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Does the use of social networking sites increase children's risk of harm?

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Abstract:

Although research findings have been equivocal as to whether the use of social networking sites (SNS) increases experiences of online risk among children, the affordances of SNS lend support to this possibility, attracting much policy and public concern. The present article examines whether the use of such services increases the risks that children and young people encounter by analyzing data from a random stratified sample of approximately 1000 internet-using children aged 9-16 years in each of 25 European countries. Four hypotheses were formulated and tested. The first hypothesis, namely that children who use social networking sites will encounter more risks online than those who do not, is supported by the data. The second hypothesis stated that SNS users with more digital competence will encounter more online risk than those with less competence; this was also supported, despite being counter to common assumptions. Thirdly, we hypothesized that SNS users with more risky SNS practices (e.g. a public profile, displaying identifying information, with a very large number of contacts) will encounter more online risk than those with fewer risky practices: this too was supported by the data; thus what matters for risk is how SNS are used, a useful point for awareness-raising initiatives. The fourth hypothesis stated that SNS users with more digital competence in using the internet will experience less harm associated with online risk. The data did not support this hypothesis, since digital competence did not reduce the probability of children saying that they have been bothered or upset by something on the internet. Finally, the study found that, although this had not been predicted, whether or not risks are experienced as harmful depends on the specific relation between risks and platforms (website, instant messaging, gaming or social networking). We call on future research to explore how particular affordances sustain particular communicative conditions and, in turn, are responded to differently by children. The research and policy implications of the findings are discussed.

Keywords:

Children, social networking sites, skills, risk, harm, Internet

Highlights

- Controlling for usage, children who use SNS are more likely to encounter online risks.
- Children with greater digital competence encounter more not fewer risks online, because they undertake a wider range of online activities in general.
- Digital competence does not reduce the likelihood that children will be upset by the online risks they encounter.
- Children with a public profile or many contacts encounter more risks than those who adhere to recommended ways of using SNS.
- The findings suggest that children's online safety may be enhanced by safety education and improved design features.

Authors' biographies

Elisabeth Staksrud (PhD) is a researcher in the Department of Media and Communication at the University of Oslo, researching children's use of new media in relation to risk, regulation and rights. She has been project director of several EC funded awareness projects related to children and risk is national coordinator for Norway in the EU Kids Online projects.

Kjartan Ólafsson is a lecturer at the University of Akureyri in Iceland where he teaches research methods and quantitative data analysis. He has been involved in several cross-country comparative projects on children, such as the ESPAD (European School Survey Project on Alcohol and other Drugs) and HBSC (Health Behavior in School-aged Children).

Sonia Livingstone is Professor of Social Psychology in the Department of Media and Communications at the London School of Economics and Political Science. Her research examines children, young people and the internet; social and family contexts and uses of ICT; media and digital literacies; the mediated public sphere; audience reception for diverse television genres; internet use and policy; public understanding of communications regulation; and research methods in media and communications.

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Does the use of social networking sites increase children's risk of harm?

1 Introduction

Social Networking Sites on the Internet (SNS) have rapidly become one of the most used online services. Following their explosive development from the mid noughties, they have become firmly embedded in the everyday lives of many citizens in the world's wealthier countries. SNS integrate impersonal communication (e.g. coordinating meetings, events, schedules and other task oriented activities), mass communication (music, news, movie clips and websites) and, most significantly, interpersonal communication (direct personal messages, sharing of daily thoughts, ideas, observations and images). While acknowledging the many benefits that social networking sites afford most of their users most of the time (boyd, 2006; Clarke, 2009; Kalmus, Runnel, & Siibak, 2009), the present paper examines the evidence underpinning one area of particular public anxiety, namely whether the use of such services – precisely because of this integration of different communicative forms, each with their own norms - increases the risks that children and young people encounter.

Fifty nine percent of European 9-16 year olds who use the internet have their own SNS profile - 38% of 9-12 year olds and 77% of 13-16 year olds (Livingstone, Ólafsson, & Staksrud, 2011). Four in five American 12-17 year old internet users also have profiles (Lenhart, et al., 2011). Indeed, among all online activities, social networking is one of the most popular, after using the internet for school work – 85%, playing games – 83% and watching video clips – 76% (Livingstone, Haddon, Görzig, & Ólafsson, 2011). What is the significance of such rapid adoption? And, since any all types of content, contact and conduct, risky or otherwise, can potentially be reached through SNS, is the consequence more harm to children?

The specific design of widely used SNS contributes to the nature and consequences of use. Boyd (2008) identifies the features of persistence (the fact of recording textual/visual messages permitting asynchronous communication), searchability (the availability of tools easing the establishment of extended and/or niche relationships), replicability (digital recording enables the generation of multiple versions of messages with no distinction between the original and the copy) and invisible audiences (the lack of certainty about who receives any communication exacerbating the sense of anonymity). In terms of user practices, young people especially have appropriated social networking sites to greatly extend their networks of contacts ('friends') and find new spaces of intimacy through the opportunity to construct and display particular aspects of the self and to tailor the conditions of publicity and privacy (Lange, 2008; Livingstone, 2008a; Taraszow, Aristodemou, Shitta, Laouris, & Arsoy, 2010; Tufekci, 2008). Clarke's (2009) ethnography of 28 English 10-14 year olds found that social networking was deeply embedded in the social fabric of their lives, and that in the associated processes of identity construction, informal online peer support played a constructive role, as it does for encouraging online pro-social behavior (Wright & Li, 2011).

The interaction between design and usage is complex, and both play a part in understanding social networking practices online. This interaction is very evident, and often fraught, in relation to privacy. On the one hand, affordances (Hutchby, 2003) shape practices (via privacy settings that distinguish public, private or partially private communications) and interpersonal relations (via settings that specify 'top friends' or wider 'circles' of acquaintance or those that distinguish friends from relatives). On the other hand, users shape affordances, including protesting when providers fail to provide desired privacy settings, for

instance (boyd, 2006), and they more routinely appropriate services for their own purposes (e.g. setting up multiple profiles to project different selves to parents and peers, or giving a false age to access sites not designed for them (Livingstone, Ólafsson, & Staksrud, in press). The design/usage interaction is also important to the contemporary discussion of digital skills and literacies – the more complex or opaque the affordances, the greater demand is placed on users' skills, and vice versa. Inequalities in digital skills, therefore, matter more for more complex interfaces, since here the less skilled face greater misuse or misunderstanding (boyd & Hargittai, 2010; Hargittai, 2010; Livingstone & Helsper, 2010).

Looking beyond the nature of use to its possible consequences, adverse or otherwise, research is less advanced. Valkenburg and Peter (2009) propose a 'rich get richer' hypothesis, namely that those with already wide networks gain disproportionately by extending these online, building on earlier theories of knowledge gaps, technology diffusion and the digital divide. Others are investigating the converse, namely that those already disadvantaged offline (whether lonely or dissatisfied or with psychological problems) are becoming newly vulnerable online also (Mitchell, Finkelhor, & Wolak, 2007; Wells & Mitchell, 2008). These parallel research literatures are thus exploring the emerging opportunities – for education, expression and civic participation (Kalmus, et al., 2009; Livingstone & Helsper, 2010; Valkenburg & Peter, 2009) and the emerging risks – for cyberbullying, sexual harassment and stranger contact (Brandtzæg, Staksrud, Hagen, & Wold, 2009; Erdur-Baker, 2010) of SNS use.

The *EU Kids Online* project, a pan-European network funded by the European Commission's Safer Internet Programme to research use, risk and safety issues regarding children's internet use in 25 countries, argues that an account of everyday internet use must recognize both opportunities and risks online and also the interrelations between them (Livingstone & Haddon, 2009). Empirically, the two are positively correlated, with those encountering more opportunities also reporting more risks, and *vice versa* (Livingstone and Helsper, 2010). Analytically, too, they are connected, for while some online activities can be classified relatively uncontroversially as either opportunities (e.g. using educational websites) or risks (e.g. cyberbullying), others are more ambiguous. For example, making a new friend online may expand one's social circle or put one at risk from an abusive stranger; seeing sexual content online may enable exploration of one's sexuality or expose one to misogynistic pornography. Such ambiguity is especially characteristic of social networking services, for these may be beneficial, harmful or, as in the case of "risky opportunities" (Livingstone, 2008a; see also Marwick & boyd, 2011), something in between, depending on the particular interaction of online affordances and user practices.

Complicating matters further, the *EU Kids Online* project also argues that exposure to risk (e.g. encountering sexual content or getting in touch with a new contact) indicates the probability but not the certainty of harm (defined as 'physical or mental damage' by Merriam-Webster Dictionary). Risk may, therefore, be safely encountered by many, and only in a proportion of cases (depending on the action of both protective and risk factors) does it result in harm. In parallel, it may be surmised that opportunities are associated with the probability but not the certainty of benefit. Recognizing, therefore, that the opportunities of social networking are related to the risks, and that risks may or may not result in actual harm, the present article analyses the *EU Kids Online* survey findings, based on 9-16 year olds in 25 countries, to ask whether SNS use increases children's online risk of harm, for which children and under which circumstances.

2 From computer-mediated communication to social networking

New media technologies have often occasioned media panics about their supposedly adverse effects, especially on children (Drotner, 1999). Early research on computer-mediated communication (CMC), with its sometimes inconsistent or later overturned conclusions, also generated some panicky media coverage (McKenna & Bargh, 2000), adding to public anxieties regarding youth online. However, as Internet usage has become an integral part of people's daily lives, CMC research has matured. One change is recognition that the online-offline separation is increasingly artificial, and so talk of 'the virtual' as if it were not part of children's real lives is inappropriate. As a result, scholars are extending the scope of CMC theories from their origins in organizational communication so as to encompass ever more aspects of communication, identity formation and social relations (Wright & Li, 2011).

But this does not mean online and offline forms of communication are now identical (Rice & Love, 1987). Following early studies showing that group interaction differs for face-to-face (F2F) and computer-linked meetings (Kiesler, Siegel, & McGuire, 1984, p. 1124), researchers have examined how CMC alters not only workplace status relations and decision making but also dimensions of interpersonal behavior. The difference made by CMC has been variously attributed to time and information processing pressures, absence of regulating feedback, dramaturgical weakness, few status and position cues, social anonymity, computing norms and immature etiquette. The importance of reduced social context information and shared usage norms (Kiesler, et al., 1984) also applies to newer technological innovations such as mobile text messages (Hutchby & Tanna, 2008).

Traditionally, CMC research has examined anonymity in online interactions, since this is often claimed to enhance intimacy in information exchange. Combined with feelings of close group unity, this can produce deindividuation - "a weakened ability for an individual to regulate his or her own behavior reduced ability to engage in rational, long-term planning, and a tendency to react to immediate cues based largely on his or her current emotional state" (McKenna & Bargh, 2000, p. 61). Sustaining intimate interpersonal relations via CMC, compared with face-to-face interaction, may in turn result in "hyperpersonal" communication (Walther, 1996), helping to explain some of the positive (empowering) and negative (degrading or depersonalizing) effects of the Internet (McKenna & Bargh, 2000). As the research literatures on CMC and SNS converge, there is evident potential for a transfer of insights from the former to the latter. Of particular interest is the argument that, on the one hand, online anonymity is linked to such forms of self-expression as nick-names (Back, Schmukle, & Egloff, 2008) and emoticons (Derks, Bos, & von Grumbkow, 2008a, 2008b; Derks, Fischer, & Bos, 2008; Lo, 2008; Park, 2007; Walther & D'Addario, 2001; Wolf, 2000), on the other hand, it is also linked to risk taking in personal disclosure (Spears & Lea, 1994) and with increased verbal aggression and nonconforming behavior, compared with face to face interaction (Parks & Floyd, 1996).

However, the typical SNS used by children generally include personal information such as real names, so that while communication may be intimate, deindividuated and/or hyperpersonal, it is generally not anonymous (Livingstone, Ólafsson, & Staksrud, 2011). SNS primarily enable communication within an existing social circle, and so this form of CMC includes personal and contextual information, as well as information by association ("a friend of a friend"). A study of young European Facebook users found that most people display full names, facial pictures, hometowns and e-mails in their profiles (Taraszow, et al., 2010). Zhao, Grasmuck, & Martin's (2008) content analysis of Facebook accounts reveals

that users display their identities via a “show rather than tell” approach that supplements explicit personal information with the person’s contacts, comments, albums and their sometimes intimate conversations with others. As SNS allow users to lurk and “listen in” on other’s semi-private exchanges, social cues are given through direct communication with others, through group conversations and by CMC among others in the social circle.

As noted at the outset, this literature is useful for identifying the dimensions of first CMC and now SNS use, although most was developed in relation to adults (especially in the workplace) rather than children and young people. Recently, a literature on youthful social networking practices has been fast developing, although there is still a scarcity of research predicting SNS usage (Livingstone et al, in press; boyd, Hargittai, Schultz, & Palfrey, 2011; Hargittai, 2007). Further, despite widespread public anxiety and policy initiatives, even less research relates SNS use to online risk exposure of various kinds. Taking a social more than a cognitive approach (for which see Baumgartner, Valkenburg, & Peter (2010) and Reyna & Farley (2006), this article asks whether children who use SNS encounter more online risks than those who do not and, if they do, whether this is related to their practices of SNS use. Recent research reveals findings that help frame the hypotheses for our analysis.

While communication with “strangers” has commonly been considered risky for children offline and online (Kitzinger, 2006; Smith, 2007), peer communication – including via SNS – may also be risky. A Dutch survey of 1445 adolescents found that perceived peer involvement predicted risky sexual online behaviors such as searching for someone to talk about sex or sending intimate photos or videos to someone (Baumgartner, et al., 2010). In another study, children with an SNS profile were more likely to be contacted online by people they did not know (Smith, 2007). However, comparing services (“places”) online where youth sexual solicitation and harassment occurs, Ybarra & Mitchell’s (2008) national online survey of 1588 American youth aged 11-15 years old found that fears of SNS increasing sexual victimization are not justified. Similarly, when surveying Norwegian children’s bullying experiences on different technological platforms, Brandtzæg et al. (2009) found that online bullying occurs mostly via e-mail. When cyberbullying was encountered in social networking sites it tended to be sexual and it occurred in communities in which the users are anonymous, which is not the case on many SNS. A study of high risk users found little association with particular platforms of Internet use, although high risk youth are more likely to talk to new people they meet online (Wells & Mitchell, 2008), and this facility is enabled by SNS; the *EU Kids Online* survey found that 39% of 11-16 year olds are in contact with “friends of friends” online that they do not know face-to-face, and 25% contact people online who have no connection to their offline lives (Livingstone, Haddon, Görzig, & Ólafsson, 2011).

Although research findings are at present equivocal as to whether SNS use increases risk, the affordances of SNS certainly lend support to this possibility. SNS encourage sharing personal information, mundane or intimate (through such features as “what are you doing?” on Twitter, “what’s on your mind?” on Facebook or “share your life in photos” on Flickr). Similarly, the ease of adding new contacts, and the constant suggestions from the services to encourage (triggered by calculations of mutual friends or recent activity) would seem to enable more contacts with those not known face to face. Last, the variety of technical features (especially regarding the much disputed and increasingly complex privacy settings) also seems likely to facilitate risky behavior among children and adolescents. Thus we hypothesize:

H1: children who use social networking sites will encounter more risks online than those who do not.

Of the possible protective factors that might mitigate online risks, research and policy interest is strongly focused on the role of digital skills (or literacies). This work builds on past CMC literature on users' abilities to evaluate messages critically (see for instance Smilowitz, Chad Compton, & Flint, 1988) or employ strategies to gain control over self-presentation (e.g. benefiting from the asynchronous nature of CMC to manage their interactions on a dating site; Gibbs et al. (2006)). This work also extends the long traditional of media literacy research to the internet (Livingstone, 2008b), although online, young people face new challenges in managing their privacy on social networking sites (Livingstone, 2008a) and YouTube (Lange, 2008). The policy hope is that increasing digital skills will reduce youthful encounters with risk. However, some prior research has found the opposite, primarily because skills enhance the range and depth of young people's online activities (and vice versa), and more diverse activities are unsurprisingly linked to more not fewer risk encounters (Livingstone & Helsper, 2010). Although there is little direct literature to go on here, we hypothesize that this relationship found in the UK may also hold across the other European countries surveyed in this article:

H2: Children with more digital skills in using the internet will encounter more online risk than those with fewer skills.

It should be noted that the measurement of online or digital skills is far from straightforward, with some advocating direct observation (Hargittai, 2010) while other scholars, bearing in mind the practicalities of survey and other non-observational methods, debate the measurement of a series of specific skills versus the use of a global self-report measure (as for Eastin & LaRose's 2000- measure of self-efficacy in internet use). Livingstone and Helsper (2010) had found a correlation of 0.47 between online risks and specific skills, and a correlation of 0.24 between risks and internet self-efficacy. However, in the *EU Kids Online* data, the specific skills measure was asked only of 11-16 year olds while the global self-report of digital competence (or internet self-efficacy) was asked also of the 9-10 year olds. To include the younger children, the latter measure is used here to examine H2, acknowledging its possibly weaker relation to risks than the specific skills scale. Sonck et al (2011) compared both measures in the *EU Kids Online* dataset (for the 11-16 year olds), reporting a 0.43 correlation between these measures and, as expected, a high correlation also between the skills measures and children's range of online activities (0.55 for specific skills, 0.36 for digital competence). The hypothesis is now rephrased as:

H2: Children with more digital competence in using the internet will encounter more online risk than those with less competence.

Given the considerable debate in both the CMC and SNS research literatures regarding specific online practices of personal information disclosure and familiarity with online contacts, we also consider whether certain potentially risky SNS practices may account for any increase in risk among SNS users. Focusing on whether or not the child makes their profile public or private, whether they disclose identifying information (such as their phone number or address), and whether they have a large number of contacts (or 'friends'), we hypothesize that:

H3: SNS users who have more risky SNS practices will encounter more online risk than those with fewer risky practices.

Last, we consider the relation between risk (the probability of harm) and actual harm, acknowledging that this is a complex issue, influenced by both risk factors and protective factors (Coleman & Hagell, 2007; Schoon, 2006), for a focus on mediated risks specifically, see Millwood Hargrave & Livingstone (2009)). Insofar as digital skills or competence may represent one such protective factor (Staksrud & Livingstone, 2009), we also hypothesize that those with more skills may be better prepared to cope with any risks they encounter, thereby reducing the harm they report following such an encounter. In other words, although digital competence (and the broader range of online activities it may enable) can increase risk encounters, it also supports the development of resilience, thereby protecting against self-reported harm or upset from that risk.

H4: SNS users with more digital competence in using the internet will experience less harm associated with online risk.

3 Method

3.1 Sample and procedure

A random stratified sample of approximately 1000 internet-using children aged 9-16 years was interviewed in each of 25 European countries (Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, the Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Turkey and the UK). These countries were selected to represent the economic, geographic and cultural diversity of European countries (including all large and most small countries in the European Union) plus Norway (the earliest adopter of the internet in Europe) and Turkey (a culturally diverse, late-adopting, aspiring member of the EU). It is beyond the scope of this article to examine cross cultural differences in SNS and SNS use (see Lobe, Livingstone, Ólafsson, & Vodeb, 2011).

The sample used was a three-stage random probability clustered sample. An official and complete register of geographical units was used as the sampling frame for each country. A random probability sampling approach was used to select households within geographical areas. The precise approach varied by countries reflecting different circumstances on the ground, the nature of sample frames available and cultural differences. In most cases “random walk” sampling and face to face recruitment was used. Each selected household was screened to identified eligible households (with a child aged 9-16 who uses the internet). An interview with one child and one parent/carer was required. Where there was more than one eligible child present, one child per household was selected using the last birthday method. The sample can be regarded as being representative of the population of internet using children both on the European level and within individual countries.

Contact, cooperation and response rates were calculated in accordance with standard definitions. It was estimated that in 53% of interviewers’ attempts to contact an eligible address (i.e., a residential address with at least one child age 9–16 that uses the internet), this was successful (contact rate). Contact rates ranged from 31% in Germany to 89% in Romania. In 79% of the estimated eligible cases, when contact was made, the interviews were completed (cooperation rate). The estimated overall response rate was 42% of all potentially eligible cases (regardless of successful contact).

The total sample size for children was 25,142. Additionally, one parent (whichever knew most about the child's internet use) was interviewed. In depth interviews permitted careful exploration of the contexts of children's internet use as well as a detailed account of the nature, skills and social mediations that characterize that use. The questionnaire, translated and back-translated from English into 24 languages, underwent cognitive testing and pilot testing to aid completion by children. Interviews took place during spring and summer 2010 in children's homes, conducted face-to-face but with private questionnaire completion (computer-assisted or pen-and-paper) for sensitive questions related to risk. Average interview time per child was 45 minutes (see Görzig, 2012).

3.2 Measures

3.2.1 Dependent variables

Apart from the first variable, these questions were asked of children in the private self-completion part of the interview.

Use of SNS: 'Do you have your OWN profile on a social networking site that you currently use, or not?' (yes = 1, no = 0). Yes = 59%.

Seeing sexual images: In the past year, you will have seen lots of different images – pictures, photos, videos. Sometimes, these might be obviously sexual – for example, showing people naked or people having sex. You might never have seen anything like this, or you may have seen something like this on a mobile phone, in a magazine, on the TV, on a DVD or on the internet. Have you seen ANYTHING of this kind in the PAST 12 MONTHS? Those who said yes were then asked: Have you seen these kinds of things on any websites in the past 12 months? (yes = 1, no = 0). Yes = 14%.

Being bullied online: Sometimes children or teenagers say or do hurtful or nasty things to someone. When people are hurtful or nasty to someone in this way, it can happen: face to face (in person), by mobile phones (texts, calls, video clips), on the internet (e-mail, instant messaging, social networking, chatrooms). Has someone acted in this kind of hurtful or nasty way to you in the PAST 12 MONTHS? Those who said yes were then asked: At any time during the last 12 months has this happen on the internet? (yes = 1, no = 0). Yes = 6%.

Meeting new online contacts offline: Have you ever had contact on the internet with someone you have not met face to face before? Followed by: And have you ever gone on to meet anyone face to face that you first met on the internet in this way? (yes = 1, no = 0).

Receiving sexual messages (only 11+): In the PAST 12 MONTHS, have you seen or received sexual messages of any kind on the internet? (yes = 1, no = 0). Yes = 15%.

Negative user generated content (only 11+): In the PAST 12 MONTHS, have you seen websites where people discuss ... a) ways of physically harming or hurting themselves, b) ways of committing suicide, c) ways to be very thin (such as being anorexic or bulimic), d) hate messages that attack certain groups or individuals, e) talk about or share their experiences of taking drugs, Coded as 1 if the child had experienced one or more of these and as 0 if the child had experienced none of these. Yes, at least one of these = 21%.

Upset after seeing sexual images: In the LAST 12 MONTHS have you seen any things like this that have bothered you in any way? For example, made you feel uncomfortable, upset, or feel that you shouldn't have seen them.(yes = 1, no = 0). Yes = 32%.

Upset after being bullied online: Thinking now about the LAST TIME this happened to you, how upset were you about what happened (if at all)? (1) Very upset, (2) fairly upset, (3) a bit upset, (3) not at all upset, (4) Don't know. Not at all upset coded as 0, other options as 1. Yes at least a bit upset = 81%.

Upset after meeting new online contacts offline: In the LAST 12 MONTHS have you gone to a meeting with someone you met in this way bothered you? For example, made you feel uncomfortable, upset, or feel that you shouldn't have seen them. (yes = 1, no = 0). Yes = 11%.

Upset after receiving sexual messages: In the LAST 12 MONTHS has any sexual message that you have seen or received bothered you in any way? For example, made you feel uncomfortable, upset, or feel that you shouldn't have seen them. (yes = 1, no = 0). Yes = 25%.

Bothered by anything seen or experienced on the internet: In the PAST 12 MONTHS have you seen or experienced something on the internet that has bothered you in some way? For example, made you feel uncomfortable, upset, or feel that you shouldn't have seen it. (yes = 1, no = 0). Yes = 12%.

3.2.2 Independent variables

Apart from age, gender and country (which were not asked directly of the child), these questions were asked of children in the face-to-face part of the interview.

Use of SNS: See description above.

Age: 9-16 years; for logistic regression, this was centered on 12 years. Mean age = 13.4 years.

Gender: coded as girls = 1, boys =0. Girls = 51%.

Frequency of internet use: 1=daily, 0=less than daily. Daily users = 77%,

Location of internet use: in their own bedroom, at home but not in their own bedroom, elsewhere only; coded as 1 = has access in own bedroom. Access in own bedroom = 49%.

Mobile use: access the internet using a mobile phone, a mobile device or neither; coded as 1 = has access via mobile phone or a handheld device, 0 = neither of these. Use a mobile phone or a handheld device = 34%.

Time spent online: in hours, estimated by combining answers to "About how long do you spend using the internet on a normal school day / normal non-school day?" For logistic regression this was centered on one hour. Mean time spent online 1.77 hours.

Digital competence: 'How true is this of you? I know lots of things about using the internet.' Those who say 'Very true' are coded as 1, others as 0. Very true = 33%.

Privacy: ‘Is your profile set to ...? Public, so that everyone can see. Partially private, so that friends of friends or your networks can see. Private so that only your friends can see.’ Profile is public coded as 1, others as 0. Profile is public = 27%.

Disclosure: ‘Which of the bits of information on this card does your profile include about you? A photo that clearly shows your face. Your last name. Your address. Your phone number. Your school. Your correct age. An age that is not your real age.’ Coded as 1 = displays phone number or address, 0 = displays neither of these. Displays phone number or address on SNS = 14%.

Country of residence: 24 binary variables with the UK as a reference point.

4 Results

For descriptive statistics, data were weighted using design weights to adjust for unequal probabilities of selection (mainly, the uneven probability of a child being selected for interviewing, given the number of children within the household), non-response weights to correct for differing levels of response across population subgroups, and a European weight to adjust for country contribution to the results according to population size. For the multivariate analysis, the data were not weighted (because some of the variables used in the analysis were also used to construct the weights). For full details of sampling and procedures, see EU Kids Online & IPSOS (2011).

Table 1 shows the percentage of children who have encountered five different types of risk online. For each risk, the table shows the percentage of all internet using children who have encountered the risk, by demographic factors and also according to their internet usage and their practices of SNS usage in particular.

Table 1. Online risks by demographics, internet use, and SNS practices

Percent who have encountered the risk out of...	Seeing sexual images on any websites	Being bullied on the internet	Meeting new online contacts offline	Receiving sexual messages (only 11+)	Negative user generated content (only 11+)
<i>All children^a</i>	14	6	9	15	21
Boys	16	5	9	16	20
Girls	12	7	8	13	23
9-10 year olds	5	3	2	n.a.	n.a.
11-12 year olds	8	5	4	7	12
13-14 year olds	17	6	9	13	22
15-16 year olds	25	8	16	22	30
Use the internet for two hours or more	25	10	17	23	31
Use the internet daily	19	8	12	17	25
Have access in own bedroom at home	18	8	11	17	25
Use a mobile phone or a handheld device	18	8	12	18	25
Digital competence (“very true” that they know lots about using the internet ²)	23	9	13	20	28
Uses SNS ^b	20	8	12	17	25
SNS is public	21	8	14	19	28
Displays phone number or address on SNS	23	11	15	22	31
Have more than 100 contacts on SNS	26	10	16	21	31

Base: a) All children who use the internet (n = 25,142); b) Children who use SNS (n = 15,420). Numbers in **bold** differ significantly from the overall number for ‘all children’. Note: These data have been weighted.

As can be seen in Table 1, children who use SNS are more likely to encounter all five risks, compared with all children. The percentage differences are not great, since the overall likelihood for these risks is low, but they are statistically significant and noteworthy. For example, 14% of children overall have seen sexual images online, but 20% of SNS users have seen such images. The incidence of risk is also raised among older children, those who use the internet more and through personalized access, and among those who engage in certain SNS practices (having a public profile, displaying personal information, and having many online contacts). The analysis that follows seeks to disentangle the effects of these variables on the incidence of online risks.

H1 states that children who use social networking sites will encounter more risks online than those who do not. A logistic regression examined whether the probability (in odds ratios) of encountering each of the five risks differs between SNS users and non-users (Table 2). For

seeing sexual images, for each child who has seen sexual images online within the non-SNS group, there will be on average some 3.4 children in SNS group who have seen such images. The smallest difference between SNS users and non-users is for receiving sexual messages and encountering negative user generated content. The biggest difference is for meeting new online contacts offline: children who use SNS are 5.7 times more likely to do this than those who do not use SNS.

Table 2. Logistic regression models of the log odds of a child encountering risks on the internet, by use of SNS

	Seeing sexual images on any websites	Being bullied on the internet	Meeting new online contacts offline	Receiving sexual messages (only 11+)	Negative user generated content (only 11+)
Constant	0.09	0.03	0.03	0.09	0.09
Uses SNS	3.38	3.37	5.69	2.34	2.56
-2 Log likelihood	18,775	9,667	12,753	12,965	19,142
Cox & Snell R ²	0.04	0.02	0.04	0.01	0.03
Nagelkerke R ²	0.07	0.04	0.07	0.02	0.04
Chi-square (model)	855	319	714	202	465
df (model)	1	1	1	1	1

Base: All children who use the internet. Coefficients are significant at < .05 unless stated otherwise.

Thus H1 appears to be supported. However, as indicated in Table 1, there are several factors associated both with having an SNS profile and with an increase in the likelihood of encountering risks. One possibility is that it is not so much SNS use but more use of the internet in general, or having personalized access to the internet, that is associated with online risk. Or, as hypothesized in H2, that internet users with more digital competence in using the internet will encounter less online risk than those with less competence; if these are also SNS users, then the effect for SNS use specifically may disappear if digital competence is added to the model. To test this, five logistic regression analyses were conducted, with each online risk as the dependent variable.

Table 3 shows the log odds of children encountering each risk online by whether the child has an SNS profile, as well as their demographics (age and gender), internet use (time spent online, private home access and mobile access), and digital competence.

Table 3. Logistic regression models of the log odds of a child encountering risks on the internet, by use of SNS, demographics and internet use

	Seeing sexual images on any websites	Being bullied on the internet	Meeting new online contacts offline	Receiving sexual messages (only 11+)	Negative user generated content (only 11+)
Constant	0.07	0.02	0.01	0.04	0.08
Uses SNS	1.55	2.14	2.63	1.46	1.56
Gender (girls)	0.64	1.58	n.s.	0.82	1.36
Age	1.24	n.s.	1.28	1.32	1.22
Time spent online (hours)	1.21	1.33	1.37	1.28	1.24
Use the internet daily	1.71	1.42	1.67	1.41	1.23
Have access in own bedroom at home	1.12	n.s.	1.16	n.s.	n.s.
Use a mobile phone or a handheld device	1.14	n.s.	n.s.	n.s.	1.18
Digital competence (“very true” that they know lots about using the internet”)	1.45	1.44	1.29	1.28	1.35
-2 Log likelihood	17,212	9,377	11,666	12,119	18,183
Cox & Snell R2	0.11	0.03	0.09	0.07	0.08
Nagelkerke R2	0.18	0.08	0.18	0.11	0.12
Chi-square (model)	2417	609	1802	1047	1424
df (model)	8	8	8	8	8

Base: All children who use the internet. Coefficients are significant at < .05 unless stated otherwise.

For each of the five risks, having a profile on SNS still increases the likelihood of encountering the risk even controlling for age and gender, internet use (amount of use, private and mobile access) and digital competence. The biggest difference observed is for meeting people offline that the child first met online. Controlling for the other variables in the model, children who use SNS are almost three times as likely to do this as those who do not use SNS. The risk of being bullied on the internet is twice as high for children who use SNS. For the other risks (seeing sexual images, receiving sexual messages and encountering negative user generated content) having an SNS profile is associated with a 50-60% increase in the chance of encountering the risk.

The likelihood of encountering each of the risks also increases by age (by between 15 to 40%) except for being bullied. Gender also has an effect with girls being about 30 per cent less likely to see sexual images online and meeting new online contacts offline but almost 60 per cent more likely to be bullied on the internet and about 40% more likely to encounter negative user generated content. Spending more time on the internet increases the likelihood of all the risks (by 20 to 40% for each extra hour), and having mobile or handheld access also increases risks.

As hypothesized by H2, those with more digital competence encounter more online risks. Children who say that it is very true that they know lots about how to use the internet are around 20 to 30 per cent more likely to encounter all of the risks. In short, greater digital competence (in turn associated with skills; Sonck, Livingstone, Kuiper, & de Haan, 2011) does not reduce online risk but, on the contrary, empowers children to experience the internet more widely, including the risks. Note that, although the model in

Table 3 does not account for country differences, adding countries to the model resulted in a slightly improved model fit (-2 Log likelihood decreases by 2-5%); however, the parameter estimates were barely changed.

Thus far, the findings lend support to the fear of some parents and policy makers that SNS use brings risks to children (H1), as does using the internet more, and with more digital competence (H2). However, given the many benefits of social networking also – to the point where many would wonder about the social standing in the peer group of those who do not use SNS – it is worth asking whether particular ways of using SNS exacerbate the risks compared with others. Focusing now on only those children who use SNS, we conducted five logistical regression models to assess the importance of certain risky SNS practices for encountering risks for those children who have a profile on SNS (Table 4). The models include the same independent variables as in

Table 3 (excluding the now-redundant variable, *uses SNS*). To test H3, the three risky SNS practices added were whether the child's SNS profile is public, whether they display their phone number or address on their SNS profile and whether they have more than 100 contacts (see Table 4).

Table 4. Logistic regression models of the log odds of a child encountering risks on the internet, for those children who use SNS, by SNS practices as well as demographics and internet use

	Seeing sexual images on any websites	Being bullied on the internet	Meeting new online contacts offline	Receiving sexual messages (only 11+)	Negative user generated content (only 11+)
Constant	0.10	0.04	0.03	0.05	0.12
Gender (girls)	0.63	1.67	1.12	0.80	1.41
Age	1.24	n.s.	1.26	1.30	1.22
Time spent online (hours)	1.19	1.32	1.35	1.24	1.21
Use the internet daily	1.68	n.s.	1.84	1.55	1.15
Have access in own bedroom at home	1.12	n.s.	n.s.	n.s.	1.10
Use a mobile phone or a handheld device	1.18	n.s.	1.13	n.s.	1.12
Digital competence	1.31	1.33	1.25	1.23	1.28
SNS is public	n.s.	n.s.	1.19	n.s.	n.s.
Displays phone number or address on SNS	1.17	n.s.	1.39	1.29	1.25
Has 100+ contacts on SNS	1.30	n.s.	1.26	1.34	1.28
-2 Log likelihood	12,127	7,002	9,515	9,580	13,669
Cox & Snell R2	0.09	0.02	0.07	0.06	0.06
Nagelkerke R2	0.13	0.04	0.13	0.10	0.09
Chi-square (model)	1112	197	956	704	759
df (model)	10	10	10	10	10

Base: All children who use SNS. Coefficients are significant at <.05 unless stated otherwise.

As predicted by H3, children whose SNS profile is public rather than private are 23% more likely to meet online contacts offline and, to a lesser degree, also more likely to see sexual images and receive sexual messages online. There is no difference for being bullied on the internet or encountering negative user generated content. Second, displaying one's phone number or address on one's SNS profile is associated with an increased likelihood of all of the risks except being bullied (40% in meeting online contacts offline, and around 17% increase in seeing sexual images, receiving sexual messages and encountering negative user generated content). Third, having a large number of SNS contacts is associated with an increase of around 30% in the likelihood of encountering all risks except being bullied. It appears, therefore, that while using SNS increases the risks of internet use generally, these risks are exacerbated by particular SNS practices. Advising SNS users to keep their profile private, not to display identifying personal information, and not to have a large number of contacts (or, to ensure they really know all their contacts) would all help reduce the risk.

To put this in perspective, consider the predicted probability of two imaginary individuals, one who has their SNS profile public, displays a phone number or address and has more than 100 contacts, and one who does none of this. If, for these individuals, we further imagine that one of them is a 14 year old girl who uses the internet for two hours each day, has access in her own bedroom, does not use a mobile phone or a handheld device and says that she knows lots about using the internet, then the predicted probability of her seeing sexual images rises from 22% to 31% if she has her SNS profile public, displays a phone number or address on the profile and has more than 100 contacts, compared to the same girl whose SNS practices include none of these things. For meeting new people the predicted probability nearly doubles from 15% to 27%, for receiving sexual messages the probability rises from 15% to 25%, and for negative user generated content the probability rises from 33% to 44%. For bullying, however, it remains virtually unchanged. One further comparison may be helpful. If we imagine the same girl not using SNS at all, the risks drop to 18% (for sexual messages), 7% of meeting new people, 13% for receiving sexual messages, and 26% for negative user generated content. From this comparison, it may be seen that using SNS safely (i.e. with a private profile, no personal information displayed and few enough contacts to know them all well), greatly helps in preventing SNS use from becoming a risk factor in and of itself.

Having established that children who use SNS are more likely to encounter various risks, especially if they use SNS in particularly risky ways, we took advantage of another question in the survey to check the analysis thus far: for four of the five risks, the survey asked not only whether the respondent had encountered the risk but also *how* they encountered it. Thus we can examine how SNS use compares, in terms of the association with risk, with other ways in which children encounter online risks.

Table 5 shows the percentage of internet using children who have encountered each risk and, for those children who encountered the risk, the percentage who encountered it through each of several possible ways. SNS use seems to be particularly associated with contact related risks (51% of those bullied and 62% of those who met a new online contact offline). Still, only half of those children who have been bullied on the internet say that this has happened on SNS, with instant messaging also a site for bullying and meeting new people. As the table also shows, sexual images and messages particularly occur via pop-ups, a feature of the online environment that has been restricted by internet service providers in countries where the internet is more established but which are still common in countries newer to the internet (especially in Eastern Europe).

Table 5. Where children encounter online risks

	Seeing sexual images on any websites	Being bullied on the internet	Meeting new online contacts offline	Receiving sexual messages (only 11+)
<i>Encountered the risk (%)</i>	14	6	9	15

Of those who encountered each risk, % who encountered it:

on a social networking site	23	51	62	25
by email	n.a.	13	8	16
in a chatroom	n.a.	15	16	13

by instant messaging	n.a.	46	42	26
in a gaming website	17	10	10	9
by 'pop-ups'	48	n.a.	n.a.	34
on a video-hosting site	33	n.a.	n.a.	n.a.
on an adult/X-rated website	28	n.a.	n.a.	n.a.
on a peer to peer file-sharing website	13	n.a.	n.a.	n.a.
some other way on the internet	20	7	11	23

Base: All children who use the internet; all children who encountered the specific risk. Note: These data have been weighted.

Recognizing that encountering risks does not necessarily result in harm, we re-present this table to show the percentage of children who report harm (i.e. those who say they were bothered or upset by these risks), again showing the way in which they encountered each risk (Table 6). This shows that, for the various different ways in which children can encounter risk, roughly the same percentage says that he or she has been bothered or upset by the experience. Looking at SNS in particular, it seems that using these is not associated especially with an increase in harm, as reported by the child.

Table 6. Harmful consequences of online risks, by where the risk was encountered

	Seeing sexual images on any websites	Being bullied on the internet	Meeting new online contacts offline	Receiving sexual messages (only 11+)
For those who have encountered the risk, how many have been bothered or upset by it?				
<i>Of those who encountered the risk, % who were bothered or upset by it</i>	32	82	12	25
Of those who encountered the risk in each way, % who were bothered or upset by it:				
on a social networking site	33	84	10	27
by email	n.a.	87	26	26
in a chatroom	n.a.	82	15	24
by instant messaging	n.a.	86	11	26
in a gaming website	35	72	17	36
by ‘pop-ups’	32	n.a.	n.a.	27
on a video-hosting site	30	n.a.	n.a.	n.a.
on an adult/X-rated website	24	n.a.	n.a.	n.a.
on a peer to peer file-sharing website	28	n.a.	n.a.	n.a.
some other way on the internet	34	80	15	21

Base: All children who use the internet; children who have encountered a specific risk and were bothered by it. Numbers in **bold** differ significantly from ‘all children’ who encountered the risk and were bothered. Note: These data have been weighted.

The table also shows that children who encounter sexual images via adult or X-rated sites are less likely to be upset by the experience than those who encountered these images in another way, possibly because these children deliberately sought out such images and so were prepared rather than exposed to the unexpected. For bullying, those who were bullied by instant messaging are more likely to be upset, while those bullied via gaming websites are least upset: possibly, the nature of the messages is different. For those bothered or upset after meeting a new online contact offline, those who made contact via e-mail are more upset, as are those who received sexual messages through gaming websites. The specific differences in risk consequences by platform had not been predicted in this study, but surely merits future research to explore how particular affordances sustain particular CMC conditions and, in turn, are responded to differently by children.

Finally, H4 asks whether SNS users with more digital competence in using the internet experience less harm resulting from online risk. To test this and also to investigate if SNS use is associated with an increase in the likelihood of a child being bothered or upset by experiences on the internet it is possible to look at the children’s answer to the general question of whether they had in the past 12 months before the survey ‘seen or experienced anything on the internet that bothered them in some ways’.

Table 7 shows three logistic regression models using this general question of ‘bothered by anything seen or experienced on the internet’ as the dependent variable. As before, the first model includes just SNS use as an independent variable. This shows that having an SNS profile is associated with a 60% increase in the likelihood of having been bothered by something on the internet in the past 12 months before the survey. However, the pseudo R square is very low, suggesting SNS use is a poor predictor of whether a child has been bothered by something on the internet or not - probably because, while many children use SNS, few report harm online.

Table 7. Logistic regression models of the log odds of a child being bothered by anything seen or experienced on the internet, by SNS use, demographics and internet use

	Exp(B) Model 1	Exp(B) Model 2	Exp(B) Model 3
Constant	0.11	0.08	0.06
Using SNS	1.58	1.25	n.s.
Gender (girls)		1.19	1.22
Age		n.s.	0.92
Time spent online (hours)		1.22	n.s.
Use the internet daily		1.21	n.s.
Have access in own bedroom at home		n.s.	n.s.
Use a mobile phone or a handheld device		n.s.	n.s.
Digital competence		1.14	n.s.
Seeing sexual images on any websites			3.01
Being bullied on the internet			5.46
Meeting new online contacts offline			n.s.
Receiving sexual messages			1.83
Negative user generated content			2.10
-2 Log likelihood	9,514	9,392	7,905
Cox & Snell R2	0.00	0.01	0.13
Nagelkerke R2	0.01	0.03	0.24
Chi-square (model)	48	170	1,658
df (model)	1	8	13

Base: All children who use the internet. Coefficients are significant at < .05 unless stated otherwise.

As noted earlier, SNS use itself is linked to the extent and nature of internet use, among other variables. Hence model 2 includes also demographics and internet use related variables. These improve the model fit, also lowering the parameter estimate for SNS use. Interestingly, children high in digital competence are not less but slightly more likely to say that they have been bothered by anything on the internet. Since risk and harm are related, the third model controls for risk by adding in the risk variables. The effects of using SNS and also of being more digitally competent disappear. In other words, although it first appears (model 1) that using SNS is associated with more harm, this reflects the underlying relation between amount of use, digital competence and risk, each of which is positively associated with both SNS use and with harm.

In short, it appears that SNS use is related to a moderate increase in the likelihood of children being bothered or upset by something online. Moreover, being more digitally competent does not reduce either risk or harm. But it should not be concluded that SNS are in and of themselves harmful; rather, use of SNS is related to increased risk online but not to increased

harm once other variables (demographic, usage, risks) are taken into account. In other words, which children experience online as harmful and which do not appears unrelated to the fact of their using SNS (or not). As we examine elsewhere, the factors that explain why only some find online risks harmful reflect the child's circumstances or psychology more than the internet or how they use it (Livingstone & Görzig, 2012).

5 Discussion and conclusions

Now that the use of social networking sites is firmly embedded in the daily activities and relations of many young people, this article set out to examine the possible consequences of SNS use for children's online experiences of risk and harm. Drawing on insights from a combined analysis of youth approach to risk, the social dimensions of internet affordances, and the findings of the literature on computer-mediated communication, a series of hypotheses were derived in order to examine whether SNS use makes a particular difference to children's encounters with a range of online risk.

The first hypothesis stated that children who use social networking sites will encounter more risks online than those who do not. This hypothesis is supported by the data. Compared with children who do not use SNS, children who use SNS are 46% more likely to have received sexual messages, 55% more likely to have seen sexual images on websites, 56% more likely to have encountered negative user generated content, 114% more likely to have been bullied on the internet and 163% more likely to have met people offline that they had only met online before. This is the case even when age, gender, frequency of use, amount of use, location of use and digital competence in using the internet are taken into account. As discussed at the outset, the relation between risk and harm cannot be assumed, for not all risks are experienced as harmful by the child and, notably, being bullied is far more often reported as upsetting than is, say, seeing sexual images or meeting new people (Livingstone, Haddon, Görzig, & Ólafsson, 2011).

The second hypothesis stated that SNS users with more digital competence will encounter more online risk than those with less competence. This hypothesis is supported also. Children who say that they know lots about using the internet are 30–45% more likely to have encountered each of the five risks (seeing sexual images on websites, being bullied on the internet, meeting online contacts offline, seeing or receiving sexual messages and encountering negative user generated content). While this finding runs counter to the assumption of digital skills training initiatives (where it is expected that greater competence enables children all the better to avoid risks), it fits the wider literature on risk and resilience in adolescence (where competence empowers greater exploration; Coleman & Hagell, 2007).

The third hypothesis stated that SNS users with more risky SNS practices will encounter more online risk than those with fewer risky practices. This hypothesis is supported by the data. Children who have their profile public, display identifying personal information or have a large number of contacts are more likely to encounter most types of risks than those who adhere to recommended ways of using SNS. *How* one uses SNS matters, therefore, even more than *whether* one uses SNS. This finding, we suggest, identifies a productive route ahead for awareness-raising initiatives, for these are unlikely to persuade children (or parents) to cease to use SNS altogether but can certainly focus on safer ways of using these services.

The fourth hypothesis stated that SNS users with more digital competence in using the internet will experience less harm associated with online risk. However, the data do not

support this hypothesis, since digital competence does not reduce the probability of children saying that they have been bothered or upset by something on the internet. It appears that digital competence cannot simply be mapped onto (or regarded as a proxy for) resilience to harm in the online domain. Rather, the explanation for harm appears to lie more with the child and their circumstances (note that girls and younger children report more harm; Table 7) rather than with their practices of SNS use, and this merits further research.

It should be noted that the present analysis, and the dataset on which it draws, has both strengths and limitations. The strengths include the scale and depth of the dataset, which permits exploration of the relations among a range of potentially relevant variables, and the size of the sample, which permits analysis of even small subsets of children (e.g. those who report being upset by something on the internet in the past year). The limitations include the cross-sectional nature of the survey, so we cannot determine which came first between digital competence and SNS use, internet usage practices and risk encounters, etc. It is also not possible to pursue further the precise interplay between the affordances of specific SNS in different countries and the risky SNS practices or the risk encounters reported by children.

Several points, therefore, remain for future research. One such is the degree to which the design of SNS sites matter – for example, if the task of making a profile private is eased, or if children’s profiles are set to private by default, does this reduce children’s risk encounters? Since risk is a probability of harm only, more work is also needed to understand why for some children exposure to sexual messages, or new contacts, for example, upsets them why for others it does not. The finding that increased digital competence does not appear to reduce either risk or harm raises some concern for digital literacy and safety initiatives also, and more specific investigation would be of value here. Recall that, so as to include the younger children in the survey (who were, and arguably could be, only asked the simple question, do you know lots of things about using the internet, rather than more concrete questions about digital skills), it may be that a different approach would produce findings more encouraging to e-safety initiatives. Further, although our findings suggest that children who use SNS ‘safely’ (with privacy settings on, no disclosure of identifying information and fewer contacts) encounter fewer risks, it would be interesting to evaluate whether implementing these practices reduces the risks reported by children after such an intervention. Last, Tables 5 and 6 suggest that particular platforms may be associated with particular risks and harms in ways yet to be understood – instant messaging and gaming sites especially merit more careful research in this regard.

This paper has examined some of the potentially negative consequences of the astonishingly rapid, recent adoption of social networking practices among many children in the world’s wealthier countries. As we have shown, SNS use does increase children’s encounters with risk online, but this depends substantially on how they use SNS, and it does not in any case increase their experiences of harm, once other variables have been taken into account.

Charting the consequences of SNS use, whether beneficial or harmful, thus requires a dual analysis of both the design affordances of particular services and the preferences, skills and practices of their users. The implication is that to reduce the probability of children’s SNS use leading to harm the most important thing is to prevent them from encountering the risks in the first place. The priority is then to examine critically the design of such services as well as to inform the users of safer ways of social networking in the future.

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