

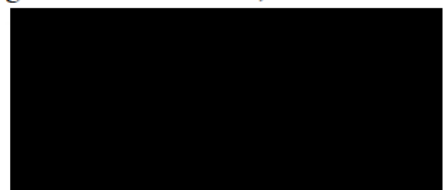
MASARYK UNIVERSITY
Faculty of Social Studies

Growing Up in the Age of Sexualized Internet Content

Habilitation Thesis

Brno 2019

Mgr. Anna Ševčíková, Ph.D.



Abstract

This habilitation thesis presents research on the exposure of adolescents to online sexual images. It notes that access to sexual content has dramatically changed with the introduction of the internet into everyday life: sexual images are more available; they can be accessed in an anonymous or private setting; and they are easily created and shared. In this respect, adolescents may seek them, but also encounter them unintentionally. This diversity of exposure is taken into consideration as part of the investigation into how seeing and sending sexual images is embedded within adolescent psychosexual development. The Differential Susceptibility to Media Effects Model frames the six distinct published studies of this thesis. The study aims to uncover the psychosocial characteristics responsible for exposure to online sexual content and exchanging sexual images at a young age; how this young generation approaches online sexual images; and how sexualized internet content affects them. Data comes from the EU Kids Online II project, a Czech project on internet-related addictive behaviors, and a Czech longitudinal panel study on the online risks among adolescents that together suggest that (1) the sexual double standard makes girls and boys approach online sexual material in a different way; (2) adolescents' use of online sexual images varies depending on their developmental needs and tasks; and (3) using online sexual stimuli in line with psychosexual development may later produce the gender-specific risk of the compulsive use of internet pornography among young men, indicating that the developmental perspective that reflects social and cultural norms may present a promising approach for understanding the patterns and effects of exposure to online sexual images at a young age.

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Introduction

Consuming pictures and stories related to erotica and pornography has a long tradition. It is the medium itself and the related technology that has been continuously changing such that it may qualitatively and quantitatively alter the accessibility of the sexual content. When I was a teen, there were only a handful sources that provided information about love, erotic stories, and pictures of reproductive organs and their names in standard language (although not always correctly, since the vulva has chronically been mistaken for the vagina). If I was exposed to so-called hardcore material, it was accidental because their owners had not properly hidden it in their home.

My experience is not shared by the young generation that is now growing up in the age of high-speed internet. The internet, along with digital, portable devices, has entirely changed access to sexual content. It has made it more affordable and more available; it has made exposure more anonymous and private; and it has made the line between exposure, production, and the circulation of sexual content blurrier than ever, because one can easily create sexual material and share it (see Cooper, 1998; Cooper & Griffin-Shelley, 2002). Not surprisingly, how these significant changes affect adolescents and their development has become an issue of public concern, and this concern can be accentuated by the fact that adolescence is a period during which interest in romantic relationships and sex becomes salient (Connolly & Goldberg, 1999; Furman & Werner, 1997; Weinstein & Rosen, 1991; Weiss & Zvěřina, 2004).

Setting the problem by rethinking terminology

This brief description of how technological innovations have substantially modified access to sexual content also suggests that shedding light on the possible impact of internet use on adolescent psychosexual development may be challenging.

There are a few shifts in terminology with relation to online sexual content. The first concerns the topic of pornography use. Since most pornography is currently accessed through the internet, many empirical studies have focused on internet pornography in adolescence by asking young people about their experience with online pornography or accessing X-rated websites (Arrington-Sanders, Harper, Morgan, Ogunbajo, Trent, & Fortenberry, 2015; Chen, Leung, Chen, & Yang, 2013; Doornwaard, van den Eijnden, Overbeek, & ter Bogt, 2015;

Flood, 2007; Hardy, Steelman, Coyne, & Ridge, 2013; Lo, & Wei, 2005; Löfgren-Mårtenson, & Månsson, 2010; Luder, Pittet, Berchtold, Akre, Michaud, & Suris, 2011; Mattebo, Tydén, Häggström-Nordin, Nilsson, & Larsson, 2013; Mesch, 2009; Van Ouytsel, Ponnet, & Walrave, 2014; Weber, Quiring, & Daschmann, 2012).

However, a large amount of research has taken into account that adolescents might not necessarily be familiar or comfortable with the term “pornography”. In addition, pornographic content may not only be accessed through X-rated websites but also through other channels, such as peer-to-peer file sharing websites and during communication on social networking sites (Livingstone, Haddon, Görzig, Ólafsson, 2011; Ševčíková, Simon, Daneback, Kvapilík, 2015; Wolak, Mitchell, & Finkelhor, 2007). Therefore, researchers have avoided the term pornography and examined experience with sexually explicit internet materials (i.e., having seen pictures/videos with clearly exposed genitals or pictures/videos in which people are having sex; Beyens, Vandenbosch, & Eggermont, 2015; Peter & Valkenburg, 2008-2011; To, Iu Kan, & Ngai, 2015; Vandenbosch, & Eggermont, 2013; Wolak et al., 2007; Ybarra, & Mitchell, 2005).

Shifting the research focus to even younger internet users and their experience with sexual content has resulted in further de-explicitation of the term. In order to make research instruments more comprehensible to early adolescent girls and boys, some scholars have opted to use a more general term for exposure to online sexual materials/images since seeing obviously sexual content or naked bodies represents the basis for the research focus (see Livingstone et al., 2011 - the EU Kids Online Project or Youth Internet Safety Survey).

Another, more profound terminology shift consists of both (1) the differentiation of wanted and unwanted or, equivalently, intentional and unintentional exposure¹, and (2) the subsequent preference for the exposure term over those indicating intentionality, such as online sexual material use or consumption. Specifically, the Youth Internet Safety Survey led by David Finkelhor (Wolak, Mitchell, & Finkelhor, 2007) was the pioneering research project which has taken the specifics of the internet into consideration and examined wanted and unwanted exposure to online sexual material even in early adolescence. Worth mentioning is that this altered reasoning for how and who may be exposed to sexual content on the internet at a young age has been accepted by the research community and subsequently elaborated upon in national and international research projects (including EU Kids Online II).

¹ Both the terms un/wanted and un/intentional exposure to sexual content are used interchangeably in this habilitation thesis.

Last but not least, it may be argued that another reconceptualization of the exposure to online sexual content has occurred due to technological changes. Some young internet users also encounter sexual content via recent technological innovations, such as on communication platforms (Livingstone, Haddon, Görzig, Ólafsson, 2011; Wolak et al., 2007) or by using technological advances for the creation and circulation of sexual images themselves – so-called sexting. In this respect, digital devices, along with communication platforms, have expanded the sources for exposure to sexual content since one may intentionally or unintentionally see sexual images in a received sext² (Döring, 2014; Krieger, 2017; Mascheroni & Ólafsson, 2014).

Rethinking the terminology used with respect to seeing online sexual images at a young age is also relevant because a substantial proportion of exposure is unintentional (Chen et al., 2013; Luder, 2011; Wolak et al., 2007). It would be appropriate to note the prevalence rates of exposure to sexual images in general. However, a recent systematic review of this issue concludes that the rates differ greatly due to the diversity in the methodology, the technological changes, and the cultural context (Peter & Valkenburg, 2016). Therefore, information on the prevalence might lead to misleading conclusions.

Psychosexual development in adolescence

Adolescence is a period in which individuals experience fundamental changes, fulfill developmental tasks within the contexts which surround them (Havighurst, 1948; Macek, 2003). Generally speaking, they are expected to use their emotional and cognitive capacity to establish and maintain relations with their peers and to acquire experience with erotic relationship and prepare for a partner relationship and family life. They fulfill this task by a gradual reorientation of their attention from relationships with care-givers (e.g., parents) to peer relationships (Sirucek & Siruckova, 2006, Umemura, Lacinová, Kraus, Horská, & Pivodová, 2018) as well as from same sex peer groups to romantic relationships (Brown, 1999; Connolly & Goldberg, 1999; Umemura et al., 2018). This reorientation process occurs within three distinct developmental stages: early (11-13 years), middle (14-16 years), and late adolescence (17-20 years). Each stage is bounded with other tasks and needs that encompass, for instance, building self-image, developing competencies in early adolescence, achieving status and popularity in early and middle adolescence, or building a deeper, more sustained

² A sext refers to a sexually related message that includes sexual images (Ringrose, Harvey, Gill, & Livingstone, 2013).

level of romantic relationships in later adolescence (Brown, 1999; Tarrant, MacKenzie, & Hewitt, 2006), indicating that dealing with dramatic physiological changes, the emergence of sexual urges, and one's own or others' sexual interests constitute one of many developmental tasks or challenges. This finding has an important implication for understanding sexual expression (e.g., sexual interest or sexual behavior) in adolescence. More precisely, Gagnon and Simon (2011) have noticed that sexual behavior may have various functions that might not necessarily be connected to libido. This implies that engaging in sexual activities might serve for attaining other goals (Byers, Wang, Harvey, Wenzel, & Sprecher, 2004; Gagnon & Simon, 2011; Lawrence & Byers, 1995).

Associations of online exposure to sexual content and psychosexual development

In my research work I have adopted the Differential Susceptibility to Media Effects Model developed by Valkenburg and Peter (2013) in order to examine the associations between online exposure to sexual content and psychosexual development in adolescence. This model holds that individuals are selective in their media use, some individuals tend to be more susceptible to media effects than others, and some media effects can be enhanced or counteracted. The Differential Susceptibility to Media Effects Model is grounded in four key propositions.

The first (I) states that media effects depend on three types of differential susceptibility categories that constitute dispositional, developmental, and social variables. In other words, the selection and responsiveness to media are shaped by (1) dispositional variables like person-related dimensions (e.g., gender, temperament, motivations, mood), (2) the developmental level of cognition and the emotion processing of social interaction (indicating stronger media effect susceptibility in adolescence than in middle or later adulthood), and finally by (3) interpersonal, institutional, and societal contexts (e.g., boys are more likely to intentionally seek online pornography, and male peer groups may exert pressure (Peter & Valkenburg, 2016) on adolescent boys to be sexually experienced and knowledgeable about sexuality (Gagnon, & Simon, 2011).

The second proposition (II) includes the statement that cognitive, emotional, and excitative response states mediate the relationship between media use and its effects. The way media are processed depends on the extent to which adolescents pay attention to the media content, how effectively they respond to the materials, and on the degree of physiological arousal in response to media (i.e., liking pornography content mediates the relationship

between pornography consumption and the notion of women as sex objects (Peter & Valkenburg, 2009)).

The third proposition (III) is based on the claim that the differential susceptibility variables introduced in proposition I may act as both predictors of media use and moderators of the effect of the media use on media response states. In other words, media (i.e., the way the content is presented) influences media response states, but dispositional, developmental, and social-context variables may influence the way adolescents respond to the media and stimulate or reduce the media effects (e.g., physiological arousal is more likely to be activated with pornography consumption among boys than girls (Mosher, & MacIan, 1994)).

The fourth proposition (IV) states that the media effects are transactional, indicating that they may influence media use, including the media response states and differential-susceptibility variables (e.g., enhance the preference for pornography use, alter the level of experienced physiological arousal, or accelerate psychosexual development).

The Differential Susceptibility to Media Effects Model is a complex theoretical framework that integrates partial theories (see Valkenburg & Peter, 2013) and findings by outlining relationships among predictors, mediators, moderators, and media effects. This model has also been introduced in order to delineate areas in which a research focus for my studies is embedded. Moreover, the following section succinctly describes the contexts – state of the art- within which my selected research is settled.

The focus of the present research

There is accumulating evidence that frequent pornography use may alter sexually related attitudes, beliefs, and sexual behavior. There is also robust evidence that frequent pornography consumption is typical for adolescent boys, pubertally more advanced adolescents, those scoring high on a sensation-seeking scale, and young internet users with a less functional family (Peter & Valkenburg, 2016). Worth mentioning is that very similar findings were found in a representative study of Czech youth; more specifically, older adolescents, boys, sensation-seekers, and excessive internet users are prone to being frequent users of online sexual material (Ševčíková, Šerek, Macháčková, & Šmahel, 2013). However, the intentionality of seeing sexual images has scarcely been taken into consideration and very little is known about the predictors of unwanted exposure to online sexual material (Hardy et al., 2013; Wolak et al., 2007; Luder et al., 2011). Moreover, there is a limited number of studies that have simultaneously examined both unintentional and intentional exposure to sexual content on the internet and systematically analyzed the dispositional, developmental,

and social predictors, and, in addition, paid attention to the societal context. This focus is needed in order to identify the factors that may increase the probability of unwanted and wanted exposure to sexual images and accordingly shape preventive measurements that may reduce unwanted exposure or counteract the media effects of the exposure to sexual images on the internet. Furthermore, an analysis of the factors related to the societal context may provide us with a greater understanding of how social milieu may shape adolescents' contact with sexual content on the internet. These under-researched issues have been addressed in **Study I**, entitled "The Roles of Individual Characteristics and Liberalism in Intentional and Unintentional Exposure to Online Sexual Material Among European Youth: A Multilevel Approach".

Irrespective of the intentionality of the exposure to online sexual material, there is strong evidence that adolescents are more likely to see this content with age (Peter & Valkenburg, 2016), suggesting that psychosocial maturation may affect the way adolescents use digital devices and the internet³. Prior research, particularly qualitative studies, provides a valuable insight into the way adolescents consume predominantly sexually explicit material (e.g., familiarization with sexual organs, function, performance, scripts), interpret them (e.g., too rough or unrealistic), and incorporate them in their sexual life (e.g., modeling sexual behavior seen on the internet) (Arrington-Sanders, et al., 2015; Löfgren-Mårtenson, & Månsson, 2010; Mattebo, Larsson, Tydén, Olsson, & Häggström-Nordin, 2012; Sabina, Wolak, & Finkelhor, 2008). However, we know little about how pornography use varies with age. More precisely, what remains largely unexplored are the age differences in watching pornography in various social settings and communicating about these experiences, as well as the age differences for the reasons for watching pornography. Again, this knowledge may help to better tailor education programs for the sexual health of youth. To fill this knowledge gap, we conducted **Study II**, entitled "Online pornography use in adolescence: Age and gender differences". Exposure to online sexual material at a young age raises public concern primarily due to the possible negative impact that seeing sexual images could have on adolescents and their psychosexual development. These concerns range from adopting permissive sexual attitudes and stereotypical sexual and gender-role beliefs to earlier sexual debut and imitating the sexual behavior depicted in the pornographic materials (e.g., unprotected sexual intercourse). A critical review of the media effects of pornography use in adolescence showed that the strength of these studied associations in cross-sectional designs

³ This interpretation is based on the Media Practice Model (Steele & Brown, 1995) that proposes a dialectical relationship between media use and psychosexual development.

tend to be stronger than in longitudinal studies (Peter & Valkenburg, 2016). From the perspective of causality, previous studies have shown that online pornography use may lead to more permissive sexual attitudes (Brown & L'Engle, 2009), gender-stereotypical sexual beliefs (Peter & Valkenburg, 2009), sexual dissatisfaction, the internalization of appearance ideals (Vandenbosch & Eggermont, 2013), and an increase in the likelihood of having sexual intercourse (Brown & L'Engle, 2009; but not risky sexual behavior, Peter & Valkenburg, 2011). These outcomes are derived from the mediators⁴ of relationships between online pornography use and its media effects. Some mediators concern the perception of online sexual images. This media content tends to be seen as more realistic (Peter & Valkenburg, 2010) or likeable (Peter & Valkenburg, 2009). However, little is known about the perception of online sexual images through unwanted exposure. Prior research has shown that adolescents perceive them as bothersome if they have unintentionally seen them (Ševčíková et al., 2015). But it remains largely unknown as to how unwanted the exposure to this type of online content changes over time; in other words, whether this leads to a habituation to sexualized media. This issue is addressed in **Study III** with the title “Exposure to online sexual materials in adolescence and desensitization to sexual content”.

For adolescent boys and young male adults, pornography use has started to be discussed within discourses of preoccupation with sexual stimuli, compulsive pornography use, sex addiction, and addictive behavior (Derbyshire & Grant, 2015; Wéry & Billieux, 2017). More precisely, there is rising public concern that pornography use at a young age may negatively impact the psychosexual development of young internet users in that they develop symptoms of compulsive pornography use. A pioneering longitudinal study showed that exposure to sexually explicit internet material at a young age provoked a preoccupation with sex (e.g., thinking of sex or being distracted by thinking of sex), albeit a transactional relationship⁵ between seeing sexual images and preoccupation was not found (Peter & Valkenburg, 2008). However, this study has not explicitly focused on the preoccupation with sexually explicit material available on the internet. Another retrospective online study showed that viewing pornography at a young age did not predict sexual compulsivity in early adulthood (Štulhofer, Jelovica, & Ružić, 2008). In contrast to this finding, recent longitudinal research showed that there are very few adolescent boys⁶ who reported symptoms of the compulsive use of sexually explicit internet material and simultaneously poorer psychological

⁴ See the second proposition of the Differential Susceptibility to Media Effects Model.

⁵ See the fourth proposition of the Differential Susceptibility to Media Effects Model.

⁶ Researchers estimate that rates of compulsive sexual behavior in adults range from 3 to 6% (Kafka, 2010).

well-being (Doornwaard, van Den Eijnden, Baams, Vanwesenbeeck, & Ter Bogt, 2016), suggesting that the current research on compulsive pornography use in adolescence and emerging adulthood is piecemeal. Moreover, the conceptualization of compulsive pornography use remains unclear. There is an ongoing and vivid debate about whether it should be conceptualized as compulsive sexual behaviour disorder or an addictive disorder (see Kafka, 2010; Potenza, Gola, Voon, Kor, & Kraus, 2017; Stark, Klucken, Potenza, Brand, & Strahler, 2018). Therefore, **Study IV** was conducted in order to explore the manifestation of problematic pornography use in adolescence and early adulthood.

Exposure to online sexual materials may also take place within sexting. Receiving and sending sexts is closely interconnected since those who sext also receive sexual messages (Klettke, Hallford, & Mellor, 2014). Sexting in adolescence receives public research attention due to several possible risks. Sexting might not always be consensual, it can be done under pressure, it can constitute sexual solicitation, and private sexts may be misused and become public. Due to these possible risks, teen sexting has started to be viewed as a risky behavior and subsequently studied to determine the extent to which it may represent a behavior that could compromise psychosexual development and covariate with other risky/problem behaviors (for review see Van Ouytsel, Walrave, Ponnet, & Heirman, 2015). Worth mentioning is that prior research also shows that teen sexting may emerge in various contexts (e.g., consensual/non-consensual sexting, teen-to-adult sexting, teen-to-teen sexting, sharing sexts in same-sex peer groups). In one context, sexting may be consensual and simultaneously constitute part of the intimate communication within a romantic relationship (for a review, see Döring, 2014). The older adolescents are, the more salient the romantic relationships become to them (Brown, 1999; Connolly & Goldberg, 1999). Moreover, in comparison to younger adolescents, the older ones become less tied to peer groups (Brown, 1999), which makes them more immune to engaging in sexting behavior under peer pressure, which, in addition, is strengthened with a sexual double standard (Lippman & Campbell, 2014; Ringrose, Harvey, Gill, & Livingstone, 2013). **Study V** is entitled “Girls' and boys' experience with teen sexting in early and late adolescence” and it takes into consideration this developmental perspective, along with a sexual double standard and reexamines the conceptualization of teen sexting as a risk behavior.

Since sexting represents a novel sexual behavior, little is known about its impact on adolescent psychosexual development. Cross-sectional studies provide evidence that the electronic exchange of sexts covariates with sexual activity (Dake et al., 2012; Rice et al., 2012; Temple et al., 2012). To explore whether sexting represents a risky behavior that incites

adolescents to sexual activities, a causal link between these two behaviors has been proposed to be studied. This hypothesis seems to be analogous to exposure to online sexual material and its effect on sexual activity in adolescence (Brown & L'Engle, 2009; Cheng et al., 2014; Vandenberg & Eggermont, 2013). However, processes responsible for the causal link between sext exchange and sexual behavior may be complex. For instance, exposing one's own body could strengthen sexual self-objectification and increase an adolescent's readiness for a sexual act⁷. Or sexting, along with having sex, may represent the "utmost" instrument for establishing/maintaining a romantic relationship in adolescence, while the latter may be used when the former fails. Nevertheless, due to the scarcity of longitudinal research, **Study VI** focuses on investigating how teen sexting may affect sexual behavior over time.

This habilitation thesis presents research work which stems from media, social, developmental, clinical psychology, and the psychology of sexuality. Particular emphasis is put on the developmental psychology that is used as the interpretation framework for the whole thesis. At the same time, the highlighted research gaps on which the selected studies (**I-VI**) elaborate are organized within the perspective of the Differential Susceptibility to Media Effects Model that enlightens the relationships among predictor, moderator, mediator, and outcome constructs (Valkenburg & Peter, 2013). This approach has been adopted in order to show which specific areas of the model constitute a research focus for Studies I-VI and how research questions are embedded within this integrative theoretical model.

⁷ This hypothesis is elaborated on assumptions of the Self-Perception Theory (Bem, 1972). According to this theory, some adolescents may start using the internet or electronic devices in accordance to what they feel that they would like or should be like.

List of Original Publications

This habilitation thesis presents a series of original publications that investigate how internet use shapes psychosexual development in adolescence. This research work is based on three main research projects: the EU Kids Online II project (SIP-KEP-321803); the Risks of Internet Use among Children and Adolescents (GAP407/11/0585); and the New Behavioral Addictions: Games and Sexuality Online (GA15-19221S). Their methodology is outlined in the subsequent section.

Study I

Ševčíková, A., Šerek, J., Barbovski, M., & Daneback, K. (2014). The roles of individual characteristics and liberalism in intentional and unintentional exposure to online sexual material among European youth: A multilevel approach. *Sexuality Research and Social Policy, 11*(2), 104-115.

Study II

Ševčíková, A., & Daneback, K. (2014). Online pornography use in adolescence: Age and gender differences. *European Journal of Developmental Psychology, 11*(6), 674-686.

Study III

Daneback, K., Ševčíková, A., & Ježek, S. (2018). Exposure to online sexual materials in adolescence and desensitization to sexual content. *Sexologies, 27*(3), e71-e76.

Study IV

Vondráčková, P., & Ševčíková, A. (2016). Nadměrné užívání internetu pro sexuální účely: případová studie. *Adiktologie, 16*(4), 368-373.

Study V

Ševčíková, A. (2016). Girls' and boys' experience with teen sexting in early and late adolescence. *Journal of adolescence, 51*, 156-162.

Study VI

Ševčíková, A., Blinka, L., & Daneback, K. (2018). Sexting as a predictor of sexual behavior in a sample of Czech adolescents. *European Journal of Developmental Psychology, 15*(4), 426-437.

Study I: The author conceptualized the study, wrote 75% of the first draft of the paper, supervised data analyses, and led work on paper revisions.

Study II, III, VI: The author conceptualized, designed, and directed the studies, data collection, and processing, wrote 100% of the first drafts of the papers, and collaborated on the data analyses and on the paper revisions.

Study IV: The author was responsible for conducting an in-depth interview and data analysis, wrote 50% of the first draft of the paper, and collaborated on paper revisions.

Study V: The author worked on a secondary data analysis.

Summary of Research Questions

The aims of the studies consisted in unveiling which psychosocial characteristics are responsible for exposure to online sexual content and exchanging sexual images at young age, how this young generation approach to online sexual images, and how sexualized internet content affects them.

In **Study I**, a broad model that predicted intentional and unintentional exposure to online sexual materials was tested. Based on Bronfenbrenner's bioecological model of human development (Bronfenbrenner, 1979), several levels of predictors and their cross-level interactions were examined. More precisely, individual characteristics such as gender, age, sexual experience, sensation seeking, parental mediation of children's internet use, and one country-level predictor (mean cultural liberalism of the country). **Study II** analyzed age and gender patterns in how adolescents use online pornography and with whom, their reason for using online pornography and how and to whom they communicate their experiences. **Study III** employed a growth modelling analysis to test whether frequent or (un)intentional exposure to online sexual content leads to a desensitizing effect on the perception of online sexual content over time. **Study IV** was a case study of a young men in treatment for his excessive use of the internet for sexual purposes (mainly pornography and video chats). The case study aimed at describing the symptoms of excessive Internet use for sexual purposes, mapping out their onset and subsequent development, and furthermore, discussing them in relation to

particular findings of existing research studies. Therefore, the goal of the study was to present a detailed picture of this phenomenon and to provide an insight into the context of its onset, development, and individual symptoms in one case study. **Study V** explored the extent to which sexting represents a problematic behavior in early and late adolescence. Psychosocial profiles of younger and older sexters according gender were researched by testing associations between sexting and risk behaviors along with emotional difficulties and self-efficacy. The aim of **Study VI** was to examine the causal relationship between active sexting and offline sexual behavior, while controlling for gender, age, and sensation seeking.

Methods

Study I

This study analyzed data from the EU Kids Online II project (eukidsonline.net; SIP-KEP-321803). The fieldwork of face-to-face data collection took place in 25 European countries (Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Ireland, Lithuania, the Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Turkey, and the UK) in 2010. By means of random stratified sampling, approximately 1,000 children aged 9-16 per country were interviewed in spring and summer 2010. The sensitive questions were asked only the older children (aged 11-16). The final study sample included 11,712 adolescents (50% girls). In this study we used variables that concerned *Exposure to online Sexual Materials* (intentional and unintentional), experience with *Sexual Intercourse*, *Parental Mediation Scale* (measuring two types of parental approaches – active and restrictive), *Patterns of Internet Use* (measuring digital skills, time spend online, private internet access), *Sensation Seeking Scale*, and *Liberalism* (the score was obtained from European Values Study 2008). Multinomial logistic regression and binary logistic regression were used to predict both intentional and unintentional exposure to sexually explicit materials.

Study II

This study analyzed first-wave data of a longitudinal study on internet usage and online risks among Czech adolescents (GAP407/11/0585). The three wave data collection with six-month intervals started in June 2012 and was completed in June 2013. Using stratified sampling, 164 primary and secondary schools located in the Czech Republic were asked to participate in the survey, and 74 schools agreed with data collection. A total of 2950 respondents aged 11-17

were questioned (Mean age = 14.08, SD = 1.87, 53.3% girls)⁸. Measurements used in the study included *Online Pornography Use* (whether they watched internet pornography in the last 6 months); *Collective Pornography Use* (with whom they watched pornography); *Talking about Pornography* (whether and with whom they talked about pornography); *Purposes of Online Pornography Use* (reasons for watching pornography – curiosity, information about sex, excitation). Based on psychosexual developmental phases of adolescent peer and romantic relationships, which are intertwined with individuals' psychosexual development (Brown, 1999; Connolly & Goldberg, 1999), the sample was divided into three distinct groups (11-13 years, 14-15 years, 16-17 years). Age differences were tested using Chi-square statistics and adjusted residuals. The analyses were conducted separately for girls and boys.

Study III

The study used longitudinal data from the three wave panel study on the use of the internet and online risks among Czech adolescents (GAP407/11/0585) (see Study II). The longitudinal sample included 1134 participants (girls, 58.8%; mean age, 13.84 ± 1.94 years) from 55 schools, with a drop-out rate of 63%. The studied measurements were *Sensitivity to the availability of online sexual materials* (how they perceived images or videos available on the Internet depicting naked bodies, genitals or people having sex) *Intentional or Unintentional Exposure to Online Sexual Materials*, *Frequency of Exposure to Online Sexual Materials*. The growth model concept was employed to address effects of frequent, intentional and unintentional exposure to online sexual materials on sensitivity to the availability of online sexual materials in a longitudinal design.

Study IV

Data for the case study were collected during the course of psychotherapy sessions with the client who sought out professional psychological help on his own initiative at the age of 21, conducted by Petra Vondráčková over two years, and in a research (half-structured) interview focused on surveying the symptoms of behavioral addiction conducted by Anna Ševčíková. This in-depth interview was conducted within a research project on behavioral addiction related internet pornography use and online gaming (GA15-19221S). Czech clinical psychologists, psychiatrists, and sexologists, and self-help groups (Sexaholics Anonymous and Sex Addicts Anonymous) were contacted for recruiting adults (18+) who were seeking

⁸ Note: The original sample included respondents aged 10 (n=33) and 18 (n=73).

professional or non-professional help to deal with their problems associated with excessive internet use for sexual purposes. Altogether 26 interviews were conducted, one of them was part of the case study. The interview presented in this case study was conducted via Skype. Due to a written form, it lasted about 4 hours. The guide topics of the semi-structured interviews included the background characteristics of the participants, such as education; family situation; diseases; other addictions; sexual development; patterns of internet use for sexual purposes; difficulties and processes that made the participant maintain the problematic behavior; symptoms of problematic behavior with the use of AICA-C (i.e., a Standardized Clinical Interview to Assess Internet addiction; Wölfling, Beutel, & Muller, 2012); and strategies for dealing with this behavior. The transcribed data were analyzed with the use of a thematic analysis. For this research purpose, a theoretical/deductive/“top down” style was chosen (Boyatzis, 1998).

Study V

This study analyzed data collected in the EU Kids Online II project (eukidsonline.net) – see Study I. Sensitive questions used in this study were asked only age group 11-16 years, so the final sample included 17,016 respondents (mean age = 13.55, SD = 1.68, 50.3% girls). The variables and scales consisted of *Sexting* (whether the participants send sexual message – in words, picture or video – in the last 12 months), *Risk Behaviors* (got drunk, had sexual intercourse – the items were then used separately), *Emotional Problems* (a 5-item subscale of *Strengths and Difficulties Questionnaire*), *Self-Efficacy* (four items adapted from *Generalized Self-Efficacy Scale*). Four multilevel logistic regression models were estimated to predict the odds of engaging in sexting in younger girls, older girls, younger boys, and older boys. Two age categories - younger adolescence (11-14 years old) and older adolescence (15-16 years old) were created, reflecting early and late adolescence and the legal age of consent for sexual intercourse. The mean age of consent across the 25 countries included in the present study is 15 (the legal age of consent varies between 14 and 17 years old).

Study VI

This study analyzed data from the aforementioned longitudinal research project (see Study II and III; GAP407/11/0585). Measurements used in this study included *Sexual Behavior* (experience with vaginal intercourse, kissing, fondling someone’s intimate body parts), *Sexting* (sending sexual messages in the last 6 months), *Brief Sensation Seeking Scale for Children*. To address adolescent sexual behavior in a longitudinal design, the growth model

concept was employed. Two-level models were used to adjust for intra class correlation (due to the nesting of students in classes within schools).

The following part presents the original publications – Studies I-VI. Their findings and conclusions are subsequently discussed in General Discussion.

General Discussion

My research work focuses on examining adolescents' experience with exposure to online sexual content and its effects on their psychosexual development. Researchers have accumulated a vast amount of knowledge that expands our understanding of how youth encounter online sexual images and respond to them or become affected by them (see overview studies conducted by Alexandraki, Stavropoulos, Anderson, Latifi, & Gomez, 2018; Cooper, Quayle, Jonsson, & Svedin, 2016; Döring, 2014; Klettke et al., 2014; Kosenko, Luurs, & Binder, 2017; Madigan, Ly, Rash, Van Ouytsel, & Temple, 2018; Owens, Behun, Manning, & Reid, 2012; Peter & Valkenburg, 2016; Smith, Liu, Degenhardt, Richters, Patton, Wand et al., 2016; Van Ouytsel et al., 2015). With respect to prior research, I believe that the contribution of this study corpus consists of (1) researching different types of exposure to online sexual material, (2) taking into consideration the specifics of developmental stages in adolescence, and (3) adopting both cross-sectional and longitudinal study designs to address the shortcomings of cross-sectional research.

This work brings together five important findings integrating Studies I- VI around which this discussion is organized. The first is that **girls approach online sexual material differently than boys due to the possible effect of the sexual double standard**. To show this, I briefly summarize results, introduce the sexual double standard, and discuss the findings with respect to this interpretation framework.

If female adolescents see sexual images, it is mostly unintentionally (Study I). If a higher proportion start to intentionally seek sexual content online, then it is likely to happen in more liberal countries (Study I)⁹. If they are exposed to this material, it occurs when they are alone, with a female friend, or with a romantic partner (Study I, II). If they actively engage in the exchange of sexual images in early adolescence, then they tend to show an increased level of psychosocial vulnerability (e.g., see OR for alcohol use = 10.38; Study V). For comparison, the same activity in younger boys is not exclusively associated with other risk factors (e.g., see OR for alcohol use = 4.41), but also with higher self-efficacy (Study V). Moreover, adolescent boys are more likely to use online sexual stimuli due to curiosity, the need to learn something about sex, and for arousal (Study II). No need to mention that intentional exposure to online sexual stimuli is traditionally more common among boys than their female counterparts (Study I).

⁹ A very similar pattern in the effect of cultural background on gender differences has been observed with respect to sexting (Baumgartner, S. E., Sumter, S. R., Peter, J., Valkenburg, P. M., & Livingstone, S. (2014)).

This brief overview of findings suggests that adolescents' behavior may be under the influence of the sexual double standard¹⁰, which indicates that the same behavior might be evaluated differently in girls and boys¹¹. More precisely, boys are inclined to consume this type of media content not only due to physiological reasons, but also due to the need to become knowledgeable enough about sex and to be more experienced. This expertise is especially salient for younger adolescent boys. Demonstrating sexual experience helps them to show masculinity and strengthen their peer status and reputation in same-sex groups that are salient to early adolescents (Brown, 1999; Connolly & Goldberg, 1999). In contrast to boys, girls show signs of being trained in sexual restrictiveness and not being valued for an explicit demonstration of sexual experience and interest. Their restrictive approach to sexual behavior can be overcome when their social milieu constitutes a more liberal climate that enhances an alternative sexual expression. Using Jessor's view of risk behavior in adolescence, the co-occurrence of sexting, alcohol use, and emotional problems observed in early adolescent girls could speak for the interpretation that engaging in these behaviors may bring some benefits — popularity, for instance (Vanden Abeele, Campbell, Eggermont, & Roe, 2014), or a feeling of being loved — due to which it could be worth ignoring the sexual double standard. This interpretation is not necessarily odd. Some parallels are noticeable in Wolak, Finkelhor, Mitchell, and Ybarra's (2010) work on the myths related to sexual under-aged-adult relationships established online. This integrative study insightfully describes that the majority of predators establish a close, trusting internet relationship mostly with vulnerable early adolescents who subsequently engage in sexual activities (e.g., accept the predator's sexual proposals)¹².

The second relevant finding is that **adolescents use online sexual stimuli in line with their psychosexual development**. According to Studies I and II, the likelihood of intentional exposure to online sexual material and the usage of online pornography within romantic relationships increases with age. In boys, there is a clear pattern that the older they are, the more they consume sexually explicit content alone for arousal at the expense of watching it with their male friends. In girls, talking about internet pornography with their male and

¹⁰ An effect of the sexual double standard on teen sexting has been described in detail in studies conducted by Lippman and Campbell (2014).

¹¹ Sexual double standard derives from the traditional sexual script. In brief, the traditional sexual script is a culturally shared understanding of when, how, and with whom one might engage in sexual activities (Gagnon & Simon, 2011). This script depicts (1) men as oversexed and women as undersexed, (2) sexual experience as a characteristic primarily valued in men and not in women, (3) men as the initiators of sex and women as the recipients of this act, (4) token resistance as a part of courtship, (5) women's worth of being in a romantic relationship, and (6) men as self-focused, while women nurture interpersonal relationships (Byers, 1999).

¹² The behavior of most online molesters does not correspond to the profile of aggressive sexual predators.

female peers peaks in middle adolescence, a developmental period in which adolescents start to socialize in mixed gender groups¹³ (Brown, 1999). These findings show age-related and gender-specific variability in pornography use at a young age.

Putting these results into a larger interpretation framework, online pornography use, along with discussion of this issue, may reflect developmental stages that are characteristic for developmental tasks and needs (e.g., building self-image, developing competencies in early adolescence, achieving status, achieving popularity in early and middle adolescence, or building a deeper, more sustained level of romantic relationships in later adolescence) which are fulfilled with respect to the sexual double standard.

Specifically, pornography constitutes a topic around which boys and girls may gather and explore the opinions, attitudes, and beliefs of others. Internet pornography use becomes a part of the interaction in romantic relationships in later adolescence, which is typical for the formation of intimate dyadic relationships and moving away from mixed gender groups (Connolly & Goldberg, 1999). In boys, solitary masturbation for arousal becomes dominant in later adolescence, where an increase of the rates of adolescent boys who report masturbation is situated (Herbenick, Reece, Schick, Sanders, Dodge, & Fortenberry, 2010). In other words, the accessibility of online sexual stimuli makes this media content part of the adolescents' psychosexual development, but they seem to use internet pornography with respect to their developmentally determined tasks and needs.

The third finding, worth emphasizing is that **frequent exposure to online sexual material, not (un)intentional exposure explains changes in the desensitization to the content over time**. Study III provides two lines of results. At the initial level of the study, exposure to online sexual images of any frequency and (un)intentionality makes adolescents less bothered by the sexual content, indicating that the availability of sexual material on the internet may affect the perception of this media content. From the longitudinal perspective, only frequent exposure to online sexual images was responsible for changes in desensitization to the content over time, indicating that repeated unintentional exposure did not contribute to further desensitization. Moreover, frequently seeing sexual images may not necessarily mean continuous desensitization, since some adolescents have been found to resume a bothersome perception of these materials. Although the exposure frequency has been consistently shown to impact psychosexual development in adolescence (for review see Alexandraki et al., 2018;

¹³ According to Connolly and Goldberg's (1999) taxonomy of developing relationships, the formation of same-sex peer precedes socialization in mixed-gender peer groups.

Owens et al., 2012; Peter & Valkenburg, 2016), Study III suggests that its effect might be multifaceted depending on the studied outcomes.

The fourth note drawn from this work is that **using online sexual stimuli in line with adolescents' psychosexual development may introduce the gender-specific risk that compulsive use of internet pornography is principally among young men**. Studies I and II suggest that internet pornography use becomes an integral part of the sexual life of many older adolescent boys. Study IV provides a preliminary view of how online pornography consumption might change into a salient activity within an adolescent male's everyday life that helped to fill unstructured free time and relax. More precisely, frequent use of internet pornography started at the end of late adolescence when he had more opportunities for using internet pornography for arousal reasons. This fact also indicates that building the habit of using internet pornography for masturbation may constitute one of the key factors responsible for developing the compulsive use of online pornography rather than the early timing of the exposure to online sexual stimuli that has originally been proposed for investigation (for review see Štulhofer et al., 2008). Bearing in mind that Study IV cannot draw any conclusion on gender differences in the problematic use of internet pornography, then it is worth the mentioning that the claim that using online sexual stimuli in line with psychosexual development may later produce the compulsive use of internet pornography among young men has a support in review studies on adult populations according to which the compulsive use of online pornography is prevalent among men than women (Derbyshire & Grant, 2015; Wéry & Billieux, 2017).

The fifth finding worth attention is that **sexting is positively associated with sexual behavior, but sexting fails to explain changes in sexual behavior over time**. This conclusion is drawn from Study VI; however, it contradicts the only available, longitudinal study that provides evidence for a causal link between the studied behavioral constructs (Temple & Choi, 2014). In this vein, more longitudinal studies to investigate the associations between an exchange of sexual images and sexual behavior in adolescence is needed.

Policy implications and future directions

In my research work, I have also focused on the social factors that may shape or moderate adolescents' contact with online sexual images. Study I showed a negative relationship between a restrictive parental mediation strategy and any type of internet exposure to sexual content. According to Study II, both boys and girls were less likely to talk about online pornography use with their teachers than with younger adolescents.

What makes restrictive parental mediation effective is that it stems from giving children permission to engage in certain online activities in a defined time. However, some scholars, such as Livingstone and Helsper (2010), warn that its overuse may prevent adolescents from profiting from other opportunities that the internet brings (e.g., to express themselves or to explore the world they live in).

Policy makers who promote sex education in schools should take into account that the school-level discussion of pornography remains scarce and, in addition, disappears as adolescents age. Explanations for this negative trend are missing. To better tailor sex education, further research is needed to investigate whether decreasing interest on the teachers' or pupils' side may be at play. However, this lack of knowledge should not lead to the resignation that sex education covers the theme of pornography use at a young age. Most of the studied effects of exposure to online sexual stimuli (i.e., sources of public concerns) are based on the assumptions that adolescents will imitate or form beliefs upon the behaviors they see on pornographic web pages. Therefore, it may be meaningful to focus on cultivating media literacy and critical thinking among youth, assuming that these skills might be applied while consuming any media content, including internet pornography. Worth mentioning is that some results of pioneering research in this area seem to be promising (Pinkleton, Austin, Cohen, Chen, & Fitzgerald, 2008).

The findings presented in this thesis provide valuable, novel insights into how new technology and internet use affect adolescents and their development. This work points out gender-specific and developmentally determined contexts in which adolescents see online sexual images. These contexts may generate similar specific risks. For instance, sexting in early adolescence is prevalent among vulnerable adolescent girls and using internet pornography for arousal may pose the risk of developing compulsive patterns of online pornography consumption for some older adolescent boys. Some of the risks might bear the form of old wine in a new bottle¹⁴ (e.g., sexting in early adolescence being conceptualized as a risky sexual activity) such that we have at our disposal the knowledge for how they should be addressed¹⁵. Other risks seem to be unique, like the case of compulsive use of internet pornography at a young age, which deviates from other perils due its possible conceptualization as a disorder (Derbyshire & Grant, 2015; Wéry & Billieux, 2017). Apart

¹⁴ See the parallel of bullying and cyberbullying (Li, 2007).

¹⁵ Romer (2003) calls for the early identification of traits and mental states that make adolescents more vulnerable to risky behavior since treating health conditions (e.g., depression) may effectively reduce unhealthy behaviors, such as risky sexual activities.

from that, little is known about the extent to which adolescents are prone to developing symptoms for the compulsive use of internet pornography and about the factors leading to this problematic internet use in adolescence. These questions warrant further research.

Despite the focus of my thesis on unwanted exposure to online sexual images, it remains uncertain as to which online activities and psychological predictors are associated with unintentionally seen sexual content. The reason for highlighting this is that we have at our disposal only a handful of studies with the potential to raise public concern. Prior research has shown that some incidents of unwanted exposure were perceived as distressing (Mitchell, Jones, Finkelhor, & Wolak, 2014) or that the likelihood of this phenomenon was increased by adolescents' psychosocial vulnerability (e.g., depression, experience with interpersonal victimization) (Chang, Chiu, Miao et al., 2016; Wolak et al., 2007). In this vein, future research should better contextualize unwanted exposure to online sexual images in order to identify the sources of distress. Whether pathways to unwanted exposure and responses to these incidents differ according to the extent of psychosocial vulnerability is another question that needs to be answered to better protect young internet users.

Moving beyond the perspective of under-studied themes, it is worth concluding this thesis with a few notes on research frameworks. I opened this thesis by outlining public concern about how technological innovations and high-speed internet may affect adolescents and their psychosexual development. This concern delineates the direction of the studied effects which drive researchers to investigate the effects of seeing sexual images online on adolescents' beliefs, attitudes, behavior, and well-being. However, this standpoint is limiting because it omits two issues. First, the developmental perspective is ignored, meaning that the current developmental state of an adolescent may very much influence the way the internet and other communication technologies are used. Although this developmental perspective has been incorporated into several theoretical frameworks (e.g., media practice model (Steele & Brown, 1995) or the co-construction model (Subrahmanyam, Smahel, & Greenfield, 2006)), the second limitation remains. This drawback is that the direction of the proposed effect in public concern neglects possible transactional relations between exposure to online sexual images and outcome variables (e.g., whether the perception of online sexual content affects the frequency of exposure itself). This transactional effect corresponds to the fourth proposition of the Differential Susceptibility to Media Effects Model (Valkenburg & Peter, 2013) stating that media effects may, in turn, influence media use, including the media response states, and differential-susceptibility variables. In this vein, the fourth proposition may fuel future research in which the developmental standpoint can be accentuated by

studying the transactional relation between media effects and psychosexual development as a predictor of media use.

To conclude, the corpus of Studies I – VI suggests with respect to prior research that (1) the sexual double standard makes girls and boys approach online sexual material in a different way; (2) adolescents' use of online sexual images varies depending on their developmental needs and tasks; and (3) using online sexual stimuli in line with psychosexual development may later produce the gender-specific risk of the compulsive use of internet pornography among young men, indicating that the developmental perspective that reflects social and cultural norms may present a promising approach for understanding the patterns and effects of exposure to online sexual images at a young age.

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