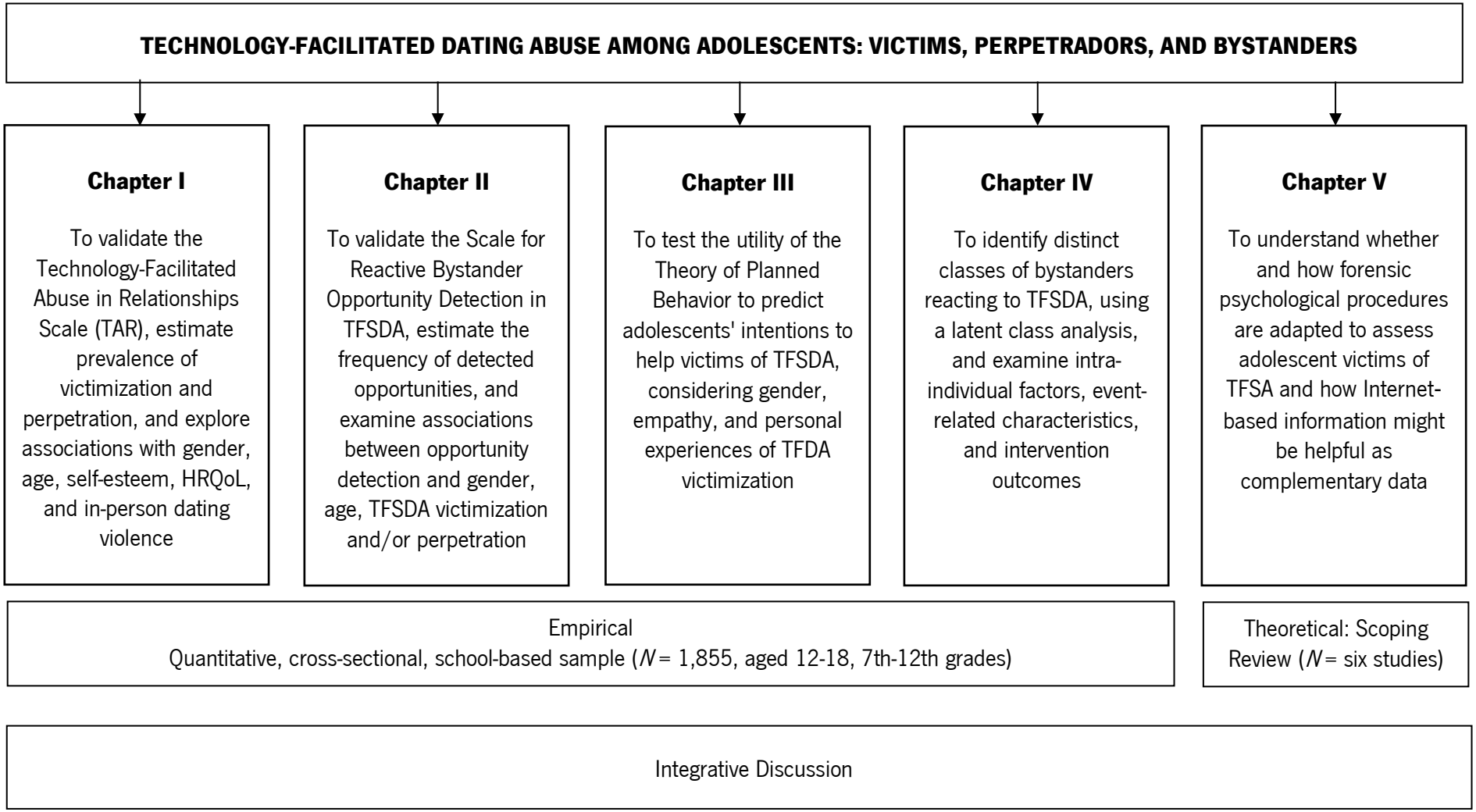
3) Forensic psychological procedures

Chapter V – a scoping review of six studies published between 2013 and 2022 – aimed to 1) understand whether and how forensic psychological procedures are adapted to assess adolescent victims of TFSA; and 2) how Internet-based information might be helpful as complementary data.

Regarding ethical considerations, all studies included in this dissertation received approval from the Ethics Committee for Research in Social and Human Sciences of the University of Minho (CEICSH-109/2021), as well as the Data Protection Department of the University of Minho (DPO-REG-ID-2020-0000; DPO-AIPD-ID-2020-0000). For Chapters I to IV, additional approval was obtained from the Portuguese General Directorate of Education (DGE-079070000) and the executive boards of the participating schools. Adolescents and their parents were informed about the study's objectives, anonymity, confidentiality, and the voluntary nature of participation, and both provided informed consent. All procedures conducted in the chapters involving human participants complied with the institutional research committee's ethical standards and the 1964 Helsinki Declaration and its later amendments or comparable ethical guidelines.

**Figure 1**

*Layout of chapters*



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## CHAPTER I[5]

TECHNOLOGY-FACILITATED ABUSE IN RELATIONSHIPS SCALE (TAR): PSYCHOMETRIC PROPERTIES OF VICTIMIZATION AND PERPETRATION AMONG PORTUGUESE ADOLESCENTS

[5] Vale, M. & Matos, M. (under review). Technology-facilitated abuse in relationships (TAR): Psychometric properties of victimization and perpetration among Portuguese adolescents. Manuscript submitted for publication. *Journal of Interpersonal Violence* (IF 2.6; Q1)

TECHNOLOGY-FACILITATED ABUSE IN RELATIONSHIPS SCALE (TAR): PSYCHOMETRIC PROPERTIES OF VICTIMIZATION AND PERPETRATION AMONG PORTUGUESE ADOLESCENTS


## Abstract

**Background:** Technology-facilitated dating abuse (TFDA) is a prevalent and harmful experience for adolescents. However, the absence of validated instruments in Portugal hinders early detection, prevention, and intervention. **Objectives:** To address this gap, this study aims to: 1) analyze the psychometric properties of the Technology-Facilitated Abuse in Relationships Scale (TAR), recognized as one of the most reliable measures in this field; 2) estimate prevalence rates; and 3) explore associations with gender, age, self-esteem, health-related quality of life, and in-person dating violence. **Method:** Between February and May 2023, 1,855 adolescents in grades 7 to 12 from 25 schools across northern and central Portugal completed an online questionnaire. Data from 859 Portuguese adolescents who dated in the past 12 months were analyzed (48.9% cisgender boys, 48.2% cisgender girls, and 2.9% gender-diverse; $M_{age}$ = 15.27, $SD$ = 1.68). **Results:** The translation and adaptation of the TAR adhered to international guidelines. Confirmatory factor analysis supported the original four-factor structure – humiliation, monitoring/control, sexual coercion, and threats – for both victimization and perpetration. The scale demonstrated adequate reliability, convergent and discriminant validity. Prevalence rates indicated 11.9% of adolescents reported victimization, 9.4% perpetration, and 34.5% victimization-perpetration. Monitoring/control behaviors were the most prevalent and bidirectional. Gender and age differences emerged, with cisgender boys more often uninvolved in monitoring/control, while cisgender girls were more frequently victim-perpetrators. Adolescents aged 14-16 showed higher rates of victimization, particularly in sexual coercion. TFDA was negatively correlated with self-esteem and health-related quality of life and positively correlated with in-person dating victimization and perpetration. **Conclusion:** These results underscore the Portuguese version of the TAR as a valid instrument for research, clinical, and forensic applications.



*Keywords:* adolescents, technology-facilitated dating abuse, victimization, perpetration, Psychometric properties

## Introduction

In Portugal, nearly 64% of adolescents report having a current or past dating relationship (Alternative and Response Women's Union; UMAR, 2024; *N* = 6,152, aged 11-21), which plays a pivotal role in shaping their identity, intimacy, and sexuality (Furman & Shaffer, 2003). These relationships typically progress from same-gender friendships to mixed-gender groups in early adolescence, followed by casual group-based dating in middle adolescence, and stable, attached relationships in late adolescence (Connolly et al., 2014). Today, in Western sociocultural contexts, adolescent dating development unfolds amid rapid shifts, including fluidity in gender and sexual identities (Katz-Wise et al., 2024), acceptance of diverse relationship types (Brown & Hegarty, 2021), a heavy reliance on digital devices for initiating, maintaining, and ending these relationships (Lenhart et al., 2015), and emerging risks like technology-facilitated dating abuse (TFDA; Brown & Hegarty, 2021).

While terms and definitions continue to evolve (Brown & Hegarty, 2018; Rocha-Silva et al., 2021; Rodríguez-deArriba, 2021), TFDA broadly refers to a range of abusive and harmful technology-facilitated behaviors in relationships (Brown & Hegarty, 2021). Rodriguez-deArriba et al. (2021) classify these behaviors into two broad categories: non-sexual, including verbal/emotional abuse, relational abuse, and monitoring/control; and sexual, such as sexual pressure/coercion and forms of image-based sexual harassment or abuse.

Internationally, 22 to 30 measures for assessing TFDA have been identified (Brown & Hegarty, 2018; Rodríguez-Domínguez et al., 2020; Martínez-Soto & Ibabe, 2022). Based on COSMIN guidelines, the Cyber Dating Abuse Questionnaire (CDAQ), Abuse in Teen Relationships Scale (CARPA), and Technology-Facilitated Abuse in Relationships Scale (TAR) are highly recommended for their robust methodological and psychometric properties (Martínez Soto & Ibabe, 2022). The CDAQ, validated in Portugal and other countries, targets adults aged 18-30 (Borrajo et al., 2015; Caridade & Braga, 2019). The CARPA, designed for Spanish adolescents aged 11-18, focuses solely on online direct aggression and control behaviors (Calvete et al., 2021). The TAR, administered to Australian youth aged 16-24 (Brown & Hegarty, 2021), is particularly suitable for adaptation in Portugal, where current assessments rely on purpose-built items (UMAR, 2024) and/or on a 7-item subscale of the Portuguese version of the Conflict in Adolescent Dating Relationships Inventory (CADRI-P), which primarily captures insults and monitoring/control behaviors during an argument (Lucas et al., 2017).

The TAR scale stands out for several reasons. First, it was developed using a theory-driven approach, ensuring face and content validity through expert consultation, youth discussion groups, and questionnaires. Second, it adopts a holistic definition of constructs, encompassing various modern

technologies – ranging from everyday digital devices to sophisticated applications – while recognizing the evolving dynamics of adolescents' dating relationships – whether monogamous or open, straight or gay, casual or serious, short-term or long-term. Third, the TAR addresses multiple abusive typologies, including humiliation, monitoring/control, sexual coercion, and threats (Brown & Hegarty, 2021). Notably, it includes sexual forms of TFDA, filling a gap identified in recent reviews, where only six of the twenty multidimensional behavioral sets considered this category (Rocha-Silva et al., 2021), despite its prevalence and association with emotional distress (Brown et al., 2021; Reed et al., 2017). Fourth, the TAR acknowledges the bidirectional nature of TFDA, challenging traditional paradigms in victimology and criminology that dichotomize individuals either as victims or perpetrators (Jennings et al., 2012). Fifth, the TAR scale was developed using exploratory factor analysis, which identified the factor structure of victimization, accounting for 53.4% of the variance with strong internal consistency (Cronbach's alphas: 0.80–0.88; Brown & Hegarty, 2021).

Studies in the U.S. and Europe have reported the following rates for individual roles in TFDA: non-involvement (23.9%-27.1%), victimization (17.6%-24.7%), perpetration (0.7%-6.3%), and victimization-perpetration (8.6%-48.9%; Ellyson et al., 2021, *N* = 696, aged 16-22; Stonard, 2021, *N* = 277, aged 12-18; Zweig et al., 2013, *N* = 3,745, grades 7-12). Non-sexual forms, particularly monitoring/control behaviors, were more common than sexual forms (e.g., Ellyson et al., 2021; Reed et al., 2017; Stonard, 2021; Zweig et al., 2013) and exhibited greater role overlap (e.g., Ellyson et al., 2021; Stonard, 2021). Specifically in Portugal, an annual report on dating violence indicated that 20.7% reported victimization through social networking sites (UMAR, 2024; *N* = 3,932, aged 11-21).

Research on gender differences in TFDA shows that non-sexual forms lack consistent gender patterns, while sexual forms predominantly involve cisgender girls as victims and cisgender boys as perpetrators (e.g., Brown et al., 2021; Ellyson et al., 2021; Reed et al., 2017; Stonard, 2021; Zweig et al., 2013). The average age of initiation for most sexual and non-sexual forms was 16 years (e.g., Ellyson et al., 2021). Several factors have been linked to TFDA (Caridade & Braga, 2020), including lower self-esteem (Smith et al., 2018), reduced health-related quality of life (HRQoL; Ortega-Barón et al., 2022), and a significant overlap with in-person dating violence (Rodríguez-deArriba et al., 2024). Following these experiences, victims report emotional/mental health-related difficulties, risky behaviors, self-harm, self-restricting behaviors, and negative impacts on relationships (Brown et al., 2021; Reed et al., 2017; Torp Løkkeberg et al., 2024).

## The current study

To our knowledge, this is the first study to test the TAR scale's proposed factorial structure for victimization, extend its validation to perpetration, and address the lack of instruments measuring TFDA among Portuguese adolescents, estimating prevalence rates and identifying correlates. These efforts enable cross-country comparative studies and contribute to early detection, prevention, and intervention efforts.

This study addressed four research questions: (1) Is the TAR scale valid and reliable for assessing TFDA among Portuguese adolescents? (2) To what extent are adolescents involved in TFDA as victims, perpetrators, and victim-perpetrators? (3) Are there gender and age differences in TFDA roles? (4) How does TFDA relate to opposing constructs, such as adolescents' self-esteem and HRQoL, and similar constructs, such as in-person dating violence?

It is hypothesized that the TAR scale will confirm its original four-factor structure with good psychometric properties (H1); TFDA will be prevalent, with many adolescents involved as victim-perpetrators (H2a), and monitoring/control will be the most common and bidirectional form (H2b); cisgender girls will more often be victims and cisgender boys perpetrators of sexual forms (H3a); middle and late adolescents will show the highest involvement in both victimization and perpetration of sexual and non-sexual forms (H3b); and TFDA will negatively correlate with self-esteem and HRQoL and positively with in-person dating violence (H4).

# Method

## Translation of TAR Scale

Following the ITC Guidelines for Translating and Adapting Tests (2017), this process included: (a) authorization from the original authors; (b) forward translation by two bilingual researchers, reconciled by a third; (c) back-translation by a bilingual researcher and a native English speaker, reconciled by a third bilingual researcher; (d) clarification of terms (e.g., "nudes") and alignment of item phrasing with Portuguese dating violence instruments by preceding items with “He/She" for victimization and "I" for perpetration (e.g., Saavedra et al., 2011); (e) expert review by nine psychology professionals; (f) a pilot study with 10 adolescents (excluded from analysis); and (g) final approval by the original authors.

## Procedures

The study was approved by the Ethics Committee for Research in Social and Human Sciences (CEICSH-109/2021), the Data Protection Department of the University of Minho (DPO-REG-ID-2020-0000; DPO-AIPD-ID-2020-0000), the Portuguese General Directorate of Education (DGE-079070000), and the school executive boards. High schools in northern and central Portugal were randomly selected from a DGE-provided list and invited via email. Twenty-five schools agreed to participate and received a letter detailing the study procedures, ethical considerations, and consent forms requiring signatures from adolescents and parents.

Data collection occurred from February to May 2023 during a single school day. Adolescents provided digital consent and were reminded not to include their names, that they could skip any questions, and that they were free to withdraw at any time. They completed a 45-minute questionnaire on Qualtrics using PCs, tablets, or smartphones in classrooms/libraries, with a teacher, lead researcher, and, when necessary, a master's or PhD psychology student who was available to clarify any questions or offer support. Afterwards, they attended a 45-minute awareness session on TFDA, covering the phenomenon, safety tips, and support contacts, including the Portuguese Victim Support Association (APAV) and the Psychology Association of the University of Minho (APsi). They were also given the project's email address to contact the researchers for assistance, to ask questions, or to access their results.

## Participants

Participants were eligible if they were adolescents aged 12–18, of Portuguese nationality, had dated in the past 12 months, and had no cognitive or severe learning difficulties (as assessed by teachers). Of 1,855 adolescents, 996 were excluded: 14 with incomplete dating status, 848 who had not dated in the past 12 months, 84 without Portuguese nationality, 28 with no responses on the TAR scale, and 22 identified as outliers.

As summarized in Table 1 ($N$ = 859), most adolescents were cisgender boys (48.9%), aged 14–16 (57%), White/Caucasian (93.2%), heterosexual (84.2%), and had been in a committed relationship within the last 12 months (47.7%). Digital devices played a key role in their relationships: 41.7% spent over five hours daily communicating, 57.6% used them to initiate relationships, 76.8% to share personal information, 38.2% for sexual intimacy, 79.4% for conflict resolution, 53% for breakups, and 73.9% for reconciliation. Furthermore, 67.3% attended public schools, 44.9% were in grades 9–10, and 51.3% lived in urban areas.

**Table 1**

*Description of the sample*

| Variables | *n* (%) |
|---|---|
| Gender | |
| Cisgender boy | 420 (48.9) |
| Cisgender girl | 414 (48.2) |
| Binary and non-binary transgender | 15 (1.8) |
| Gender-questioning | 10 (1.1) |
| Age-group | |
| 12-13 years | 144 (16.8) |
| 14-16 years | 490 (57) |
| 17-18 years | 225 (26.2) |
| Ethnicity | |
| White/Caucasian | 801 (93.2) |
| Afro descendants/Black | 36 (4.2) |
| Roma/Gypsy | 16 (1.9) |
| Asian | 1 (0.1) |
| Multi-Ethnic | 5 (0.6) |
| Sexual orientation | |
| Heterosexual | 729 (84.9) |
| Bisexual | 84 (9.8) |
| Gay/Lesbian | 29 (3.4) |
| Other | 16 (1.9) |
| Relationship status in the last 12 months | |
| Committed dating | 410 (47.7) |
| Casual dating | 368 (42.8) |
| Committed and casual dating | 81 (9.4) |
| Daily digital communication with their partner | |
| 1-2 hours | 251 (29.2) |
| 3-4 hours | 242 (28.2) |
| More than 5 hours | 358 (41.7) |
| Initiate the relationship | 495 (57.6) |
| Share personal information, interests, and experiences | 660 (76.8) |
| Engage in sexual intimacy (i.e., sexting) | 328 (38.2) |
| Discuss and resolve conflicts | 682 (79.4) |
| Communicate breakups | 455 (53) |
| Reconcile after an argument and/or rekindle the relationship | 635 (73.9) |
| Type of school | |
| Public | 578 (67.3) |
| Private/Professional | 281 (32.7) |
| Education level | |

| | |
|---|---|
| 7th-8th grades | 226 (26.3) |
| 9th-10th grades | 386 (44.9) |
| 11th-12th grades | 247 (28.8) |
| Residential zone | |
| Urban | 441 (51.3) |
| Rural | 414 (48.2) |

*Note*. Missing data ranged from 0.1% for sexual orientation to 0.9% for daily digital communication with their partner, with 0.5% missing for residential zone.

## Measures

### *Sociodemographic Questionnaire*

Single items were developed to collect data on gender, age, ethnicity, sexual orientation, relationship status, use of digital devices in dating relationships, type of school, education level, and residential zone.

### *Technology-Facilitated Abuse in Relationships Scale (TAR)*

The following pre-survey definitions were provided (Brown & Hegarty, p. 4):

a) "Dating relationships. We define dating as two or more people in an emotionally and/or physically intimate relationship. The relationship may or may not be sexual. It may be casual or serious, short-term or long-term, straight, gay, monogamous, or open. Terms used to describe these kinds of relationships include boyfriend, girlfriend, going out, hanging out, hooking up, seeing each other, friends with benefits, and unofficially dating. In this survey, we will use the terms girlfriend and boyfriend to refer to dating relationships."

b) "Digital devices. A digital device includes any type of modern-day technology used to interact with other people. Examples include (but are not limited to) mobile phones, smartphones, computers, tablets, laptops, notepads, the internet, social media, GPS devices, software, and apps."

The TAR (Brown & Hegarty, 2021) is a 30-paired item self-report scale that assesses the prevalence of victimization and perpetration over the past 12 months across four dimensions: humiliation (10 items), monitoring/control (7 items), sexual coercion (8 items), and threats (5 items). Items were initially rated on a 6-point Likert scale (0 = never to 5 = daily/almost daily), and responses were recoded to a 4-point scale (0 = never to 3 = monthly, weekly, daily/almost daily) to address floor and ceiling effects. Higher scores correspond to a higher prevalence of victimization and/or perpetration.

### *Rosenberg Self-Esteem Scale (RSES)*

The RSES (Rosenberg, 1965; Portuguese adolescent validation of Santos & Maia, 2003) is a 10-item self-report scale that evaluates general feelings of self-esteem. Responses are rated on a 4-point Likert scale (1 = strongly disagree to 4 = strongly agree). Higher scores indicate a higher level of self-esteem ($\alpha$ = 0.86).

### *Kidscreen-27*

The Kidscreen-27 (Ravens-Sieberer et al., 2007; Portuguese adolescent validation of Gaspar & Matos, 2008) is a 27-item self-report scale that evaluates HRQoL over the past week across five dimensions: physical well-being (5 items, $\alpha$ = 0.60), psychological well-being (7 items, $\alpha$ = 0.89), autonomy and parent relations (7 items, $\alpha$ = 0.88), peers and social support (4 items, $\alpha$ = 0.91), and the school environment (4 items, $\alpha$ = 0.77). Responses are rated on a 5-point Likert scale (1 = never/nothing to 5 = always/totally). The Rasch person parameter replaces sum scores and is then translated into T-values. Higher scores correspond to a better perception of HRQoL for the respective dimension ($\alpha$ = 0.92).

### *Conflict in Adolescent Dating Relationships Inventory (CADRI)*

The CADRI (CADRI; Wolfe et al., 2001; Portuguese adolescent validation of Saavedra et al., 2011) is a 25-paired item self-report scale that assesses the prevalence of victimization and perpetration over the past 12 months across five dimensions: physical abuse (4 items, 0.45 for victimization, 0.30 for perpetration), verbal/emotional abuse (10 items, $\alpha$ = 0.85 for victimization, 0.80 for perpetration), relational abuse (3 items, $\alpha$ = 0.82 for victimization, 0.55 for perpetration), sexual abuse (4 items, $\alpha$ = 0.63 for victimization, 0.58 for perpetration), and threatening behaviors (4 items, $\alpha$ = 0.42 for victimization, 0.19 for perpetration). Responses are rated on a 4-point Likert scale (0 = never to 3 = always). Higher scores correspond to a higher frequency of victimization and/or perpetration ($\alpha$ = 0.88, 0.82). As recommended, only adolescents in a committed relationship completed the CADRI.

## Data analysis

Little's MCAR test (Little, 1988) confirmed that data for the TAR scale, RSES, KIDSCREEN-27, and CADRI were missing completely at random ($\chi^2(4220) = 3463.06$, $p > 0.05$). Approximately 4% of cases had less than 10% missing data (0.7%-2.7%), which were imputed using multivariate imputation by chained equations with the random forest algorithm, employing 10 imputations and 50 iterations. Density plots confirmed similar distributions between the original and imputed data. Outliers were

identified using Mahalanobis distance. Item analysis included descriptive statistics and normality tests (Kolmogorov-Smirnov, Shapiro-Wilk, skewness > 2, kurtosis > 7; Finney & DiStefano, 2013).

Confirmatory Factor Analysis (CFA) tested the original four-factor structure using the MLM estimator, with residual variances fixed to 1 and allowed to correlate. Fit criteria included chi-square/degrees of freedom ($\chi^2$/df) ≤ 5, Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) ≥ 0.90, Root Mean Square Error of Approximation (RMSEA) ≤ 0.08 with a non-significant p-close ($p$ > 0.05), Standardized Root Mean Square Residual (SRMR) ≤ 0.08 (Marôco, 2021), and factor loadings > 0.32 (Tabachnick & Fidell, 2007). Model re-specifications adhered to modification indices aligned with theoretical considerations (Hair et al., 2019). Reliability was evaluated using Cronbach's alpha ≥ 0.70 (Dunn et al., 2014), mean inter-item correlations (MIIC) between 0.15 and 0.50 (Clark & Watson, 1995), and corrected item-total correlations (CITC) ≥ 0.20 (Nunnally & Bernstein, 1994). Convergent validity was assessed using average variance extracted (AVE) ≥ 0.50 and composite reliability (CR) ≥ 0.60 (Hair et al., 2019), while discriminant validity was evaluated using the heterotrait-monotrait ratio of correlations (HTMT) ≤ 0.85 (Henseler et al., 2015). Chi-square or Fisher's exact tests (when > 20% of expected cell counts were below five; Field, 2017) examined associations with gender and age, with residuals identifying significant deviations ($z \geq 1.96$, $z \leq -1.96$). Spearman correlations assessed associations with self-esteem, HRQoL, and in-person dating violence. All effect sizes were interpreted as small ($r_s \simeq 0.10$), moderate ($r_s \simeq 0.30$), and large ($r_s \simeq 0.50$; Cohen, 1988).

Missing data imputation, CFA, and validity assessments were conducted in R (version 4.2.3, R Core Team, 2023), using MICE, VIM, lavaan and semTools packages; all other analyses were conducted in SPSS (version 29, IBM Corporation, 2022).

## Results

### Psychometric properties

The results support our first hypothesis. As shown in Tables 2 and 3, the most frequently reported behavior was "Checked to see whom I (he/she) was communicating with on my (his/her) digital device in a way that made me feel uncomfortable" (Item 15, 18.3% victimization, 19.5% perpetration). The least frequent behaviors were "Signed me onto a pornography site without my permission" (Item 1, 1.5% victimization) and "Pressured him/her to engage in phone sex" (Item 20, 1% perpetration). Normality tests indicated highly positively skewed and leptokurtic distributions, which is consistent with previous research on violence-related topics.

**Table 2**

*Descriptive and item analyses of the victimization scale*

| Item | Frequency distribution, *n* (%) | | | | *M* | *SD* | *Sk* (SE = 0.08) | *Ku* (SE = 0.17) |
|---|---|---|---|---|---|---|---|---|
| | Never | Once | Few times | Monthly, weekly, daily/almost daily | | | | |
| 1. Signed me onto a pornography site without my permission. | 846 (98.5) | 5 (0.6) | 3 (0.3) | 5 (0.6) | 0.03 | 0.27 | 9.71 | 98.10 |
| 2. Started a social networking page to post negative information about me. | 833 (97) | 21 (2.4) | 4 (0.5) | 1 (0.1) | 0.04 | 0.23 | 7.34 | 63.46 |
| 3. Threatened to distribute intimate/sexual image(s) (nudes) of me. | 837 (97.4) | 16 (1.9) | 4 (0.5) | 2 (0.2) | 0.03 | 0.24 | 8.30 | 79.24 |
| 4. Told me on a digital device to harm myself. | 828 (96.4) | 21 (2.4) | 7 (0.8) | 3 (0.3) | 0.05 | 0.29 | 6.79 | 51.77 |
| 5. Edited a photo or video of me in an offensive manner and sent it to me. | 836 (97.3) | 17 (2) | 5 (0.6) | 1 (0.1) | 0.03 | 0.23 | 7.72 | 68.22 |
| 6. Threatened on a digital device to physically hurt me. | 832 (96.9) | 18 (2.1) | 8 (0.9) | 1 (0.1) | 0.04 | 0.26 | 6.85 | 51.75 |
| 7. Changed an aspect of my online profile without my permission. | 838 (97.6) | 15 (1.7) | 5 (0.6) | 1 (0.1) | 0.03 | 0.22 | 8.07 | 74.05 |
| 8. Posted something negative through my account without my permission. | 837 (97.4) | 13 (1.5) | 7 (0.8) | 2 (0.2) | 0.04 | 0.26 | 7.78 | 66.62 |
| 9. Threatened on a digital device to physically hurt my family or friends. | 837 (97.4) | 16 (1.9) | 5 (0.6) | 1 (0.1) | 0.03 | 0.23 | 7.89 | 71.05 |
| 10. Shared a hurtful meme about me on a digital device. | 828 (96.4) | 21 (2.4) | 8 (0.9) | 2 (0.2) | 0.05 | 0.28 | 6.61 | 48.80 |
| 11. Made me remove or add contact(s) on my digital device. | 773 (90) | 54 (6.3) | 26 (3) | 6 (0.7) | 0.14 | 0.48 | 3.66 | 13.88 |
| 12. Made me stop interacting with another person(s) on my digital device. | 735 (85.6) | 70 (8.1) | 43 (5) | 11 (1.3) | 0.22 | 0.59 | 2.86 | 7.75 |
| 13. Pressured me to share my password(s) with him/her. | 831 (96.7) | 14 (1.6) | 10 (1.2) | 4 (0.5) | 0.05 | 0.32 | 6.73 | 48.44 |
| 14. Made me disclose digital conversation(s) I have had with another person(s) to him/her. | 789 (91.9) | 38 (4.4) | 29 (3.4) | 3 (0.3) | 0.12 | 0.44 | 3.87 | 14.99 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 15. Checked to see who I was communicating with on my digital device in a way that made me feel uncomfortable. | 702 (81.7) | 66 (7.7) | 78 (9.1) | 13 (1.5) | 0.30 | 0.70 | 2.21 | 3.76 |
| 16. Logged onto my digital device without my permission. | 790 (92) | 33 (3.8) | 30 (3.5) | 6 (0.7) | 0.13 | 0.47 | 3.94 | 15.48 |
| 17. Monitored where I am via tracking software. | 814 (94.8) | 18 (2.1) | 17 (2) | 10 (1.2) | 0.10 | 0.44 | 5.05 | 25.94 |
| 18. Pressured me to send intimate/sexual image(s) (nudes) of myself. | 818 (95.2) | 22 (2.6) | 15 (1.7) | 4 (0.5) | 0.07 | 0.36 | 5.47 | 31.72 |
| 19. Pressured me on a digital device to send sexually explicit messages. | 842 (98) | 11 (1.3) | 4 (0.5) | 2 (0.2) | 0.03 | 0.23 | 9.28 | 96.59 |
| 20. Pressured me to engage in phone sex. | 840 (97.8) | 13 (1.5) | 5 (0.6) | 1 (0.1) | 0.03 | 0.22 | 8.46 | 80.69 |
| 21. Pressured me on a digital device to engage in sexual acts. | 844 (98.3) | 8 (0.9) | 7 (0.8) | 0 (0) | 0.03 | 0.20 | 8.53 | 75.14 |
| 22. Pressured me on a digital device to discuss sexual issues. | 834 (97.1) | 14 (1.6) | 11 (1.3) | 0 (0) | 0.04 | 0.26 | 6.56 | 43.97 |
| 23. Pressured me to engage in sexual activity via live video. | 845 (98.4) | 10 (1.2) | 3 (0.3) | 1 (0.1) | 0.02 | 0.19 | 10.24 | 120.52 |
| 24. Sent me unwelcome intimate/sexual image(s) (nudes). | 823 (95.8) | 16 (1.9) | 19 (2.2) | 1 (0.1) | 0.07 | 0.34 | 5.37 | 29.16 |
| 25. Shared intimate/sexual images (nudes) or videos of me without my permission. | 839 (97.7) | 19 (2.2) | 1 (0.1) | 0 (0) | 0.02 | 0.16 | 6.98 | 52.42 |
| 26. Sent me threatening messages on a digital device. | 832 (96.9) | 22 (2.6) | 4 (0.5) | 1 (0.1) | 0.04 | 0.23 | 7.19 | 61.01 |
| 27. Threatened on a digital device to emotionally hurt me. | 815 (94.9) | 28 (3.3) | 14 (1.6) | 2 (0.2) | 0.07 | 0.34 | 5.26 | 29.79 |
| 28. Threatened on a digital device to damage things that are important to me. | 842 (98) | 14 (1.6) | 3 (0.3) | 0 (0) | 0.02 | 0.17 | 8.24 | 74.57 |
| 29. Made me feel threatened if I ignored their calls or messages. | 816 (95) | 23 (2.7) | 20 (2.3) | 0 (0) | 0.07 | 0.34 | 4.85 | 23.11 |
| 30. Threatened on a digital device to physically hurt him/herself if I didn't do what he/she wanted. | 825 (96) | 26 (3) | 6 (0.7) | 2 (0.2) | 0.05 | 0.28 | 6.49 | 48.73 |

*Note.* M = Mean; SD = Standard deviation; SK = Skewness; Ku = Kurtosis; SE = Standard error.

**Table 3**

*Descriptive and item analyses of the perpetration scale*

| Item | Frequency distribution, *n* (%) | | | | *M* | *SD* | *Sk* (SE = 0.08) | *Ku* (SE = 0.17) |
|---|---|---|---|---|---|---|---|---|
| | Never | Once | Few times | Monthly, weekly, daily/almost daily | | | | |
| 1. Signed him/her onto a pornography site without his/her permission. | 842 (98) | 8 (0.9) | 4 (0.5) | 5 (0.6) | 0.04 | 0.28 | 8.80 | 81.80 |
| 2. Started a social networking page to post negative information about him/her. | 845 (98.4) | 11 (1.3) | 2 (0.2) | 1 (0.1) | 0.02 | 0.18 | 10.57 | 132.36 |
| 3. Threatened to distribute intimate/sexual image(s) (nudes) of him/her. | 844 (98.3) | 12 (1.4) | 2 (0.2) | 1 (0.1) | 0.02 | 0.18 | 10.20 | 124.16 |
| 4. Told him/her on a digital device to harm him/herself. | 845 (98.4) | 9 (1) | 4 (0.5) | 1 (0.1) | 0.02 | 0.20 | 9.93 | 110.53 |
| 5. Edited a photo or video of him/her in an offensive manner and sent it to him/her. | 837 (97.4) | 14 (1.6) | 6 (0.7) | 2 (0.2) | 0.04 | 0.25 | 7.95 | 70.39 |
| 6. Threatened on a digital device to physically hurt him/her. | 838 (97.6) | 15 (1.7) | 6 (0.7) | 0 (0) | 0.03 | 0.21 | 7.40 | 58.32 |
| 7. Changed an aspect of his/her online profile without his/her permission. | 842 (98) | 14 (1.6) | 3 (0.3) | 0 (0) | 0.02 | 0.17 | 8.24 | 74.57 |
| 8. Posted something negative through his/her account without his/her permission. | 842 (98) | 15 (1.7) | 2 (0.2) | 0 (0) | 0.02 | 0.16 | 8.07 | 72.11 |
| 9. Threatened on a digital device to physically hurt his/her family or friends. | 839 (97.7) | 16 (1.9) | 4 (0.5) | 0 (0) | 0.03 | 0.19 | 7.59 | 62.82 |
| 10. Shared a hurtful meme about him/her on a digital device. | 816 (95) | 30 (3.5) | 11 (1.3) | 2 (0.2) | 0.07 | 0.32 | 5.47 | 33.07 |
| 11. Made him/her remove or add contact(s) on his/her digital device. | 786 (91.5) | 47 (5.5) | 21 (2.4) | 5 (0.6) | 0.12 | 0.44 | 4.06 | 17.49 |
| 12. Made him/her stop interacting with another person(s) on his/her digital device. | 781 (90.9) | 49 (5.7) | 24 (2.8) | 5 (0.6) | 0.13 | 0.45 | 3.86 | 15.54 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 13. Pressured him/her to share his/her password(s) with me. | 829 (96.5) | 20 (2.3) | 7 (0.8) | 3 (0.3) | 0.05 | 0.29 | 6.89 | 53.11 |
| 14. Made him/her disclose digital conversation(s) he/she has had with another person(s). | 804 (93.6) | 31 (3.6) | 22 (2.6) | 2 (0.2) | 0.09 | 0.39 | 4.46 | 20.41 |
| 15. Checked to see who he/she was communicating with on his/her digital device. | 692 (80.6) | 65 (7.6) | 91 (10.6) | 11 (1.3) | 0.33 | 0.71 | 2.04 | 2.87 |
| 16. Logged onto his/her digital device without his/her permission. | 801 (93.2) | 38 (4.4) | 16 (1.9) | 4 (0.5) | 0.10 | 0.39 | 4.67 | 23.54 |
| 17. Monitored where he/she was via tracking software. | 810 (94.3) | 25 (2.9) | 17 (2) | 7 (0.8) | 0.09 | 0.42 | 4.99 | 26.02 |
| 18. Pressured him/her to send intimate/sexual image(s) (nudes) of him/herself. | 838 (97.6) | 15 (1.7) | 3 (0.3) | 3 (0.3) | 0.03 | 0.25 | 8.72 | 86.24 |
| 19. Pressured him/her on a digital device to send sexually explicit messages. | 849 (98.8) | 9 (1) | 0 (0) | 1 (0.1) | 0.01 | 0.14 | 13.74 | 236.12 |
| 20. Pressured him/her to engage in phone sex. | 850 (99) | 6 (0.7) | 2 (0.2) | 1 (0.1) | 0.02 | 0.16 | 12.93 | 189.85 |
| 21. Pressured him/her on a digital device to engage in sexual acts. | 846 (98.5) | 10 (1.2) | 3 (0.3) | 0 (0) | 0.02 | 0.16 | 9.52 | 98.83 |
| 22. Pressured him/her on a digital device to discuss sexual issues. | 842 (98) | 13 (1.5) | 4 (0.5) | 0 (0) | 0.02 | 0.18 | 8.28 | 74.40 |
| 23. Pressured him/her to engage in sexual activity via live video. | 849 (98.8) | 8 (0.9) | 1 (0.1) | 1 (0.1) | 0.02 | 0.16 | 13.01 | 201.48 |
| 24. Sent him/her unwelcome intimate/sexual image(s) (nudes). | 825 (96) | 21 (2.4) | 12 (1.4) | 1 (0.1) | 0.06 | 0.30 | 5.89 | 37.09 |
| 25. Shared intimate/sexual images (nudes) or videos of him/her without his/her permission. | 849 (98.8) | 8 (0.9) | 1 (0.1) | 1 (0.1) | 0.02 | 0.16 | 13.01 | 201.48 |
| 26. Sent him/her threatening messages on a digital device. | 842 (98) | 14 (1.6) | 0 (0) | 3 (0.3) | 0.03 | 0.22 | 10.50 | 127.85 |
| 27. Threatened on a digital device to emotionally hurt him/her. | 842 (98) | 13 (1.5) | 2 (0.2) | 2 (0.2) | 0.03 | 0.21 | 9.87 | 113.27 |
| 28. Threatened on a digital device to damage things that are important to him/her. | 846 (98.5) | 12 (1.4) | 1 (0.1) | 0 (0) | 0.02 | 0.14 | 9.01 | 89.81 |
| 29. Threatened him/her if he/she ignored my calls or messages. | 839 (97.7) | 14 (1.6) | 6 (0.7) | 0 (0) | 0.03 | 0.21 | 7.58 | 61.07 |
| 30. Threatened on a digital device to physically hurt him/herself if he/she didn't do what I wanted. | 848 (98.7) | 11 (1.3) | 0 (0) | 0 (0) | 0.01 | 0.11 | 8.68 | 73.54 |

*Note.* M = Mean; SD = Standard deviation; SK = Skewness; Ku = Kurtosis; SE = Standard error.

As presented in Table 4, the victimization scale exhibited good fit (S-B$\chi^2$/df = 1.14, CFI = 0.94, TLI = 0.94, RMSEA = 0.04, *p*-close > 0.05, and SRMR = 0.07). Factor loadings ranged from 0.32 to 0.77, except for Item 25: "Shared intimate/sexual images (nudes) or videos of me without my permission." The perpetration scale initially exhibited suboptimal fit, which improved significantly after adding theoretically justified error term correlations (S-B$\chi^2$/df = 1.13, CFI = 0.91, TLI = 0.90, RMSEA (90%) = 0.03, *p*-close > 0.05, and SRMR = 0.07). Factor loadings ranged from 0.35 to 0.91, except for Item 24: "Sent him/her unwelcome intimate/sexual image(s) (nudes)" and Item 28: "Threatened on a digital device to damage things that are important to him/her."

Detailed CFA models with standardized loadings and error terms are available in Figure 1.

**Table 4**

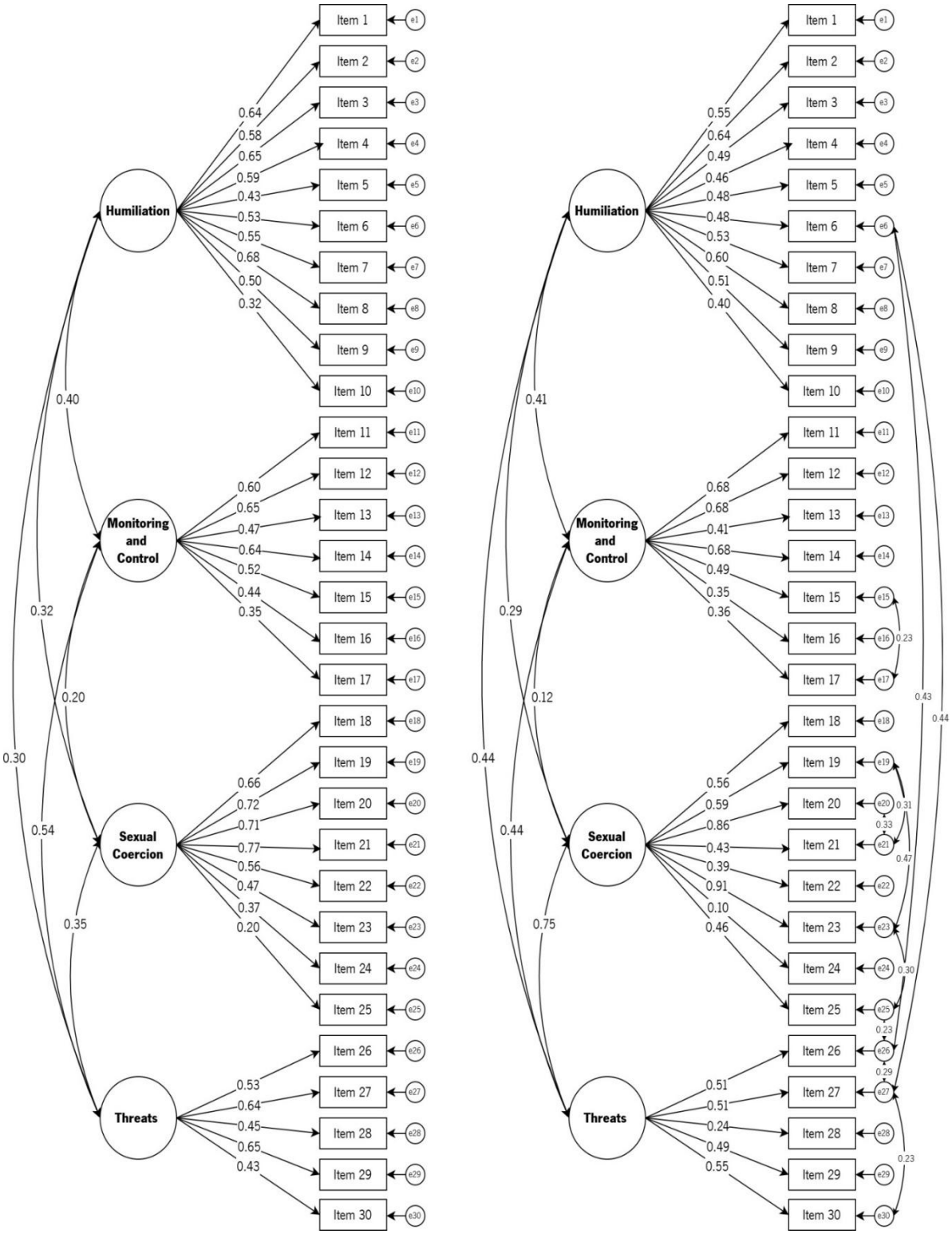
*Model fit statistics for confirmatory factor analysis*

| | S-B$\chi^2$ | df | S-B$\chi^2$/df | CFI | TLI | RMSEA | 90% CI | *p*-close | SRMR |
|---|---|---|---|---|---|---|---|---|---|
| Victimization scale | 454.193* | 399 | 1.14 | 0.94 | 0.94 | 0.03 | [0.01-0.04] | > 0.05 | 0.07 |
| Perpetration scale | | | | | | | | | |
| Model without correlated error terms | 509.108 | 399 | 1.28 | 0.77 | 0.75 | 0.04 | [0.03- 0.05] | > 0.05 | 0.08 |
| Model with correlated error terms | 439.077* | 389 | 1.13 | 0.91 | 0.90 | 0.03 | [0.01-0.04] | > 0.05 | 0.07 |

*Note.* S-B$\chi^2$ = Satorra-Bentler chi-square test; df = degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation (90% confidence interval); SRMR = Standardized Root Mean Square Residual.

**Figure 2**

*Standardized factor loadings for the TAR victimization scale (left) and TAR perpetration scale (right)*



As outlined in Table 5, both scales showed good internal consistency (victimization: $\alpha$ = 0.66–0.82, perpetration: 0.63–0.82) and homogeneity (victimization: 0.16–0.31 and perpetration: 0.17–0.30). Item discriminative power was acceptable, with only Item 25 (victimization) and Items 24 and 28 (perpetration) falling below the CITC threshold of 0.20 (CITC = 0.18–0.66 for victimization; 0.08–0.71 for perpetration). Furthermore, both scales exhibited small to moderate positive correlations (victimization: $r_s$ = 0.19–0.35; perpetration: $r_s$ = 0.19–0.26). While AVE values fell below the 0.50 threshold (victimization: 0.30–0.35; perpetration: 0.22–0.29), CR values exceeded 0.60 (victimization: 0.69–0.81; perpetration: 0.67–0.76), indicating acceptable construct validity (Fornell & Larcker, 1981) except for the Threats factor of the perpetration scale. HTMT values supported good discriminant validity (victimization: HTMT = 0.21–0.52; perpetration: HTMT = 0.26–0.68).

**Table 5**

*Reliability, intercorrelations, convergent and discriminant validity*

| | | | | | | | | | HTMT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | α | MIIC | CITC | H | MC | SC | T | AVE | CR | H | MC | SC |
| Victimization scale | 0.82 | 0.16 | 0.22-0.50 | | | | | | | | | |
| H | 0.81 | 0.30 | 0.30-0.60 | 1 | | | | 0.31 | 0.81 | 1 | | |
| MC | 0.72 | 0.27 | 0.32-0.53 | 0.20*** | 1 | | | 0.30 | 0.73 | 0.40 | 1 | |
| SC | 0.77 | 0.31 | 0.18-0.66 | 0.24*** | 0.19*** | 1 | | 0.35 | 0.78 | 0.28 | 0.21 | 1 |
| T | 0.66 | 0.29 | 0.34-0.52 | 0.30*** | 0.27*** | 0.35*** | 1 | 0.33 | 0.69 | 0.26 | 0.52 | 0.43 |
| Perpetration scale | 0.82 | 0.17 | 0.13-0.53 | | | | | | | | | |
| H | 0.77 | 0.27 | 0.37-0.54 | 1 | | | | 0.25 | 0.76 | 1 | | |
| MC | 0.72 | 0.28 | 0.32-0.54 | 0.20*** | 1 | | | 0.29 | 0.69 | 0.43 | 1 | |
| SC | 0.71 | 0.30 | 0.08-0.71 | 0.20*** | 0.19*** | 1 | | 0.27 | 0.67 | 0.51 | 0.26 | 1 |
| T | 0.63 | 0.25 | 0.17-0.53 | 0.19*** | 0.21*** | 0.26*** | 1 | 0.22 | 0.49 | 0.43 | 0.54 | 0.68 |

*Note.* H = Humiliation; MC = Monitoring/control; SC = Sexual coercion; T = Threats; α = Cronbach's alpha; MIIC = Mean inter-item correlations; CITC = Corrected item-total correlations; AVE = Average Variance Extracted; CR = Composite Reliability; HTMT = Heterotrait-Monotrait Ratio of Correlation. *** $p <$ .001, two-tailed.

## Prevalence of TFDA

The results support our second hypothesis. As detailed in Table 6, among the 55.8% ($n$ = 479) of adolescents involved in TFDA, 11.9% ($n$ = 102) reported being victims, 9.4% ($n$ = 81) perpetrators, and 34.5% ($n$ = 296) victim-perpetrators. Monitoring/control behaviors were the most common (41.2%, $n$ = 354) and bidirectional (24.3%, $n$ = 209), while sexual coercion (84.1%, $n$ = 722) and threats (84.6%, $n$ = 727) were the least reported.

## Gender and age associations

Hypotheses 3a and 3b were partially supported, as gender and age influenced specific forms and roles. Chi-square tests identified a significant association between gender and monitoring/control ($\chi^2(6) = 16.64$, $p = 0.01$, Cramer's V = 0.10). Residuals indicated that cisgender boys were significantly more likely than expected to be uninvolved ($z$ = 2.8), while cisgender girls were more likely to be involved as victim-perpetrators ($z$ = 2.7). Significant associations were also found between age and overall involvement in TFDA ($\chi^2(6) = 13.12$, $p$ = 0.04, Cramer's V = 0.09) and specifically in sexual coercion ($\chi^2(6) = 13.11$, $p$ = 0.04, Cramer's V = 0.09). Residuals indicated adolescents aged 14–16 years were significantly more likely than expected to be victims of TFDA ($z$ = 2.9) and sexual coercion ($z$ = 3.0).

## Associations with self-esteem, HRQoL, and in-person dating violence

The results support our fourth hypothesis. As shown in Table 7, both scales negatively correlated with self-esteem (victimization: $r_s$ = -0.15; perpetration: $r_s$ = -0.13) and HRQoL (victimization: $r_s$ = -0.07 to -0.20; perpetration: $r_s$ = -0.10 to -0.20). Conversely, victimization correlated positively with in-person dating victimization ($r_s$ = 0.17 to 0.40), while perpetration correlated positively with in-person dating perpetration ($r_s$ = 0.10 to 0.36).

**Table 6**

*Prevalence of technology-facilitated dating abuse, gender, and age associations*

| | | Gender | | | | | Age group | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total (*N* = 859) | Cisgender boy (*n* = 420) | Cisgender girl (*n* = 414) | Gender-diverse (*n* = 25) | $\chi^2$ | Effect size | 12-13 (*n* = 144) | 14-16 (*n* = 490) | 17-18 (*n* = 225) | $\chi^2$ | Effect size |
| Total | | | | | 8.29[a] | 0.07 | | | | 13.12[a]* | 0.09 |
| Non-involvement | 380 (44.2) | 200 (23.3) | 171 (19.9) | 9 (1) | | | 72 (8.4) | 199 (23.2) | 109 (12.7) | | |
| Victims | 102 (11.9) | 53 (6.2) | 44 (5.1) | 5 (0.6) | | | 11 (1.3) | 72 (8.4) | 19 (2.2) | | |
| Perpetrators | 81 (9.4) | 38 (4.4) | 40 (4.7) | 3 (0.3) | | | 14 (1.6) | 42 (4.9) | 25 (2.9) | | |
| Victim-Perpetrators | 296 (34.5) | 129 (15) | 159 (18.5) | 8 (0.9) | | | 47 (5.5) | 177 (20.6) | 72 (8.4) | | |
| Humiliation | | | | | 5.47[b] | 0.06 | | | | | |
| Non-involvement | 660 (76.8) | 322 (37.5) | 320 (37.3) | 18 (2.1) | | | 105 (12.2) | 370 (43.1) | 185 (21.5) | 6.44[a] | 0.06 |
| Victims | 72 (8.4) | 35 (4.1) | 34 (4) | 3 (0.3) | | | 13 (1.5) | 46 (5.4) | 13 (1.5) | | |
| Perpetrators | 62 (7.2) | 26 (3) | 35 (4.1) | 1 (0.1) | | | 12 (1.4) | 38 (4.4) | 12 (1.4) | | |
| Victim-Perpetrators | 65 (7.6) | 37 (4.3) | 25 (2.9) | 3 (0.3) | | | 14 (1.6) | 36 (4.2) | 15 (1.7) | | |
| Monitoring/control | | | | | 16.64[a]** | 0.10 | | | | 6.85[a] | 0.06 |
| Non-involvement | 505 (58.8) | 267 (31.1) | 225 (26.2) | 13 (1.5) | | | 93 (10.8) | 274 (31.9) | 138 (16.1) | | |
| Victims | 79 (9.2) | 42 (4.9) | 32 (3.7) | 5 (0.6) | | | 12 (1.4) | 50 (5.8) | 17 (2.0) | | |
| Perpetrators | 66 (7.7) | 25 (2.9) | 39 (4.5) | 2 (0.2) | | | 13 (1.5) | 36 (4.2) | 17 (2.0) | | |
| Victim-Perpetrators | 209 (24.3) | 86 (10) | 118 (13.7) | 5 (0.6) | | | 26 (3) | 130 (15.1) | 53 (6.2) | | |
| Sexual coercion | | | | | 6.17[b] | 0.06 | | | | 13.11[a]* | 0.09 |
| Non-involvement | 722 (84.1) | 360 (41.9) | 341 (39.7) | 21 (2.4) | | | 128 (14.9) | 402 (46.8) | 192 (22.4) | | |
| Victims | 52 (6.1) | 22 (2.6) | 30 (3.5) | 0 (0) | | | 4 (0.5) | 40 (4.7) | 8 (0.9) | | |
| Perpetrators | 37 (4.3) | 19 (2.2) | 16 (1.9) | 2 (0.2) | | | 3 (0.3) | 20 (2.3) | 14 (1.6) | | |
| Victim-Perpetrators | 48 (5.6) | 19 (2.2) | 27 (3.1) | 2 (0.2) | | | 9 (1.0) | 28 (3.3) | 11 (1.3) | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Threats | | | | | 8.49[b] | 0.07 | | | | 9.81[a] | 0.08 |
| Non-involvement | 727 (84.6) | 366 (42.6) | 339 (39.5) | 22 (2.6) | | | 122 (14.2) | 408 (47.5) | 197 (22.9) | | |
| Victims | 74 (8.6) | 30 (3.5) | 43 (5) | 1 (0.1) | | | 8 (0.9) | 47 (5.5) | 19 (2.2) | | |
| Perpetrators | 31 (3.6) | 15 (1.7) | 14 (1.6) | 2 (0.2) | | | 8 (0.9) | 21 (2.4) | 2 (0.2) | | |
| Victim-Perpetrators | 27 (3.1) | 9 (1) | 18 (2.1) | 0 (0) | | | 6 (0.7) | 14 (1.6) | 7 (0.8) | | |

Note. $\chi^2$ = Chi-square test; a = Pearson Chi-Square; b = Fisher Exact test; * $p < .05$. ** $p < .01$, two-tailed.

**Table 7**

*Correlations between technology-facilitated dating abuse, self-esteem, HRQoL, and in-person dating violence*

| | Victimization scale | | | | | Perpetration scale | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | H | MC | SC | T | Total | H | MC | SC | T | Total |
| Self-esteem | -0.03 | -0.15*** | -0.10** | -0.09** | -0.15*** | -0.05 | -0.15*** | -0.02 | -0.03 | -0.13*** |
| HRQoL | | | | | | | | | | |
| Physical well-being | -0.05 | -0.04 | -0.07* | -0.12*** | -0.07+ | -0.03 | -0.15*** | -0.02 | -0.08* | -0.14*** |
| Psychological well-being | -0.09** | -0.19*** | -0.12*** | -0.15*** | -0.20*** | -0.09** | -0.19*** | -0.05 | -0.04 | -0.19*** |
| Parent relations | -0.08* | -0.15*** | -0.18*** | -0.12*** | -0.18*** | -0.14*** | -0.16*** | -0.08+ | -0.05 | -0.16*** |
| Peers and social support | -0.06 | -0.10** | -0.11** | -0.07+ | -0.14*** | -0.08* | -0.10** | -0.08* | -0.03 | -0.10** |
| School environment | -0.08* | -0.12*** | -0.06 | -0.11** | -0.13*** | -0.08* | -0.16*** | -0.01 | -0.03 | -0.14*** |
| Total | -0.09** | -0.18*** | -0.15*** | -0.14*** | -0.20*** | -0.11** | -0.21*** | -0.06+ | -0.05 | -0.20*** |
| In-person dating violence | | | | | | | | | | |
| Physical abuse | 0.26*** | 0.07 | 0.17*** | 0.12** | 0.17*** | 0.19*** | 0.08 | 0.04 | 0.16*** | 0.10* |
| Emotional abuse | 0.21*** | 0.33*** | 0.17*** | 0.33*** | 0.36*** | 0.18*** | 0.35*** | 0.09+ | 0.12** | 0.32*** |
| Relational abuse | 0.26*** | 0.24*** | 0.16*** | 0.30*** | 0.27*** | 0.25*** | 0.11* | 0.15** | 0.23*** | 0.21*** |
| Sexual abuse | 0.15** | 0.13** | 0.34*** | 0.21*** | 0.24*** | 0.26*** | 0.09+ | 0.19*** | 0.17*** | 0.19*** |
| Threats | 0.21*** | 0.12** | 0.19*** | 0.26*** | 0.20*** | 0.08+ | 0.10* | 0.09+ | 0.14*** | 0.11* |
| Total | 0.25*** | 0.35*** | 0.24*** | 0.36*** | 0.40*** | 0.25*** | 0.35*** | 0.13** | 0.18*** | 0.36*** |

*Note.* H = Humiliation; MC = Monitoring/Control; SC = Sexual Coercion; T = Threats; Self-Esteem ($n$ = 769); HRQoL = Health-Related Quality of Life ($n$ = 769); In-Person Dating Violence ($n$ = 426). The victimization scale was correlated with in-person dating victimization, while the perpetration scale was correlated with in-person dating perpetration. + $p$ < .10. * $p$ < .05. ** $p$ < .01. *** $p$ < .001, two-tailed.

## Discussion

The main aims of this pioneering study were to evaluate the utility of the TAR scale among Portuguese adolescents, estimate prevalence rates of TFDA, and examine its associations with gender, age, self-esteem, HRQoL, and in-person dating violence.

Results supported Hypothesis 1, confirming the original four-factor structure – Humiliation (ridicule, devaluation, embarrassment), Monitoring/Control (privacy intrusion, control over activities and interactions), Sexual Coercion (sexual pressure, image-based sexual abuse), and Threats (intimidation, expressed intent to harm; Brown & Hegarty, 2021) – as valid in Portugal. The victimization scale fit well without modifications, while the perpetration scale required theoretically justified error correlations due to similar item wording, content, or latent factors (Marôco, 2021). Lower factor loadings for Items 25 (victimization), 24, and 28 (perpetration) may reflect lower prevalence or (un)intentional underreporting, aligning with previous findings (e.g., Ellyson et al., 2021; Reed et al., 2017; Stonard, 2021; Zweig et al., 2013). These items remain essential due to their negative impact (Brown et al., 2021; Reed et al., 2017), the lack of measures addressing these behaviors (Rocha-Silva et al., 2021), and the need for symmetry between scales (none showed low factor loadings on both scales). Cronbach's alpha for the Threats factor was slightly below 0.70, but values above 0.60 are acceptable in exploratory research (Hair et al., 2019), especially with MIIC values within recommended ranges. Although Items 24, 25, and 28 had CITC values below thresholds (Nunnally & Bernstein, 1994), their removal did not significantly impact reliability, further supporting their retention. Regarding convergent validity, AVE values fell below 0.50, but CR exceeded 0.60 for most factors, meeting Fornell and Larcker's (1981) criteria, except for the Threats factor in the perpetration scale, likely due to the lower prevalence and reduced loading of Item 28. Discriminant validity was supported, confirming the scale's overall robustness (Henseler et al., 2015).

Consistent with Hypothesis 2a, TFDA was prevalent, with most adolescents identified as victim-perpetrators. These findings align with international studies (e.g., Ellyson et al., 2021; Stonard, 2021; Zweig et al., 2013) but differ from the only Portuguese study (UMAR, 2024), mainly due to the TAR scale's broader capture of abuse typologies and roles. Several factors may explain these patterns. Adolescents, who are undergoing brain development, physiological changes (Spear, 2000), and identity exploration (Erikson, 1963), often lack essential skills such as effective communication, negotiation, anticipation of moral, social, and legal consequences (Selman, 1986), and the ability to recognize unhealthy dating behaviors (Baker & Carreño, 2016). These developmental challenges can result in inadequate coping strategies. Social contexts - family, peers, school, and community - also shape these

experiences (Caridade & Braga, 2020). Technology further mediates these dynamics (ecological techno-subsystem; Johnson, 2010), with the accessibility of communication and the perceived anonymity or comfort behind screens, amplifying power and control, while reducing accountability and facilitating both proactive and reactive aggression (i.e., online disinhibition effect; Suler, 2004). Recommendations call for integrating unhealthy dating behaviors, assertive communication, emotional regulation, critical thinking, conflict resolution, empathy, intervention skills, digital literacy, and anti-TFDA campaigns into adolescents' formal and informal contexts. They also stress the importance of sensitizing caregivers, school-based services, and formal support systems to better address the needs of adolescent victims and perpetrators.

Hypotheses 2b and 3a identified monitoring and control as the most prevalent and bidirectional forms of TFDA, with cisgender boys often uninvolved and cisgender girls more frequently being victim-perpetrators. Qualitative research indicates that adolescents usually perceive these behaviors as expressions of love, care, trust, and commitment, with practices such as sharing account passwords being common early in relationships (Baker & Carreño, 2016; Lucero et al., 2014; Stonard et al., 2017). However, such behaviors are also associated with jealousy and are often dismissed as problematic unless extreme, reinforcing victim-perpetrator dynamics (Baker & Carreño, 2016; Lucero et al., 2014). Traditional gender norms may further explain these patterns. Heteronormative masculinity, emphasizing dominance, self-reliance, and independence (Villora et al., 2021) often discourages cisgender boys from disclosing their experiences. In contrast, cisgender girls are more likely to discuss these behaviors (both their own and their partners; Baker & Carreño, 2016), viewing them as necessary for maintaining relationships (Lucero et al., 2014) or attributing them to protective or caring traits associated with heteronormative femininity (Stonard et al., 2017; Villora et al., 2021). Addressing these issues requires deconstructing romantic myths to help adolescents recognize abuse, seek support, or end unhealthy relationships; creating safe, stigma-free spaces for victims to share their experiences; and further examining the role of gender stereotypes and socialization practices in TFDA.

Regarding Hypothesis 3b, age influenced specific forms and roles of TFDA, with adolescents aged 14–16 reporting higher victimization, particularly in sexual coercion. This vulnerability may stem from greater involvement in dating and sexual relationships (Connolly et al., 2014; Thulin et al., 2021), engagement in risk-taking behaviors such as flirting, initiating relationships online, sexting, and consuming pornography (Lenhart et al., 2015; Widman et al., 2021), reduced parental supervision, and/or decreased influence from adults/parents (Thulin et al., 2021; Vale et al., 2018). Early

identification of vulnerable subpopulations and age-appropriate prevention strategies are crucial to prevent TFDA from becoming entrenched in adolescence and persisting into adulthood.

Hypothesis 4 was supported, consistent with previous studies (e.g., Ortega-Barón et al., 2022; Rodríguez-deArriba et al., 2024; Smith et al., 2018). These associations suggest that TFDA may contribute to reduced self-esteem and HRQoL. However, it is also plausible that adolescents with lower self-esteem and HRQoL are more vulnerable to TFDA involvement. This underscores that TFDA has causes and consequences, likely impacting multiple aspects of adolescents' lives (Caridade & Braga, 2020). Additionally, TFDA may precede, coexist with, or result from in-person dating violence (e.g., Rodríguez-deArriba et al., 2024), highlighting their interconnectedness and the potential for a cycle where one form of abuse reinforces the other. While TFDA shares similarities with in-person dating violence, its technological nature introduces unique challenges, such as the absence of temporal and geographical limits, evolving abusive methods, broad audience reach, and the permanence of digital evidence, all of which can hinder recovery (Afrouz & Vassos, 2024; Fernet et al., 2019; Vale et al., 2021; Zweig et al., 2014). Longitudinal studies are needed to determine these relationships.

## Limitations

Some limitations should be noted, offering directions for future research: a) the cross-sectional design limits causal inferences; b) the convenience sample restricts generalizability; c) self-reports may be affected by recall errors and social desirability bias; d) adolescents were asked about specific abusive behaviors, rather than self-identifying as victims and/or perpetrators; e) assessing TFDA over the past 12 months may overlook lifetime experiences; and f) measurement invariance across gender and age was not tested, and future research should address this.

## Conclusion

The TAR scale effectively captures TFDA, addressing the needs of adolescents, researchers, and practitioners. Internationally, its validation facilitates cross-country comparative studies, while in Portugal, it marks significant progress and lays the groundwork for future advancements by: a) enhancing knowledge related to prevalence rates, etiology, risk and protective factors, and consequences; b) enabling early identification and referrals of victims and perpetrators to appropriate services; c) supporting the development of evidence-based prevention and intervention strategies for victims, perpetrators, and bystanders; d) guiding the allocation of funding, resources, and support for services working with adolescents; and e) increasing public awareness. Moreover, it highlights the need

for a whole-of-society strategic response, engaging communities—adolescents, parents, teachers, clinicians, child protection professionals, researchers, technology companies, and legal and policy practitioners. Such a collective effort is essential to protect adolescents during this critical developmental stage, foster healthy adult relationships, and reinforce that TFDA is unacceptable and will not be tolerated.

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## CHAPTER II[6]

# VALIDATION OF A SCALE FOR REACTIVE BYSTANDER OPPORTUNITY DETECTION IN TECHNOLOGY-FACILITATED SEXUAL DATING ABUSE AMONG PORTUGUESE ADOLESCENTS

[6] Vale, M., Hines, D., & Matos, M. (under review). Validation of a scale for reactive bystander opportunity detection in technology-facilitated sexual dating abuse among Portuguese adolescents. Manuscript submitted for publication. *Cyberpsychology, Behavior, and Social Networking* (IF 4.2; Q1)

VALIDATION OF A SCALE FOR REACTIVE BYSTANDER OPPORTUNITY DETECTION IN TECHNOLOGY-FACILITATED SEXUAL DATING ABUSE AMONG PORTUGUESE ADOLESCENTS


## Abstract

**Background:** Technology-facilitated sexual dating abuse (TFSDA) involves non-consensual sexual behaviors in relationships, such as the sharing nude/sexual content, often visible to bystanders who can interrupt them and reduce harm. However, in Portugal, the lack of assessment measures limits understanding of which opportunities to intervene are detected and which adolescents detect them. **Objectives:** This study aims to analyze the psychometric properties of the Scale for Reactive Bystander Opportunity Detection in TFSDA, estimate the frequency of detected opportunities, and examine associations between opportunity detection and gender, age, and TFSDA victimization and/or perpetration. **Method:** Between February and May 2023, 1,604 Portuguese adolescents (51.4% cisgender boys; $M_{age}$ = 14.92, $SD$ = 1.73) in grades 7-12 from 25 schools in northern and central Portugal completed an online questionnaire. This sample was divided into calibration ($n_1$ = 444) and validation ($n_2$ = 579, $n_3$ = 581). **Results:** Exploratory factor analysis identified an 8-item, two-factor structure – sexual coercion and image-based sexual harassment/abuse – explaining 53% of the variance. Confirmatory factor analysis demonstrated good fit indices, and measurement invariance was achieved for gender and age. Convergent and discriminant validity were acceptable, with high reliability across samples. Results indicated that 21.3% of adolescents detected opportunities to intervene in TFSDA. Cisgender girls were less likely, while older adolescents were more likely to detect opportunities to intervene in image-based sexual harassment/abuse. Additionally, victims and victim-perpetrators of TFSDA reported higher opportunity detection. **Conclusion:** The study confirms the scale's robust psychometric properties for research, clinical, and forensic use, while offering insights into those who need awareness or skills training to respond to TFSDA.



*Keywords:* adolescents, bystanders, technology-facilitated sexual dating abuse, psychometric properties

## Introduction

Information and communication technologies (ICT) offer new opportunities for adolescents to meet, date, and break up with a romantic partner (Lenhart et al., 2015). Simultaneously, they heighten the risk of technology-facilitated dating abuse (Brown & Hegarty, 2021; Caridade et al., 2019; Fernet et al., 2019; Rocha-Silva et al., 2021; Rodríguez-deArriba et al., 2021), which includes non-sexual (e.g., verbal, emotional, and relational abuse; monitoring/control; Barter et al., 2017; Brown & Hegarty, 2021; Rodríguez-deArriba et al., 2021; Sánchez-Jiménez et al., 2023) and sexual forms (e.g., pressure, coercion, and image-based sexual abuse/harassment; Brown & Hegarty, 2021; Dick et al., 2014; Ellyson et al., 2021; Kernsmith et al., 2018; Reed et al., 2017; Rodríguez-deArriba et al., 2021; Sánchez-Jiménez et al., 2023; Stonard, 2021; Zweig et al., 2013; Chapter I). This study focuses on the latter, termed technology-facilitated sexual dating abuse (TFSDA).

In Europe, where this study was conducted, TFSDA victimization rates range from 6.1% to 29.2% and perpetration from 4.3% to 15% (Sánchez-Jiménez et al., 2023; Stonard, 2021; Chapter I), with forms of image-based sexual harassment/abuse being the most prevalent (Sánchez-Jiménez et al., 2023; Chapter I). TFSDA is among the worst dating experiences (Reed et al., 2020), leading to low self-esteem, depression, anxiety, impaired relationships, self-harm, suicidal behavior, school problems, and trauma symptoms (Finkelhor et al., 2023; Hamilton-Giachritsis et al., 2021; Torp Løkkeberg et al., 2024). Recovery can be further hindered by partner betrayal, negative attitudes of others, loss of control over digital evidence, lasting concerns of exposure into adulthood, and revictimization (Finkelhor et al., 2024; Hamilton-Giachritsis et al., 2021).

Bystanders – whether physically or virtually present, or aware of harmful situations – play a key role in disrupting incidents and mitigating their impact (Allison & Bussey, 2016; Banyard, 2015). Despite the availability of single-item or validated bystander measures in the U.S. (Banyard et al., 2022, 2025; Edwards et al., 2018; Mennicke et al., 2023; Rothman et al., 2019; Waterman et al., 2020), Australia (Flynn et al., 2022), and Europe (González-Cabrera et al., 2020; Sarmiento et al., 2019), these measures fail to capture adolescents' detection opportunities to intervene in TFSDA, leaving critical gaps in understanding which opportunities are detected and by whom.

First, most measures primarily survey adult or college-age samples (Mennicke et al., 2023). However, adolescents – despite ongoing brain development, social skills limitations, and risk-taking tendencies (Selman et al., 1986; Spear, 2000) –
exhibit increasing perspective-taking (Van der Graaff et al., 2014) and prosocial behaviors toward friends (Padilla-Walker et al., 2018), enhancing their willingness to help. Second, adolescent-focused

measures often address in-person dating violence (Rothman et al., 2019; Waterman et al., 2020), peer sexual violence (Banyard et al., 2022, 2025), bullying (González-Cabrera et al., 2020), or cyberbullying (Sarmiento et al., 2019) but not TFSDA. Although TFSDA overlaps with in-person sexual dating violence (Dick et al., 2014; Kernsmith et al., 2018; Zweig et al., 2013; Chapter I), its digital nature offers distinct opportunities to intervene, as the sharing of nude/sexual content leaves a wide digital footprint that can be viewed, shared, and circulated unpredictably, expanding the potential to help. Third, the Situational Model of Bystander Behavior (SMBB; Latané & Darley, 1969) suggests that intervention begins with detecting an opportunity to intervene, followed by interpreting it as requiring intervention, assuming responsibility, knowing how to intervene, and acting. However, most measures focus on the "take action" stage (Mennicke et al., 2023), overlooking earlier barriers that may prevent bystanders from helping.

Building on this, research on in-person dating and sexual violence, and peer sexual violence suggests that adolescents are more likely to detect opportunities to intervene in frequent and/or public incidents, such as unwanted touching, sexual harassment, and sexual rumor spreading (Banyard et al., 2022, 2025; Rothman et al., 2019; Waterman et al., 2020). Girls, older adolescents (Banyard et al., 2022), and those with victimization experiences (Banyard et al., 2025) are more likely to detect these opportunities.

## The current study

This study addressed these gaps through the following questions: RQ1) Is the Scale for Reactive Bystander Opportunity Detection in TFSDA – adapted from the Technology-Facilitated Abuse in Relationships Scale (TAR; Brown & Hegarty, 2021), one of the most reliable measures of technology-facilitated dating victimization/perpetration (Martínez-Soto et al., 2022), and already validated for Portuguese adolescents (Chapter I) – a valid and reliable measure? RQ2) To what extent do adolescents detect opportunities to intervene in TFSDA? RQ3) How does opportunity detection vary by gender, age, and experiences of TFSDA victimization and/or perpetration?

Given the study's exploratory nature, no predictions were made regarding the scale's psychometric properties; however, it was hypothesized that adolescents would detect opportunities to intervene (H1a), particularly in public behaviors (H1b). Cisgender girls (H2a), older adolescents (H2b), and those with victimization and/or perpetration experiences (H2c) were expected to show higher detection levels.

## Method

### Procedures

The study was approved by the Ethics Committee for Research in Social and Human Sciences (CEICSH-109/2021), the Data Protection Department of the University of Minho (DPO-REG-ID-2020-0000; DPO-AIPD-ID-2020-0000), the Portuguese General Directorate of Education (DGE-079070000), and the school executive boards. High schools in northern and central Portugal were randomly selected from a DGE-provided list and invited via email. Twenty-five schools agreed to participate and received a letter detailing the study procedures, ethical considerations, and consent forms requiring signatures from adolescents and parents.

Data collection occurred from February to May 2023 during a single school day. Adolescents provided digital consent and were reminded not to include their names, that they could skip any questions, and that they were free to withdraw at any time. They completed a 45-minute questionnaire on Qualtrics using PCs, tablets, or smartphones in classrooms/libraries, with a teacher, the lead researcher, and, when necessary, a master's or PhD psychology student who was available to clarify any questions or offer support. Afterwards, they attended a 45-minute awareness session on TFDA, covering the phenomenon, safety tips, and support contacts, including the Portuguese Victim Support Association (APAV) and the Psychology Association of the University of Minho (APsi). They were also given the project's email address to contact the researchers for assistance, to ask questions, or to access their results.

### Participants

Adolescents were eligible if they were 12–18 years old, Portuguese, and had no cognitive or severe learning difficulties (as assessed by teachers). Of 1,855 respondents, 251 were excluded: 97 for missing bystander scale responses, 137 for non-Portuguese nationality, and 17 as outliers.

Table 8 summarizes the eligible sample ($n$ = 1,604). Most were cisgender boys (51.4%), aged 12-15 (62.2%), White/Caucasian (94.3%), heterosexual (86.2%), had dated in the past year (52.6%), attended public schools (74%), were in grades 9-10 (42.4%), and lived in rural areas (50.4%).

**Table 8**

*Description of the sample and subsamples*

| | Total ($N$ = 1,604) | EFA ($n_1$ = 444) | CFA-1 ($n_2$ = 579) | CFA-2 ($n_3$ = 581) |
|---|---|---|---|---|
| Variables | *n (%)* | *n (%)* | *n (%)* | *n (%)* |
| Gender | | | | |
| Cisgender boy | 825 (51.4) | 217 (48.9) | 307 (53) | 301 (51.8) |
| Cisgender girl | 743 (46.3) | 220 (49.5) | 258 (44.6) | 265 (45.6) |
| Binary and non-binary transgender | 22 (1.4) | 6 (1.4) | 8 (1.4) | 8 (1.4) |
| Questioning | 9 (0.6) | - | 4 (0.7) | 5 (0.9) |
| Age-Group | | | | |
| 12-15 years | 998 (62.2) | 290 (65.3) | 344 (59.4) | 364 (62.7) |
| 16-18 years | 606 (37.8) | 154 (34.7) | 235 (40.6) | 217 (37.3) |
| Ethnicity | | | | |
| White/Caucasian | 1513 (94.3) | 418 (94.1) | 554 (95.7) | 541 (93.1) |
| Afro descendants/Black | 55 (3.4) | 15 (3.4) | 19 (3.3) | 21 (3.6) |
| Roma/Gypsy | 26 (1.6) | 7 (1.6) | 5 (0.9) | 14 (2.4) |
| Asian | 2 (0.1) | - | - | 2 (0.3) |
| Multi-ethnic | 8 (0.5) | 4 (0.9) | 1 (0.2) | 3 (0.5) |
| Sexual orientation | | | | |
| Heterosexual | 1383 (86.2) | 394 (87.7) | 503 (86.9) | 486 (83.6) |
| Bisexual | 125 (7.8) | 32 (7.2) | 43 (7.4) | 50 (8.6) |
| Gay/Lesbian | 46 (2.9) | 7 (1.6) | 17 (2.9) | 22 (3.8) |
| Other | 41 (2.6) | 9 (2) | 13 (2.2) | 19 (3.3) |
| Dating relationship | 843 (52.6) | 218 (49.1) | 323 (55.8) | 302 (52) |
| Type of school | | | | |
| Public | 1187 (74) | 341 (76.8) | 428 (73.9) | 418 (71.9) |
| Private/Professional | 417 (26) | 103 (23.2) | 151 (26.1) | 163 (28.1) |
| Education level | | | | |
| 7th-8th grades | 539 (33.6) | 146 (32.9) | 187 (32.3) | 206 (35.5) |
| 9th-10th grades | 680 (42.4) | 186 (41.9) | 244 (42.1) | 250 (43) |
| 11th-12th grades | 385 (24) | 112 (25.2) | 148 (25.6) | 125 (21.5) |
| Residential zone | | | | |
| Urban | 788 (49.1) | 206 (46.4) | 278 (48) | 304 (52.3) |
| Rural | 809 (50.4) | 235 (52.9) | 301 (52) | 273 (47) |

*Note.* In the overall sample, missing data ranged from 0.3% ($n$ = 5) for gender identity, 0.4% ($n$ = 6) for residential zone, and 0.6% ($n$ = 9) for sexual orientation. EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis.

## Measures

The following pre-survey definitions were provided (Brown & Hegarty, p. 4):

a) “Dating relationships. We define dating as two or more people in an emotionally and/or physically intimate relationship. The relationship may or may not be sexual. It may be casual or serious, short-term or long-term, straight, gay, monogamous, or open. Terms used to describe these kinds of relationships include boyfriend, girlfriend, going out, hanging out, hooking up, seeing each other, friends with benefits, and unofficially dating. In this survey, we will use the terms girlfriend and boyfriend to refer to dating relationships.”

b) “Digital devices. A digital device includes any type of modern-day technology used to interact with other people. Examples include (but are not limited to) mobile phones, smartphones, computers, tablets, laptops, notepads, the internet, social media, GPS devices, software, and apps.”

### *Sociodemographic Questionnaire*

Single items were developed to collect data on gender, age, ethnicity, sexual orientation, relationship status, type of school, education level, and residential zone.

### *Reactive Bystander Opportunity Detection in TFSDA*

The translation and adaptation followed standard procedures (ITC Guidelines for Translating and Adapting Tests, 2017): author authorization; bilingual forward and back-translation; adaptation of the question stem and items for bystanders; term clarification (e.g., "nudes"); expert review (nine psychologists); and a pilot study (ten adolescents, excluded from analysis). Adolescents answered, "In the last twelve months, how often have you witnessed or had knowledge of someone being targeted by or committing these behaviors against a current or former boyfriend/girlfriend (excluding news reports)?" Nine items were rated on a 4-point scale (0 = never to 3 = frequently/more than 6-times). Higher scores indicate greater opportunity detection.

### *TFSDA Victimization and/or Perpetration*

The TAR scale (Brown & Hegarty, 2021; Chapter I) assessed these experiences. Dating adolescents answered, "In the last twelve months, how often have these behaviors happened with you and your current or former boyfriend/girlfriend?" Nine items were rated on a 6-point Likert scale (0 = never to 5 = daily/almost daily). Higher scores indicate greater victimization ($\alpha$ = 0.89) and/or perpetration ($\alpha$ = 0.86). The structure aligned with the validated bystander scale for comparability.

## Data analysis

Little's MCAR test (Little, 1988) confirmed data were missing completely at random ($\chi^2$ (15) = 0.252, $p > 0.05$), and listwise deletion was applied. Outliers were identified via Mahalanobis distance, Cook's distance, and Leverage (Hair et al., 2019).

For RQ1, item analysis included descriptive statistics and normality tests (Hair et al., 2019). Factorability was assessed with the Kaiser–Meyer–Olkin-test (> 0.70) and Bartlett's test ($p < 0.001$). Factor extraction followed Parallel Analysis and the Empirical Kaiser Criterion Method. Exploratory Factor Analysis (EFA; $n_1$ = 444) used principal-axis factoring with promax rotation, excluding items with factor loadings ≤ 0.32 or cross-loadings ≤ 0.15 difference (Marôco, 2021a; Worthington & Whittaker, 2006). Confirmatory factor analysis (CFA; $n_2$ = 579, $n_3$ = 581) used the MLM estimator, with model fit assessed via $\chi^2$/df ≤ 5, CFI ≥ 0.90, TLI ≥ 0.90, RMSEA ≤ 0.08, and SRMR ≤0.08 (Hu & Bentler, 1999; Marôco, 2021b). Measurement invariance across gender (cisgender boys, cisgender girls) and age (12-15, 16-18) was tested using changes in CFI (Δ ≤ 0.01), RMSEA (Δ ≤ 0.015), and SRMR (≤ 0.03 for metric, ≤ 0.01 for scalar; Chen, 2007). Convergent validity was assessed via Average Variance Extracted (AVE, ≥ 0.50) and Composite Reliability (CR, ≥ 0.60; Hair et al., 2019), while discriminant validity was assessed using Heterotrait-Monotrait Ratio (HTMT, ≤ 0.85; Henseler et al., 2015). Reliability was evaluated through Cronbach's alpha (α, ≥ 0.70; Dunn et al., 2014), Mean Inter-Item Correlations (MIIC, 0.15–0.50; Clark & Watson, 1995) and Corrected Item-Total Correlations (CITC, ≥ 0.20; Nunnaly & Bernstein, 1994).

For RQ2 and RQ3, latent means comparisons assessed gender and age differences, chi-square tests examined victimization and/or perpetration associations, with adjusted residuals identifying deviations and Cramer's V measuring association strength (small ≃ 0.10 to large ≃ 0.50; Cohen, 1988).

EFA, CFA, measurement invariance, and validity assessments were conducted in R (version 4.2.3, R Core Team, 2023), using psych, EFA.dimensions, lavaan, and semTools packages; all other analyses were conducted in SPSS (version 29, IBM Corporation, 2022).

# Results

## RQ1. Psychometric properties

Item analysis and EFA. Skewness and kurtosis indicated non-normal distributions. Initial EFA identified cross-loadings on item 3, leading to its removal. The revised EFA confirmed factorability (KMO = 0.82; $\chi^2(28) = 1390.13$, $p < 0.001$) and identified a two-factor structure: Sexual Coercion (4

items on forced/pressured sexual conversations and activities) and Image-Based Sexual Harassment/Abuse (4 items on unwanted requests, unsolicited receipt, and the non-consensual distribution of or threats to nude/sexual content). Both factors showed adequate loadings and explained 53% of the variance (see Table 9).

CFA and measurement invariance. CFA-1 required error term correlations (Items 4 and 5) for improved fit, while CFA-2 showed good fit without modifications. Configural (factor structure), metric (factor loadings), and scalar (intercepts) invariance were supported across gender and age groups (see Table 10 and Figure 3).

**Table 9**

*Descriptive, item analyses, and exploratory factor analysis*

| Item | Frequency distribution, *n* (%) | | | | *M* | *SD* | *Sk* (SE = 0.06) | *Ku* (SE = 0.12) | EFA | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Never | Rarely (1 to 2 times) | Sometimes (3 to 5 times) | Frequently (More than 6 times) | | | | | Sexual Coercion (λ) | Image-Based Sexual Harassment Abuse (λ) |
| 1. Threatening to distribute intimate/sexual images (nudes). | 1426 (88.9) | 155 (9.7) | 21 (1.3) | 2 (0.1) | 0.13 | 0.38 | 3.26 | 11.60 | | 0.84 |
| 2. Pressuring to send intimate/sexual images (nudes). | 1483 (92.5) | 103 (6.4) | 15 (0.9) | 3 (0.2) | 0.09 | 0.33 | 4.34 | 21.89 | | 0.75 |
| 3. Pressuring on a digital device to send sexually explicit messages. | 1522 (94.9) | 71 (4.4) | 9 (0.6) | 2 (0.1) | 0.06 | 0.27 | 5.39 | 34.58 | - | - |
| 4. Pressuring to engage in phone sex. | 1538 (95.9) | 56 (3.5) | 7 (0.4) | 3 (0.2) | 0.05 | 0.26 | 6.40 | 49.53 | 0.70 | |
| 5. Pressuring on a digital device to engage in sexual acts. | 1553 (96.8) | 40 (2.5) | 7 (0.4) | 4 (0.2) | 0.04 | 0.25 | 7.53 | 66.55 | 0.75 | |
| 6. Pressuring to discuss sexual issues. | 1510 (94.1) | 80 (5) | 10 (0.6) | 4 (0.2) | 0.07 | 0.30 | 5.25 | 33.17 | 0.54 | |
| 7. Pressuring to engage in sexual activity via live video. | 1554 (96.9) | 40 (2.5) | 5 (0.3) | 5 (0.3) | 0.04 | 0.25 | 7.84 | 72.41 | 0.92 | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 8. | Sending unwelcome intimate/sexual images (nudes). | 1486 (92.6) | 96 (6) | 17 (1.1) | 5 (0.3) | 0.09 | 0.35 | 4.57 | 24.26 | 0.53 |
| 9. | Sharing intimate/sexual images or videos (nudes) without permission. | 1497 (93.3) | 82 (5.1) | 24 (1.5) | 1 (0.1) | 0.08 | 0.33 | 4.40 | 20.62 | 0.71 |

*Note.* M = Mean; SD = Standard deviation; Sk = Skewness; K = Kurtosis; SE = Standard Error; $\lambda$ = Factor loadings; EFA = Exploratory factor analysis.

**Table 10**

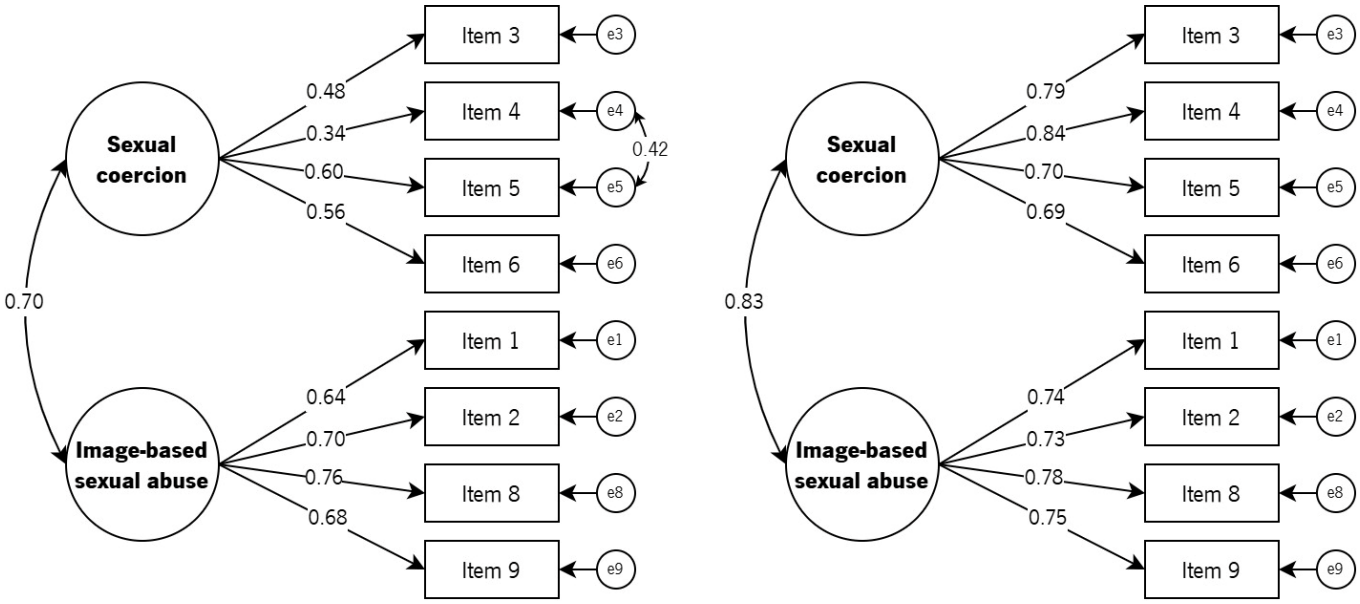
*Model fit statistics for confirmatory factor analysis and measurement invariance across gender and age*

| | S-B$\chi^2$(df) | S-B$\chi^2$(df) | CFI | TLI | RMSEA | 90% CI | *p-close* | SRMR |
|---|---|---|---|---|---|---|---|---|
| CFA-1 ($n_2$= 579) | 30.63(19)* | 1.61 | 0.92 | 0.88 | 0.09 | [0.01-0.14] | > 0.05 | 0.08 |
| Items 3-4 error correlation | 22.13(18) | 1.23 | 0.98 | 0.96 | 0.05 | [0.00-0.10] | > 0.05 | 0.05 |
| CFA-2 ($n_3$= 581) | 29.67 (19) | 1.56 | 0.96 | 0.94 | 0.08 | [0.00-0.13] | > 0.05 | 0.06 |
| | S-B$\chi$2(df) | Δ S-B$\chi$2(df) | CFI | ΔCFI | RMSEA | ΔRMSEA | SRMR | ΔSRMR |
| | Gender: cisgender boys ($n$ = 608) and cisgender girls ($n$ = 523) | | | | | | | |
| Configural | 50.027 (38) | - | 0.972 | - | 0.059 | - | 0.053 | - |
| Metric | 58.230 (44) | 8.203 (6) | 0.964 | 0.008 | 0.063 | 0.004 | 0.076 | 0.023 |
| Scalar | 67.373 (50) | 9.143 (6) | 0.960 | 0.004 | 0.062 | 0.001 | 0.077 | 0.001 |
| | Age range: 12-15 years ($n$ = 708) and 16-18 years ($n$ = 452) | | | | | | | |
| Configural | 56.396* (38) | - | 0.958 | - | 0.074 | - | 0.056 | - |
| Metric | 56.694 (44) | 0.298 (6) | 0.968 | 0.010 | 0.059 | 0.015 | 0.066 | 0.010 |
| Scalar | 63.605 (50) | 6.911 (6) | 0.970 | 0.002 | 0.054 | 0.005 | 0.066 | 0.000 |

*Note*. CFA = Confirmatory factor analysis; S-B$\chi^2$ = Satorra-Bentler chi-square test; df = Degrees of freedom; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index RMSEA = Root Mean Square Error of Approximation; 90% CI = 90% confidence interval; SRMR = Standardized Root Mean Square Residual; Δ = difference; *$p < 0.05$; For measurement invariance ($n_2$ = 579, $n3$ = 581) the minority gender group was excluded due to a low sample size ($n$ = 25).

**Figure 3**

*Standardized Factor Loadings for the CFA-1 (left) and CFA-2 (right)*



Convergent and discriminant validities. CFA-1 had AVE values below 0.50, but CR was close to or exceeded 0.60, supporting convergent validity (Fornell & Larcker, 1981). HTMT values confirmed discriminant validity. In CFA-2, all indices were adequate (see Table 11).

**Table 11**

*Convergent and discriminant validity*

| | | | HTMT | |
|---|---|---|---|---|
| | AVE | CR | Sexual coercion | Image-based sexual harassment/abuse |
| CFA-1 ($n_2$ = 579) | | | | |
| Sexual coercion | 0.28 | 0.53 | 1 | |
| Image-based sexual harassment/abuse | 0.48 | 0.78 | 0.66 | 1 |
| CFA-2 ($n_3$= 581) | | | | |
| Sexual coercion | 0.57 | 0.84 | 1 | |
| Image-based sexual harassment/abuse | 0.57 | 0.84 | 0.69 | 1 |

*Note.* CFA = Confirmatory factor analysis; AVE = Average Variance Extracted; CR = Composite Reliability; HTMT = Heterotrait Monotrait Ratio of Correlation.

Reliability, homogeneity, and item discrimination. CFA-1 showed low internal consistency for Sexual Coercion, likely due to the small item count, but values above 0.60 remain acceptable in exploratory research (Hair et al., 2019), especially when MIIC meets thresholds. All other reliability indices were adequate (see Table 12).

**Table 12**

*Reliability, homogeneity, and discriminative power of items*

| | Sexual coercion | | | Image-based sexual harassment/abuse | | | Overall | | |
|---|---|---|---|---|---|---|---|---|---|
| | α | MIIC | CITCR | α | MIIC | CITCR | α | MIIC | CITCR |
| EFA ($n_1$ = 444) | 0.83 | 0.57 | 0.59-0.76 | 0.77 | 0.46 | | 0.83 | 0.40 | 0.46-0.66 |
| CFA-1 ($n_2$= 579) | 0.62 | 0.31 | 0.36-0.51 | 0.79 | 0.49 | 0.57-0.62 | 0.79 | 0.33 | 0.31-0.66 |
| CFA-2 ($n_3$ =581) | 0.84 | 0.57 | 0.63-0.72 | 0.84 | 0.56 | 0.62-0.70 | 0.87 | 0.47 | 0.56-0.70 |
| Total ($N$=1604) | 0.79 | 0.50 | 0.55-0.64 | 0.81 | 0.51 | 0.61-0.65 | 0.84 | 0.41 | 0.54-0.65 |

*Note.* EFA = Exploratory factor analysis; CFA = Confirmatory factor analysis; α = Cronbach's alpha; MIIC = Mean inter-item correlations; CITC = Corrected item-total-correlations range.

**RQ2. Detection of opportunities to intervene**

H1a-b were supported: 21.3% ($n$ = 341) detected opportunities, primarily in Image-Based Sexual Harassment/Abuse (16.8%, $n$ = 269) and least in Sexual Coercion (9.9%, $n$ =158).

**RQ3. Gender, age, and TFSDA victimization and/or perpetration**

H2a unsupported: cisgender girls were less likely to detect Image-Based Sexual Harassment/Abuse (cisgender boys = 0; cisgender girls = -0.13, $p$ = 0.04, $z$ = -2.05), with no significant differences in Sexual Coercion (cisgender boys = 0; cisgender girls = -0.02, $p$ = 0.73, $z$ = -0.34). H2b marginally supported: older adolescents were slightly more likely to detect Image-Based Sexual Harassment/Abuse (12–15 years = 0; 16–18 years = 0.14, $p$ = 0.08, $z$ = 1.78), with no significant differences in Sexual Coercion (12–15 years = 0; 16–18 years = 0.01, $p$ = 0.90, $z$ = -0.12).

H2c supported: detection was associated with victimization and/or perpetration of Sexual Coercion ($\chi^2(3) = 11.74$, $p = 0.01$), Image-Based Sexual Harassment/Abuse ($\chi^2(3) = 21.14$, $p < 0.001$) and overall TFSDA ($\chi^2(3) = 14.74$, $p < 0.001$). Non-involvers were less likely to detect opportunities ($z$ = 3.4-4.5). In contrast, victims of Image-Based Sexual Harassment/Abuse ($z$ = 3.5) and victim-perpetrators of Sexual Coercion ($z$ = 2.1), Image-Based Sexual Harassment/Abuse ($z$ = 2.4), and overall TFSDA ($z$ = 2.4) were more likely to do so (see Table 13).

**Table 13**

*Opportunity detection and associations with TFSDA victimization and/or perpetration*

| TFSDA involvement | Who detected opportunity *n (%)* | Who did not detect opportunity *n (%)* | $\chi^2$(df) | Cramer's V |
|---|---|---|---|---|
| Sexual coercion | | | 11.74(3)** | 0.12 |
| Non-involvement | 133 (15.8)[a] | 591 (70.1)[b] | | |
| Victims | 14 (1.7)[a] | 32 (3.8)[a] | | |
| Perpetrators | 9 (1.1)[a] | 18 (2.1)[a] | | |
| Victim-Perpetrators | 15 (1.8)[a] | 31 (3.7)[b] | | |
| Image-based sexual harassment/abuse | | | 21.14(3)*** | 0.16 |
| Non-involvement | 142 (16.8)[a] | 630 (74.7)[b] | | |
| Victims | 15 (1.8)[a] | 19 (2.3)[b] | | |
| Perpetrators | 6 (0.7)[a] | 12 (1.4)[a] | | |
| Victim-Perpetrators | 8 (0.9)[a] | 11 (1.3)[b] | | |
| Overall | | | 14.74(3)** | 0.13 |
| Non-involvement | 124 (14.7)[a] | 571 (67.7)[b] | | |

| | | |
|---|---|---|
| Victims | 16 (1.9)[a] | 37 (4.4)[a] |
| Perpetrators | 12 (1.4)[a] | 25 (3.0)[a] |
| Victim-Perpetrators | 19 (2.3)[a] | 39 (4.6)[b] |

*Note*. TFSDA = Technology-facilitated sexual dating abuse; $\chi^2$ = Chi-square test; $^{**}p < .01$. $^{***}p < .001$. [a,b] Percentages in the same row sharing superscripts differ significantly, as determined by a post hoc z-test (for chi-square tests).

## Discussion

The scale's psychometric properties confirmed its robustness, supporting its applicability in research, clinical, and forensic settings. EFA identified a two-factor structure – Sexual Coercion and Image-Based Sexual Harassment/Abuse – consistent with documented abusive behaviors (Dick et al., 2014; Ellyson et al., 2021; Kernsmith et al., 2018; Reed et al., 2017; Sánchez-Jiménez et al., 2023; Stonard, 2021; Zweig et al., 2013; Chapter I). CFA validated the model's fit, with one error covariance added in CFA-1 due to item/factor similarities (Marôco, 2021b). The model demonstrated invariance across gender and age, enabling meaningful group comparisons. The scale also demonstrated convergent and discriminant validity, reliability, homogeneity, and strong item discrimination.

Consistent with H1a, a substantial percentage of adolescents detected opportunities to intervene in TFSDA, possibly reflecting its high victimization and perpetration rates (Sánchez-Jiménez et al., 2023; Stonard, 2021; Chapter I) and underscoring the need for refined bystander-measures to address emerging forms of technology-facilitated violence.

H1b was supported, with Image-Based Sexual Harassment/Abuse detected more frequently than Sexual Coercion, aligning with victimization/perpetration trends (Sánchez-Jiménez et al., 2023; Chapter I) and their distinct characteristics (Fernet et al., 2019). Sexual Coercion is private and direct, occurring within relationships and targeting only the victim, making it less visible (Fernet et al., 2019) and leading to lower victim disclosure (Ellyson et al., 2021) and detection rates. In contrast, the public nature of Image-Based Sexual Harassment/Abuse – such as viewing nude/sexual content on someone's device, receiving or encountering it in group chats, social media posts, or websites, or hearing about it through disclosures or rumors (Naezer & van Oosterhout, 2021; Van Ouytsel et al., 2016) – enhances visibility and detection.

Contrary to H2a, cisgender girls were less likely to detect Image-Based Sexual Harassment/Abuse, despite being more victimized, whereas cisgender boys – who are more likely to perpetrate it (Dick et al., 2014; Ellyson et al., 2021; Kernsmith et al., 2018; Reed et al., 2017, Zweig et al., 2013; Chapter I) – showed greater detection. This may stem from gender norms and sexual

double standards: girls experience pressure to engage in sexualized behaviors yet face victim-blaming, "slut-shaming," and stigma (Naezer & van Oosterhout, 2021), while heteronormative masculinity, emphasizing dominance and status, leads boys to share such images within peer groups for validation, coerce victims into further sexual acts, or seek revenge after breakups (Lucero et al., 2014; Van Ouytsel et al., 2016).

H2b was partially supported, with older adolescents slightly more likely to detect Image-Based Sexual Harassment/Abuse. This may result from their greater involvement in dating relationships (Connolly et al., 2014), increased risk-taking, peer influence, reduced parental supervision (Selman et al., 1986; Spear, 2000), and vulnerability to TFSDA victimization and/or perpetration (Sánchez-Jiménez et al., 2023; Stonard, 2021; Chapter I). Additionally, increased perspective-taking (Van der Graaff et al., 2014) and prosocial behaviors (Padilla-Walker et al., 2018) may enhance awareness.

Aligned with H2c, adolescents with TFSDA victimization or victimization-perpetration experiences reported greater opportunity detection. Real-life experiences may enhance awareness, improve recognition of problematic behaviors, and heighten empathy, while exposure to peers with similar experiences may further sensitize them to potential risks and abuse (Banyard et al., 2025; Woods et al., 2016, 2022).

## Limitations

Some limitations should be noted, offering directions for future research: a) the cross-sectional design limits causal inferences; b) the convenience sample restricts generalizability; c) self-reports may be affected by recall errors and social desirability bias; d) the scale may not account for new sexual abusive behaviors arising from technological advancements; e) adolescents may have detected opportunities but interpreted them differently than framed in the questions; f) assessing detection over the past twelve months may have missed lifetime opportunities; and g) future research should also explore the scale's relationship with other relevant constructs (e.g., empathy, attitudes, and social norms towards TFSDA).

## Conclusion

This scale lays a foundation for understanding bystanders' intentions and behaviors in Portugal, supporting evidence-based prevention and intervention. Bystander-focused strategies should address the contrasting nature of behaviors: for Sexual Coercion, fostering a supportive environment to encourage disclosure; for Image-Based Sexual Harassment/Abuse, emphasizing consequences,

perspective-taking, and accessible reporting. Awareness-based interventions may benefit cisgender girls and younger adolescents, while skills-based approaches can help cisgender boys, older adolescents, and those with victimization and/or perpetration experiences by challenging gender norms, enhancing empathy, resisting peer pressure, fostering accountability, understanding legal and social implications, and intervening effectively. Advancing from awareness to skill-building fosters collective responsibility, enhances safety, and reinforces the unacceptability of TFSDA.

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## CHAPTER III[7]

# ADOLESCENTS' BYSTANDER INTENTIONS TO HELP VICTIMS OF TECHNOLOGY-FACILITATED SEXUAL DATING ABUSE: THE THEORY OF PLANNED BEHAVIOR

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ADOLESCENTS' BYSTANDER INTENTIONS TO HELP VICTIMS OF TECHNOLOGY-FACILITATED SEXUAL DATING ABUSE: THE THEORY OF PLANNED BEHAVIOR


## Abstract

**Background:** Technology-facilitated sexual dating abuse (TFDSA) refers to the use of information and communication technologies to facilitate forms of sexual coercion and image-based sexual harassment/abuse within dating relationships. Most adolescent-focused research emphasizes victimization and perpetration, with limited attention to bystanders – particularly those who have not witnessed such incidents but may help a victim in the future**. Objectives:** This study tested the Theory of Planned Behavior (TPB) in predicting adolescents' intentions to help victims of TFSDA, accounting for gender, empathy, and victimization. **Method:** Between February and May 2023, 1,235 adolescents (53.2% cisgender boys; $M_{age}$ = 14.88, *SD* = 1.72) in grades 7–12 from 25 schools in Portugal completed an online questionnaire. **Results:** Structural equation modeling showed excellent fit, explaining 49.3% of the variance in helping intentions. All TPB components were significant: favorable attitudes toward helping, supportive subjective norms toward helping – from parents, friends, teachers, and members of the community – and greater perceived behavioral control over helping. Being a cisgender girl and having higher empathy were positively associated with attitudes, subjective norms, perceived behavioral control, and helping intentions. In contrast, prior victimization was positively related to attitudes but negatively associated with subjective norms and perceived behavioral control. TPB components mediated the effects of gender, empathy, and victimization on helping intentions. **Conclusion:** Prevention efforts should reinforce the value of helping, establish helping as a social expectation, equip adolescents with helping skills, address gender-specific factors, promote empathy, and mitigate victimization-related barriers.



*Keywords*: adolescents, bystanders, technology-facilitated sexual dating abuse, theory of planned behavior, empathy, victimization

## Introduction

Information and communication technologies (ICT) offer adolescents new opportunities to date and sext[8] (Barroso et al., 2023) but also increase the risk of technology-facilitated sexual dating abuse (TFSDA; e.g., Brown & Hegarty, 2021; Ellyson et al., 2021; Reed et al., 2017; Sánchez-Jiménez et al., 2023; Stonard, 2021; Zweig et al., 2013; Chapter I). A promising community-level approach to mitigate TFSDA's prevalence and consequences involves bystander intervention, identifying theory-driven behavioral determinants influencing helping intentions. The Situational Model of Bystander Behavior (SMBB; Latané & Darley, 1969, 1970) outlines the decision-making steps involved in helping but overlooks cognitive factors (Casey et al., 2017) addressed by the Theory of Planned Behavior (TPB; Ajzen & Schmidt, 2020). While TPB's predictive validity has been well-established across various forms of interpersonal violence (e.g., Branscum et al., 2022; Brehmer, 2023; Casey et al., 2017; DeSmet et al., 2016; Hayashi & Tahmasbi, 2022; Lemay et al., 2017; Maes et al., 2024), it has not been applied to predict adolescents' intentions to help TFSDA victims, accounting for gender, empathy, and personal experiences of technology-facilitated dating victimization.

### Technology-facilitated sexual dating abuse

Technology-facilitated dating abuse – also known as "cyber dating abuse" or "digital dating abuse" (Rocha-Silva et al., 2021) – encompasses a range of abusive and harmful behaviors enabled through digital devices (from everyday technologies to advanced applications) across diverse dating relationships (heterosexual or same-sex, monogamous or open, casual or serious, short-term or long-term) at any stage (from courtship to after a breakup) and in both private and public settings (Brown & Hegarty, 2021; Fernet et al., 2019).

Rodríguez-de-Arriba et al. (2021) classify these behaviors into non-sexual forms – such as verbal/emotional abuse (e.g., Sánchez-Jiménez et al., 2023), relational abuse (e.g., Barter et al., 2017), and monitoring/control (e.g., Brown & Hegarty, 2021) – and sexual forms, including sexual pressure/coercion and image-based sexual harassment/abuse[9] (e.g., Brown & Hegarty, 2021; Ellyson et al., 2021; Reed et al., 2017; Sánchez-Jiménez et al., 2023; Stonard, 2021; Zweig et al., 2013; Chapter I). This study focuses on the latter – here referred to as TFSDA – which may precede, co-occur with, or result from in-person sexual dating violence (e.g., Zweig et al., 2013).

[8] Sexting is a consensual form of sexual expression in adolescent dating, involving the exchange of sexually explicit messages, images, or videos via digital devices (Barroso et al., 2023).

[9] Image-based sexual abuse involved the non-consensual creation, distribution, or threats to distribute nude/sexual content. Image-based sexual harassment refers to unwanted requests for nudes and sending the unsolicited explicit images, commonly known as "dick pics" (Ringrose et al., 2022).

Emerging research highlights that a significant proportion of adolescents' experience TFSDA In the U.S., victimization rates range from 11.2% (Zweig et al., 2013; *n* = 3,745, 7th-12th grades) to 32.2% (Reed et al., 2017; *n* = 703, aged 13–19) and 36.4% (Ellyson et al., 2021; *n* = 696, aged 16–22). Similar variability is observed in Europe, where this study was conducted, with rates of 6.1% in Portugal (Chapter I), 19.6%–20.7% in England (Stonard, 2021; *n* = 277, aged 12–18), and 29.2% in Spain (Sánchez-Jiménez et al., 2023; *n* = 307, aged 14–18).

TFSDA has been associated with low self-esteem, depression, anxiety, sleep disturbances, impaired relationships, self-harm, suicidal ideation, school problems, and trauma symptoms (Hamilton-Giachritsis et al., 2020; Joleby et al., 2020; Torp Løkkeberg et al., 2024). Recovery may be further hindered by partner betrayal, victim-blaming, and the persistent nature of digital abuse, as the indefinite circulation of nude/sexual content can lead to ongoing distress and concerns of exposure well into adulthood (Finkelhor et al., 2024; Hamilton-Giachritsis et al., 2020).

Recent TFSDA research highlights the need for prevention efforts that engage all adolescents as bystanders (Chapter II) – third parties who may remain passive, support perpetrators, and/or act as actionists (Banyard, 2015). Actionists engage in prosocial behavior by promoting/modeling prosocial norms without risk (proactive) or by intervening to de-escalate risk and help victims when witnessing or becoming aware of violence, online or in-person (reactive; Banyard, 2015). This study examines adolescents' reactive helping intentions, as most have not yet encountered TFSDA intervention opportunities but may in the future.

## Theory of Planned Behavior

The SMBB outlines the decision-making steps involved in helping: noticing the situation, interpreting it as needing intervention, assuming responsibility, knowing how to intervene, and acting (Latané & Darley, 1969, 1970). While insightful, it overlooks cognitive factors that shape how individuals progress through these stages (Casey et al., 2017). The TPB addresses this gap, proposing that intentions – reflecting motivation/readiness to act – are shaped by attitudes, subjective norms, and perceived behavioral control, influencing behavior (Ajzen & Schmidt, 2020). The TPB's predictive validity has been demonstrated across various behavioral domains (e.g., McEachan et al., 2011), including bystander intervention in self-directed (e.g., Banyard, 2024) and interpersonal violence (e.g., Branscum et al., 2022; Brehmer, 2023; Casey et al., 2017; DeSmet et al., 2016; Hayashi & Tahmasbi, 2022; Lemay et al., 2017; Maes et al., 2024).

*Attitudes* include affective and cognitive evaluations of a behavior and its outcomes (Ajzen & Schmidt, 2020). Favorable attitudes toward prosocial bystander behavior have been linked to adolescents' intentions to support cyberbullying victims (DeSmet et al., 2016) and confront those who non-consensually forward sexts (Maes et al., 2024). However, affective attitudes were unrelated to college students' intentions to address physical-social exclusion of peers in hypothetical group scenarios (Brehmer, 2023).

*Subjective norms* include descriptive norms (perceptions of others' behaviors) and injunctive norms (perceptions of what others believe one should do; Ajzen & Schmidt, 2020). Manipulating descriptive norms – such as suggesting peers frequently intervene in dating violence – has been shown to increase helping intentions among college students (Lemay et al., 2017). However, another study found that neither descriptive nor injunctive norms from peers, professors, or faculty predicted intentions to intervene in sexual assault; instead, a combined construct including moral norms was a significant predictor (Branscum et al., 2022).

*Perceived behavioral control* refers to confidence and efficacy in performing a behavior (Ajzen & Schmidt, 2020). It has significantly predicted intentions to intervene in situations of non-consensual sext forwarding (Maes et al., 2024), sexual assault (Branscum et al., 2022), cyberbullying (DesMet et al., 2016), and relational bullying (Brehmer, 2023). However, one study found no significant effect in predicting intentions to help cyberbullying victims (Hayashi & Tahmasbi, 2022).

Overall, favorable attitudes, supportive subjective norms, and greater perceived behavioral control are linked to intention, though their importance varies – attitudes were the strongest predictor in some studies (e.g., Branscum et al., 2022; Hayashi & Tahmasbi, 2022), while in others, perceived behavioral control had the greatest influence (e.g., Maes et al., 2024).

### Gender, empathy, and victimization

Individual-level factors may influence the relationships between TPB components and intentions (Ajzen & Schmidt, 2020), with sex/gender, empathy, and experiences of (cyber)victimization among the most studied in bystander intervention (e.g., Debnam & Mauer, 2021; Lambe et al., 2019; Ma et al., 2019; Sobol et al., 2025, for reviews). Girls are more likely to help or intend to help in situations of dating, sexual, and peer sexual violence (e.g., Banyard et al., 2022, 2025; Edwards et al., 2015; Hebert et al., 2014; Rothman et al., 2019). Empathy – including affective (experiencing another's emotions) and cognitive (understanding another's emotions; Jolliffe & Farrington, 2006) – is linked to helping in (cyber)bullying cases (e.g., Lambe et al., 2019; Ma et al., 2019; Sobol et al.,

2025). Additionally, adolescents with experiences of (cyber)victimization are more likely to help or intend to help (e.g., Casey et al., 2017; DeSmet et al., 2016; Edwards et al., 2015).

## The current study

Several gaps remain in applying TPB to bystander intervention. First, most TPB studies are U.S.-based (e.g., Branscum et al., 2022; Casey et al., 2017; Hayashi & Tahmasbi, 2022; Lemay et al., 2017), despite the influence of TPB components[10] varying across cultures. This highlights the need to examine TPB's applicability in diverse contexts to ensure culturally sensitive prevention efforts. Second, research has focused primarily on college-aged samples (e.g., Branscum et al., 2022; Brehmner, 2023; Hayashi & Tahmasbi, 2022; Lemay et al., 2017). Yet, adolescents – for whom friendships and dating relationships are increasingly central (Connolly et al., 2014) and from whom victims are more likely to seek help than from adults (e.g., Ellyson et al., 2021) – report exposure to TFSDA, with 21.3% identifying intervention opportunities (Chapter II). Their growing perspective-taking (Van der Graaff et al., 2014) and prosocial behavior toward friends (Padilla-Walker et al., 2018) further support the need examining their intentions to inform early prevention efforts. Third, while TPB has been applied to dating violence (Casey et al., 2017; Lemay et al., 2017), sexual assault (Branscum et al., 2022), non-consensual forwarding of sexts (Maes et al., 2024), and (cyber)bullying (Brehmer, 2023; Casey et al., 2017; DeSmet et al., 2016; Hayashi & Tahmasbi, 2022), its role in TFSDA remains unexplored. Given that TPB's relevance depends on the target behavior (Ajzen & Schmidt, 2020), applying it to TFSDA is essential. For instance, the non-consensual sharing of nude/sexual images – often involving a sender, receiver, and third-party viewer (Harder, 2021) – creates a lasting digital footprint, allowing the content to be viewed, shared, and circulated unpredictably, thereby expanding opportunities for intervention. Finally, incorporating individual-level factors may strengthen TPB's explanatory power, as acknowledged and supported (e.g., Ajzen & Schmidt, 2020; DeSmet et al., 2016; Hayashi & Tahmasbi, 2022).

This study addressed these gaps by examining the following research questions and hypotheses:

RQ1. To what extent do TPB components predict adolescents' helping intentions, and which has the strongest influence? Favorable attitudes (H1a), supportive subjective norms (H1b), and greater perceived behavioral control (H1c) will predict helping intentions; given the study's exploratory nature, no hypothesis is made regarding the strongest predictor.

[10] For cross-cultural insights on norms, refer to Fischer et al. (2019).

RQ2. How do gender, empathy, and personal experiences of technology-facilitated dating victimization predict adolescents' helping intentions? Being a cisgender girl (H2a), having higher empathy (H2b), and having personal victimization experiences (H2c) will predict helping intentions; given the study's exploratory nature, no additional effects are hypothesized.

## Method

### Procedures

The study was approved by the Ethics Committee for Research in Social and Human Sciences (CEICSH-109/2021), the Data Protection Department of the University of Minho (DPO-REG-ID-2020-0000; DPO-AIPD-ID-2020-0000), the Portuguese General Directorate of Education (DGE-079070000), and the school executive boards. High schools in northern and central Portugal were randomly selected from a DGE-provided list and invited via email. Twenty-five schools agreed to participate and received study details and consent forms requiring signatures from adolescents and parents. Before data collection, nine psychology professionals assessed the questionnaire for content and face validity, and it was piloted with 10 adolescents whose responses were excluded from analysis.

Data collection occurred from February to May 2023. Adolescents provided digital consent and were reminded not to include their names, of their option to skip questions and of their freedom to withdraw at any time. They completed a 45-minute Qualtrics questionnaire on PCs, tablets, or smartphones in classrooms/libraries, with the presence of a teacher, lead researcher, and, when necessary, a master's or PhD psychology student, who were available to clarify any questions or offer support. Afterward, they attended a 45-minute awareness session on TFDA, covering the phenomenon, safety tips, and support contacts, including the Portuguese Victim Support Association (APAV) and the Psychology Association of the University. They were also given with the project's email to contact researchers for support, questions, or access to their results.

### Participants

Adolescents were eligible if they were 12–18 years old and had no cognitive or severe learning difficulties that could hinder their understanding of the questionnaire (as assessed by teachers). Of the 1,855 adolescents who qualified and completed the questionnaire, 620 were excluded: 97 did not respond to the bystander scale, 377 reported witnessing or having knowledge of TFDSA, 105 had more than 10% missing on relevant variables, 12 were identified as outliers, and 29 self-identified as transgender or questioning (a group with an insufficient sample size for analysis). Table 14 details the sample, disaggregated by gender. Among the 1,235 participants, most identified as cisgender boys

(53.2%), were aged 12–15 (63.5%), Portuguese (92.7%), White/Caucasian (92.4%), heterosexual (88.8%), had dated in the past year (50.9%), attended public schools (74.3%), were in grades 7–9 (55.3%), and lived in urban areas (51.6%).

**Table 14**

*Description of the sample*

| | Total sample ($N$ = 1,235) | Cisgender Boys ($n$ = 657) | Cisgender Girls ($n$ = 578) |
|---|---|---|---|
| | *n (%)* | *n (%)* | *n (%)* |
| Sociodemographic characteristics | | | |
| Age group | | | |
| 12-15 years | 784 (63.5) | 425 (34.4) | 359 (29.1) |
| 16-18 years | 451 (36.5) | 232 (18.8) | 219 (17.7) |
| Nationality | | | |
| Portuguese | 1145 (92.7) | 609 (49.4) | 536 (43.5) |
| Other | 88 (7.1) | 46 (3.7) | 42 (3.4) |
| Ethnicity | | | |
| White/Caucasian | 1141 (92.4) | 595 (48.2) | 546 (44.2) |
| Afro-descendants/Black | 61 (4.9) | 39 (3.2) | 22 (1.8) |
| Roma/Gypsy | 19 (1.5) | 14 (1.1) | 5 (0.4) |
| Asian | 4 (0.3) | 4 (0.3) | 0 (0) |
| Multi-ethnic/Other | 9 (0.7) | 5 (0.4) | 4 (0.3) |
| Sexual orientation | | | |
| Heterosexual | 1088 (88.1) | 626 (51.1) | 462 (37.7) |
| Bisexual | 85 (6.9) | 11 (0.9) | 74 (6) |
| Gay/Lesbian | 29 (2.3) | 8 (0.7) | 21 (1.7) |
| Other | 24 (1.9) | 7 (0.6) | 17 (1.4) |
| Dating relationship in the last 12 months | 628 (50.9) | 316 (25.6) | 312 (25.2) |
| Type of school | | | |
| Public | 918 (74.3) | 484 (39.2) | 434 (35.1) |
| Private/Professional | 317 (25.7) | 173 (14) | 144 (11.7) |
| Education level | | | |
| 7th-9th grades | 683 (55.3) | 365 (29.6) | 318 (25.7) |
| 10th-12th grades | 552 (44.7) | 292 (23.6) | 260 (21.1) |
| Residential zone | | | |
| Urban | 637 (51.6) | 350 (28.4) | 287 (23.3) |
| Rural | 595 (48.2) | 305 (24.8) | 290 (23.5) |

*Note*. TFDV = Technology-facilitated dating victimization; TPB = Theory of Planned Behavior; TFSDA = Technology-facilitated dating sexual abuse; In the overall sample, missing data ranged from 0.2% for nationality, 0.1% for ethnicity, 0.7% for sexual orientation, and 0.2% for residential zone.

## Measures

The following pre-survey definitions were provided (Brown & Hegarty, p. 4):

a) "Dating relationships. We define dating as two or more people in an emotionally and/or physically intimate relationship. The relationship may or may not be sexual. It may be casual or serious, short-term or long-term, straight, gay, monogamous, or open. Terms used to describe these kinds of relationships include boyfriend, girlfriend, going out, hanging out, hooking up, seeing each other, friends with benefits, and unofficially dating. In this survey, we will use the terms girlfriend and boyfriend to refer to dating relationships."

b) "Digital devices. A digital device includes any type of modern-day technology used to interact with other people. Examples include (but are not limited to) mobile phones, smartphones, computers, tablets, laptops, notepads, the internet, social media, GPS devices, software, and apps."

### *Sociodemographics*

Adolescents provided their gender, age, ethnicity, sexual orientation, relationship status in the last 12 months, type of school, education level, and residential zone.

### *Scale for Reactive Bystander Opportunity Detection in TFSDA (screening scale)*

This eight-item self-report scale (Portuguese version in Chapter II) assesses how often adolescents witnessed or had knowledge of TFSDA (excluding news reports) over the past 12 months, across two dimensions: sexual coercion (four-items, e.g., "Pressuring someone to discuss sexual issues") and image-based sexual abuse/harassment (four-items, e.g., "Threatening to distribute intimate or sexual images (nudes)"). Responses were rated on a 4-point scale (0 = never to 3 = frequently/more than 6-times; $\alpha = 0.90$).

### *TPB Questionnaire*

The questionnaire was based on TPB guidelines (e.g., Fishbein & Ajzen, 2010) and prior TPB-based bystander studies (e.g., Hayashi & Tahmasbi, 2022; Lemay et al., 2017). Adolescents who reported no TFSDA exposure were instructed to "Imagine that you witness or become aware of these behaviors in the future. The following questions aim to understand the reasons that might lead you to help someone targeted by these behaviors from their boyfriend/girlfriend."

Attitudes toward helping were measured using three items on 7-point semantic differential scales. Participants rated the statement "Helping someone targeted by these behaviors would be ..." across three dimensions: goodness (1 = bad to 7 = good), necessity (1 = unnecessary to 7 = necessary), and relevance (1 = irrelevant to me to 7 = important to me).

Subjective norms toward helping were assessed using eight items measuring descriptive e.g., "My parents would help ...") and injunctive norms (e.g., "My parents think I should help ...") across four referent groups: parents, peers, teachers, and community members. Responses were rated on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree).

Perceived behavioral control toward helping was assessed using eleven-items focused on victim-oriented intervention (e.g., "I am confident that I can comfort ..." "I am confident that I can advise ..."; "I am confident that I can encourage to seek help ..."). Responses were rated on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree).

Helping intentions were assessed using three-items (e.g., "I plan to help ..."; "It is likely that I will help..."). Responses were rated on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree).

***Technology-Facilitated Abuse in Relationships Scale (TAR)***

The TAR scale (original version of Brown & Hegarty, 2018; Portuguese version in Chapter I) is a 30-item self-report scale measures the frequency of technology-facilitated dating victimization over the past 12 months, across four dimensions: humiliation (ten-items, e.g., "Shared a hurtful meme about me on a digital device"), monitoring/control (seven-items, e.g., "Pressured me to share my password(s) with him/her."), sexual coercion (eight-items, e.g., "Pressured me to engage in phone sex."), and threats (five-items, e.g., "Sent me threatening messages on a digital device."). Responses were rated on a 6-point Likert scale (0 = never to 5 = daily/almost daily; $\alpha = 0.86$).

***Basic Empathy Scale—Short Version (BES-A)***

The BES-A (original version by Jolliffe & Farrington, 2006; Portuguese version of Pechorro et al., 2018) is a seven-item self-report scale that comprises two dimensions: affective (e.g., "I get caught up in other people's feelings easily") and cognitive (e.g., "I can often understand how people are feeling even before they tell me"). Responses were rated on a 5-point Likert scale (1 = totally false to 5 = totally true; $\alpha = 0.86$).

**Data analysis**

Little's MCAR test (Little, 1988) confirmed that data were missing completely at random ($\chi^2$ (2229) = 1269.68, $p > 0.05$). Approximately 7% of cases had less than 10% missing data (1.6%-6.5%), which were imputed using multivariate imputation by chained equations (random forest algorithm; 10 imputations, 50 iterations; Shah et al., 2014; van Buuren & Groothuis-Oudshoorn, 2011). Density plots confirmed similar distributions between original and imputed data. Outliers were identified via

Mahalanobis distance, Cook's distance, and Leverage values. Non-normality at the scale level was confirmed through Kolmogorov-Smirnov and Shapiro-Wilk tests (Hair et al., 2019).

The TPB questionnaire's validity was assessed through Confirmatory Factor Analysis (CFA) using the MLR estimator to test a four-factor structure. Model fit was evaluated using chi-square/degrees of freedom ($\chi^2$/df) ≤ 5, Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) ≥ 0.90, Root Mean Square Error of Approximation (RMSEA) ≤ 0.08 with a non-significant p-close ($p \geq 0.05$), Standardized Root Mean Square Residual (SRMR) ≤ 0.08 (Marôco, 2021), and factor loadings > 0.32 (Tabachnick & Fidell, 2007). Model re-specifications were guided by modification indices and theoretical considerations**.** The model exhibited good fit ($\chi^2$/df = 5.02, CFI = 0.93, TLI = 0.92, RMSEA = 0.07 with *p-close* < 0.05, SRMR = 0.05, factor loadings = 0.33-0.93), with two error correlations added between descriptive and injunctive norms for friends and community members. Internal consistency was assessed using Cronbach's α ≥ 0.70 (Hair et al., 2019) and was adequate: attitudes (α = 0.75), subjective norms (α = 0.94), perceived behavioral control (α = 0.93), and intentions (α = 0.90).

Pearson correlations examined relationships among study variables (effect sizes: small ≃ 0.10 to large ≃ 0.50; Cohen, 1988). A Structural Equation Model (SEM) tested t the TPB's predictive ability, accounting for gender, empathy, and victimization. The relative importance of TPB components was assessed using Paternoster et al.'s (1998) formula:

$$z = \frac{\beta 1 - \beta 2}{SE_{\beta 1}^2 + SE_{\beta 2}^2}$$

Mediation effects were examined using the delta method (Sobel test).

Missing data imputation, CFA, and SEM were conducted in R (version 4.2.3, R Core Team, 2023), using the MICE, VIM, and lavaan packages; other analyses were conducted in SPSS (version 29, IBM Corporation, 2022).

## Results

### Descriptive statistics

As shown in Table 15, adolescents reported favorable attitudes, supportive subjective norms, a greater sense of perceived behavioral control, strong helping intentions, moderate empathy and experiences of two victimization behaviors. Cisgender girls scored higher than cisgender boys on all variables.

**Table 15**

*Descriptive statistics of study variables*

| | Total sample (*N* = 1,235) | Cisgender Boys (*n* = 657) | Cisgender Girls (*n* = 578) |
|---|---|---|---|
| | *M* (*SD*) | *M* (*SD*) | *M* (*SD*) |
| Empathy | 21.01 (5.77) | 19.96 (5.82) | 22.22 (5.46) |
| Personal experiences of TFDV | 1.96 (4.97) | 1.54 (4.95) | 2.39 (4.95) |
| TPB components | | | |
| Attitudes | 18.44 (3.55) | 17.97 (3.64) | 18.97 (3.37) |
| Subjective norms | 43.12 (9.38) | 41.86 (10.09) | 44.59 (8.28) |
| Perceived behavioral control | 59.88 (12.26) | 58.07 (12.99) | 61.94 (11.04) |
| Intentions to help a victim of TFSDA | 17.06 (3.92) | 16.21 (4.30) | 18.05 (3.18) |

*Note*. TFDV = Technology-facilitated dating victimization; TFSDA = Technology-facilitated sexual dating abuse; M = Mean; SD = Standard deviation

## Pearson correlations

As presented in Table 16, in the total sample, all TPB components were intercorrelated (moderate to high effect sizes). Empathy was positively correlated with all components (moderate effect sizes), while victimization experiences were negatively correlated with subjective norms, perceived behavioral control, and helping intentions (small effect sizes). Similar patterns emerged for cisgender girls and boys: TPB components were intercorrelated (moderate to high effect sizes), empathy remained positively linked to all components (moderate effect sizes), and victimization experiences were negatively correlated with subjective norms and perceived behavioral control (small effect sizes).

**Table 16**

*Intercorrelation among study variables*

| | | | TPB components | | | |
|---|---|---|---|---|---|---|
| | Empathy | Personal experiences of TFDV | Attitudes | Subjective norms | Perceived behavioral control | Intentions to help a victim of TFSDA |
| Empathy | – | .008 | .259*** | .330*** | .319*** | .319*** |
| Personal experiences of TFDV | .002/-.026 | – | .053 | -.146*** | -.157*** | -.088* |
| Attitudes | .266***/.201*** | .043/.032 | – | .356*** | .383*** | .407*** |
| Subjective norms | .327***/.289*** | -.115**/-.135** | .363***/.314*** | – | .744*** | .629*** |
| Perceived behavioral control | .295***/.304*** | -.119**/-.129** | .423***/.292*** | .742***/.733*** | – | .630*** |
| Intentions to help a victim of TFSDA | .327***/.226*** | .061/-.076 | .418***/.345*** | .637***/.586*** | .649***/.566*** | – |

*Note*. TFDV = Technology-facilitated dating victimization; TPB = Theory of Planned Behavior; TFSDA = Technology-facilitated sexual dating abuse; Correlations for the total sample are presented above the diagonal, while correlations for cisgender boys and cisgender girls, respectively, are presented below the diagonal and separated by a slash. *$p < .05$, **$p < .01$, ***$p < .001$.

**Structural equation modeling**

Figure 4 illustrates the model. A saturated model was initially estimated, specifying all paths between study variables. To improve parsimony, two nonsignificant paths ($p > .05$) were removed: the direct path from victimization experiences to helping intention ($\beta = 0.01$, $p = 0.82$) and the covariance between victimization experiences and empathy ($\beta = 0.01$, $p = 0.64$). The final model demonstrated a good fit: ($\chi^2(2) = 0.20$, $p = 0.91$, CFI = 1.00, TLI = 1.00, RMSEA = 0.00, and SRMR = 0.00), explaining 49.3% of the variance in helping intentions.

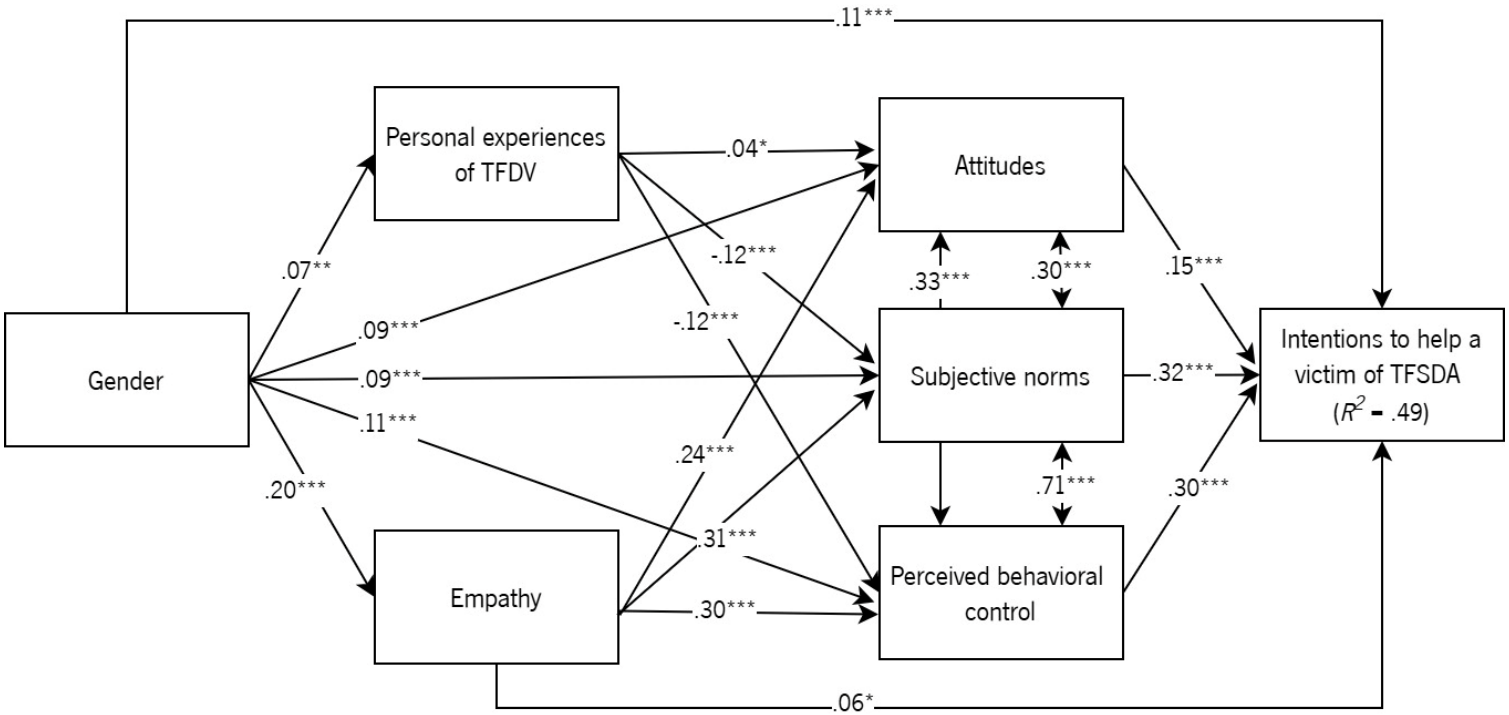
All TPB components were intercorrelated ($\beta = 0.31$ to $0.71$, $p < 0.001$). Subjective norms ($\beta = 0.32$, SE = 0.017, $p < 0.001$) and perceived behavioral control ($\beta = 0.30$, SE = 0.097, $p < 0.001$) were the strongest predictors of intention, followed by attitudes ($\beta = 0.15$, SE = 0.028, $p < 0.001$). According to Paternoster et al.'s (1998) formula, subjective norms had a significantly stronger effect than attitudes ($z = -5.19$), while perceived behavioral control did not significantly differ from either attitudes ($z = -1.56$) or subjective norms ($z = 0.13$). These findings highlight subjective norms and perceived behavioral control as key predictors, while attitudes had a weaker influence.

Other significant direct effects emerged. Being a cisgender girl was positively associated with empathy ($\beta = 0.20$, $p < 0.001$), victimization experiences ($\beta = 0.07$, $p = 0.009$), attitudes ($\beta = 0.09$, $p < 0.001$), subjective norms ($\beta = 0.09$, $p < 0.001$), perceived behavioral control ($\beta = 0.11$, $p < 0.001$), and helping intentions ($\beta = 0.11$, $p < 0.001$). Empathy was positively related to attitudes ($\beta = 0.24$, $p < 0.001$), subjective norms ($\beta = 0.31$, $p < 0.001$), perceived behavioral control ($\beta = 0.30$, $p < 0.001$), and helping intentions ($\beta = 0.06$, $p = 0.018$). In contrast, victimization experiences were positively associated with attitudes ($\beta = 0.04$, $p = 0.022$) but negatively associated with subjective norms ($\beta = -0.12$, $p < 0.001$) and perceived behavioral control ($\beta = -0.12$, $p < 0.001$).

Mediation analysis revealed significant indirect effects. Being a cisgender girl and higher empathy levels were positively associated with helping intentions through attitudes ($\beta = 0.01$, $p = 0.005$; $\beta = 0.04$, $p < 0.001$), subjective norms ($\beta = 0.03$, $p < 0.001$; $\beta = 0.10$, $p < 0.001$), and perceived behavioral control ($\beta = 0.03$, $p < 0.001$; $\beta = 0.09$, $p < 0.001$). In contrast, victimization experiences had mixed indirect effects: positively affecting helping intentions via attitudes ($\beta = 0.01$, $p = 0.039$) but negatively influencing intentions via subjective norms ($\beta = 0.04$, $p < 0.001$) and perceived behavioral control ($\beta = 0.04$, $p < 0.001$).

**Figure 4**

*Structural equation model predicting adolescents' intentions to help a victim of technology-facilitated sexual dating abuse, considering gender, empathy, and personal experiences of technology-facilitated dating victimization; *p < .05, **p < .01, ***p < .001.*



## Discussion

To our knowledge, this is the first study to examine the utility of TPB in predicting Portuguese adolescents' intentions to help a victim of TFSDA (RQ1), accounting for the effects of gender, empathy, and personal experiences of technology-facilitated dating victimization (RQ2).

### Theory of Planned Behavior

Consistent with H1a-c, all TPB components predicted helping intentions, supporting the TPB's utility for bystander intervention (e.g., Branscum et al., 2022; Brehmer, 2023; Casey et al., 2017; DeSmet et al., 2016; Hayashi & Tahmasbi, 2022; Lemay et al., 2017; Maes et al., 2024) and its relevance for integration into prevention programs (e.g., Bringing in the Bystander-High School Curriculum; Edwards et al., 2019).

Supporting H1a, favorable attitudes toward helping – seeing it as good, necessary, and relevant – were positively associated with helping intentions. This aligns with qualitative studies on dating violence and bullying where some adolescents value helping to de-escalate conflict, support victims, prompt perpetrator reflection, and enhance self-respect (Casey et al., 2017); others, however, see intervention as pointless, risky for the victim, and fear being labeled a 'snitch' or becoming a target themselves (Casey et al., 2017; Edwards et al., 2015). These findings suggest that adolescents weigh the benefits and costs of helping (Dovidio et al., 1981) and may engage in moral disengagement mechanisms (Bandura et al., 1996). Strengthening favorable attitudes while addressing barriers is essential and can be achieved through awareness-raising, myth deconstruction, and emphasizing the personal, social, and legal responsibility and value of helping.

Supporting H1b, supportive subjective norms – endorsed by parents, friends, teachers, and the community – were associated with helping intentions. These findings both align with and diverge from prior research on dating violence, sexual violence, and bullying. Some studies highlight the influence of parental and peer norms favoring intervention (Casey et al., 2017; Rizzo et al., 2022), trusting teacher-student relationships, teachers modelling bystander behavior (Casey et al., 2017; Storer et al., 2017), as well as perceptions that the community values intervention (Rothman et al., 2019). Others, however, report no significant effects of teacher or community norms (Rizzo et al., 2022). These results support the idea that adolescents learn when and how to help by observing others (Bandura, 1977), with intentions shaped by perceived norms (Ajzen & Schmidt, 2020) and the desire to fit in ("normative social influence"; Deutsch & Gerard, 1955). Promoting helping as a social norm and correcting misperceptions – gaps between perceived and actual norms (Waterman et al., 2022) – is crucial. This

can be achieved through open communication, positive role modelling, institutional support, policy enforcement, and public awareness, including media campaigns and hashtag movements (e.g., #logoutaoabuso, #NãoPartilhes in Portugal).

Supporting H1c, greater perceived behavioral control was also positively associated with helping intentions, as shown in research on non-consensual sext forwarding (Maes et al., 2024), sexual assault (Branscum et al., 2022), and (cyber)bullying (Brehmer, 2023; Desmet et al., 2016). Confidence in one's ability shapes both willingness and the method of helping. While some adolescents express a willingness to act in situations involving dating violence or non-consensual forwarding of nudes, many feel ill-equipped (Casey et al., 2017; Barrense-Dias et al., 2024); others, however, feel confident supporting victims but less so confronting bullies or involving adults (DeSmet et al., 2014). Building knowledge, skills, and confidence through practical strategies such as step-by-step guidance, role-playing, and simulations is essential (Banyard, 2015; Edwards et al., 2015). Key training areas include ethical decision-making, emotional regulation, assertiveness, problem-solving, resisting peer pressure, understanding reporting mechanisms (e.g., the Portuguese Safer Internet Centre), and coping strategies to deal with potential distress or backlash post-intervention (Banyard, 2015).

Notably, subjective norms and perceived behavioral control emerged as the strongest predictors – contrasting TPB studies on health-related behaviors – where attitudes were the strongest predictor (e.g., McEachan et al., 2011) – and reflecting variation seen in bystander intervention studies (e.g., Hayashi & Tahmasbi, 2022; Maes et al., 2024). The weaker predictive power of attitudes may reflect the socially embedded nature of bystander behavior, where external influences – particularly during adolescence – outweigh personal evaluations. Additionally, attitudes were measured with only three items, potentially limiting their explanatory power. Future research should strengthen this component using qualitative insights (e.g., Casey et al., 2017; Edwards et al., 2015) or validated measures (e.g., Pros and Cons of Bystander Action Scale; Edwards et al., 2018).

### Gender, empathy, and victimization

Consistent with H2a, being a cisgender girl was directly associated with helping intentions (e.g., Banyard et al., 2022, 2025; Edwards et al., 2015; Hebert et al., 2014; Rothman et al., 2019). It was also directly linked to TPB components and indirectly associated with helping intentions through TPB components. Gender Intensification Theory (Hill & Lynch, 1983) suggests that as adolescents mature, they face growing pressure to conform to traditional gender roles. Girls are often socialized to be more empathetic and prosocial—potentially viewing helping as a moral duty, receiving more

reinforcement for it, and feeling more confident in their ability to help. Social Role Theory (Eagly, 2009) posits that gender role beliefs shape intervention styles rather than reflecting an inherent tendency for one gender to be more helpful: men tend to engage in assertive or heroic acts, while women often provide emotional support and care. In this study, behavioral control – reflecting confidence in providing emotional support, advice, and encouraging help-seeking – align more closely with traditionally feminine behaviors, potentially reinforcing gender norms. Future research should explore whether confronting perpetrators follows different gendered patterns (e.g., Maes et al., 2024), while prevention efforts should involve male role models (e.g., parents, teachers, coaches, influencers) and target male-dominated spaces (e.g., gaming communities) to encourage emotionally supportive behaviors.

Aligned with H2b, higher empathy was directly associated with helping intentions (e.g., Lambe et al., 2019; Ma et al., 2019; Sobol et al., 2025). Empathy was directly associated with being a cisgender girl and TPB components while indirectly influencing helping intentions through TPB components. This supports evidence that girls tend to show greater empathic concern and perspective-taking (Van der Graaff et al., 2014) and may align with altruistic and egoistic helping mechanisms. Witnessing – or anticipating – another's distress can elicit self-focused discomfort or other-focused empathy, motivating action to relieve personal or others' distress (Batson et al., 1987). To prevent desensitization, programs should integrate victim empathy-inducing exercises. Notably, Hines et al., (2019) found that an empathy-based intervention increased negative emotions and reduced attitudes condoning sexual assault among female college students, which in turn promoted prosocial bystander behaviors at a 6-month follow-up.

H2c was partially supported: victimization experiences did not directly predict helping intentions but were associated with being a cisgender girl and had mixed effects—positive through attitudes and negative through subjective norms and perceived behavioral control. Consistent with prior research, girls are more likely to self-report victimization (e.g., Ellyson et al., 2021; Reed et al., 2017; Chapter I) and victims identify more intervention opportunities in TFSDA (Chapter II). Such experiences can heighten sensitivity to similar situations and foster favorable attitudes toward helping. However, social discouragement – such as witnessing bystander inaction, experiencing victim-blaming/"slut-shaming" (e.g., Barrense-Dias et al., 2024; Naezer et al., 2021), or encountering unprepared forensic and child protection professionals (e.g., Chapter V) – may reinforce perceptions that intervention is uncommon or ineffective, contribute to internalized self-blame and stigma, and reduce victims' perceived ability to help others (e.g., Hebert et al., 2014). Experiential avoidance (Hayes et al., 2004)

and learned helplessness (Peterson & Seligman, 1983) may further explain these results, as victims may disengage from helping intentions to avoid distressing memories and emotions related to their own experience or assume intervention would be ineffective based on past powerlessness. Empowering victims may involve fostering safe disclosure, countering victim-blaming narratives, providing trauma-informed support, and equipping them with alternative intervention strategies (e.g., seeking adult help, anonymous reporting, or flagging harmful content).

## Limitations

Some limitations should be noted, offering directions for future research: a) the cross-sectional design limits causal inferences; b) the use of a convenience sample with limited gender, ethnic, and sexual diversity restricts generalizability; c) self-reports may be influenced by recall errors and social desirability bias; d) adolescents may have recognized intervention opportunities but interpreted them differently than intended in the screening-questions; e) assessing detection over the past 12-months may have overlooked lifetime experiences; f) intentions serve only as a proxy for behavior; g) this study did not control for confounding variables, such as prior intervention experiences influencing helping intentions; h) distinctions between descriptive and injunctive norms were not examined, despite evidence that descriptive norms are particularly influential for adolescents (Rothman et al., 2019); and i) future research should explore other bystander intentions, such as support for the perpetrator (DeSmet et al., 2016).

## Conclusion

TFSDA among adolescents is prevalent and consequential. This study tested the utility of the TPB in predicting adolescents' helping intentions, accounting for gender, empathy, and victimization experiences. Key recommendations include early prevention efforts that reinforce the personal, social, and legal responsibility of helping, establishing helping as a social norm, equipping adolescents with the knowledge, skills, and confidence to intervene, addressing gender-specific factors, promoting empathy, and mitigating victimization-related barriers. A comprehensive, society-wide response is essential – engaging adolescents, parents, school personnel, clinicians, child protection professionals, researchers, technology companies, and legal and policy practitioners – to safeguard adolescents, reduce the prevalence and tolerance of TFSDA, and cultivate a shared responsibility for helping victims.

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# CHAPTER IV[11]

## ADOLESCENT BYSTANDERS IN TECHNOLOGY-FACILITATED SEXUAL DATING ABUSE: A LATENT CLASS ANALYSIS

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ADOLESCENT BYSTANDERS IN TECHNOLOGY-FACILITATED SEXUAL DATING ABUSE: A LATENT CLASS ANALYSIS


## Abstract

**Background:** Adolescent bystander responses to technology-facilitated sexual dating abuse (TFSDA) and their influencing factors remain understudied. **Objectives:** This study used a latent class analysis to identify distinct classes of bystanders reacting to TFSDA and examined intra-individual factors, event-related characteristics, and intervention outcomes. **Method:** Between February and May 2023, 322 adolescents (54.7% cisgender girls; $M_{age}$=15.17, $SD$=1.65) in grades 7–12 from 25 schools in northern and central Portugal completed an online questionnaire. **Results:** Four bystander classes emerged: *Victim-centered helpers* (37%), *Passive bystanders* (32.6%), *Comprehensive helpers* (22.4%), and *Inconsistent bystanders* (8.1%). Cisgender girls were more often *Victim-centered* and *Comprehensive helpers*, while cisgender boys tended to be *Passive bystanders*. Younger adolescents were more likely to be *Victim-centered helpers*, whereas older ones were *Comprehensive helpers*. Identifying as a sexual minority and having experienced sexual victimization were associated with *Comprehensive helpers* and *Inconsistent bystanders.* Greater empathy was associated with *Victim-centered* and *Comprehensive helpers*. Recognizing TFSDA as inappropriate was more common among *Comprehensive helpers* than among *Inconsistent* and *Passive bystanders*. *Comprehensive helpers* were also more likely to engage in proactive actionism when compared to *Victim-centered helpers* and *Passive bystanders*. Identifying the victim as a cisgender girl and personally knowing the victim were linked to *Victim-centered* and *Comprehensive helpers*; knowing the perpetrator was linked to *Inconsistent bystanders*; not knowing who was involved in the incident characterized *Passive bystanders*. Attributing responsibility to the perpetrator, feeling sadness for the victim, and anger toward the perpetrator were more common among *Victim-centered* and *Comprehensive helpers* than among *Passive bystanders*. Positive feelings about intervening were most prominent among *Comprehensive helpers*. **Conclusion:** Implications are discussed.



*Keywords:* adolescents, bystanders, technology-facilitated sexual dating abuse, latent class analysis

## Introduction

Information and Communication Technologies (ICT) enable adolescents to date and sext[12] (Barroso et al., 2023) and also heighten the risk of technology-facilitated sexual dating abuse (TFSDA; e.g., Brown & Hegarty, 2021; Ellyson et al., 2021; Reed et al., 2017; Sánchez-Jiménez et al., 2023; Stonard, 2021; Zweig et al., 2013). Given the high prevalence (e.g., Sánchez-Jiménez et al., 2023; Stonard, 2021; Chapter I) and serious consequences of TFSDA (e.g., Hamilton-Giachritsis et al., 2020; Joleby et al., 2020; Torp Løkkeberg et al., 2024), adolescent bystander behavior deserves greater attention as a key prevention strategy (Banyard, 2015). However, quantitative studies often focus on detection or intentions to intervene (e.g., Chapters II and III) rather than actual behaviors. To address these gaps, this study has two aims: identify distinct classes of bystanders reacting to TFSDA using a person-centered approach and examine the intra-individual factors, event-related characteristics, and outcomes of bystander intervention associated with each class.

### Technology-facilitated sexual dating abuse

Technology-facilitated dating abuse encompasses a broad spectrum of abusive and harmful behaviors enabled through digital devices, occurring across diverse dating relationships – from courtship to post-breakup – and in both private and public settings (Brown & Hegarty, 2021; Fernet et al., 2019). Rodriguez-de-Arriba et al. (2024) classify these behaviors as non-sexual (e.g., verbal/emotional abuse, relational abuse, and monitoring/control; Barter et al., 2017; Brown & Hegarty, 2021; Sánchez-Jiménez et al., 2023) and sexual (e.g., pressure/coercion and image-based sexual harassment/abuse[13]; Brown & Hegarty, 2021; Ellyson et al., 2021; Reed et al., 2017; Sánchez-Jiménez et al., 2023; Stonard, 2021; Zweig et al., 2013; Chapter I). This study focuses on the latter, referred to here as TFSDA. Prevalence estimates vary, but in Europe – where this study was conducted – victimization rates range from 6.1% to 29.2% and perpetration from 4.3% to 15% (Sánchez-Jiménez et al., 2023; Stonard, 2021; Chapter I). These rates are concerning given their association with serious consequences, including low self-esteem, depression, anxiety, stress, sleep disturbances, impaired relationships, self-harm, suicidal ideation, school problems, and trauma symptoms, among others (Hamilton-Giachritsis et al., 2020; Joleby et al., 2020; Torp Løkkeberg et al., 2024).

[12] Sexting is a consensual form of sexual expression in adolescent dating, involving the exchange of sexually explicit messages, images, or videos via digital devices (Barroso et al., 2023).

[13] Image-based sexual abuse involves the non-consensual creation, distribution, or threats to distribute nude/sexual content. Image-based sexual harassment refers to unwanted requests for nudes and sending the unsolicited explicit images, commonly known as "dick pics" (Ringrose et al., 2022).

## Reactive bystander behavior

TFSDA often involves bystanders (e.g., Chapters I and II) – third parties who witness the abuse in person or online or become aware of it before, during, or after it occurs (Banyard, 2015). In some cases, their presence is a precondition, as in the non-consensual sharing of nudes involving a sender, a receiver, and a third-party viewer (Harder, 2021). Upon becoming aware, bystanders may adopt various roles: passive/outsiders (who do nothing), helpers/actionists/defenders (who help victims), and assistants/reinforcers (who join in, e.g., Banyard et al., 2015, 2020, 2021; Pöyhönen et al., 2012). These roles are typically identified through theoretical or variable-centered approaches that assign individuals to discrete groups; in contrast, person-centered approaches – such as Latent Class Analysis (LCA) – allow for identifying subgroups based on shared behavioral patterns (Weller et al., 2020). LCA has been widely applied in (cyber)bullying research. For example, Waasdorp and Bradshaw (2018), using data from 18,863 school students, identified five bystander classes in peer bullying: limited involvement (64.8%), defenders (20.4%), passive (9.7%), contributors (3.4%), and inconsistent (1.7%). Similarly, Schultze-Krumbholz et al. (2018), using data from 849 school students, identified five bystander classes in cyberbullying: prosocial defenders (52.2%), communicating outsiders (28.4%), aggressive defenders (9.5%), bully-victims (7.1%), and assistants (2.8%). These findings highlight the value of identifying distinct bystander classes in TFSDA to inform more tailored and effective bystander-focused prevention efforts.

## Theories of bystander behavior

Casey et al. (2017) proposed the Situational-Cognitive Model of Adolescent Bystander Behavior, which integrates the Situational Model of Bystander Behavior (SMBB; Latané & Darley, 1969, 1970) and the Theory of Planned Behavior (TPB; Ajzen, 1991) to explain bystander responses in bullying and dating violence. The SMBB[14] (Latané & Darley, 1969, 1970) outlines the decision-making steps involved in helping: noticing the situation, interpreting a situation as problematic, assuming responsibility for intervening, knowing how to intervene, and taking action. The TPB[15] (Ajzen, 1991) highlights the influence of attitudes, subjective norms, and perceived behavioral control on intentions and behavior. This study is guided by Banyard's (2015) Bystander Action Coils Model – developed to address sexual and intimate partner violence – which expands on these theories by conceptualizing

[14] The decision process can be influenced by the "bystander effect," where the presence of others reduces intervention likelihood due to "diffusion of responsibility" (sharing responsibility among bystanders), "evaluation apprehension" (fear of judgment when acting publicly), and "pluralistic ignorance" (assuming intervention is not needed if others remain passive; Latane & Darley, 1970).

[15] Attitudes include affective and cognitive evaluations of a behavior and its outcomes; subjective norms include descriptive norms (perceptions of others' behaviors) and injunctive norms (perceptions of what others believe one should do); perceived behavioral control refers to one's confidence and efficacy in performing a behavior (Ajzen, 1991).

bystander behavior as a non-linear, ecologically informed process involving interconnected "action coils": individual decision-making, contextual influences, event characteristics, and the perceived consequences of bystander intervention.

### *Intra-individual factors*

Bystander behaviors are shaped by demographics, prior victimization, empathy, attitudes toward helping, and proactive actionism (e.g., Debnam & Mauer, 2021; Domínguez-Hernández et al., 2018; Jeyagobi et al., 2022, for reviews). Girls are more likely to intervene in sexual and dating violence (e.g., Banyard et al., 2025; Edwards et al., 2015), while boys tend to remain passive or adopt assistant/reinforcer roles in cyberbullying (e.g., Desmet et al., 2016; Machackova et al., 2018; Schultze-Krumbholz et al., 2018). Younger adolescents are more likely to help in cyberbullying (e.g., Erreygers et al., 2016; Schultze-Krumbholz et al., 2018), whereas older adolescents adopt varied roles, including helping, assisting/reinforcing, or staying passive (e.g., Olenik-Shemesh et al., 2015; Van Cleemput et al., 2014). Sexual minority adolescents also report greater willingness to help in sexual and dating violence (e.g., Banyard et al., 2021; López et al., 2023). Prior victimization is associated with an increased likelihood of intervening in sexual and dating violence (e.g., Edwards et al., 2015) and cyberbullying (e.g., Erreygers et al., 2016; Van Cleemput et al., 2014). Empathy – both affective (experiencing another's emotions) and cognitive (understanding another's emotions; Jolliffe & Farrington, 2006) – is also a predictor of helping in cyberbullying (e.g., Cai & Zhou, 2024, for meta-analysis). In contrast, perceiving abuse (e.g., sexual and dating violence or non-consensual forwarding of nudes) as trivial, private, or "none of their business" can hinder intervention (e.g., Barrense-Dias et al., 2024; Casey et al., 2017; Edwards et al., 2015). Actionists/helpers can intervene reactively – by responding to a risk or act of violence – or proactively, such as promoting healthy relationships on social media (Banyard, 2015; Rothman et al., 2019). Reactive interventions are significantly associated with proactive interventions in studies of bystander of peer sexual violence (e.g., Banyard et al., 2021).

### *Event-related characteristics*

Demographics of those involved also influence bystander behaviors, as do the victim's and perpetrator's relationship to the bystander, the bystander's perceptions of responsibility, and the bystander's emotional reactions toward the victim and perpetrator (e.g., Debnam & Mauer, 2021; Domínguez-Hernández et al., 2018; Jeyagobi et al., 2022, for reviews). Adolescents are more likely to intervene when the victim is female (e.g., Casey et al., 2017; Edwards et al., 2015), and especially

when they know the individuals involved – particularly the victim (e.g., Barrense-Dias et al., 2024; Casey et al., 2017; Desmet et al., 2016; Edwards et al., 2015). When the bully is a friend, however, bystanders may choose to remain passive or attempt to reason with them (e.g., Thornberg et al., 2018). In an adult sample, perceived victim responsibility was negatively associated with willingness to intervene in intimate partner violence, whereas perceived perpetrator responsibility was positively associated; these associations were mediated by sympathy for the victim and anger toward the perpetrator, respectively (Wijaya et al., 2021).

### *Outcomes of the bystander intervention*

While much research has explored why bystanders intervene, few studies have examined what happens afterwards. Banyard (2015) highlights that these consequences – including the bystander's feelings and perceived reactions of others – influence their future willingness to intervene. In adult samples – intervening in sexual and dating violence has been associated with positive feelings such as pride and empowerment (Witte et al., 2017), with distraction or distancing strategies associated with more positive feelings than direct confrontation of the perpetrator (Moschella & Banyard, 2020).

## The current study

Research on adolescent bystanders in the context of TFSDA has primarily focused on detecting opportunities to intervene (e.g., Chapter II) or intentions to intervene (e.g., Chapter III) rather than on enacted behaviors. Given its exploratory nature, this study was guided by broad objectives rather than specific hypotheses and extended the literature in two ways: (a) by identifying distinct classes of bystanders reacting to TFSDA using a person-centered approach; and (b) by examining whether the following factors differed across the identified classes: intra-individual factors (bystander gender, age, sexual orientation, experiences of technology-facilitated sexual victimization, empathy, recognition of TFSDA as inappropriate or requiring intervention, and proactive actionism), event-related characteristics (victim and perpetrator gender, relationships to the bystander, perceived responsibility and emotions toward the victim and perpetrator), and outcomes of intervention (bystander positive feelings), all of which have been previously associated with bystander responses in sexual/dating violence, non-consensual forwarding of nudes, and (cyber)bullying.

## Method

### Procedures

Approval was obtained by the Ethics Committee for Research in Social and Human Sciences (CEICSH-109/2021), the Data Protection Department of the University of Minho (DPO-REG-ID-2020-0000; DPO-AIPD-ID-2020-0000), the Portuguese General Directorate of Education (DGE-079070000), and the school executive boards. High schools in northern and central Portugal were randomly selected from a DGE-provided list and invited via email to participate in the larger research project. Twenty-five schools agreed to participate and received study details, ethical considerations, and consent forms requiring signatures from adolescents and parents. Before data collection, nine psychology professionals assessed the questionnaire for content and face validity, and it was piloted with 10 adolescents whose responses were excluded from the final analysis.

Data collection occurred from February to May 2023. Adolescents provided digital consent and were reminded not to include their names, that they could skip any questions, and that they were free to withdraw at any time. They completed a 45-minute questionnaire on Qualtrics using PCs, tablets, or smartphones in classrooms/libraries, with a teacher, lead researcher, and, when necessary, a master's or PhD psychology student who was available to clarify any questions or offer support. Afterwards, they attended a 45-minute awareness session on technology-facilitated dating abuse, covering the phenomenon, safety tips, and support contacts, including the Portuguese Victim Support Association (APAV) and the Psychology Association of the University of Minho (APsi). They were also given the project's email address to contact the researchers for assistance, ask questions, or access their results.

### Participants

Participants for this study were a subsample of 322 adolescents drawn from a larger survey of 1,855 adolescents aged 12–18 (Chapter II). This subsample included only those who reported having witnessed or had knowledge of TFSDA – excluding news reports – within the past 12 months (i.e., bystanders), and who had no more than 10% missing data on relevant variables.

Table 17 presents the characteristics of this subsample. Among the 322 participants, most identified as cisgender girls (54.7%), were aged 12-15 (55.3%), Portuguese (94.4%), White/Caucasian (93.2%), heterosexual (80.4%), had not dated in the past 12 months (50.6%), attended public schools (72%), were in grades 10-12 (54.7%), and lived in rural areas (50.3%).

**Table 17**

*Description of the sample*

| Variables | *n (%)* |
|---|---|
| Gender | |
| Cisgender boy | 137 (42.5) |
| Cisgender girl | 176 (54.7) |
| Binary and non-binary transgender; questioning | 9 (2.1) |
| Age group | |
| 12-15 years | 178 (55.3) |
| 16-18 years | 144 (44.7) |
| Nationality | |
| Portuguese | 304 (94.4) |
| Other | 18 (5.6) |
| Ethnicity | |
| White/Caucasian | 300 (93.2) |
| Afro descendants/Black | 15 (4.7) |
| Roma/Gypsy | 6 (1.9) |
| Multi-ethnic | 1 (0.3) |
| Sexual orientation | |
| Heterosexual | 259 (80.4) |
| Bisexual | 37 (11.5) |
| Gay/Lesbian | 17 (5.3) |
| Other | 9 (2.8) |
| Dating relationship in the last 12 months | 159 (49.4) |
| Type of school | |
| Public | 232 (72) |
| Private/Professional | 90 (28) |
| Education level | |
| 7th-9th grades | 146 (45.3) |
| 10th-12th grades | 176 (54.7) |
| Residential zone | |
| Urban | 156 (48.4) |
| Rural | 162 (50.3) |

*Note*. Missing data accounted for 1.2% ($n = 4$) of the residential zone variable.

## Measures

The following pre-survey definitions were provided (Brown & Hegarty, p. 4):

a) "Dating relationships. We define dating as two or more people in an emotionally and/or physically intimate relationship. The relationship may or may not be sexual. It may be casual or

serious, short-term or long-term, straight, gay, monogamous, or open. Terms used to describe these kinds of relationships include boyfriend, girlfriend, going out, hanging out, hooking up, seeing each other, friends with benefits, and unofficially dating. In this survey, we will use the terms girlfriend and boyfriend to refer to dating relationships."

b) "Digital devices. A digital device includes any type of modern-day technology used to interact with other people. Examples include (but are not limited to) mobile phones, smartphones, computers, tablets, laptops, notepads, the internet, social media, GPS devices, software, and apps."

***Screening measure: Exposure to TFSDA***

The Scale for Reactive Bystander Opportunity Detection in TFSDA (Chapter II) is an eight-item self-report scale assessing how often adolescents witnessed or had knowledge of TFSDA (excluding news reports) in the past 12 months. The scale includes two dimensions: sexual coercion and image-based sexual abuse/harassment. Responses were rated on a 4-point scale (0 = never to 3 = frequently/more than 6 times; $\alpha = 0.85$).

As shown in Table 18, 17.4% ($n = 56$) reported witnessing sexual coercion, 51.6% ($n = 166$) image-based abuse/harassment, and 31.1% ($n = 100$) both. Adolescents who witnessed a single incident were asked to reflect on that experience; those with multiple exposures were asked to respond based on the most impactful experience (see Table 2).

**Table 18**

*Detection of opportunities to intervene in TFSDA*

| Item | Frequency distribution *n* (%) | | | |
|---|---|---|---|---|
| | Never | Rarely (1 to 2 times) | Sometimes (3 to 5 times) | Frequently (More than 6 times) |
| Sexual coercion | | | | |
| Pressuring to engage in phone sex | 252 (78.3) | 54 (16.8) | 9 (2.8) | 7 (2.2) |
| Pressuring on a digital device to engage in sexual acts | 264 (82) | 42 (13) | 8 (2.5) | 8 (2.5) |
| Pressuring to discuss sexual issues | 216 (67.1) | 81 (25.2) | 15 (4.7) | 10 (3.1) |
| Pressuring to engage in sexual activity via live video | 272 (84.5) | 36 (11.2) | 6 (1.9) | 8 (2.5) |
| Image-based sexual abuse/harassment | | | | |
| Threatening to distribute intimate/sexual images (nudes) | 131 (40.7) | 158 (49.1) | 27 (8.4) | 6 (1.9) |
| Pressuring to send intimate/sexual images (nudes) | 188 (58.4) | 103 (32) | 20 (6.2) | 11 (3.4) |
| Sending unwelcome intimate/sexual images (nudes) | 186 (57.8) | 102 (31.7) | 24 (7.5) | 10 (3.1) |
| Sharing intimate/sexual images or videos (nudes) without permission | 206 (64) | 85 (26.4) | 26 (8.1) | 5 (1.6 |

### *Latent class indicators: Reactive bystander behaviors*

Participants were asked, "What did you do after witnessing or having knowledge of this/these behavior(s)?" Fifteen items – adapted from Banyard et al. (2021), Casey et al. (2017), and Debnam and Mauer (2021) – captured a range of possible responses aligned with established bystander roles: passive/outsiders (e.g., "Did nothing/ignored the situation"), helpers/actionists/defenders (e.g., "Comforted the person targeted," "Suggested the person targeted to keep records/evidence of what happened," "Spoke to the person who committed these behaviors to try to get them to stop"), and assistants/reinforcers (e.g., "Found the behavior amusing"). Participants indicated how often they had engaged in each behavior on a 4-point scale (0 = never to 3 = frequently/more than 6 times). For the purposes of LCA, responses were dichotomized as 0 (*no intervention*) and 1 (intervened; $\alpha = 0.89$).

### *Intra-individual factors*

**Bystander demographics.** Adolescents reported their gender, age, ethnicity, sexual orientation, relationship status over the past 12 months, type of school, education level, and residential zone.

**Technology-facilitated sexual victimization.** TFSDA was assessed using an eight-item self-report scale – adapted from the Technology-Facilitated Abuse in Relationships Scale (Brown & Hegarty, 2021; Chapter I) – asking how often such behaviors occurred with a current or former boy/girlfriend. The scale includes two dimensions: sexual coercion (four items, e.g., "Pressured me to talk about sexual things") and image-based sexual abuse/harassment (four items, e.g., "Threatened to share intimate or sexual images (nudes) of me"; $\alpha = 0.96$). Sextortion was assessed with one item – adapted from Finkelhor et al. (2022) and Wolak et al. (2018) – asking how often someone had threatened to show, share, or publish their intimate or sexual conversations, images, or videos in exchange for something (e.g., additional content, sexual acts, or money). Grooming was assessed with one item – adapted from Gámez-Guadix et al. (2021) and Wachs et al. (2016) – asking how often an adult (18+) initiated online contact – initially expressing interest in the adolescent's activities and/or problems and gradually encouraging them to share intimate or sexual content (e.g., conversations, images, or videos) and/or arrange a face-to-face meeting. All responses were rated on a 6-point Likert scale (0 = never to 5 = daily/almost daily), referencing the past 12 months, and dichotomized as 0 (non-victim) and 1 (victim of at least one behavior).

**Empathy.** The Basic Empathy Scale—Short Version (BES-A; original version by Jolliffe & Farrington, 2006; Portuguese version of Pechorro et al., 2018) is a seven-item self-report scale comprising two dimensions: affective empathy (three items, e.g., "I get caught up in other people's

feelings easily") and cognitive empathy (four items, e.g., "I can often understand how people are feeling even before they tell me"). Responses were rated on a 5-point Likert scale (1 = totally false to 5 = totally true; $\alpha = 0.85$), with average mean scores calculated.

**Recognition of TFSDA as inappropriate and requiring intervention**. Two items – adapted from Debman and Mauer (2021) and Casey et al. (2017) – assessed whether adolescents viewed TFSDA behaviors as acceptable (e.g., signs of love/trust) or private matters not requiring intervention. Responses were rated on a 5-point Likert scale (0 = completely disagree to 4 = completely agree) and dichotomized as 0 (disagreement) and 1 (agreement or neutrality) for each item.

**Proactive actionism.** Five items – adapted from Banyard et al. (2021) and Rothman et al. (2019) – assessed how often adolescents discussed the TFSDA behaviors and/or potential actions they could take to address them with four referent groups (parents, peers, teachers, and community members) and via social media (e.g., texts, images, videos, or hashtags) over the past 12 months. Responses were rated on a 4-point scale (0 = never to 3 = frequently/more than 6 times; $\alpha = 0.67$), with average mean scores calculated.

***Event-related characteristics***

**Victim and perpetrator information**. Adolescents reported the gender of the victim and perpetrator and whether they had a relationship with each (e.g., friend/classmate, family member, or neighbor). For analysis, responses were grouped as known individuals or strangers due to small subgroup sizes.

**Perceived responsibility and emotions.** Three items – adapted from Wijaya et al. (2021) – assessed adolescents' perceptions of responsibility and emotional responses to the TFSDA incident. Adolescents indicated who they believed was responsible ("victim," "perpetrator," or "don't know"); responses indicating "other persons" or multiple selections were excluded due to small sample sizes. Two additional items assessed sadness for the victim and anger toward the perpetrator. Responses were rated on a 5-point Likert scale (0 = nothing to 4 = very much; $\alpha = 0.87$).

***Outcomes of bystander intervention***

**Bystander positive feelings**. Adolescents were asked, "Reacting this way left you feeling...:". Five items – adapted from Banyard et al. (2019) – assessed how adolescents felt about their response to the TFSDA incident they witnessed, regardless of whether they acted or not. The items reflected feelings of pride, satisfaction, confidence in future intervention, awareness of how to help, and perceived capability to help. Responses were rated on a 5-point Likert scale (0 = nothing to 4 = very much; $\alpha = 0.91$), with average mean scores calculated.

**Data analysis**

Little's MCAR test (Little, 1988) confirmed that data were missing completely at random ($\chi^2$ (1375) = 1432.52, $p$ = 0.14). Approximately 13% of the cases exhibited less than 10% missing data, which were imputed using multivariate imputation by chained equations (random forest algorithm; 10 imputations, 50 iterations; Shah et al., 2014; van Buuren & Groothuis-Oudshoorn, 2011). Density plots confirmed similar distributions between original and imputed data. Kolmogorov-Smirnov and Shapiro-Wilk tests confirmed non-normality at the scale level (Hair et al., 2019).

For Aim 1, an LCA was conducted to determine the optimal number of classes based on 15 categorical indicators of reactive bystander behaviors, following established guidelines (e.g., Nylund-Gibson & Choi, 2018; Sinha et al., 2021; Weller et al., 2020). A stepwise approach was employed, starting with a 1-class model and progressively increasing the number of classes to identify the best-fitting solution. Lower values on the Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), adjusted Bayesian Information Criterion (aBIC), and consistent Akaike's Information Criterion (CAIC) indicate better fitting solutions. Higher entropy values (≥ 0.80) indicate well-separated latent classes, and higher average posterior probabilities (AvePP, ≥ 0.90) indicate that individuals are correctly classified within each class. Theoretical interpretability should also be considered.

For Aim 2, the classes were compared based on intra-individual factors, event-related characteristics, and consequences of bystander intervention. For categorical variables, chi-square tests or Fisher's exact tests (when more than 20% of expected cell counts were below five; Field, 2017) were conducted, with adjusted standardized residuals ($z$ = 1.96) and Cramer's V assessing association strength (small ≃0.10 to large ≃0.50). For continuous variables, one-way ANOVAs with Tamhane's T2 post hoc analysis were performed, with eta squared ($\eta^2$) measuring effect size (small ≃0.01 to large ≃0.14).

Missing data imputation and LCA were conducted in R (version 4.2.3, R Core Team, 2023), using the MICE, VIM, and poLCA packages; all other analyses were conducted in SPSS (version 29, IBM Corporation, 2022).

# Results

## Model selection

Table 19 presents the fit statistics for the 1- to 5-class latent class solutions. The 4- and 5-class solutions were considered the most plausible based on fit indices and classification diagnostics. The 4-class solution showed lower BIC and CAIC values, higher entropy, and AvePP. While the 5-class solution had slightly lower AIC and aBIC values, the additional class did not reveal a distinct response pattern. Therefore, the 4-class model was the most appropriate for subsequent analyses.

**Table 19**

*Model fit statistics for latent class analysis*

| Number of classes | Log-likelihood | df | AIC | BIC | ABIC | CAIC | Entropy | *p*-value | AvePP |
|---|---|---|---|---|---|---|---|---|---|
| 1-class | -2898.168 | 307 | 5826.336 | 5882.954 | 5835.377 | 5897.954 | – | <.001 | – |
| 2-class | - 2197.241 | 291 | 4456.482 | 4573.493 | 4475.165 | 4604.493 | 0.929 | <.001 | 0.978-0.985 |
| 3-class | - 2033.282 | 275 | 4160.563 | 4337.967 | 4188.889 | 4384.967 | 0.918 | <.001 | 0.948-0.985 |
| **4-class** | **- 1935.819** | **259** | **3997.639** | **4235.436** | **4035.608** | **4298.436** | **0.939** | **<.001** | **0.955-0.995** |
| 5-class | - 1899.378 | 243 | 3987.871 | 4256.405 | 4004.368 | 4333.945 | 0.906 | <.001 | 0.848-0.985 |

*Note.* AIC = Akaike's Information Criterion. BIC = Bayesian Information Criterion. ABIC = sample size adjusted Bayesian Information Criterion. CAIC = consistent Akaike's Information Criterion. AvePP = Average posterior probabilities. The best solution appears in bold.

**Class description and comparison**

Figure 5 illustrates item response probabilities for the four-class model, and Table 20 summarizes comparisons across classes. Class labels were assigned according to terminology established in the literature and the distinguishing behavioral characteristics of each class.

Class 1: *Comprehensive helpers* (22.4%, $n = 72$). This third largest class adopted both victim- and perpetrator-focused intervention strategies, including emotional support, advice, encouraging help-seeking, reporting, urging the perpetrator to stop, and, at times, direct confrontation. According to $\chi^2$ tests of independence, members of this class were significantly more likely than expected to be cisgender girls ($z = 3.4$), aged 16–18 ($z = 2.9$), identify as LGB$^+$ ($z = 2.0$), report prior victimization ($z = 4.2$), recognize TFSDA as inappropriate ($z = 3.0$), know the victim ($z = 3.6$), perceive the perpetrator as responsible ($z = 2.6$), and feel sadness for the victim ($z = 3.7$) and anger toward the perpetrator ($z = 3.7$). ANOVA analyses indicated that they reported higher levels of empathy than *Inconsistent bystanders* ($p = .010$) and *Passive bystanders* ($p < .001$), reported engaging in greater proactive actionism than *Victim-centered helpers* ($p = .033$) and *Passive bystanders* ($p = .006$), and reported more positive feelings about their intervention than *Victim-centered helpers* ($p < .001$) and *Passive bystanders* ($p < .001$).

Class 2: *Inconsistent bystanders* (8.1%, $n = 26$). This smallest group displayed high engagement across all behaviors. According to $\chi^2$ tests of independence, members of this class were significantly more likely than expected to identify as LGB$^+$ ($z = 2.0$), report prior victimization ($z = 3.1$), and know the perpetrator ($z = 3.2$), while they were significantly less likely than expected to recognize TFSDA as inappropriate ($z = -3.8$). ANOVA analyses indicated that they reported lower levels of empathy than *Comprehensive helpers* ($p = .010$) and more positive feelings about their intervention than *Passive bystanders* ($p < .001$).

Class 3: *Victim-centered helpers* (37%, $n = 119$). This largest class primarily focused on victim-focused strategies, such as emotional support, advice, and encouraging informal help-seeking. According to $\chi^2$ tests of independence, members of this class were significantly more likely than expected to be cisgender girls ($z = 2.9$), aged 12–15 ($z = 2.1$), identify cisgender girls as victims ($z = 3.4$), know the victim ($z = 3.4$), perceive the perpetrator as responsible ($z = 3.0$), and feel sadness for the victim ($z = 2.3$) and anger toward the perpetrator ($z = 2.7$). ANOVA analyses indicated that they reported higher levels of empathy than Passive bystanders ($p = .008$), reported engaging in less proactive actionism than *Comprehensive helpers* ($p = .033$), and reported more positive feelings about

their intervention than *Passive bystanders* ($p < .001$), but lower than those reported by *Comprehensive helpers* ($p < .001$).

Class 4: *Passive bystanders* (32.6%, $n = 105$). This second-largest class exhibited the least engagement. According to $\chi^2$ tests of independence, members of this class were significantly more likely than expected to be cisgender boys ($z = 5.3$), heterosexual ($z = 2.3$), not to know the gender of the victim ($z = 3.7$) or the perpetrator ($z = 3.8$), and not to know whether the victim or the perpetrator was responsible for the TFSDA incident ($z = 4.1$). They were significantly less likely than expected to report prior victimization ($z = -4.8$), recognize TFSDA as inappropriate ($z = -2.0$), know the victim ($z = 7.3$), feel sadness for the victim ($z = -6.0$), and feel anger toward the perpetrator ($z = -6.5$). ANOVA analyses indicated that they reported lower levels of empathy than both *Comprehensive helpers* ($p < .001$) and *Victim-centered helpers* ($p = .008$), reported engaging in less proactive actionism than *Comprehensive helpers* ($p = .006$), and reported fewer positive feelings in response to their (lack of) intervention ($p < .001$).

**Figure 5**

*Item response probabilities across classes*

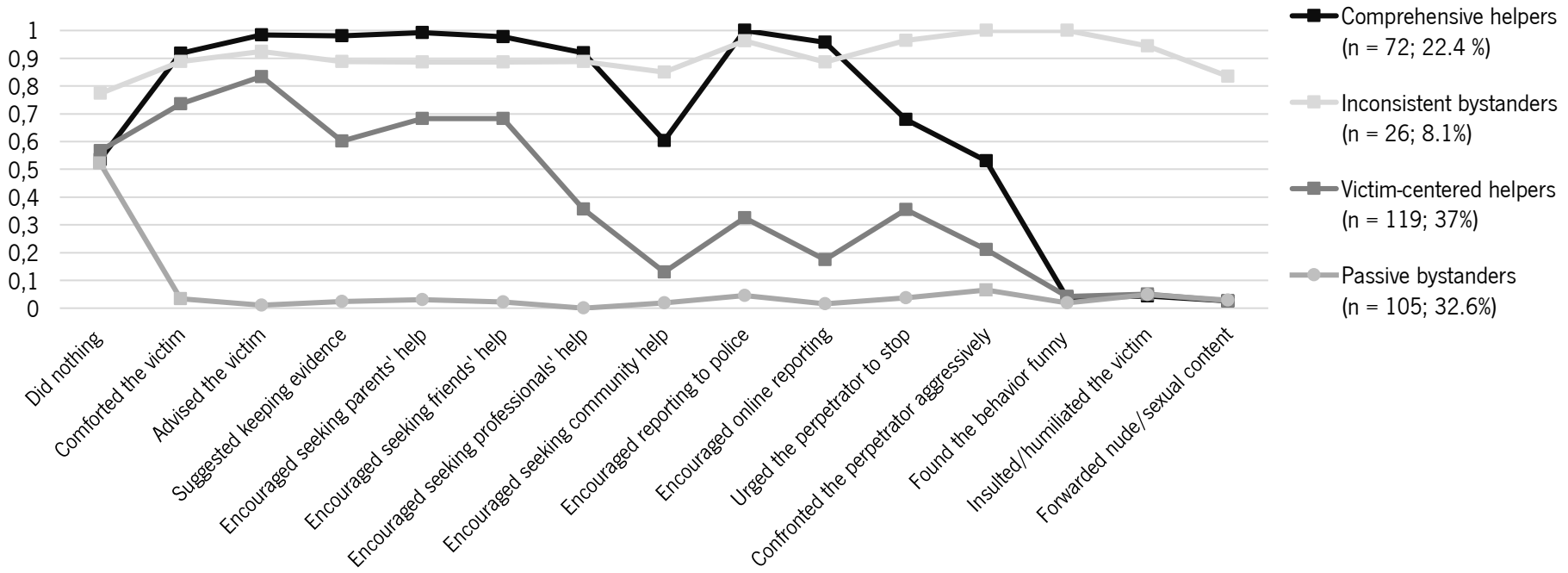


**Table 20**

*Class comparisons: intra-individual factors, event-related characteristics, and outcomes of bystander intervention*

| | Comprehensive helpers (*n* = 72) | Inconsistent bystanders (*n* = 26) | Victim-centered helpers (*n* = 119) | Passive bystanders (*n* = 105) | $\chi^2$/F (*p*) | Effect size |
|---|---|---|---|---|---|---|
| | *n (%), M (SD)* | *n (%), M (SD)* | *n (%), M (SD)* | *n (%), M (SD)* | | |
| **Intra-individual factors** | | | | | | |
| Gender (*n* = 313) | | | | | 33.95 (<.001) | .33 |
| Cisgender boy | 18 (26.1)[a] | 13 (54.2)[a,b] | 39 (33.3)[a] | 67 (65)[b] | | |
| Cisgender girl | 51 (73.9)[a] | 11 (45.8)[a,b] | 78 (66.7)[a] | 36 (35)[b] | | |
| Age | | | | | 10.07 (.02) | .18 |
| 12-15 years | 29 (40.3)[a] | 13 (50)[a,b] | 75 (63)[b] | 61 (58.1)[a,b] | | |
| 16-18 years | 43 (59.7)[a] | 13 (50)[a,b] | 44 (37)[b] | 44 (41.9)[a,b] | | |
| Sexual orientation | | | | | 10.55 (.01) | .18 |
| Heterosexual | 52 (72.2)[a,b] | 17 (65.4)[b] | 98 (82.4)[a,b] | 92 (87.6)[a] | | |
| Bisexual, gay/lesbian, or other | 20 (27.8)[a,b] | 9 (34.6)[b] | 21 (17.6)[a,b] | 13 (12.4)[a] | | |
| Technology-facilitated sexual victimization | 37 (51.4)[a] | 15 (57.7)[a] | 34 (28.6)[b] | 14 (13.3)[c] | 38.26 (<.001) | .35 |
| Empathy | 23.25 (4.53)[a] | 18.23 (6.98)[b] | 22.03(5.08)[a,b] | 19.55 (6.14)[c] | 9.87 (<.001) | .09 |
| Recognition of TFSDA as inappropriate | 63 (87.5)[a] | 11 (42.3)[b] | 93 (78.2)[a,c] | 70 (66.7)[b,c] | 24.13 (<.001) | .27 |
| Recognition of the need of intervention | 26 (36.1)[a] | 15 (57.7)[a] | 50 (42.0)[a] | 50 (47.6)[a] | 4.54 (.21) | .12 |
| Proactive actionism | 3.67 (2.83)[a] | 3.96 (3.70)[a] | 2.58 (2.09)[b] | 2.29 (2.44)[b] | 6.33 (<.001) | .06 |
| **Event-related characteristics** | | | | | | |
| Victims' gender (*n* = 314) | | | | | 20.18 (.002) | .18 |
| Cisgender boy | 12 (16.9)[a] | 5 (20.0)[a] | 12 (10.4)[a] | 15 (14.6)[a] | | |
| Cisgender girl | 47 (66.2)[a,b] | 13 (52.0)[a,b] | 86 (74.8)[b] | 51 (49.5)[a] | | |
| I don't know | 12 (16.9)[a] | 7 (28.0)[a,b] | 17 (14.8)[a] | 37 (35.9)[b] | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Victim-bystander relationship | | | | | 54.65 (<.001) | .41 |
| Colleagues/friends (*n* = 175), family members (*n* = 11), neighbors (*n* = 5) | 56 (77.8)[a] | 18 (69.2)[a] | 85 (71.4)[a] | 32 (30.5)[b] | | |
| Strangers | 16 (22.2)[a] | 8 (30.8)[a] | 34 (28.6)[a] | 73 (69.5)[b] | | |
| Perpetrators' gender | | | | | | |
| Gender (*n* = 313) | | | | | 16.49 (.010) | .17 |
| Cisgender boy | 49 (69)[a] | 12 (54.5)[a,b] | 78 (66.1)[a] | 49 (48)[b] | | |
| Cisgender girl | 10 (14.1)[a] | 6 (27.3)[a] | 17 (14.4)[a] | 14 (13.7)[a] | | |
| I don't know | 12 (16.9)[a] | 4 (18.2)[a,b] | 23 (19.5)[a] | 39 (38.2)[b] | | |
| Perpetrator-bystander relationship | | | | | 11.49 (.009) | .19 |
| Colleagues/friends (*n* = 90), family members (*n* = 2), neighbors (*n* = 4) | 21 (29.2)[a,b] | 15 (57.7)[b] | 35 (29.4)[a] | 25 (23.8)[a] | | |
| Strangers | 51 (70.8)[a,b] | 11 (42.3)[b] | 84 (70.6)[a] | 80 (76.2)[a] | | |
| Perceived responsibility (*n* = 290) | | | | | 30.65 (<.001) | .23 |
| Victim | 7 (10.6)[a] | 3 (12.0)[a] | 5 (4.7)[a] | 10 (10.8)[a] | | |
| Perpetrator | 46 (69.7)[a] | 10 (40.0)[a,b] | 71 (67.0)[a] | 34 (36.6)[b] | | |
| I don't know | 13 (19.7)[a] | 12 (48.0)[a,c] | 30 (28.3)[a,c] | 49 (52.7)[b] | | |
| Sadness for the victim | 69 (95.8)[a] | 22 (84.6)[a,b] | 104 (87.4)[a] | 65 (61.9)[b] | 38.15 (<.001) | .34 |
| Anger toward the perpetrator | 69 (95.8)[a] | 23 (88.5)[a,b] | 106 (89.1)[a] | 64 (61.0)[b] | 41.97 (<.001) | .37 |
| **Outcomes of bystander intervention** | | | | | | |
| Positive feelings about their intervention | 13.99 (3.84)[a] | 11.50 (5.29)[b,c] | 10.50 (4.83)[b] | 3.93 (4.98)[c] | 73.29 (<.001) | .41 |

*Note*. [a,b,c] Percentages or means in the same row sharing superscripts differ significantly, as determined by a post hoc z-test (for chi-square tests) or Tamhane's T2 post hoc test (for one-way ANOVA). Small sample sizes prevented chi-square tests for gender minority groups (bystanders, victims, or perpetrators) and led to the exclusion of "other persons" or multiple selections in perceived responsibility.

## Discussion

This study identifies distinct classes of bystanders reacting to TFSDA and examines intra-individual factors, event-related characteristics, and outcomes of bystander intervention associated with each class.

### Reactive bystander behaviors

The LCA identified four classes – *Victim-centered helpers*, *Passive bystanders*, *Comprehensive helpers*, and *Inconsistent bystanders* – reflecting the variability observed in (cyber)bullying research (e.g., Schultze-Krumbholz et al., 2018; Waasdorp & Bradshaw, 2018), though no assistant/reinforcer class emerged. These distinct profiles highlight the need to tailor awareness-raising and skill-building efforts to specific bystander roles, as no single approach may suit all.

Over half of adolescents were classified as *Victim-centered helpers* or *Comprehensive helpers*, indicating a promising trend toward prosocial responses (e.g., Schultze-Krumbholz et al., 2018). These patterns may be attributed to developmental advancements in "the social brain" (Blakemore, 2008), including increased perspective-taking (Van der Graaff et al., 2014), moral reasoning (Chiasson et al., 2017), and prosocial behavior (Van der Graaff et al., 2018), along with the impact of national awareness efforts (e.g., APAV, Safer Internet Centre, PSP – Safe School Program). However, sustaining helping behavior requires more than one-off training (Banyard, 2015), because as technologies evolve, so does the complexity of abuse (e.g., Finkelhor et al., 2023[16]), which then creates new avenues for intervention (e.g., the Take It Down platform[17]). Bystanders also need ongoing opportunities to develop skills, reflect on their experiences, and receive support after acting and facing potential consequences (Banyard, 2015).

Even among prosocial classes, *Victim-centered helpers* and *Comprehensive helpers* differ in their approaches. *Victim-centered helpers* favor victim-focused strategies, often encouraging informal help-seeking – possibly reflecting a reluctance to involve adults or formal systems. Focus group research suggests adolescents are hesitant to report dating and sexual violence to teachers/school staff due to fears of being labeled a "snitch," discomfort discussing sensitive issues with unfamiliar teachers, or the perception that teachers are unconcerned – mainly when incidents occur outside of school (Edwards et al., 2015). Similarly, interviews with adolescents and adult supporters regarding the non-consensual forwarding of nudes reveal a preference for peer-based resolution due to concerns

[16] For insights into categories of image-based sexual exploitation and abuse of children, refer to Finkelhor et al. (2023).
[17] Take It Down is a free service developed by the National Center for Missing & Exploited Children that allows users worldwide to submit a report that can help remove online nude, partially nude, or sexually explicit photos and videos depicting a child under 18 years old (https://takeitdown.ncmec.org/).

about adult overreaction, victim-blaming, and potential self/peer criminalization (Dodge & Lockhart, 2022). *Victim-centered helpers* may benefit from training on when formal intervention is necessary. At the same time, adults – parents, educators, child protection professionals, and law enforcement – must create environments in which adolescents feel supported in seeking help.

By contrast, *Comprehensive helpers* also intervene with perpetrators by urging them to stop or confronting them directly. These strategies – from initiating conversations and educating the perpetrator to, at times, physical confrontation – have been documented in prior studies (e.g., Casey et al., 2017; Dodge & Lockhart, 2022; Edwards et al., 2015). Training in emotional regulation, assertiveness, and problem-solving may help ensure that interventions remain constructive and avoid escalating conflict.

Nearly one-third were *Passive bystanders*, taking no action. Inaction may stem from viewing the abuse as trivial, a desire to avoid "drama," conformity to peers, fear of social disapproval or retaliation, or a lack of motivation, skills, or confidence to intervene (e.g., Barrense-Dias et al., 2024; Casey et al., 2017; Edwards et al., 2015; Olenik-Shemesh et al., 2015). Moreover, the affordances of the online environment – such as the ease of spreading non-consensually shared sexual or nude content to a broad audience – can foster diffusion and displacement of responsibility (Runions & Bak, 2015[18]). Adverse reactions to previous intervention attempts – whether from victims, perpetrators, or other bystanders – may have further discouraged engagement (Moschella & Banyard, 2020). *Passive bystanders* may benefit from targeted interventions focused on TFSDA literacy, socio-emotional skill-building, safety strategies, support resources, and reporting mechanisms (e.g., the Portuguese Safer Internet Centre).

*Inconsistent bystanders* showed fluctuating responses, aligning with previous findings in the peer bullying literature (e.g., Waasdorp & Bradshaw, 2018). This class highlights bystander behavior's dynamic and context-dependent nature, which may shift based on the victim's evolving needs (Banyard, 2015) or be shaped by cost-benefit evaluations (Dovidio et al., 1981). Adolescents are more likely to intervene when benefits outweigh risks, and they may be more likely to disengage—or even align with perpetrators—when risks seem greater; sometimes they accomplish this through moral disengagement (Bandura et al., 1996). This highlights the importance of fostering not intervention skills but also a strong sense of moral responsibility to counteract self-justification and promote consistent helping behavior.

[18] Runions and Bak (2015) propose a conceptual framework illustrating how affordances of the online context may enable mechanisms that facilitate moral disengagement in cyberbullying perpetration; this framework is applied here to explore potential processes contributing to bystander inaction.

## Theories of bystander behavior

The findings provide empirical support for Banyard's (2015) Bystander Action Coils Model, illustrating how intra-individual factors, event-related characteristics, and the outcomes of intervention interact in shaping bystander behavior.

### *Intra-individual factors*

Gender differences emerged, such that cisgender girls tended to be *Victim-centered helpers* and *Comprehensive helpers*, while cisgender boys were more often *Passive bystanders*. These findings align with previous research (e.g., Banyard et al., 2025; Desmet et al., 2016; Edwards et al., 2015). Girls' greater exposure to victimization (e.g., Ellyson et al., 2021; Reed et al., 2017; Zweig et al., 2013) may contribute to their heightened sensitivity and willingness to help others. Boys, on the other hand, often downplay these behaviors and gain social status within networked peer groups by obtaining and sharing nude/sexual content of girls (e.g., Ringrose et al., 2022). These patterns may also reflect Gender Intensification Theory (Hill & Lynch, 1983) and Social Role Theory (Eagly, 2009), which suggest that girls are socialized to be nurturing, empathetic, and supportive of others, while boys are more likely to help in heroic or assertive ways (Eagly, 2009; Hill & Lynch, 1983). Notably, the behaviors assessed in this study primarily reflected feminine-typed responses, which may partially explain these patterns and overlook forms of intervention more common among boys. Future research should assess a wider range of potential helping behaviors that boys may be more likely to engage in. Nonetheless, gender-sensitive prevention should empower all adolescents and counteract norms that discourage boys from engaging in supportive intervention.

Younger adolescents were more likely to be *Victim-centered helpers*, while older ones tended to be *Comprehensive helpers*. Although findings on age are mixed (e.g., Erreygers et al., 2016; Olenik-Shemesh et al., 2015; Schultze-Krumbholz et al., 2018; Van Cleemput et al., 2014), this pattern aligns with research showing increased prosocial behavior across adolescence (Van der Graaff et al., 2018), particularly toward friends (Padilla-Walker et al., 2018). As adolescents age, the shift in strategy may reflect greater investment in peer and dating relationships (Connolly et al., 2014), where they strengthen social-emotional and conflict resolution skills, navigate shifting social status, and become more confident in addressing perpetrators.

Sexual minority adolescents and those with experiences of sexual victimization were more likely to belong to the *Comprehensive helpers* and *Inconsistent bystanders*, supporting evidence linking these factors to increased intervention (e.g., Banyard et al., 2021; Edwards et al., 2015; Erreygers et al.,

2016; López et al., 2023; Van Cleemput et al., 2014). On one hand, these findings align with the Altruism Born of Suffering Theory (Staub & Vollhardt, 2008), suggesting that adversity – such as oppression and discrimination faced by sexual minorities (Meyer, 2003) or personal experiences of victimization – may enhance empathy and motivation to help (Staub & Vollhardt, 2008). On the other hand, their inconsistent responses may reflect a tension between this motivation and concerns about identity exposure, reactivation of distressing memories, fear of retaliation or exclusion, or prior negative experiences with intervention. While these explanations warrant further investigation, prevention efforts should adopt an intersectional[19] and trauma-informed approach that recognizes the strengths and challenges these bystanders face and equips them to intervene safely and effectively (Banyard, 2015).

Regarding empathy, *Victim-centered helpers* and *Comprehensive helpers* reported higher levels than *Passive bystanders*, consistent with existing evidence (e.g., Cai & Zhou, 2024, for meta-analysis). This data supports altruistic and egoistic helping models, wherein witnessing distress may evoke self-focused discomfort or other-focused empathy—both of which can motivate action to alleviate personal or others' distress (Batson et al., 1987). Of note, perceived severity – and thus justification for intervention – can depend on the victim's visible distress (e.g., Casey et al., 2017). While this study did not assess the context in which TFSDA was encountered, online settings lacking socio-emotional cues (e.g., facial expressions, tone of voice) may limit empathic responses (Runions & Bak, 2015). Prevention efforts should include empathy-building strategies to counter desensitization and ambiguity in digital environments.

Recognition of TFSDA as inappropriate was more common among *Comprehensive helpers* than *Inconsistent bystanders* and *Passives bystanders*, suggesting that without such recognition, opportunities to intervene may be missed (e.g., Barrense-Dias et al., 2024; Casey et al., 2017; Edwards et al., 2015). According to Banyard et al. (2022), the *Readiness to Change* model (Prochaska et al., 2015) can be relevant here: *Comprehensive helpers* may be ready for skill-building, while others may benefit from awareness-raising to help identify and interpret abusive situations. Privacy norms did not differentiate classes, possibly due to item ambiguity – some adolescents may view TFSDA as private yet still support intervention. Future qualitative research could clarify these perceptions, and quantitative studies should consider using validated measures (e.g., the Denial subscale of the *Readiness to Help Scale*; Banyard et al., 2014).

Proactive actionism also differentiated the classes, being more common among *Comprehensive helpers* than among *Victim-centered helpers* and *Passive bystanders*. These

[19] Intersectionality Theory examines how multiple social identities – gender, sexual orientation, race, ethnicity, disability, and other individual characteristics – intersect to create unique experiences of discrimination and disadvantage (Crenshaw, 1991).

adolescents may represent "innovators" or "early adopters" within the Diffusion of Innovation Theory (Rogers, 2002) – roughly 16% of a group or population embrace new ideas or behaviors – making them promising candidates for peer leadership roles in prevention efforts (Banyard et al., 2015, 2021). Programs addressing sexual and dating violence, such as Green Dot, build on this model by promoting the diffusion of bystander intervention through peer networks (Cook-Craig et al., 2014).

### *Event-related characteristics*

Identifying the victim as a cisgender girl and personally knowing the victim was associated with *Victim-centered helpers* and *Comprehensive helpers*; knowing the perpetrator was linked to *Inconsistent bystanders*, while uncertainty about those involved characterized *Passive bystanders*. As previously noted, this gender pattern may support existing evidence that girls are more frequently victims of TFSDA (e.g., Ellyson et al., 2021; Reed et al., 2017; Zweig et al., 2013), while also raising questions about whether bystanders are more likely to recognize and respond to female victims (e.g., Casey et al., 2017; Edwards et al., 2015), potentially overlooking male victimization. Relational closeness with the victim – through anticipated reciprocity or a sense that the victim's well-being affects one's own (Banyard, 2015) – may also explain the likelihood of intervention (e.g., Barrense-Dias et al., 2024; Casey et al., 2017; Desmet et al., 2016; Edwards et al., 2015; Machackova et al., 2018). In contrast, a relationship with the perpetrator may create more hesitation, victim-blaming, or loyalty conflicts, leading to less consistent behavior (e.g., Thornberg et al., 2018). Notably, uncertainty about those involved may lead to emotional detachment, minimization of the incident's seriousness, and reduced perceived responsibility to act. Prevention efforts should address gender bias in the recognition of TFSDA – ensuring male victims are acknowledged and supported – and reinforce that helping is important regardless of personal connection, offering safe strategies for various social contexts.

Perceiving the perpetrator as responsible, feeling sadness for the victim, and feeling anger toward the perpetrator were more common among *Victim-centered* and *Comprehensive helpers* than *Passive bystanders.* These findings are in line with adult research (e.g., Wijaya et al., 2021) and support Weiner's Attribution Theory (2018), which posits, in this case, that attributing responsibility to the perpetrator – implying the situation is beyond the victim's control (cognitive attribution) – and eliciting sympathy/sadness for the victim and anger toward the perpetrator (emotional reaction) increase the likelihood of helping behavior (action). Prevention efforts should challenge potential victim-blaming attitudes and reinforce perpetrator accountability.

### *Outcomes of bystander intervention*

*Comprehensive helpers* reported feeling the most positive feelings about how they intervened, while *Passive bystanders* felt the least positive feelings, likely due to their lack of intervention. This finding adds to the previous adult research (e.g., Moschella & Banyard, 2020; Witte et al., 2017) and suggests that helping behavior can elicit rewarding emotions and reinforce a sense of self-efficacy, potentially increasing the likelihood of future intervention. Future research on TFSDA should explore whether inaction is linked to negative emotions (e.g., discomfort or regret), which may in turn impact on the bystanders' mental health over time. In addition, research should adopt holistic measures - including perceived responses from victims, perpetrators, and other bystanders (e.g., Compendium of Bystander Consequences; Banyard et al., 2019) – to better tailor prevention efforts toward actions that are effective and less likely to have negative consequences for the bystander (Banyard, 2015; Banyard et al., 2019).

## Limitations

Some limitations should be acknowledged, providing directions for future research: a) the cross-sectional design limits conclusions about the stability or transitions of bystander classes over time; b) the use of a convenience sample with limited gender, ethnic, and sexual diversity constrains generalizability; c) reliance on self-reports may introduce recall errors and social desirability bias; d) adolescents may have detected opportunities to intervene but interpreted them differently than intended in the questions; e) assessing detection over the past twelve months may have overlooked lifetime experiences; f) future research should develop more nuanced and comprehensive measures to better capture reactive bystander behaviors in TFSDA, including actions like liking or posting a range of emojis (Edwards et al., 2015), gossiping, mocking, victim-blaming, and slut-shaming (Barrense-Dias et al., 2024) to better identify assistant/reinforcer roles; g) in addition, measures should capture contextual details such as when and where the intervention occurred (e.g., before, during, or after the incident, online *vs.* in-person), whether others were present, the perceived effectiveness of the response, and the reactions it elicited; and h) reactive and proactive bystander behaviors should also be analyzed separately, as these may reflect different influences (e.g., Banyard et al., 2021).

## Conclusion

This study identified four classes of reactive bystanders to TFSDA, offering insights for prevention efforts to tailor skill-building to distinct roles. Gender, age, sexual minority status,

victimization history, empathy, recognition of TFSDA as inappropriate, and proactive actionism were all associated with class membership, highlighting the importance of prevention efforts tailored to bystanders' characteristics and experiences. Event-related characteristics – including victims' and perpetrators' gender, relationships with those involved, perceived responsibility, and emotional reactions—also shaped bystander responses and should inform context-sensitive training and intervention strategies. The consequences of bystander intervention – captured here through positive feelings – highlight the importance of reinforcing the emotional benefits of helping while addressing potential adverse outcomes to sustain future engagement. A comprehensive, society-wide response is essential – engaging adolescents, parents, school personnel, clinicians, child protection professionals, researchers, technology companies, and legal and policy practitioners – to safeguard adolescents, reduce the tolerance of TFSDA, and cultivate a shared responsibility for helping victims.

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## CHAPTER V[20]

FORENSIC PSYCHOLOGICAL PROCEDURES IN CASES OF TECHNOLOGY-FACILITATED SEXUAL ABUSE AMONG ADOLESCENTS: A SCOPING REVIEW

[20] Vale, M., Gomes, J. P., & Matos, M. (2024). Forensic psychological procedures in cases of technology-facilitated sexual abuse among adolescents: A scoping review. *Behavioral Sciences & the* Law, *42*(4), 313-337. https://doi.org/10.1002/bsl.2658 (IF 1; Q2)

FORENSIC PSYCHOLOGICAL PROCEDURES IN CASES OF TECHNOLOGY-FACILITATED SEXUAL ABUSE AMONG ADOLESCENTS: A SCOPING REVIEW


## Abstract

**Background:** Technology-facilitated sexual abuse refers to the use of information and communication technologies to facilitate both virtual and in-person sexual crimes. Research on this topic has focused on rates, risk factors, and consequences. **Objectives:** This scoping review aims to understand whether and how forensic psychological procedures are adapted to assess adolescent victims and how Internet-based information might be useful as complementary data. **Method:** Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extensions for Scoping Reviews guidelines, searches were conducted in April 2023 in five electronic databases to include Portuguese, Spanish, or English quantitative, qualitative, or mixed-method peer-reviewed studies. **Results:** Of the 2523 studies, six were considered eligible. Identified procedures include forensic interviews following the National Institute for Child Health and Human Development Protocol, and risk and trauma assessments. While discussing technology's role in abuse during interviews was informative, confronting adolescents with evidence of their abuse had adverse effects on their testimony and recovery. The assessment tools often had a narrow focus or overlooked the abuse unless explicitly disclosed, implied a referral, or when safeguarding concerns were raised. **Conclusion:** Clinical, forensic, and criminal implications are elaborated.



*Keywords:* adolescents, forensic psychological procedures, Internet-based information, technology-facilitated sexual abuse, victimization

## Introduction

Information and communication technologies (ICT) have become an integral part of the daily lives of the digital- born generations (Ponte & Batista, 2019; Smahel et al., 2020; Vogels et al., 2022). Consistent with this trend, the Pew Research Center found that nearly all U.S. adolescents report daily Internet use (97%), smartphone access (95%), and engagement on social networking platforms such as YouTube (95%), TikTok (67%), and Instagram (62%; Vogels et al., 2022; $n$ = 1316, 13–17 years old). While ICT allows adolescents to develop their identities, establish different interpersonal relationships, explore their sexual interests, and expand extrafamilial bonds (Borca et al., 2015; Eleuteri et al., 2017; Lenhart et al., 2015), its use may also increase the likelihood of becoming victims of technology-facilitated sexual abuse (hereinafter TFSA; De Santisteban & Gámez-Guadix, 2018; Finkelhor et al., 2022, 2023; Gámez-Guadix et al., 2022; Patchin & Hinduja, 2020; Turner et al., 2023; Wolak et al., 2018).

TFSA (also known as "online child sexual abuse"; Finkelhor et al., 2022, 2023; Turner et al., 2023) refers to a spectrum of sexually based harms (e.g., nonconsensual image taking and misuse, forced image recruitment, threatened sharing, unwanted online sexual talk, questions, and acts requests, voluntary older partner, commercial talk, images, or other sexual online activity) that, in various combinations, overlap with broader typologies from the literature (e.g., image-based sexual abuse, self-produced child sexual abuse, online solicitations, online grooming, sextortion, and online commercial sexual exploitation; Finkelhor et al., 2022, 2023).

Whatever typologies the TFSA takes, evidence highlights that it victimizes a significant proportion of adolescents at the international level (Internet Watch Foundation [IWF], 2022[21]; National Centre for Missing & Exploited Children [NCMEC], 2022[22]; We Protect Global Alliance, 2021[23]), is associated with different risk factors (De Santisteban & Gámez-Guadix, 2018; Finkelhor et al., 2022, 2023; Gámez-Guadix et al., 2022; Patchin & Hinduja, 2020; Turner et al., 2023; Wolak et al., 2018), and poses a dangerous threat to their health and well-being, in both the short and long terms (Joleby et al., 2020, 2021; Wolak et al., 2018).

Managing these cases may imply a referral to children's services, where the adolescent undergoes forensic psychological procedures for future legal proceedings (tertiary prevention). However, to our knowledge, there is a dearth of studies with an evidence-based approach and a

[21] The IWF is a UK-based organization that works to combat online child abuse sexual materials (IWF, 2022).
[22] The NCMEC is a U.S.-based organization that aims to find missing children, reduce child sexual abuse and exploitation, and prevent child victimization. NCMEC operates a CyberTipline, which is a reporting mechanism for multiple forms of online child sexual abuse and exploitation (NCMEC, 2022).
[23] The WeProtect Global Alliance is an international initiative (101 governments, 65 private sector companies, 91 civil society organizations, and nine intergovernmental organizations) focused on preventing and combating the multiple forms of online child sexual abuse and exploitation (WeProtect Global Alliance, 2021).

structured methodology focused on understanding whether and how these forensic psychological procedures are adapted to assess adolescent victims and how Internet-based information might be useful complementary data. While parallels to TFSA can be drawn in the broader context of offline child sexual abuse (e.g., Fernandes et al., 2023; Machado et al., 2011; Peixoto & Ribeiro, 2020), it is essential to recognize that the technological and online elements introduce unique characteristics, manifestations, and implications.

First, TFSA is a ubiquitous crime that transcends temporal and geographical constraints, manifesting as an immediate, fast, and uninterrupted threat (e.g., IWF, 2022; NCMEC, 2022; We Protect Global Alliance, 2021). Second, TFSA is an ever evolving and innovative crime, with continuous technological advancements leading to changes in the diversity and sophistication of its modus operandi, which results in different TFSA' typologies (Finkelhor et al., 2022, 2023). Third, TFSA is a flexible crime that can be perpetrated by both adolescents and adults within the context of different relationships, ranging from strangers targeting random adolescents online to acquaintances, friends, and current or former intimate partners (Finkelhor et al., 2022, 2023; Patchin & Hinduja, 2020; Wolak et al., 2018). Still, it can occur through different platforms, occurring in private (e.g., phone calls, and messages) and in social or public settings (e.g., live sex chats, and real-time webcam transmissions; Koops et al., 2018). Fourth, adolescents' ICT usage patterns increase the risk of TFSA, enhancing visibility to and the likelihood of contact with motivated perpetrators, as in other tech-related crimes (Vale et al., 2022). This is coupled with a sense of comfort where the screen, as a medium, plays a dual role: contributing to adolescents' behavioral disinhibition and propensity for risky behaviors (known as the online disinhibition effect; De Santisteban & Gámez- Guadix, 2018; Suler, 2004; Wolak et al., 2018), while also fosters the deindividuation of perpetrators' actions and underscores the bidirectional nature of TFSA (i.e., the victim-perpetrator overlap; Gámez-Guadix et al., 2022; Patchin & Hinduja, 2020). In support of these ideas, studies confirm that adolescents who add unknown individuals to their social networking friends list and engage in the exchange of texts, images, or videos with explicit sexual content about themselves face an elevated risk of victimization (De Santisteban & Gámez-Guadix, 2018). Additionally, Patchin and Hinduja (2020) found that adolescent boys who threatened to disseminate images with sexual content were more likely to be victims themselves. Fifth, different TFSA' typologies tend to co-occur (Gámez- Guadix et al., 2022; Wolak et al., 2018), involving the use of technology to "blackmail, escalate, and silence" the victims (Hamilton-Giachritsis et al., 2021). These incidents may precede, coexist with, or result from various in- person abusive behaviors (e.g., threats, attempts or acts of physical or sexual assault, dating violence, stalking, and harassment;

Patchin & Hinduja, 2020; Wolak et al., 2018), increasing the likelihood of multiple or poly-victimization. Additional factors contribute to the complexities of TFSA, complicating the recovery process: difficulties for victims to become aware they were being abused (some only realize TFSA after law enforcement contacts them); heightened levels of blame arising from adolescents' initiative or participation in sexual content and/or interaction; easier access to and preservation of concrete evidence of TFSA; and persistent fear that this evidence may continue circulating, thereby increasing the likelihood of the victims' recognition (Joleby et al., 2020, 2021).

Recognizing the complexities of TFSA within the framework of forensic psychological procedures can yield several benefits. These include the identification, protection, and treatment of victims; the prosecution and resocialization of perpetrators; the rapid removal of abusive material from online platforms; informed and targeted clinic, forensic, and criminal interventions; and enhanced public awareness. This, in turn, fosters a collective, comprehensive, and coordinated response to assess and intervene in TFSA.

## Technology-facilitated sexual abuse among adolescents

The conceptual debate surrounding TFSA is still ongoing (Patel & Roesch, 2022). Meanwhile, Finkelhor et al.' (2022) integrative operationalization of TFSA stood out for addressing distinct victimization forms that, in various combinations, overlap with broader typologies from the literature[24]: (a) nonconsensual image taking and misuse (e.g., "Has someone ever made, taken, or shared with others a sexual picture or video of you without your consent?"); (b) forced image recruitment (e.g., "Has someone ever threatened, tried to force you, or strongly pressured you to provide sexual pictures or videos online?"); (c) threatened sharing (e.g., "Has someone ever threatened to share a sexual picture or video of you to get you to send other sexual material of yourself, have a sexual relationship with them, or something else?"); (d) unwanted online sexual talk, questions, and acts requests (e.g., "Did anyone ever use the Internet to try to get you to talk about sex, ask you for sexual information about yourself, or ask you to do something sexual that you did not want to do?"); (e) voluntary older partner (e.g., "Did you share sexual messages, pictures or videos, even if you wanted to, with a person who was 5 or more years older than you?"), and (f) commercial talk, images, or other sexual online

[24] Nonconsensual sexting includes nonconsensual image taking, misuse and forced image recruitment. Revenge pornography includes nonconsensual image taking and misuse with the intention to cause harm. Image-based sexual abuse includes nonconsensual image taking and misuse, forced image recruitment, threatening sharing, voluntary older partner, and commercial sexual images. Self-produced child sexual abuse images include nonconsensual image taking, misuse, forced image recruitment, voluntary older partner, and commercial sexual images. Sextortion includes threatened sharing. Online solicitations include unwanted online sexual talk, questions, and act requests. Online grooming by an adult includes forced image recruitment, threatened sharing, unwanted online sexual talk, questions, and act requests, voluntary older partner and commercial talk, images, or other sexual online activity. Online commercial sexual exploitation includes commercial talk, images, or other sexual online activity (refer Finkelhor et al., 2022).

activity (e.g., “Have you made, sent, or posted sexual messages, pictures or videos of yourself in exchange for money, drugs, or other valuable items?”; Finkelhor et al., 2022).

The TFSA is a transnational crime, and adolescents are targeted at alarming rates. The NCMEC's CyberTipline received more than 32 million reports related to suspected child sexual exploitation (e.g., child pornography, online enticement of children for sexual acts, unsolicited obscene material sent to a child; NCMEC, 2022). The IWF investigated a total of 375,230 reports, confirming that 255,588 of these reports contained child sexual abuse imagery (IWF, 2022). Similarly, a retrospective large-scale study demonstrated that 54% of respondents had experienced at least one of four online sexual harms during childhood, with some regions standing out: North America, Australasia, and Western Europe (We Protect Global Alliance, 2021; $n$ = 5302, 18–20 years old).

The sociodemographic characterization indicated that being an older adolescent and identifying as a girl, transgender, non-binary, and with a non-heterosexual orientation are related to a higher probability of TFSA victimization (e.g., De Santisteban & Gámez-Guadix, 2018; Finkelhor et al., 2022, 2023; Gámez-Guadix et al., 2022; Patchin & Hinduja, 2020; Turner et al., 2023; Wolak et al., 2018). Some studies have indicated that victims of TFSA are prone to developing negative self-concept and self-esteem, along with depression, anxiety, self-harming or suicidal behavior, sleep disturbances, trust issues, impaired relationships, school-related problems, and the necessity to relocate to another community (De Santisteban & Gámez-Guadix, 2018; Joleby et al., 2020, 2021; Wolak et al., 2018).

## Forensic psychological procedures

Forensic psychological procedures designed to assess adolescent victims of sexual abuse entail a systematic approach to data collection, typically conducted by multidisciplinary teams. This process encompasses two main procedures: forensic interviews and forensic psychological assessments (Machado et al., 2011; Peixoto & Ribeiro, 2020).

Forensic interviews aim to collect and record adolescents' testimonies about their victimization experiences, intended for application in legal decision-making (Fernandes et al., 2023; Peixoto & Ribeiro, 2020). Recent work by Fernandes et al. (2023) has identified 30 different forensic interview protocols used with victims of child sexual abuse. While the National Institute for Child Health and Human Development (NICHD) Protocol (Lamb et al., 2018) emerged as the most used (frequency count = 69; 37.30%), the authors also highlighted that forensic interviews generally follow six phases: (a) introduction; (b) rapport building; (c) episodic memory training; (d) free recall; (e) questioning; and (f) closure. It's important to note, however, that these protocols appear to be primarily adapted for

cases of offline child sexual abuse, potentially neglecting the complexities of TFSA. On the other hand, forensic psychological assessments offer a more comprehensive procedure. They can be conducted to (a) evaluate the psychological development of the adolescent and determine whether they have the basic requirements to provide a credible account of their experiences; (b) assess the facts and their credibility; (c) assess the well-being and functioning of the adolescent; (d) assess family adjustment and support; and (e) collect information on risk and safety (Machado et al., 2011; Peixoto & Ribeiro, 2020).

Alongside conducting these assessment procedures, forensic psychologists are often called upon to provide expert testimony based on their specialized knowledge and training in TFSA and trauma-informed approaches, playing a crucial role in legal proceedings related to TFSA cases.

### The current study

This scoping review aims to understand whether and how forensic psychological procedures are adapted to assess adolescent victims of TFSA and how Internet-based information might be useful complementary data. A scoping review helps map the existing evidence on a certain subject, identifying gaps, and providing answers to far larger topics (Munn et al., 2018).

## Method

### Protocol and registration

A protocol was drafted, debated, and approved by the reviewers. The protocol followed the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology and its extensions for Scoping Reviews (Tricco et al., 2018) and was registered in the Open Science Framework Registries (reference: https://osf.io/2yng8).

### Eligibility criteria

Study selection was conducted based on the following inclusion criteria: a) studies published in Portuguese, Spanish, or English; b) quantitative, qualitative, or mixed-method studies published in peer-reviewed journals; c) studies focused on adolescents, with ages between 12 and 18 years old, who were (alleged) victims of TFSA; and d) studies focused on forensic psychological procedures to assess adolescents who were (alleged) victims of TFSA. For a study to be excluded, one or more of the following criteria need to be presented: a) studies published in a language other than Portuguese, Spanish, or English; b) systematic reviews, scoping reviews, and meta-analysis; c) grey literature,

literature reviews, theoretical articles, conference articles, opinion articles, posters, legislation, and news that did not report empirical results; d) studies focused on adults, aged 19 years old or older; and (e) studies focused on other forensic procedures (e.g., medical). There were no criteria set for the year of publication, study design and method, or publication status.

**Information sources and search strategy**

The search strategy was drafted, debated, and approved by the reviewers. Considering the multiple scientific constructs that have been used to define and operationalize TFSA, two research equations were used.

Pre-established keywords addressing the construct of TFSA were identified and searched using the following search equation: (forensic* OR "forensic psych*" OR "forensic interview*" OR evaluation* OR assessment* OR protocol* OR guideline* OR criminal* OR judicial* OR testi* OR court*) AND (adolescen* OR teen* OR youth* OR juvenile* OR young* OR minor* OR student*) AND ("technology facilitated sexual violence" OR "image based sexual abuse" OR sext* OR "non consensual sext*" OR "abusive sext*" OR "not allow* sext*" OR "sext* under pressure" OR "aggravat* sext*" OR "revenge porn*" OR "non consensual porn*" OR sextortion).

To identify studies that address the construct of TFSA without referring to these pre-established keywords, the following research equation was developed, combining primary keywords related to a technological/online element and secondary keywords related to a sexually abusive element: (forensic* OR "forensic psych*" OR "forensic interview*" OR evaluation* OR assessment* OR protocol* OR guideline* OR criminal* OR judicial* OR testi* OR court*) AND (adolescen* OR teen* OR youth* OR juvenile* OR young* OR minor* OR student*) AND (cyber* OR technolog* OR digital OR internet OR online OR electronic) AND ("sexual aggression*" OR "sexual abuse*" OR "sexual coercion*" OR "sexual pressure*" OR "sexual harassment*" OR "sexual exploitation*" OR "sexual assault*" OR "sexual misconduct*" OR "sexual molestation*" OR "sexual grooming" OR "sexual solicitation" OR "sexual bullying").

Two reviewers consulted five electronic databases (APA PsycArticles, Embase, PubMed, Scopus, and Web of Science) as information sources. The search covered all available studies up to and including 14 April 2023, and was restricted to titles, abstracts, and keywords in Portuguese, Spanish, or English. This search was complemented with a hand-search procedure (e.g., a bibliographic review of relevant studies, searches in specialized interdisciplinary journals), as well as a consultation with experts in the field.

### Selection of sources of evidence

The identified studies were imported and managed using Rayyan software (Ouzzani et al., 2016). Duplicates were excluded. Titles and abstracts (first screening) and full-text studies (second screening) were analyzed by two independent reviewers. Uncertainty or disagreement in these stages was resolved by consensus, and if a decision could not be made, a third independent reviewer could be consulted.

### Data charting process and data items

A data charting form in Excel was drafted, debated, and approved by the reviewers. The data extracted included: a) study identification (i.e., author(s), year of publication, journal, country, type of TFSA, study design, sample and recruitment, main objectives, and type of outcome); b) victims' sociodemographic profile (i.e., sample size, age, and sex); c) TFSA's characterization (i.e., type of abuse, victim-perpetrator relationship, setting, frequency, and severity of abuse); d) interviewer's and professionals' education and employment profiles (i.e., sample size, profession, experience, and training); e) forensic psychological procedures (i.e., delay between the incidents and the procedure, type of procedure and its description, setting of the procedure, number of sessions, duration, and record); and f) Internet-based information as complementary data. The data charting of the included studies was conducted by two independent reviewers. Uncertainty or disagreement in these stages was resolved by consensus, and if a decision could not be made, a third independent reviewer could be consulted.

### Critical appraisal of individual sources of evidence

The Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018) was used to evaluate the methodological quality and risk of bias for each included study. The MMAT is a critical appraisal tool that was developed for the appraisal stage of systematic mixed studies reviews (i.e., qualitative, quantitative randomized controlled trials, quantitative non- randomized, quantitative descriptive, and mixed methods). This tool starts with two screening questions along with five distinct methodological criteria. Each of these criteria can be classified as “Yes,” “No,” or “Can't tell” and if/ when necessary, an overall quality score can be reported (i.e., 20%, 40%, 60%, 80%, or 100% of the quality criteria met). Studies with a rating of high methodological quality have a low risk of bias, whereas studies with a rating of low methodological quality have a high risk of bias. For the MMAT, the exclusion of studies with low methodological quality is usually discouraged.

Inter-rater agreement was calculated through Cohen's kappa coefficient ($\kappa$), a robust statistic that assesses the degree of agreement between two independent reviewers relating to the same qualitative or categorical items while considering chance agreement (McHugh, 2012). Cohen's kappa coefficient ($\kappa$) can vary from -1 to þ1, where ≤0 indicates no agreement; 0.01–0.20 indicates none to a slight agreement; 0.21–0.40 indicates fair agreement; 0.41–0.60 indicates moderate agreement; 0.61–0.80 indicates substantial agreement; 0.81–0.99 indicates almost perfect agreement, and one indicates perfect agreement (McHugh, 2012). The inter-rater agreement analysis was conducted using SPSS, versions 29 for Windows (IBM SPSS Statistics for Windows, Version 29, 2022). Two independent reviewers conducted the quality appraisal process. Uncertainty or disagreement in these stages was resolved by consensus, and if a decision could not be made, a third independent reviewer could be consulted.

### Synthesis of results

The included studies were analyzed and reviewed in a qualitative synthesis, as presented in the Results section. The key findings were summarized and presented in a table and narrative format.

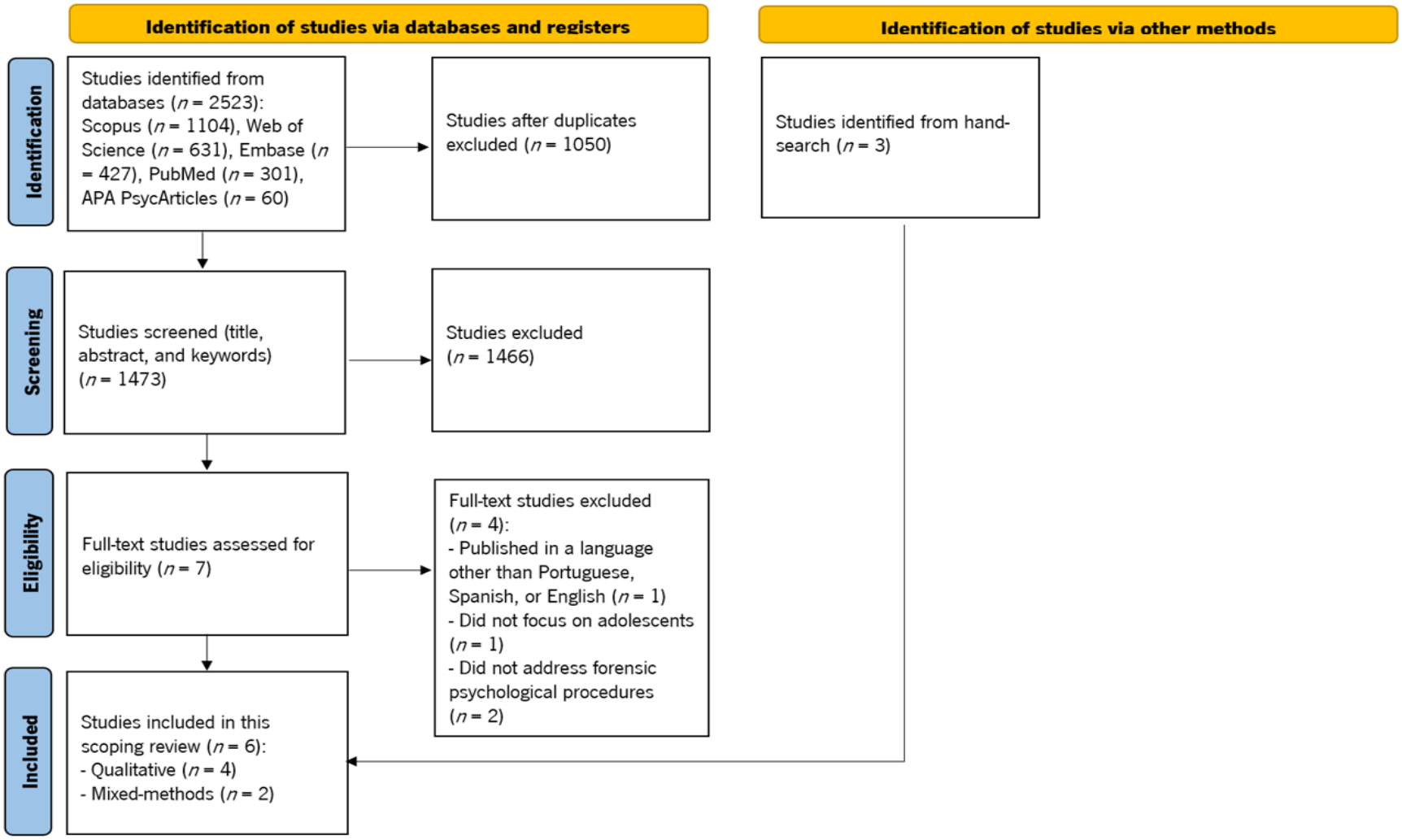
## Results

### Selection of sources of evidence

Our electronic database search yielded 2523 studies, of which 1050 were duplicates and consequently eliminated. Thus, 1473 were screened based on title, abstract, and keywords to assess eligibility. From this analysis, 1466 were excluded because the inclusion criteria were not fulfilled. As a result, seven studies were fully read, and one was excluded because it was published in a language other than Portuguese, Spanish, or English; one was excluded because it did not focus on adolescents; and two were excluded because they did not address forensic psychological procedures. Three studies were added through the hand-search procedure. In sum, a total of six studies were included in this scoping review, and data were extracted from each of them. The included studies were marked with an "*" in the section of references. A description of the PRISMA flow diagram, including the identification, screening, eligibility, and inclusion processes, is presented in Figure 6.

**Figure 6**

*Preferred reporting items for systematic reviews and meta-analyses flow diagram of the literature review process*



**Critical appraisal within sources of evidence**

Of the six included studies, four used a qualitative design (El-Asam et al., 2021; Gemara et al., 2022; Katz, 2013; Martin, 2016), and the remaining two studies used a mixed-method design (Edinburgh et al., 2015; Hamilton- Giachritsis et al., 2021). The quality appraisal revealed that four studies met 100% quality criteria (El-Asam et al., 2021; Gemara et al., 2022; Katz, 2013; Martin, 2016), one study met 80% quality criteria (Edinburgh et al., 2015), and the remaining study met 60% quality criteria (Hamilton-Giachritsis et al., 2021). Factors leading to reduced quality assessment scores comprised: (a) insufficient elaboration on non-response bias details (e.g., low nonresponse rate, reasons for nonresponse, and statistical adjustments for nonresponse; Hong et al., 2018); and (b) lack of representativeness (e.g., sample sizes, reasons for non-participation among eligible respondents, and efforts made to obtain a respondent sample reflecting the target population; Hong et al., 2018). It is crucial to emphasize that in studies employing a mixed-method design, with 15 criteria for evaluation, the fundamental principle is that the overall methodological quality of a composite cannot exceed the methodological quality of its weakest component. Thus, the overall methodological quality score is the lowest of the study components (Hong et al., 2018). The agreement index revealed substantial agreement among the reviewers, $\kappa$ = 0.67 (95% CI, 0.75– 0.90), $p$ = 0.023. A detailed quality appraisal of each criterion and the final overall quality rating of the included studies are presented in Table 21.

**Table 21**

*Critical appraisal within sources of evidence with the mixed methods appraisal tool (MMAT)*

| | Screening[1] | | Qualitative[2] | | | | | Quantitative descriptive[3] | | | | | Mixed-Methods[4] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Author(s), Year of publication | Q1 | Q2 | Q1 | Q2 | Q3 | Q4 | Q5 | Q1 | Q2 | Q3 | Q4 | Q5 | Q1 | Q2 | Q3 | Q4 | Q5 | |
| Edinburgh et al. (2015) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Can't tell | Yes | Yes | Yes | Yes | Yes | Yes | **** |
| El-Asam et al. (2021) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | | | | | | ***** |
| Gemara et al. (2022) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | | | | | | ***** |
| Hamilton-Giachritsis et al. (2020) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | Yes | Can't tell | Yes | Yes | Yes | Yes | Yes | Yes | *** |
| Katz (2013) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | | | | | | ***** |
| Martin (2016) | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | | | | | | | | | ***** |

*Note.* [1]Screening questions. Q1: Are there clear research questions? Q2: Do the collected data allow us to address the research questions? [2]Qualitative. Q1: Is the qualitative approach appropriate to answer the research question? Q2: Are the qualitative data collection methods adequate to address the research question? Q3: Are the findings adequately derived from the data? Q4: Is the interpretation of results sufficiently substantiated by data? Q5: Is there coherence between qualitative data sources, collection, analysis, and interpretation? [3]Quantitative descriptive. Q1: Is the sampling strategy relevant to addressing the research question? Q2: Is the sample representative of the target population? Q3: Are the measurements appropriate? Q4: Is the risk of non-response bias low? Q5: Is the statistical analysis appropriate to answer the research question?[4]Mixed Methods. Q1: Is there an adequate rationale for using mixed methods design to address the research question? Q2: Are the different components of the study effectively integrated to answer the research question? Q3: Are the outputs of the integration of qualitative and quantitative components adequately interpreted? Q4: Are divergences and inconsistencies between quantitative and qualitative results adequately addressed? Q5: Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?[5]1* = 20% quality criteria met; 2 ** or 40% quality criteria met; 3 *** or 60% quality criteria met; 4 **** or 80% quality criteria met; 5***** or 100% quality criteria met.

**Characteristics of sources of evidence**

Most of the studies had multiauthor contributions (Edinburgh et al., 2015; El-Asam et al., 2021; Gemara et al., 2022; Hamilton-Giachritsis et al., 2021), with two studies involving one-author contributions (Katz, 2013; Martin, 2016). Regarding the year of publication, all studies were published in the last decade, ranging from 2013 (Katz, 2013) to 2022 (Gemara et al., 2022). The studies spanned three continents: Europe (United Kingdom, $n$ = 2, El-Asam et al., 2021; Hamilton-Giachritsis et al., 2021), Asia (Israel, $n$ = 2, Gemara et al., 2022; Katz, 2013), and North America (United States of America, $n$ = 1, Edinburgh et al., 2015; Canada, $n$ = 1, Martin, 2016). Four studies employed a qualitative research design (El-Asam et al., 2021; Gemara et al., 2022; Katz, 2013; Martin, 2016), and two studies employed a mixed-method design (Edinburgh et al., 2015; Hamilton-Giachritsis et al., 2021).

Distinct constructs were used to designate TFSA: sexual exploitation (SE, pimp/trafficker-managed SE and self- managed SE; Edinburgh et al., 2015), sexting, revenge porn, grooming (El-Asam et al., 2021), online sexual solicitation (OSS; Gemara et al., 2022), technology-assisted child sexual abuse (TA-CSA; Hamilton-Giachritsis et al., 2021), Internet-related child sexual abuse (Internet-related CSA; Katz, 2013), and child sexual abuse images online (CSAIO; Martin, 2016).

Regarding the sample and recruitment method, three studies collected data from forensic samples, specifically, adolescents referred to a forensic interview following potential SE (Edinburgh et al., 2015), substantiated evidence that OSS (Gemara et al., 2022), and Internet-related CSA occurred (e.g., Internet-based information, medical examinations, eyewitness testimonies, and suspects' admissions; Katz, 2013). The remaining three studies obtained data from specialist samples, specifically professionals from children's services (El-Asam et al., 2021; Hamilton- Giachritsis et al., 2021; Martin, 2016).

Based on the objectives of this scoping review and the studies included, the results were organized into two major outcomes: (a) studies that explored adolescents' narratives during forensic interviews related to TFSA (Edinburgh et al., 2015; Gemara et al., 2022; Katz, 2013), and (b) studies that explored professionals' perceptions about and experiences with risk and/or trauma assessments related to TFSA (El-Asam et al., 2021; Hamilton- Giachritsis et al., 2021; Martin, 2016).

A description of the characteristics of the included studies is presented in Table 22.

**Table 22**

*Description of characteristics of included studies*

| Author(s), Year of publication, Journal | Country | Type of TFSA | Study design | Sample and recruitment | Objectives | Type of outcome |
|---|---|---|---|---|---|---|
| Edinburgh et al. (2015), Child Abuse & Neglect | USA | SE (pimp-managed SE and self-managed SE) | Mixed methods | Children referred to the CAC for the assessment of potential SE | Document the contexts and experiences of sexually exploited runaway adolescents; Identify physical findings, risk behaviors, and trauma symptoms; Evaluate how the questions asked during forensic interviews elicit new and useful responses when SE involves multiple perpetrators | Adolescents' narratives |
| El-Asam et al. (2021), Children and Youth Services Review | United Kingdom | Sexting, revenge porn, grooming | Qualitative | Professionals recruited purposefully from a range of services within a local authority/government | Explore how local services working with children and adolescents address cases with digital components and how equipped they are to do so | Professionals' perceptions and experiences |
| Gemara et al. (2022), Child Abuse & Neglect | Israel | OSS | Qualitative | Children referred for forensic investigation based on substantiated evidence of OSS | Explore children's experiences during forensic interviews concerning OSS | Adolescents' narratives |
| Hamilton-Giachritsis et al. (2021), Child Abuse & Neglect | United Kingdom | TA-CSA | Mixed methods | Professionals recruited within one organization, via a child protection | Assess how professionals working with victims define TA-CSA, perceive its impact, and evaluate | Professionals' perceptions and experiences |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | conference, and via email lists within relevant national organizations | services and organizational responses to this form of abuse | |
| Katz (2013), Children and Youth Services Review | Israel | Internet-related CSA | Qualitative | Children referred to investigative interviews following suspicions of Internet-related CSA | Provide an in-depth analysis of children's narratives during investigative interviews to assess what they disclose about Internet-related CSA and explore how their narratives can inform practices in both clinical and forensic contexts | Adolescents' narratives |
| Martin (2016) British Journal of Social Work | Canada | CSAIO | Qualitative | Professionals self-selected and recruited through snowball and purposeful sampling | Explore perceptions about and experiences with assessment, treatment, and training related to CSAIO | Professionals' perceptions and experiences |

*Note.* CAC = Child Advocacy Center; CSAIO = Child Sexual Abuse Images Online; Internet-Related CSA = Internet-Related Child Sexual Abuse; OSS = Online Sexual Solicitation; SE = Sexual Exploitation; TA-CSA = Technology-Assisted Child Sexual Abuse; TFSA = Technology-Facilitated Sexual Abuse

## Results of the studies that explored adolescents´ narratives during forensic interviews related to TFSA

### *Victims' sociodemographic profile*

The sample size of the alleged victims ranged from 20 (Gemara et al., 2022; Katz, 2013) to 62 (Edinburgh et al., 2015). The victims' ages at the time of the interview varied between 11 (Gemara et al., 2022; Katz, 2013) and 17 (Edinburgh et al., 2015), and most of them were girls (Edinburgh et al., 2015; Katz, 2013).

### *TFSA's characterization*

In cases related to OSS and Internet-related CSA, all the suspected perpetrators were unknown to the adolescents (Gemara et al., 2022; Katz, 2013). Specifically on Internet-related CSA, the suspect's grooming process extended over a few months, involving online interactions lasting from one to six months, with a few months later in-person meetings suggested. Eight out of the 12 adolescents who received invitations to in-person meetings with the perpetrators ultimately complied, resulting in instances of rape (Katz, 2013). Regarding SE, the exploitation of adolescents involved both pimp/trafficker-managed and self-managed SE, without providing much-identifying information about pimps/traffickers and purchasers (Edinburgh et al., 2015). In most cases, SE occurred after adolescents ran away from home or were expelled. Various pathways led to their exploitation, including meeting someone in person, exchanging phone numbers, having brief conversations, and being solicited for in-person sexual encounters. Some adolescents met pimps/traffickers or purchasers online through social networking sites, with SE continuing due to threatened or violent episodes. Among those who did not have a pimp/trafficker, many posted their ads or connected with purchasers on websites and phone chat lines (e.g., BackPages, Craigslist, Facebook, LiveLinks).

### *Interviewer's education and employment profile*

The forensic interviews were conducted by well-trained social workers (Gemara et al., 2022; Katz, 2013) and professionals from Child Advocacy Centers (CAC5; Edinburgh et al., 2015). Some of these professionals indicated having a minimum of one and a half years of experience as a child forensic interviewer (Gemara et al., 2022) and at least three years of experience as investigative interviewer (Katz, 2013). They were familiar with the NICHD Protocol, having received systematic training on it (Gemara et al., 2022; Katz, 2013).

### *Forensic interviews*

The delay between the reported incidents and the first interview ranged from zero days (Katz, 2013) to three months (Gemara et al., 2022). In two of the studies, the forensic interviews, focusing on the present allegation, adhered to the NICHD Protocol (Gemara et al., 2022; Katz, 2013). For a comprehensive description of the NICHD, one can refer to La Rooy et al. (2015) and Lamb et al. (1998). The third study did not specify the protocol used but presented a collection of interview prompts employed during evaluations at a hospital-based CAC, where the forensic interviewing principles outlined by Lamb et al. (1998) remained applicable (Edinburg et al., 2015). Generally, the forensic interviews followed this structure: a) introduction of the topic; b) elicitation of a free narrative; c) questioning and clarification; d) closing; and e) other considerations. It is noteworthy that in this study, beyond the present allegation, during the elicitation of a free narrative, there were questions that often did not pertain to SE but covered other factors, such as violent experiences or other risky situations. The interviews were obtained from the Unit of Investigative Interviews, which belongs to the Welfare Office (Gemara et al., 2022; Katz, 2013) and the CAC (Edinburg et al., 2015). Each study analyzed a single interview per adolescent, and all interviews were recorded on video (Edinburg et al., 2015; Gemara et al., 2022; Katz, 2013).

### *Internet-based information as complementary data*

Internet-based information was addressed in all forensic interviews, with one study mentioning the use of questions (Edinburgh et al., 2015), while the other two studies highlighted the utilization of concrete evidence of the abuse for data collection advancement (Gemara et al., 2022; Katz, 2013). Asking for information about how technology may have facilitated SE or aided adolescents in finding safety appeared to be useful. Questions related to phone numbers, pictures, or ads provided valuable information, necessitating follow-up questions to gather more specific details (e.g., “Did anyone take pictures of you? What are they used for? Do you know where the pictures might be now? Has anyone ever offered or wanted to post an ad for you? If yes, where was the ad posted? Do you know what phone numbers were used? What did the ad say?”; Edinburg et al., 2015). On the other hand, when interviewers failed to elicit disclosure and confronted the adolescents with proof of their abuse (e.g., “Well, I have read the chat documentation between the two of you, and I would like to ask you about it.”), they continued to refuse to cooperate (“Well, and how do you know that it is me? It may be that someone broke into my computer.” Katz, 2013). In Gemara et al.'s study (2022), interviewers simultaneously presented adolescents with evidence while encouraging them to view (e.g., “I believe

that naked pictures of you were found on somebody's computer. I want you to look at these pictures.") and discuss them ("About the picture of the buttocks that you sent, tell me, what did it exactly look like?"). In some interviews, the adolescent was exposed to new information. In the following instance, the adolescent found out that the person pretending to be a girl was an adult man ("She asked me if I was a virgin. Now that I talk about it, I understand that everything connects. Maybe it was a boy. I thought the whole time it was a girl of my age."). By making the victims relive the abuse, this approach threatened their coping mechanisms (denial, dissociation, and identity redefinition) and either caused or exacerbated their trauma (Gemara et al., 2022). In short, during the interviews, although involving additional potential distress, using Internet-based information as complementary data in some cases helped raise victims' awareness of these abusive dynamics and gather additional and concrete evidence, crucial for criminal information gathering.

## Results of studies that explored professionals' perceptions about and experiences with risk and trauma assessments related to TFSA

### *Professional's education and employment profile*

The sample size of the professionals varied, ranging from 14 (El-Asam et al., 2021; Martin, 2016) to 52 (Hamilton- Giachritsis et al., 2021). They were recruited from various areas of children's protection services (e.g., youth justice, social work/care, counseling/therapy, education, police, and voluntary sector advice centers; El-Asam et al., 2021; Hamilton-Giachritsis et al., 2021; Martin, 2016). All of them reported having experience working with children/ adolescents who have been sexually abused and exploited (El-Asam et al., 2021; Hamilton-Giachritsis et al., 2021; Martin, 2016). Only two professionals mentioned specific training related to the TFSA (Martin, 2016).

### *Risk and trauma assessments*

The three studies used risk and/or trauma assessments without referring to specific guidelines or protocols (El- Asam et al., 2021; Hamilton-Giachritsis et al., 2021; Martin, 2016).

### *Internet-based information as complementary data*

Professionals frequently highlighted the reliance of current assessment tools on methods centered around comprehending offline child sexual abuse (El-Asam et al., 2021; Hamilton-Giachritsis et al., 2021; Martin, 2016). In Martim's study (2016), it was revealed that half of the 14 professionals interviewed had not previously considered CSAIO before the interview, leading to the topic not being

incorporated into their assessments. Some professionals pointed out that assessments often have a restricted viewpoint on TFSA or tend to overlook it unless professionals are informed in advance through the adolescent's disclosure, child protection referral, or suspicions related to grooming or safeguarding concerns (El-Asam et al., 2021; Hamilton-Giachritsis et al., 2021; Martin, 2016). Moreover, they indicated that these tools failed to consider how CSAIO complexities might affect adolescents, specifically in terms of the perceived (or actual) permanence and reach of images (Martin, 2016). Although this trend was prevalent among professionals, three individuals (two of whom had received some training in CSAIO) mentioned the inclusion of Internet-based questions in their assessments (Martin, 2016). Noteworthy is one professional who developed an informal assessment tool specifically addressing questions related to CSAIO ("When has somebody asked you to show your private parts on a webcam?" and "How often did so and so take pictures of you or videotape you when the abuse was happening?"; Martin, 2016). Hence, the professionals highlighted the imperative to refine and develop targeted risk and trauma assessment protocols for the TFSA. They also pointed out the absence of structured, mandatory, and specialized training tailored to online life, vulnerability, and risk, expressing a sense of being unprepared and ill-equipped to assess such cases effectively (El-Asam et al., 2021; Hamilton-Giachritsis et al., 2021; Martin, 2016).

A detailed description of the victims' sociodemographic profile, TFSA's characterization, interviewer's and professionals' education and employment profiles, forensic psychological procedures, and Internet-based information as complementary data is presented in Table 23.

**Table 23**

*Description of the victims' profiles, TFSA's characterization, interviewer's and professionals' profiles, forensic psychological procedures, and Internet-based information as complementary data*

| Author(s), Year of publication | Victims' sociodemographic profile [N, age at the time of the procedure, and sex: female (F) and male (M)] | TFSA's characterization (type of abuse, victim-perpetrator relationship, setting, frequency, and severity of abuse) | Interviewer's and professionals' education and employment profiles (N, profession, experience, training) | Forensic psychological procedures (delay between the incidents and the procedure, type of procedure and its description, setting of the procedure, number of sessions, duration, and record) | Internet-based information as complementary data |
|---|---|---|---|---|---|
| Edinburgh et al. (2015) | N = 62<br>Age: 12-17, (*M* =15.0, *SD* = 1.56)<br>F = 55, M = 7 | Type of abuse: SE (pimp-managed SE and self-managed SE)<br>Victim-perpetrator relationship: Vague descriptions, without providing names or many identifying details of pimps/traffickers and purchasers<br>Setting of abuse: Meeting someone in person, exchanging phone numbers, having brief conversations, and being solicited for in- | Profession: Professionals from CAC | Type of procedure: Comprehensive health care assessments with forensic interviews (focused on the allegation presented and other factors such as violent experiences or other risky situations)<br>Setting of the interview: CAC<br>Number of sessions and duration: 1 session, 2–3 hours<br>Record: Videotaped | Questions on how technology may have facilitated SE or helped adolescents find safety (e.g., phone numbers, pictures, or adds) |

| | | | | |
|---|---|---|---|---|
| | person sexual encounters; meeting pimps/traffickers, or purchasers online through social networking sites; posting their own ads or connecting with purchasers on websites and phone chat lines. Frequency and severity of abuse: Involves threats and violent episodes | | | |
| El-Asam et al., (2021) | Type of abuse: SE, sexting, revenge porn, grooming | N = 14<br>Profession: Professionals from 10 services, including mental health, social care, youth justice, police, teenage pregnancy prevention, voluntary sector online youth counseling, school nursing, children's education, and safeguarding | Type of procedure: Risk assessments | Services are narrowly focused, with some omitting assessments or having a limited view of online risks; Online risks are only explored when directly suspected of being related to grooming or safeguarding issues; Lack of mandatory, specialist, and structured training programs around online life, vulnerability, and risk |

| | | | | | |
|---|---|---|---|---|---|
| | | | services<br>Experience: All had experience working with vulnerable children and adolescents | | |
| Gemara et al. (2022) | N = 20<br>Age = 11-13 (*M* = 12.25)<br>F = 20 | Type of abuse: OSS<br>Victim-perpetrator relationship: unknown | N = 5<br>Profession: Social workers<br>Experience: At least one and a half years as a child forensic interviewer<br>Training: Familiarity with the NICHD Protocol | Delay between the incidents and the interview: 3 months<br>Type of procedure: Forensic interviews using the NICHD Protocol (focused on the allegation presented)<br>Setting of the interview: Unit of Investigative Interviews, Welfare Office<br>Number of sessions and duration: 1 session (initial forensic interview)<br>Record: Videotaped | Concrete evidence of the abuse for data collection advancement (e.g., texts, pictures) |
| Hamilton-Giachritsis et al., (2021) | | Type of abuse: TA-CSA | N = 7 completed a paper-based pilot questionnaire, and 45 completed a revised questionnaire<br>Profession: Social work, counselling, therapy, primary care designated professional | Type of procedure: Risk assessments | Current assessment approaches are grounded in knowledge about offline child sexual abuse; Need to refine and develop specific risk assessment tools; Need for specialized training on TA-CSA |

| | | | | | |
|---|---|---|---|---|---|
| | | | for child protection, education, and police<br>Experience: All had experience working with children/adolescents who had experienced sexual abuse, whether offline or online | | |
| Katz (2013) | N = 20<br>Age = 11-14<br>F = 19, M = 1 | Type of abuse: Internet-related CSA<br>Victim-perpetrator relationship: Unknown<br>Frequency of abuse: The online interactions occurred over a duration of 1 to 6 months, with in-person meetings being offered only after a few months<br>Severity of abuse: Among the 20 adolescents, 8 did not disclose any allegations. However, 12 described a linear process of grooming. Out of these | N = 5<br>Profession: Social workers<br>Experience: At least three years as investigative interviewers<br>Training: Familiarity with the NICHD Protocol and systematic training on it | Delay between the incidents and interview: Occurred soon after the reported incidents<br>Type of procedure: Forensic interviews using the NICHD Protocol (focused on the allegation presented)<br>Setting of the interview: Unit of Investigative Interviews, Welfare Office<br>Number of sessions and duration: 1 session<br>Record: Videotaped | Concrete evidence of the abuse for data collection advancement (e.g., chat documentation) |

| | | | | |
|---|---|---|---|---|
| | 12 adolescents, 8 reported having face-to-face meetings with the perpetrator, all of which culminated in instances of rape | | | |
| Martin (2016) | Type of abuse: CSAIO | N= 14<br>Profession: Social workers and other helping professionals in child protection and treatment services<br>Experience: Clinical experience ranged from 2 to over 30 years, with half reporting more than 10 years of experience working in the field of child sexual abuse<br>Training: All had specialized training in child sexual abuse; those providing assessment and treatments were all trained in TF-CBT; two | Type of procedure: Risk and trauma assessments | Lack of CSAIO-specific protocols; Outdated and inadequate assessments that failed to consider the complexities and impact of CSAIO; Some professionals would assess CSAIO only if informed through the adolescent's disclosure or a child protection referral. Three professionals, two with CSAIO training, explored technology use during assessment, with one creating an informal tool. Lack of specific training left professionals lacking confidence in their ability to assess and respond to CSAIO |

| | |
|---|---|
| | had some training in CSAIO |

*Note.* CAC = Child Advocacy Center; CSAIO = Child Sexual Abuse Images Online; Internet-Related CSA = Internet-Related Child Sexual Abuse; NICHD = National Institute for Child Health and Human Development Protocol; OSS = Online Sexual Solicitation; SE = Sexual Exploitation; TA-CSA = Technology-Assisted Child Sexual Abuse; TFSA = Technology-Facilitated Sexual Abuse; TF-CBT = Trauma Focused-Cognitive Behavioral Therapy

## Discussion

This scoping review sought to understand whether and how forensic psychological procedures are adapted to assess adolescent victims of TFSA and how Internet-based information might be useful complementary data.

One of the major findings emphasizes the limited amount of research on this topic, with only six studies identified. This underscores the urgent need for increased investment in identifying and developing evidence-based forensic psychological procedures to address the complexities of TFSA (Edinburgh et al., 2015; El-Asam et al., 2021; Gemara et al., 2022; Hamilton-Giachritsis et al., 2021; Katz, 2013; Martin, 2016). In addition to being scarce, scientific interest in this field is relatively recent, with all studies published within the last decade (2013–2022). This trend aligns with expectations, linking to the significant rise in adolescents' access to and use of ICT in recent years (Ponte & Batista, 2019; Smahel et al., 2020; Vogels et al., 2022). It also mirrors the scientific community's growing recognition of the imperative to assess and intervene in the new forms of sexual abuse emerging in the digital environment (e.g., Henry & Powell, 2018; Patel & Roesch, 2022; Ringenberg et al., 2022). Israel and the United Kingdom stood out in the research encompassing four countries (El-Asam et al., 2021; Gemara et al., 2022; Hamilton-Giachritsis et al., 2021; Katz, 2013). In contrast, Fernandes et al. (2023) specifically addressed forensic interview protocols, primarily utilized in offline sexual abuse cases, and identified 146 studies conducted across 18 different countries. This highlights the critical need for cross-cultural research to understand and compare how clinical, forensic, and criminal systems refer to and assess adolescent victims of TFSA globally. Such comprehensive research, covering TFSA typologies, assessment procedures, resource availability, interdisciplinary collaboration, legal frameworks, and cultural influences on victims' recognition and children's protection, holds substantial potential to advance and enhance forensic psychological procedures for this vulnerable population amidst the escalating prevalence of this crime. Qualitative designs predominated, enabling a thorough in exploration of the complexities of TFSA, and contributing valuable insights that can inform the formulation of objectives, research questions, and hypotheses for subsequent quantitative studies (Morgan, 1998). Furthermore, there was a lack of conceptual consensus, and TFSA manifested in various forms: SE (Edinburgh et al., 2015), sexting (El-Asam et al., 2021), OSS (Gemara et al., 2022), TA-CSA (Hamilton-Giachritsis et al., 2021), Internet-related CSA (Katz., 2013), and CSAIO (Martin, 2016). The imperative next step involves establishing precise definitions for TFSA, recognizing that different typologies possess distinct characteristics (Finkelhor et al., 2022, 2023), and may co-occur (Gámez-Guadix et al., 2022; Wolak et al., 2018), requiring targeted assessment procedures.

Identified forensic psychological procedures include forensic interviews (Edinburgh et al., 2015; Gemara et al., 2022; Katz, 2013) and risk/trauma assessments (El-Asam et al., 2021; Hamilton-Giachritsis et al., 2021; Martin, 2016).

In conducting forensic interviews, standardized protocols, and appropriate principles were followed, including the NICHD Protocol (Gemara et al., 2022; Katz, 2013) and the principles of forensic interviewing outlined by Lamb et al. (1998) (Edinburg et al., 2015). Additionally, Internet-based information was addressed in all interviews. However, while questions concerning technology's role in abuse yielded new and useful information (Edinburg et al., 2015), confronting adolescents with external evidence of their abuse and encouraging them to view and discuss it negatively impacted both the quality of their testimony and their recovery process (Gemara et al., 2022; Katz, 2013).

Hence, it is recommended to adapt and adjust the NICHD Protocol to align with TFSA's cases. The interviewer should pose questions that effectively elicit new and useful information, encourage disclosure, and foster collaboration (Edinburg et al., 2015). While some questions in a forensic interview of offline child sexual abuse overlap with TFSA cases, introducing specific questions tailored to the complexities of TFSA is needed. Therefore, acknowledging that effective questioning for one type of TFSA may not be suitable for another (e.g., online solicitations have different nuances than online commercial sexual exploitation; Finkelhor et al., 2022), the potential co-occurrence of different TFSA typologies (Gámez-Guadix et al., 2022; Wolak et al., 2018), their interconnection with in-person crimes (Patchin & Hinduja, 2020; Wolak et al., 2018), and the possibility that some adolescents may be unaware they are being abused (Gemara et al., 2022) is essential in the questioning process.

Forensic interviews involving TFSA may also differ from those concerning other forms of abuse due to the presence of concrete evidence held by the interviewer (Gemara et al., 2022; Katz, 2013). In the introductory phase of the interview, where the interviewer introduces, explains the purpose of the interview, and outlines ground rules, it may be important to brief the adolescent on the typical information available in these cases, including Internet- based information. During the questioning stage, if the adolescent has not voluntarily disclosed the TFSA in response to open-ended prompts and concrete evidence needs to be addressed, confrontation contradicts best practices and should be avoided. Along with re-experiencing trauma and threatening adolescents' coping mechanisms (denial, dissociation, and identity redefinition; Gemara et al., 2022), confrontation and cross-examination can lead them to change aspects of their testimony, increasing the probability of the case being dismissed (Gemara et al., 2022; Katz & Barnetz, 2018; Zajac & Cannan, 2009). Instead, in these cases, following the Revised NICHD Protocol (Hershkowitz et al., 2014) can be more beneficial than its standard

version, as it aims to increase adolescents' emotional comfort and address reluctance to disclose. In the revised version, the rapport-building phase precedes (rather than follows) the explanation of ground rules and expectations, with added instructions for ongoing rapport-building and supportive interviewing (Hershkowitz et al., 2014) and the potential need for multiple sessions (Hershkowitz et al., 2021)

Interview recordings can also be sensitive. Studies showed that having a video camera during TFSA interviews triggered traumatic memories and caused emotional distress (e.g., "Can you turn off the camera? What is there to explain? I want to be off. I do not feel like being videotaped."; Gemara et al., 2022). Therefore, if the adolescent feels more comfortable, interviewers should opt for written transcripts or audio-only recordings. Incorporating this knowledge into forensic interview guidelines, protocols, and interviewer training is crucial for promoting clear and reliable testimonies, preventing re-traumatization, and supporting the recovery process.

TFSA also poses notable challenges in the context of risk and/or trauma assessment tools. The current tools are generally generic, primarily tailored for cases of offline child sexual abuse, often exhibiting a limited perspective, or overlooking TFSA unless explicitly disclosed, implied by a referral, or prompted by explicit safeguarding concerns (El-Asam et al., 2021; Hamilton-Giachritsis et al., 2021; Martin, 2016).

Considering that these assessments are typically at the forefront of any interaction with adolescents, the absence of routine Internet-based questions raises significant concerns (El-Asam et al., 2021; Hamilton-Giachritsis et al., 2021; Martin, 2016). A qualitative meta-analysis on facilitators of child sexual abuse disclosure highlighted the importance of professionals and adults engaging with children question them about their lives and well-being. This approach fosters opportunities for children to disclose, facilitates their access to someone they can trust, ensures that they will be taken seriously, and helps them recognize that the abuse is not normal (Brennan & McElvaney, 2020). Therefore, there is a considerable probability that all of this has been compromised with potential TFSA victims simply because they were never questioned about their experiences. To address this, it is imperative to involve multidisciplinary teams in identifying needs and developing evidence-based procedures. Recommendations include incorporating the digital environment as a new system in the ecology of the adolescent (Bronfenbrenner, 1979; Johnson, 2010; Martin, 2016) and formulating questions about various aspects of online activities, online risks (such as content, contact, conduct, and commercialism; Livingstone & Haddon, 2009), digital skills, and parental mediation strategies.

While the presence of well-trained frontline members on TFSA is crucial, professionals uniformly acknowledge a lack of training (El-Asam et al., 2021; Hamilton-Giachritsis et al., 2021;

Martin, 2016). Noteworthy initiatives, such as the 'Click: Path to Protection' interdisciplinary training program developed by the Marie Collins Foundation in the UK, have emerged and appear to be a valuable recommendation to begin addressing the training gap. In a recent evaluation, professionals who completed this program reported increases in their knowledge and self- confidence in assessing risk and working with children who have experienced TFSA (Bond & Dogaru, 2019). These initiatives may also play a crucial role in mitigating harmful beliefs, attitudes, and practices, as highlighted in Hamilton-Giachritsis et al. (2021), where TFSA is sometimes perceived as a less immediate concern with lower impact, and blame may occasionally be attributed to victims within organizations (secondary victimization).

Furthermore, the limited understanding of TFSA, inadequately focused assessment tools, and a lack of tailored specialist training may also result from broader structural challenges in services. This includes poor or simplistic databases and systems, the absence of referral mechanisms for evidence related to online risks, a lack of multi- agency collaboration on adolescents' digital lives, and a deficiency in saving and sharing evidence (El-Asam et al., 2021). While these macro-organizational issues are beyond the article's scope, they are crucial and should be addressed, as they may hamper the identification of TFSA cases, leading to missed assessment opportunities and impacting subsequent referrals and treatment plans.

## Limitations

This scoping review has specific limitations that should be considered in the design of future research studies. Firstly, it focused on adolescents, leading to the inclusion of studies with victims primarily in this age group, though some included children. This focus might limit the studies identified, potentially overlooking literature exclusively featuring children. Secondly, data collection was confined to English, Spanish, or Portuguese peer-reviewed studies, which may result in the omission of valuable insights from other languages or literature that did not report empirical results. Thirdly, the review concentrated on assessment procedures. Exploring the effectiveness of these procedures and broadening the focus to include therapeutic interventions for victims of TFSA (refer to trauma treatment approaches to victims of CSAIO in Martin, 2016) could be helpful.

## Conclusion

The emergence of TFSA among adolescents has added another layer of complexity to forensic psychological procedures, requiring careful consideration. The absence of standardized, evidence-

based guidelines or specific protocols for assessing TFSA, coupled with a lack of specialized training, leaves interviewers/professionals inadequately prepared to deal with TFSA cases. The main goal of these procedures and practices should be to obtain necessary information while fostering trusting relationships with adolescents, guiding the practices based on their vulnerabilities and needs, and establishing a child-friendly environment. In forensic interviews, adapting the NICHD Protocol to align with TFSA's cases, formulating open-ended and targeted questions, exercising caution when presenting concrete evidence of the abuse, considering the use of the Revised NICHD Protocol, exploring alternative methods to record testimony, and being attuned to the victim's emotional state are crucial aspects. TFSA should be systematically integrated into risk and trauma assessments, incorporating questions about adolescents' digital lives while enhancing knowledge, confidence, and mitigating the harmful beliefs, attitudes, and practices of the professionals. It is crucial to note that, while in this study, Internet-based information as complementary data was in the form of questions or concrete evidence related to TFSA (e.g., conversations, pictures), recent literature has explored how consult clients' social networking sites can serve as valuable collateral sources in forensic psychological assessments (Coffey et al., 2018; Pirelli et al., 2016). Among preliminary recommendations, the authors suggest that the use of this information should be approached on a case-by-case basis, carefully weighing its potential usefulness against harmful effects, and disclosing this to the examinee during the informed consent process (Coffey et al., 2018; Pirelli et al., 2016). Crucial to guiding all these decisions is the ongoing investment in the professional development of interviewers/professionals in forensic assessment, child protection, victim-centered care, cultural competencies, and trauma-informed care. Efforts should be undertaken for the development and implementation of forensic psychological procedures and practices for the identification, protection, and treatment of victims; the prosecution and resocialization of perpetrators; the rapid removal of abusive material from online platforms; informed and targeted clinic, forensic, and criminal interventions; and enhanced public awareness. Refining a whole-of-society strategic response will be needed to ensure progress on such fronts.

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# INTEGRATIVE DISCUSSION

This dissertation aims to advance scientific knowledge on TFDA – a field with some international gaps and still in its early stages in Portugal – by addressing the following research priorities:

1) From the measurement to the correlates of victimization and perpetration (Chapter I): Validation of a scale for assessing TFDA victimization and perpetration, along with the estimation of prevalence rates and analysis of socio-ecological correlates.

2) Bystander intervention (Chapters II, III, and IV): Validation of a scale for assessing adolescent bystanders' detection of opportunities to intervene in TFSDA, along with examining their intentions to help victims and their actual intervention behaviors.

3) Forensic psychological procedures (Chapter V): Examination of whether and how forensic psychological procedures are adapted to assess adolescent victims of technology-facilitated sexual abuse and how Internet-based information might be useful as complementary data.

Collectively, these research priorities contribute to a nuanced and comprehensive understanding of TFDA, providing a foundation for the development of holistic and evidence-based prevention strategies.

The following integrative discussion is structured around key findings and implications, strengths, limitations, directions for future research, and final remarks.

## Key findings and implications

The specific findings of each chapter have already been discussed in detail. This section aims to highlight the key findings and implications across the three interconnected research priorities and emphasize how they integrate and complement one another.

1) From the measurement to the correlates of victimization and perpetration: The TAR scale is suitable for use in Portugal. TFDA is prevalent, bidirectional – with monitoring/control behaviors standing out – and it is related to different areas of adolescents' lives.

> "*It's Materially Impossible to Control a Person like That, without Social [Media] ... A girl was so jealous that had me download an app to check where I was and what percentage the phone battery was ... I had her Instagram [account] and she had mine. [...] If I have to give her my password, and she doesn't give me hers [...] it means [she's] hiding something.*"
>
> (Belotti et al., 2022, p. 41, 43, 44)

Chapter I showed that the TAR scale has adequate psychometric properties, supports Brown and Hegarty's (2021) original structure – Humiliation, Monitoring/Control, Sexual Coercion, and Threats – holds promise for clinical, forensic, and research applications in assessing TFDA victimization and perpetration, potentially allowing for a better understanding of prevalence, etiology, and consequences, earlier identification and referral of victims and perpetrators, the development of evidence-based prevention strategies, more targeted resource allocation, and greater public awareness.

TFDA emerged as both prevalent and bidirectional. While these findings do not permit a reliable comparison with national reports (e.g., UMAR, 2025) – as the TAR scale captures a broader range of abusive behaviors and roles – they align with international studies (e.g., Ellyson et al., 2021; Stonard, 2021; Zweig et al., 2013) and underscore the need to reconsider traditional victimology and criminology paradigms that dichotomize individuals as either victims or perpetrators (Jennings et al., 2012), given the frequent victim–perpetrator overlap observed in such forms of violence (e.g., Vale et al., 2018).

Monitoring/control behaviors – particularly among cisgender girls – underscore the need to challenge their normalization as expressions of love, trust, and commitment (e.g., Baker & Carreño, 2016; Lucero et al., 2014), and to critically examine how heteronormative gender roles may reinforce these patterns. Adolescents aged 14-16 emerged as especially vulnerable – particularly to sexual coercion – suggesting a period of heightened risk (e.g., Connolly et al., 2014; Lenhart et al., 2015; Thulin et al., 2022; Widman et al., 2021) and developmental window in which prevention efforts should be intensified, incorporating content on sexual consent, sexting, digital boundaries, and (un)healthy dating relationships. TFDA may contribute to diminished self-esteem and HRQoL (e.g., Ortega-Barón et al., 2022; Smith et al., 2018) – including physical and psychological well-being, autonomy and parent relations, peers and social support, and the school environment – while adolescents with pre-existing vulnerabilities may also be at greater risk of involvement. Programming should be multi-dimensional, addressing both the causes and consequences of TFDA while also supporting adolescents' overall well-being. Finally, the co-occurrence of TFDA and in-person dating violence (e.g., Rodríguez-deArriba et al., 2024) points to the need for holistic approaches that acknowledge and address their interdependence.

2) Bystander intervention: Part of "becoming a better bystander" involves understanding which opportunities to intervene are detected, what motivates adolescents' intentions, and how they choose to intervene – each shaped by individual, relational, and contextual factors.

> *"I don't think it ever gets easier to take the risk and try and do the right thing. But if you do take the risk to try and help then you'll feel more rewarded as a person. It's not like being rewarded like by the school or by your peers but being better with yourself"*
>
> (Casey et al., 2017, p. 10).

Chapter II demonstrated that the Scale for Reactive Bystander Opportunity Detection in TFSDA has adequate psychometric properties and achieved measurement invariance across gender and age groups, supporting its use across diverse adolescent populations. Notably, while the original TAR scale (Brown & Hegarty, 2021) grouped sexually abusive behaviors under a single factor – Sexual Coercion (see Chapter I) – the bystander version revealed a two-factor structure: Sexual Coercion and Image-Based Sexual Harassment/Abuse. This distinction suggests that adolescents perceive and categorize abusive behaviors differently when observing them in others, likely due to differences in visibility and situational context. Importantly, the scale – innovative at both the national and international levels – holds promise for enabling a more nuanced understanding of bystander intervention opportunities, intentions, and behaviors, as well as for informing the development of tailored, evidence-based prevention strategies.

Detection of intervention opportunities varied by behavior type and individual characteristics. Image-Based Sexual Harassment/Abuse – being more publicly visible and apparently more prevalent (see Chapter I) – was more frequently identified than Sexual Coercion, which typically occurs in private and directly targets the victim (Fernet et al., 2019; Naezer & van Oosterhout, 2021; Van Ouytsel et al., 2016). These differences underscore the need for behavior-specific bystander approaches: promoting awareness, empathy, and reporting mechanisms in Image-Based Sexual Harassment/Abuse, while fostering safe disclosure environments in cases of Sexual Coercion. Specifically, for cisgender girls, social pressure to engage in sexualized behaviors may coexist with silence and fear of stigma or blame (Naezer & van Oosterhout, 2021), contributing to lower detection of Image-Based Sexual Harassment/Abuse—even among those most affected. In contrast, cisgender boys may receive social reinforcement for sharing such content within peer groups (Lucero et al., 2014; Van Ouytsel et al., 2016), contributing to higher detection. Older adolescents, compared to younger ones, showed slightly

higher detection, likely reflecting a period of heightened risk, exploration, and developmental gains in empathy and prosocial behaviors (Connolly et al., 2014; Padilla-Walker et al., 2018; Sánchez-Jiménez et al., 2023; Spear, 2000; Van der Graaff et al., 2014). Additionally, adolescents with personal experience of TFSDA demonstrated greater recognition, suggesting that lived experience may enhance situational awareness and emotional sensitivity (Banyard et al., 2025). These findings highlight the need for tiered bystander interventions: awareness-raising for those with lower detection and skills-based training for those with higher detection of opportunities to intervene in TFSDA.

Chapter III confirmed the relevance of the TPB in predicting adolescents' intentions to help victims of TFSDA. Favorable attitudes, supportive subjective norms – from parents, friends, teachers, and community members – and greater perceived behavioral control all significantly contributed to helping intentions, consistent with findings in other phenomena (e.g., Branscum et al., 2022; Brehmer, 2023; Casey et al., 2017; DeSmet et al., 2016; Hayashi & Tahmasbi, 2022; Lemay et al., 2017; Maes et al., 2024). These findings support prevention efforts that reinforce the personal, social, and legal responsibility of helping, establish it as a social norm, and equip adolescents with the knowledge, skills, and confidence to intervene.

Being a cisgender girl and having higher empathy were both directly and indirectly associated with helping intentions through TPB components. Girls are often socialized to be more empathetic and emotionally supportive (Eagly, 2009; Hill & Lynch, 1983) – traits reflected in helping behaviors measured as perceived behavioral control (e.g., offering support, advice, or encouraging help-seeking). Witnessing or anticipating others' suffering may evoke either self-focused discomfort or other-focused empathy, both of which can motivate intervention (Batson et al., 1987). Prior victimization – more frequent among girls (Chapter I) and linked to higher detection of intervention opportunities (Chapter II) – had complex effects: it was positively associated with attitudes but negatively with subjective norms and perceived control. While victimization may increase empathy, negative social responses such as victim-blaming, bystander inaction, and unprepared professionals (e.g., Barrense-Dias et al., 2024; Naezer et al., 2021), along with learned helplessness (Peterson & Seligman, 1983) or experiential avoidance (Hayes et al., 2004), may reduce adolescents' confidence and perceived support to intervene. Together, these findings underscore the need for gender-sensitive, empathy-based, and trauma-informed prevention strategies.

Chapter IV identified four bystander classes in response to TFSDA, each reflecting differences in intra-individual factors, event-related characteristics, and perceived outcomes, in line with Banyard's (2015) Bystander Action Coils Model. Among these, *Victim-Centered Helpers* and *Comprehensive*

*Helpers* were more likely to be cisgender girls (younger or older), identify as LGB+, report prior victimization, show higher empathy, recognize TFSDA as inappropriate, engage in proactive actionism, know the victim (typically a cisgender girl), perceive the perpetrator as responsible, feel sadness for the victim and anger toward the perpetrator, and report more positive feelings about their intervention. In contrast, *Inconsistent bystanders* were more likely to identify as LGB+, report prior victimization, tend to know the perpetrator, and were less likely to recognize TFSDA as inappropriate. *Passive bystanders* were more likely to be cisgender, heterosexual boys, and non-victims, and reported limited knowledge of those involved or responsible, lower empathy levels, less proactive actionism, and fewer positive feelings in response to their lack of intervention.

Therefore, prevention efforts should be (a) tailored to different bystander roles – *Victim-Centered* and *Comprehensive Helpers* may benefit from training on when formal intervention is necessary and how to ensure their actions remain constructive. *Inconsistent bystanders* should be equipped with skills that encourage consistent helping. *Passive bystanders* may require foundational education on TFSDA literacy and socio-emotional skill-building; (b) gender sensitive, recognizing that girls are more often socialized to be empathetic and supportive—traits aligned with the helping behaviors measured—while boys may favor help in heroic/assertive actions, downplay abuse, and gain social status through inaction (Eagly, 2009; Hill & Lynch, 1983; Ringrose et al., 2022); (c) age-appropriate, given that prosocial behavior tends to increase with developmental maturity, underscoring the importance of timely and targeted interventions (Padilla-Walker et al., 2018; Van Cleemput et al., 2014); (d) intersectional and trauma-informed, as identifying as a sexual minority or experiencing prior victimization can enhance empathy and motivation to help, but also lead to inconsistent responses due to fear of retaliation, emotional distress, or negative past experiences (Banyard, 2015; Staub & Vollhardt, 2008); (e) empathy-based, since witnessing suffering can elicit both self- and other-focused empathy, which may drive motivation to help (Batson et al., 1987); (f) tiered by readiness, with adolescents who already recognize TFSDA as inappropriate and engage in proactive actionism being suitable for skills-based training and peer leadership roles, while others may first need foundational awareness (Banyard, 2015; Prochaska et al., 2015; Rogers, 2002); (g) context-sensitive, addressing gender bias in the recognition of TFSDA, reinforcing that helping is valuable regardless of personal connection, challenge potential victim-blaming attitudes and reinforce perpetrator accountability (e.g., Banyard, 2015; Casey et al., 2017; Edwards et al., 2015; Weiner et al., 2018); and (h) reinforce the emotional benefits of helping, while addressing potential adverse outcomes to sustain future engagement (Banyard, 2015)

3) Forensic psychological procedures: Two types of forensic psychological procedures were identified: forensic interviews and risk/trauma assessments. Internet-based information was used in interviews – though in some cases inappropriately or unethically – and rarely considered in assessments.

*"[Forensic interviewer]: Why don't you want to look at the pictures? It will help you remember. [Adolescent]: It won't help me. Just the opposite, it will frighten me." (Gemara, et al., 2022 p.7)*

*"[Practitioner in child protection]: We are relying on the child to tell, so not knowing to ask the question ... we probably don't ask enough."*

(Martin, 2016, p. 377).

Forensic interviews followed the National Institute for Child Health and Human Development (NICHD) Protocol or general principles of forensic interviewing outlined by Lamb et al. (1998), which were originally developed for offline child sexual abuse and are not fully adapted to the unique characteristics of TFSA (Edinburgh et al., 2015; Gemara et al., 2022; Katz, 2013). While asking how technology may have facilitated abuse proved useful (Edinburgh et al., 2015), confronting adolescents with evidence of their abuse – particularly when disclosure had not occurred spontaneously – had detrimental effects on both their testimony and recovery (Gemara et al., 2022; Katz, 2013). To address this, it is recommended that the NICHD Protocol be adapted to incorporate open-ended, TFSA-specific questions, while acknowledging that effective questioning must be tailored to the nuances of different TFSA typologies (e.g., online solicitations have different nuances than online commercial sexual exploitation; Finkelhor et al., 2022). In cases where disclosure is absent but concrete evidence must be addressed, the Revised NICHD Protocol (Hershkowitz et al., 2014) may be more appropriate, as it emphasizes rapport-building and emotional support. Additional findings indicate that some adolescents may be unaware they are being abused and that the use of standard interview recordings (e.g., video) may elicit traumatic responses (Gemara et al., 2022). These considerations further underscore the importance of adopting trauma-informed and context-sensitive procedures in the forensic assessment of adolescent victims of TFSA.

Similarly, risk and trauma assessments were found to be generic and largely modeled on cases of offline child sexual abuse (El-Asam et al., 2021; Hamilton-Giachritsis et al., 2021; Martin, 2016). These tools tend to overlook TFSA unless it is explicitly disclosed, suggested by a referral, or prompted by explicit safeguarding concerns. Professionals also reported a lack of specific training and confidence

in recognizing and responding to TFSA (El-Asam et al., 2021; Hamilton-Giachritsis et al., 2021; Martin, 2016). Consequently, many adolescents' victims may remain hidden simply because their digital experiences were never explored. Improving identification and support for TFSA victims requires the integration of questions about adolescents' online lives into assessment procedures. It also calls for enhanced training to build professionals' knowledge, confidence, and sensitivity – particularly in addressing the beliefs and practices that may perpetuate secondary victimization.

### Strengths, limitations, and directions for future research

Major contributions of this dissertation are at the assessment level, with the establishment of two valid and reliable Portuguese measures – one for assessing TFDA victimization and perpetration and another for evaluating bystanders' detection of opportunities to intervene in TFSDA; at the conceptual level, with the empirical test of the TPB in predicting adolescents' intentions to help victims of TFSDA and proposal of an ecological approach to explain bystander behavior; and at the intervention level, with the review of existing forensic psychological procedures for managing TFSA cases.

Nonetheless, some important limitations should be noted, providing directions for future research:

a) The cross-sectional design limits causal inferences. Longitudinal studies would be especially valuable for describing developmental patterns and identifying risk and protective factors over time, thereby improving our understanding of causes and consequences.

b) Qualitative or mixed-method approaches – such as interviews or focus groups – could complement quantitative findings to gain deeper insight into adolescents' experiences.

c) The use of a convenience, school-based sample of adolescents aged 12–18, coupled with limited diversity in gender, ethnicity, and sexual orientation, restricts the representativeness of the findings and limits generalizability. Future studies should strive for broader and more diverse samples, including forensic samples, to capture a wider range of experiences and needs.

d) The questionnaire's length may have contributed to missing data. Moreover, it did not include attention or social desirability checks, and some items lacked gender-inclusive language (e.g., using "he/she" rather than "they"). Addressing these issues in future research could enhance participation rates and ensure more accurate representation.

e) All measures relied on self-report, which may have been affected by recall bias and social desirability effects, potentially leading to underreporting or overreporting of experiences.

f) Although two existing scales were adapted and validated for use in Portugal as part of this thesis, certain limitations warrant further consideration: the fast-changing nature of digital technologies may outpace current items; adolescents were asked about specific behaviors rather than identifying as victims, perpetrators, or bystanders; some participants may have interpreted behaviors differently than intended; and the 12-month recall period may overlook relevant lifetime experiences. Future research should aim to replicate these findings, further examine the psychometric properties of the scales (e.g., measurement invariance across gender and age in the TAR scale), adapt/validate short versions of these scales, and incorporate alternative sources of information, such as dyadic data from both partners in the context of victimization and perpetration or observational methods to assess bystander behavior.

g) While this thesis provides some initial insights into TFDA victimization and perpetration, a cross-country, longitudinal, and multi-year study would be valuable to produce an integrative mapping of TFDA, encompassing its prevalence, characterization, causal relationships with risk and protective factors, and the aftermath of TFDA incidents—including adolescents' coping strategies, help-seeking behaviors, perceived barriers to disclosure, and the short- and long-term consequences experienced by victims and perpetrators.

h) Building on the initial insights gained into bystander intervention in the context of TFSDA, future research should, for instance, further explore various correlates of the detection of intervention opportunities, test the TPB among adolescents who have actually witnessed TFSDA incidents, with particular attention to the pathways between intention and behavior, and collect contextual details about bystander interventions, such as how the bystander witnessed or became aware of the incident, when and where the intervention occurred, whether others were present, and how helpful the intervention was, ideally also including the perspectives of those who received or witnessed the intervention. In addition, future studies should explore the roles and responses of other potential bystanders (e.g., adults, teachers, school personnel) to better understand the broader network of intervention opportunities.

i) Moving beyond understanding, future research should focus on the development, implementation, and evaluation of prevention programs targeting all adolescents, recognizing that some may be victims, perpetrators, and bystanders.

j) Future studies should investigate the beliefs, attitudes, practices, procedures, and needs of professionals involved in working with children and adolescents. Specific attention should be given to adapting forensic interview protocols to address TFSA, systematically integrating the exploration of

adolescents' online experiences into risk and trauma assessments, and enhancing professional training to better identify, assess, interview, and support victims.

## Final remarks

This dissertation underscores the urgent need for a comprehensive, society-wide response to TFDA, mobilizing adolescents, families, educators, professionals, and policymakers in a unified effort.

Parents and caregivers need to promote a warm and responsive home environment, encourage open dialogue about intimacy, boundaries, and (un)healthy dating relationships, foster trust-based monitoring of digital lives, and support adolescents in navigating their experiences—whether as victims, perpetrators, or bystanders. Schools also have responsibilities. School climate should foster a culture of respect, safety, non-violence, and shared responsibility in helping others. School personnel – including teachers, counselors, and administrators – should be approachable and trained on identifying signs of TFDA, responding appropriately to disclosures, and supporting victims, perpetrators, and bystanders sensitively. It could be important to designate a few trained point-persons (e.g., school psychologists) responsible for managing these incidents and referrals. Evidence-informed curricula and prevention programs are also crucial. WHO (2022) recommends that programs need to have various sessions and modalities and should highlight acquiring and practicing skills, including emotional regulation, assertiveness, problem-solving, conflict resolution, empathy, perspective-taking, help-seeking and bystander intervention, including content about (un)healthy dating relationships, consent, and boundaries. Peer-led groups and parent-school partnership initiatives can also be beneficial. Overall, teachers, health professionals, psychologists, criminologists, police officers, prosecutors, and judges should invest in training and expand their knowledge of TFDA – particularly in light of potential generational digital gaps. They should respond in a non-critical and respectful manner, avoid victim-blaming attitudes, adopt an intersectional and trauma-informed approach in their practices, and rely on evidence-based procedures. In addition, forensic psychological procedures – including forensic interviews, risk and trauma assessments – must be updated to reflect the specific challenges of TFDA. Likewise, technological industries must redesign platforms with long-term solutions to anticipate, classify, report, and mitigate TFDA in a timely and effective manner. Lawmakers should seek to update and enforce laws discouraging these behaviors, holding individuals criminally responsible, and promoting the social reintegration of perpetrators to prevent revictimization experiences. Social organizations should persist in addressing TFDA in their initiatives. At the same time, media campaigns

should sensitize the public with appropriate information and language, including victim's rights, legal proceedings, and available services.

In conclusion, to efficiently combat this urgent societal issue, all communities must consider TDFA fundamental priority and place it at the forefront of their scholarly, practical, scientific, media, political, and public agendas. Such a collective effort is essential to protect adolescents during this critical developmental stage, foster healthy adult relationships, reduce the tolerance of TFSDA, cultivate a shared responsibility for helping victims, and dissuade perpetrators.

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