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Taking risks when communicating on the internet: the role of offline social-psychological factors in young people's vulnerability to online risks

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Children and young people encounter a range of risks on the internet relating to communication. Making friends online has attracted particular attention as a risky behaviour, especially when this leads to offline meetings, as has giving out personal information online. This article, based on the 'UK Children Go Online' survey, seeks to explain the online communication of 9 – 19 year olds in terms of their offline socio-psychological characteristics (shyness, life satisfaction, risk-taking), family communication patterns and online behaviour/skills. Findings show that older teens engage in more online communication activities than do younger children and so encounter more communication risks. Although girls communicate more on the internet, this seems not to put them more at risk. It was found that children's offline social psychological characteristics, particularly their levels of life satisfaction and risk-taking, influence their online communication, with different online communication activities being predicted by different patterns of off and online characteristics. There are weak indications that, in families which have a more conversational style of communication, teens may take fewer risks online, including a lower likelihood of meeting online friends offline. Multiple regression analyses show that those children and teens who are less satisfied with their lives and who have become more frequent and skilled internet users are more likely to value the internet as a communicative environment in which they feel more confident than they do offline, particularly in relation to the potential for anonymous communication. Since this in turn leads some into risky activities, the implications for research and policy are discussed.

Keywords   Children and young people, online communication, contact risks, anonymity, trust

Online opportunities and risks

The internet is widely recognised as affording both opportunities and risks to those who use it, although the balance between the opportunities and risks, and the question of whether the internet increases the overall likelihood of children encountering risks such as paedophile contact, stalking, bullying or race hate is unresolved (Livingstone, 2001; Seiter, 2005; Valkenburg & Soeters, 2001). While overall evaluations remain elusive, the notions of internet 'uses' and 'users' must be disaggregated: different internet users, depending on their social contexts, will take up distinct functionalities of the internet (LaRose et al., 2001) and so, in consequence, will encounter different opportunities and risks.

While a considerable body of research has sought to identify the many and various benefits afforded by internet communication, especially for young people (e.g. Clark, 2005; Leung, 2001; Pew, 2001), others have more pessimistically drawn attention to the risks. Concerns arise in relation to children and young people regarding the risk of encountering commercial content, pornographic content and violent content (Greenfield, 2004; Larsson, 2003; Livingstone & Bober, in press; Mitchell, Finkelhor, & Wolak, 2003; Montgomery, 2001). However, it is the potential of the internet for peer-to-peer networking that arouses the greatest anxieties among those concerned with youth safety (Muir, 2005). In acknowledgment of the widespread public concern attaching especially to the risks of meeting strangers online and then offline (Carr, 2004; Internet Crime Forum, 2000), and notwithstanding the many benefits that the internet undoubtedly affords young people, this article focuses on the risks that children and young people may encounter as they use the internet to communicate with peers, including giving out personal information, making friends online and going to offline meetings with people met online (c.f. Larsson, 2003; Liau, et al, 2005; Turow & Nir, 2000). Thus, it asks which young people are taking up the opportunity to communicate on the internet, why, and with what consequences?

Using the internet to communicate

To understand what goes on online, it is important to grasp what goes on offline, for there is no easy assumption of difference or opposition between these two spheres of communication (McGerty, 2000; Slater, 2002). Indeed, it is increasingly argued that the social relationships mediated by computers and the internet reflect, or are continuous with, the relationships people have offline (Spears, Postmes, Wolbert, Lea, & Rogers, 2000; Walther, 1996; Wellman, Quan Haase, Witte, & Hampton, 2001). For example, precisely because women are regarded as better communicators offline, it has been hypothesised that they will use the internet more to communicate and will feel more comfortable using it as a communication tool (Singh, 2001; Weiser, 2000). We note, however, that empirical research sometimes (Boneva, Kraut, & Frohlich, 2001), but not always, supports this claim (Shaw & Grant, 2002). Partly, this is a matter of research measures. For example, in the case of gender, Hargittai and Shafer (2006) found that women tend to self-assess their internet skills as lower than do men, and this may negatively affect the extent and breadth of their internet uses; yet their research also shows that women's actual online skills are little different from men's. However, in relation to communication in particular, women and, especially, teenage girls, appear to make greater use of the internet (Raphael, Bachen, Lynn, Baldwin-Philippi, & McKee, 2006). While in many ways this is beneficial, it is also the case that girls are more likely to experience the risks of online communication, for example by receiving more online sexual solicitations (Mitchell, Finkelhor & Wolak, 2003).

In a parallel debate, some have suggested internet use to be associated with isolation and loneliness, the online apparently compensating for difficulties (whether social or psychological) offline (Kraut et al., 1998). Although subsequent research has instead found it to support an expansion in social networks (Bakardjieva, 2003; Kraut et al., 2002; Mesch, 2001), albeit through weak ties (Hampton & Wellman, 2003), nonetheless, concerns remain over whether internet use is associated with social isolation (Griffiths, Davies, & Chappell, 2004; Nie, 2001). Thus research provides indications that those who lack strong relationships offline will seek them online (McKenna & Bargh, 1998), that use of the internet for sociability and self-disclosure is inversely

linked to satisfaction and quality of life (Leung & Lee, 2005 – as are many other aspects of young people's lives, see Huebner, 2001), and that using the internet increases loneliness and depression among those who are not psychologically stable (Bessiere, Kiesler, Kraut, & Boneva, 2005; Subrahmanyam, Kraut, Greenfield, & Gross, 2000). While it is not always possible to determine the direction of causality underlying these observed associations (Kraut, Kiesler, Boneva, & Shklovski, 2006), in a longitudinal study, Jackson et al (2001) found that depressed people make greater use of email and that, in addition, using email seems to lessen (rather than increase) feelings of loneliness.

Focusing specifically on youth, an American survey of 7th grade children (c.12 years old) found no relation – neither positive nor negative - between time spent online and well-being in general, but it did find that those who felt lonely or socially anxious were more likely to use instant messaging to communication with people they did not know well (Gross, Juvonen, & Gable, 2002). Similarly, a large American survey of 9th-grade (c.14 year old) students found that use of internet chat rooms was associated with greater likelihood of psychological distress, a difficult living environment and risky behaviours (Beebe, Asche, Harrison, & Quinlan, 2004). More positively, Mesch and Talmud (n.d.) found that, among Israeli adolescents, those who lack social support offline (but not those with low self-esteem offline) may compensate by developing strong and meaningful friendships online, particularly with others who are similar to them (Mesch & Talmud, in press).

These continuities between offline and online may not only derive from social psychological characteristics such as shyness or lack of life satisfaction. Research on media effects (Bryant & Zillman, 2002) suggests, for example, that those who seek risks (or sensation) in everyday life tend to seek the same kind of stimulation in the media. It may be, therefore, that those who take risks offline will do the same online, a hypothesis particularly apposite to our present concern, since making friends online and, especially, meeting them offline are often framed as risky activities, particularly in policy debates over online safety, and so may well be undertaken by risk-takers or sensation-seekers. Slater, Henry, Swaim, and Cardador (2004, p.644) define 'sensation-seeking' as 'a dispositional tendency to seek out novelty and accept risk as a desirable source of arousal'. While this definition is itself neutral, we are here concerned with the possibly negative, rather than beneficial, consequences of such a tendency.

Importantly, the consequences of online relationships are not always easy to judge, though there are indications that for most, online communication may be positive, enabling beneficial online relationships, but for those who are in some way psychologically vulnerable, online communication may be harmful or risky. One major American survey, which found that teens who lack good communication with their peers or parents offline are more likely to form close online relationships (Wolak, Mitchell, & Finkelhor, 2003), speculated that for some, these relationships may be beneficial, while for others they may be risky. Surveys also show that parents are often unaware of, and ineffectual regarding, the risks their children take online, raising crucial questions regarding the quality of communication between parents and children in mediating children's online communication (Larsson, 2003; Liau, et al, 2005; Livingstone & Bober, in press). Thus the quality of children's and teenagers' communication with their parents seems to be a relevant social context worth investigating (Fitzpatrick, et al, 1996), especially since in policy circles, so much safety awareness material is targeted at parents. In addition to research on whether online communication is a cause of, or a response to, the social psychological problems in children's offline lives, there is also a growing literature charting the specific risks introduced by online communication. The 'Youth Internet Safety Survey', based on 1,501 10 to 17 year olds in the USA who use the Internet regularly (Finkelhor, Mitchell, & Wolak, 2000), found that one in five had received a sexual solicitation or approach over the internet in the last year, one in 17 had been threatened or harassed, and one in 33 received an aggressive sexual solicitation, often from someone who asked to meet them, telephoned them, or sent them regular mail, money or gifts. Although around one quarter had been distressed by these incidents, few reported them to a parent, law-enforcement agency or internet service provider (see also Livingstone & Bober, 2004b).

Other surveys, often among students, reveal the growing incidence of cyber-harassment and cyber-stalking (Barak, 2005; Bocij, 2003), online bullying (Ybarra & Mitchell, 2004) and hostile or embarrassing messaging. The 'UK Children Go Online' survey found that one third of 9-19 year old internet users have received unwanted sexual (31%) or nasty/bullying comments (33%) via email,

chat, instant message or text message (Livingstone & Bober, 2004b). Girls seem more vulnerable than boys to such behaviour online: 33% of the girls had received sexual comments compared with 29% of boys; the difference for bullying was even greater - 38% of girls have been bullied compared with 27% of boys. As further analysis of that survey also showed, more frequent and more skilled internet users encounter a greater range of online risks as well as opportunities (Livingstone, Bober, & Helsper, 2005): 38% of daily users had received sexual comments and had been bullied while only 25% of weekly users had received sexual comments and 27% had been bullied.

Little is yet known of how people cope with online threats, though it seems that many lack the requisite skills (Bocij, 2003). Ybarra (2004) found not only that 10-17 year olds who reported major depressive-like symptoms were 3.5 times more likely also to report an unwanted sexual solicitation online compared to youths with mild/no symptoms, but also that, among those reporting an online solicitation, youths with major depressive-like symptoms were twice as likely to feel emotionally distressed by the incident. Ybarra suggests that depression exacerbates both unwanted sexual contact and the distress experienced as a result (see also Ybarra & Mitchell, 2004).

In what follows, we first consider who communicates using the internet. We then ask about the social psychological, peer and family-related characteristics that may differentiate among different kinds of user and, therefore, different categories of risk. We must note, however, that the distinction between opportunities and risks is by no means straightforward, creating uncertainty over which activities are to be encouraged or restricted. As we have stressed, communication is by no means problematic in itself, indeed generally it is a benefit. However, for a small minority of growing concern to policy makers, law enforcement and parents, it can be risky. Thus, while 'making friends online' is regarded by young people as an opportunity, it is regarded as risky by parents and law enforcement agencies, especially as the incidence of paedophile activity on the internet increases (Palmer & Stacey, 2004; Wolak, Mitchell, & Finkelhor, 2003). Similarly, 'seeking advice on the internet' is in many ways an opportunity for relationship or health advice, permitting the candid exchange of sensitive information (Center For Media Education, 2002; Prasad & Owens, 2001; Suzuki & Calzo, 2004), but may also be seen as a risk if the advice concerns suicide (Becker, Mayer, Nagenborg, El-Faddagh, & Schmidt, 2004; Savin-Williams & Ream, 2003) or self-harm (Whitlock, Powers & Eckenrode, 2006).

Design and methods

As part of a broader, quantitative and qualitative research project on children and young people's use of the internet in the UK, a national survey was conducted through an in-home, 40 minute, face to face, computer-assisted interview with children and young people aged 9-19, using Random Location sampling across the UK.1 Following the design and piloting of the survey questionnaire by the research team, the fieldwork was carried out by a reputable market research company (British Market Research Bureau International). This was conducted via multi-media computer-assisted personal interviewing with children, together with a paper questionnaire completed by one parent of each of the 9-17 year olds, in Spring 2004. Informed consent was obtained from all respondents and, for respondents under 18 years old, from a parent also (see www.children-go-online.net for the research ethics policy).

In total, 1,511 interviews with 9-19 year olds were completed (see Table 1). The UKCGO survey asked a range of questions, distinguishing those questions which could be directed to all respondents (including basic questions of internet access and use) and those which could only be directed to internet users; here we focused on those who used the internet at least once per week (84% of the sample), asking more detailed questions of these respondents regarding specific online skills, perceived self-efficacy online and questions about a range of online activities.[2] In addition, 1077 parents of those aged 9-17 agreed to complete a questionnaire of which 920 paper questionnaires were received and 906 were usable. In this article, percentages have been weighted to data from BMRB's Target Group Index and Youth surveys. The weighting efficiency was 91% and the effective sample size was 1375. Raw sample sizes and all statistical analyses are based on unweighted data.

Table 1 Survey participants (N=1511) by demographic characteristics

Demographics	Subgroup sample sizes			
Age	9-11 years (N=380)	12-15 years (N=605)	16-17 years (N=274)	18-19 years (N=251)
Gender	Boys (N=669)	Girls (N=842)		
Socioeconomic Status (SES)[3]	AB (N=264)	C1 (N=418)	C2 (N=407)	DE (N=422)
Region	England (N=1,228)	Wales (N=69)	Scotland (N=166)	Northern Ireland (N=48)
Ethnicity	White (N=1,336)	Non-white (N=171)		

As at this present, early stage of research on youth and the internet, no single theoretical framework proposes which factors may mediate risky or negative aspects of internet use, in formulating our research questions we have drawn on all the research reviewed above in order to design the survey questionnaire. Such factors include demographic factors, internet use measures, offline social psychological factors (including measures of shyness, self-esteem, (dis)satisfaction with one's life, and risk-taking or sensation-seeking), family communication dynamics, and perceptions of the nature of internet-based communication (confidence, secrecy, anonymity, intimacy, etc) (see Tables 4 and 5 for items). Thus, the following research questions were formulated:.

- RQ1: Do girls communicate more online than boys and, therefore, encounter more communicative risks (making friends, giving out personal information etc)?
- RQ2: Are those who are socially anxious or lack self-esteem offline more likely to explore communicative opportunities online, thus engaging in more risky behaviours?
- RQ3: Are those who lack an open communication channel with parents more likely to seek intimacy and guidance online?
- RQ4: Do those who are more experienced, frequent and skilled internet users engage in a greater range of risky internet-related communications?

Results and discussion

The extent, nature and perception of online communication

Children and young people use the internet to communicate in different ways (see Table 2). Email is the most popular activity (72% of 9-19 year olds), followed by instant messaging (55%) and chatrooms (21%). However, socio-demographic factors make a difference. Middle class internet users communicate at least once a month while those from working class homes do so less than once a month. Email is more frequently used by older teens than by young children, and is a little more used by girls and by middle class children. Similarly, instant messaging is more frequently used by older and middle class teens. However, chat rooms are more frequently used by older and working class teens, though there are no significant differences by gender in the use of chat rooms or instant messaging.

Table 2 Analyses of variance for frequency of online communication, by socio-demographic factors

	Instant Messaging	Email	Chat	Online communication overall
9-11 yrs	1.70	2.09	1.25	1.76
12-15 yrs	2.80	3.00	1.53	2.61
16-17 yrs	3.43 **	3.62 **	1.48 **	2.93 **
18-19 yrs	2.89	3.92	1.53	2.84
Male	2.62	2.95	1.50	2.49
Female	2.76	3.16 *	1.42	2.57
AB	2.95	3.39	1.31	2.59
C1	2.73	3.10	1.44	2.51
C2	2.72 **	3.03 **	1.61 **	2.56
DE	2.33	2.66	1.50	2.41
Total	2.69	3.05	1.46	2.53

Base: All 9 to 19 year olds who use the internet at least once a week (N=1262).
Note: The frequency scale used is: 1 = never, 2 = less often, 3 = once a month, 4 = at least once a week, 5 = every day. * Significant at $p<0.05$. ** Significant at $p<0.01$

The differences between the social grades disappear for instant messaging if one just compares those who have home access. However, for emailing and chatting the differences between the social groups persist even when home access is equalised. Children with equivalent access will thus use instant messaging in the same manner, but it seems that, for other reasons, middle class young users email more and chat less than working class young users.

What do children and young people do when they communicate online? Many simply continue their offline friendships online, earning them the label, 'the constant contact generation' (Clark, 2005). Such routine chatting to friends that they also meet at school or in their neighbourhood is valued by young people as extending their communication possibilities (Livingstone & Bober, 2004a). Though sometimes deplored by parents as a distraction or waste of time, it is not this communication that occasions great hopes or anxieties among observers. The survey examined several forms of online communication can be regarded as risky (especially, as facilitating unwanted, harassing or paedophile contact), though each can also be regarded as affording positive opportunities. Thus questions asked about making new friends online, meeting people offline that they first met online, seeking personal advice online, and giving out personal information online. This permits a further research question:

- RQ5: Do similar factors explain whether and which children engage in different risky behaviours, or does each require a different explanation (and, possibly, a different policy intervention)?

The popularity of these different activities varies. The findings show that 4 in 10 have given out personal information;[4] further, 1 in 3 have made friends online, 1 in 4 have sought personal advice online and 9% have met someone offline that they first met offline (see Table 3). As before, these activities vary for different socio-demographic groups. Giving out personal information is more common among teens, boys and those from middle class homes. This may be because, as shown elsewhere, those with better quality of access tend to use the internet more and so take up more opportunities as well as encountering more risks (Livingstone et al., 2005). The other activities do not vary by gender or socioeconomic status, but they are each more common among teens than younger children.

Table 3 Analyses of variance for frequency of online communication, by socio-demographic factors

	Friends online (a)	Meet people offline (a)	Seek advice online (b)	Give out personal information online (a)
9-11 yrs	16%	2%	N/A	19%
12-15 yrs	33%	7%	21%	42%
16-17 yrs	43% **	14% **	29% **	55% **
18-19 yrs	32%	16%	32%	49%
Male	33%	10%	26%	43%
Female	29%	7%	23%	36% **
AB	31%	9%	26%	45%
C1	34%	8%	26%	42%
C2	32%	8%	24%	36% **
DE	28%	8%	23%	34%
Total	31%	9%	25%	39%

Base: a) All 9 to 19 year olds who use the internet at least once a week (N=1262).
b) All 12 to 19 year olds who use the internet at least once a week (N=974).
* Significant at $p < 0.05$
** Significant at $p < 0.01$

The 9%, who attend offline meetings with online friends is regarded with considerable concern by law enforcement agencies. This figure is higher than the 3% found for a younger sample of primary school children (O'Connell, 2003) but lower than the 14% of 9-16 year olds reported in a five-nation European survey (Larsson, 2003) and the 16% of 12-17 year olds in Singapore (Liau, Khoo, & Ang, 2005). As Liau et al show, attending such meetings is predicted by age, frequency of internet use and parental rules.

To pursue the question of why children and young people communicate online for these different purposes, the survey asked some more subjective questions regarding the perception of online communication. Respondents' answers to five items, presented using a 5 point Likert-type scale, were entered into a factor analysis. This identified two distinct scales, one concerned with feeling more confident with online than offline communication, one concerned with the advantages of an anonymous form of communication (see Table 4).

Table 4 Factor analyses for perceptions of online communication

	Online confidence	Value anonymity
Talking on the internet is more satisfying than in real life	0.36	
I feel more confident on the internet than I do in real life	0.60	
It's easier to keep things secret on the internet		0.32
It's fun to be rude or silly on the internet		0.54
It's easier to talk about personal things on the internet		0.35
Variance explained	27%	18%

Base: All 12 to 19 year olds who use the internet at least once a week and use chat, email or instant messaging (N=831).

Note: Factors extracted through Maximum Likelihood method based on Varimax Rotation with a selection criterion of eigenvalue >=1, $R^2 = 44\%$.

Making friends, disclosing personal information and seeking advice all require a certain degree of trust in online communication, and this is, perhaps, enabled by a sense of anonymity or confidence in the online environment (Joinson 2001; Spears et al., 2000; Walther 1996). It seems

that children and young people vary in the degree to which they consider the internet a communication environment that inspires their confidence or trust. But to ask which young people feel this, and whether this leads them into riskier uses of the internet, requires some further steps in the analysis, as we undertake below.

Differentiating among users

Thus far, we have distinguished young people in terms of their socio-demographic characteristics. But, as the research literature stresses, a more subtle approach is needed. Although a survey can be a blunt instrument with which to measure the subtleties of children's psychology or family relationships, without a large sample size it is difficult to discern subtle associations between social/psychological contexts and internet use. Hence, the survey included items concerned with the social psychology of the child and the family, presented in a private, self-completion section. These concerned social anxiety (specifically, social avoidance and fear of negative evaluation; Chapman, 2002), risk-taking or sensation-seeking (Stephenson, Hoyle, Palmgreen, & Slater, 2003), life satisfaction (Huebner, 2001), and family communication patterns (using items from the children's version of the Revised Family Communication Pattern Instrument; Koerner & Fitzpatrick, 2002). A factor analysis produced factors for life satisfaction (including fear of negative evaluation items) and family communication patterns (distinguishing conversation-oriented and conformity-oriented), leaving shyness and sensation-seeking as independent single item scales (see Table 5).

Table 5 Factor analysis results for the social psychological and family communication variables

	Shyness	Life satisfaction	Sensation-seeking	Conversation-oriented family	Conformity-oriented family
I feel shy around people I don't know	0.99				
I'm happy with my life at the moment		-0.46			
I would like to change things in my life		0.72			
I worry what other people think of me		0.40			
I often do dangerous things for fun		0.21	a)		
My parents generally ask what I think when the family is talking about something				0.51	
In my family, people like to look at different sides of an issue				0.62	
I can tell my parents almost everything				0.46	
My parents become irritated if my views are different from theirs					0.48
My parents often say "you'll know better when you grow up"					0.53
Variance explained	21%	16%		12%	10%

Base: All 9 to 19 year olds (N=1511)
Note: Factors extracted through Maximum Likelihood method based on Varimax Rotation with a selection criterion of eigenvalue >=1, R^2=58%.

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a) Since the highest factor loading of sensation-seeking was only 0.21, and previous research showed this to be important, the sensation-seeking item was kept as a separate indicator.

These social psychological and family communication characteristics are not distributed evenly through the population (see Table 6). In general, analyses of variance show that girls are shyer than boys; boys are more sensation-seeking, and they judge their families to be more conversation-oriented than do girls. Age is also important: as children grow into teens, they become more sensation-seeking, and their life satisfaction falls. Younger children and older teens both perceive their families to be more conversation-oriented than do those in their middle teens, though the younger children are also likely to consider their families fairly conformity-oriented, unlike the older teens. Social grade makes little difference, except that lower social grade children judge their family communication to be more conformity-oriented. Note that the correlation between conformity- and conversation-orientation measures is only -.05 (p=0.06), confirming that these are independent rather than opposed measures (c.f. Fitzpatrick, Marshall, Leutwiler, & Krcmar, 1996); it is thus possible for children to see their parents both as conversation- and conformity-oriented, though others may see their parents are more conversation- than conformity-oriented, or *vice versa*.

Table 6 Analyses of variance for social psychological and family characteristics, by socio-demographic variables

	Shyness	Sensation-seeking	Life satisfaction	Conversation-oriented family	Conformity-oriented family
9-11 yrs	3.44	2.01	3.52	3.84	3.19
12-15 yrs	3.36	2.37	3.29	3.73	3.05
16-17 yrs	3.29	2.35 **	3.18 **	3.68 *	2.85 **
18-19 yrs	3.24	2.45	3.04	3.85	3.00
Male	3.22	2.63	3.32	3.69	3.02
Female	3.48 **	1.93 **	3.24	3.84 **	3.06
DE	3.33	2.36	3.28	3.76	3.26
C2	3.40	2.37	3.31	3.69	3.10
C1	3.36	2.22	3.29	3.75	3.03 **
AB	3.32	2.22	3.25	3.84	2.77
Total	3.35	2.29	3.28	3.76	3.04

Base: All 9 to 19 year olds (N=1511)
* Significant at p<0.05
** Significant at p<0.01

Predicting the take up of online communicative opportunities and risks

Although qualitative research has argued that offline social relations frame the conduct of online social relations (Baym, 2001; Slater, 2002), others have suggested that the online world is somewhat divorced from, and so not predictable by, life offline (e.g., Turkle, 1995). Correlations between the online communication variables (confidence in online communication, valuing the anonymity of online communication) and offline social psychological and family variables (shyness, sensation-seeking, life satisfaction, conversation-oriented and conformity-oriented family) suggest that these are linked. Thus, children and teens who feel more confident on the internet are more likely to be shy (r=0.09, p<0.01), to be less satisfied with their lives (r=-0.10, p<0.01), and to come from conformity- (r=0.08, p<0.05) more than conversation-oriented (r=-0.13, p<0.01) families. Further, those who value the anonymity of online communication are also more likely to be shy (r=0.11, p<0.01), to be more sensation-seeking (r=0.17, p<0.01) and to be less satisfied with their lives (r=-0.17, p<0.01).

This pattern of associations suggests that both offline and online variables may help to explain the communicative risks and opportunities that children encounter on the internet. In the final step of these analyses, we conducted a series of multiple regressions - a linear regression to explain the continuous variable of frequency of online communication, and four logistic regressions

for the binary variables of whether or not the respondent has a friend online, has met an online friend offline, has sought advice online, or has given out personal information online. The model was selected based on stepwise regression in which variables are entered one by one into the equation and variables are dropped from the model if they lose significance when a new variable is entered into the equation. The results are shown in Table 7.

Table 7 Linear and logistic regressions for measures of online communication

	Freq. of online communication		Friend online		Offline meeting		Advice		Personal info	
	B	Beta	B	Exp (B)	B	Exp (B)	B	Exp(B)	B	Exp(B)
(Constant)	-0.78		-4.05	0.02	-4.95	0.01	-2.90	0.06	-2.00	0.14
Social grade										
Age	0.03	0.10			0.21	1.23	0.08	1.08	0.07	1.07
Gender (Female)	0.20	0.11								
Years internet use					-0.18	0.84				
Frequency of use	0.32	0.31	0.46	1.58			-0.30	0.74	0.27	1.31
Self-efficacy									-0.22	0.80
Skills	0.11	0.24	0.18	1.20	0.18	1.20	0.27	1.32	0.13	1.14
Shyness					-0.22	0.80				
Sensation-seeking	0.04	0.06			0.28	1.32			0.18	1.19
Life satisfaction			-0.19	0.83	-0.30	0.74	-0.17	0.85	-0.35	0.70
Online confidence			0.74	2.10	0.60	1.82				
Value anonymity	0.60	0.18	1.05	2.86	1.31	3.71	1.06	2.89	1.15	3.15
% correct	R^2=0.31		69%		89%		74%		66%	
N=	877		840		858		750		750	

Base: All 12 to 17 year olds who use the internet at least once a week and have used chatrooms, emails or instant messaging.

The regression analysis shows that those who communicate more frequently on the internet tend to be older teens, girls, frequent internet users, those who claim more online skills, who are sensation-seeking in their daily lives, and who value the anonymity afforded by online communication. Not all those who communicate online necessarily make new friends this way; as noted earlier, much online communication is conducted with friends that the child has already established through their offline activities. However, for the one in three who do go on to make a friend online that they have not met offline, this is not, it appears, a matter of demographic variables, being typical neither of older teens or girls, even though these groups do communicate online more in general. Rather, it seems that online friendships are characteristic of more frequent, skilled internet users who, in their daily lives, are less satisfied with their lives and who feel more confident online, greatly valuing the anonymity the internet offers.

Going to meet an online friend offline is seen by many to involve yet further risk. This step is taken, the results suggest, by older teens, boys and girls, who have not been using the internet for so long, though they claim more online skills. They are, interestingly, less shy offline and they are more likely to be sensation-seekers who are dissatisfied with their lives. Like those who make friends online, those who feel more confident communicating online than offline and value the anonymity of the internet are more likely to meet someone offline. In short, the relatively risky activities of making and meeting online friends seems to depend on a particular balance of online and offline characteristics. In both cases, the likelihood of such activities is greater for the child who

is less satisfied with their offline life, yet has become skilled online; this environment then affords them the opportunity to feel more confident in their communication with others and, especially, to provide the benefits of anonymity, including exchanging secrets, silliness and personal disclosure. What makes the difference between having an online friend and going to meet them offline, however, is being older (and so, presumably, more used to meeting people in public places), being less shy offline and, notably, being more sensation-seeking. For example, those who are high sensation seekers (score 5) are four times as likely as those who are not sensation seekers (score 1) to have met someone offline.

Follow up survey questions show that such meetings are partly risky because children may do not tell friends or family that they are going to such a meeting: 45% told their parents and 78% told their friends. Further, they rarely go with an adult (11% went with a parent), though 66% did take a friend with them. It is important to note that, for most young people, these meetings are a positive experience: 58% said that they had a good time, 33% said it was nothing special and only 1% said they did not enjoy it. Nor did we find, for the 160 in the survey who attended a meeting, any differences in the experience of the meeting comparing those with different social psychological and family communication characteristics.

Turning to two activities that could be regarded as either benefits and risks of online communication – seeking personal advice and giving out personal information – a somewhat similar pattern emerges (see Table 7). Both activities are more common among older teens, though they are unrelated to gender and socioeconomic status. Both activities are also more characteristic of those who are dissatisfied with their offline lives but are skilled online and value the anonymity offered by online communication. Further, seeking advice online is more typical of those who use the internet less frequently, possibly because their use of the internet is instrumental, motivated by a need established offline. Giving out personal information, as noted earlier, is required by most websites that facilitate more sophisticated, personalised or interactive uses of the internet, and so is understandably characteristic of more frequent users: indeed, frequently users are constantly invited to give out personal information such as one's name, email address and personal preferences; unsurprisingly then, they seem more likely to accede to these requests. It is a perhaps puzzling that those young people who give out personal information also have lower self-efficacy online, but it may be that, since they are engaged in more complex online interactions (being skilled and frequent users), they have come to judge their own skills more modestly. Notably, they are also more likely to be sensation-seeking: whether or not they are aware of the frequent warnings against providing personal information online, it seems they go ahead.

Conclusions

Research question 1 asked whether girls communicate more online than boys and, therefore, encounter more communicative risks (making friends, giving out personal information etc)? The findings show that it is age more than gender that is crucial (see also Liau, et al, 2005). Older teens engage in a greater range of online communication activities than do younger children, and thus they may encounter a greater range of communication risks; the exception is that they are no more likely to make a friend online than are younger children. Social grade does not differentiate among children, and gender makes a difference only to the overall frequency of online communication: girls communicate more on the internet, but this seems not to put them more at risk in relation to the other activities examined, raising questions for future research regarding possible gender differences in responses to risky encounters.

Research question 2 asked whether those who are socially anxious or lack self-esteem offline are more likely to explore communicative opportunities online, thus engaging in more risky behaviours. The findings showed that the offline social psychological characteristics of children lives do influence their online communication. Being shy offline makes little difference online, except it decreases the likelihood of offline meetings with people met online – apparently a continuity between off and online. However, being dissatisfied with one's life is important: although not associated with more frequent online communication (this being more a matter of demographics and quality of internet access; Livingstone & Bober, 2004a), lower life satisfaction

appears to increase the likelihood of risky communication, suggesting the online compensates in some way for the offline. Such dissatisfaction offline is, therefore, associated with making friends online, going to offline meetings with online friends, seeking personal advice online and giving out personal information online. Further, being sensation-seeking matters: those who are more sensation-seeking in their lives generally are also more likely to be sensation-seeking online – another continuity between off and online: these teens communicate online more frequently, go to offline meetings with friends made online, and disclose personal information online.

In answer to research question 3, which asked whether those who lack an open communication channel with parents are more likely to seek intimacy and guidance online, we observe that the family communication variables did not contribute significantly to these multiple regression analyses. This may be because they were correlated with the social psychological variables. Specifically, shyness is negatively correlated with life satisfaction (r=-0.22, p<0.01) and positively correlated with a conformity-oriented family (r=0.11, p<0.01). Life satisfaction, in turn, is positively correlated with conversation orientation (r=0.17, p<0.01) and negatively correlated with conformity orientation (r=-0.16, p<0.01). Lastly, sensation-seeking is negatively correlated with life satisfaction (r=-0.17, p<0.01) and conversation orientation (r=-0.07, p<0.01) and positively correlated with conformity orientation (r=0.15, p<0.01). It seems, then, that shyer children are less happy with their lives and are more likely to come from a conformity-oriented family. Although shyness and sensation-seeking are unrelated, children who are more sensation-seeking also come from conformity- more than conversation-oriented families and are, also, less happy with their lives. Putting this the other way around, those who see their families as more conformity-oriented are more likely to be shy, dissatisfied and/or sensation-seeking, while conversation-oriented families are more likely to have satisfied children who, although they may or may not be shy, are less sensation-seeking.

We can also identify some modest associations between family communication and children's online communication activities. Children and teens who judge their family more conversation-oriented use the internet less often in general (r=-0.07, p<0.05), telephone people more often (r=0.06, p<0.05), and are less likely to meet an online friend offline (r=-0.06, p<0.05). Those who judge their family more conformity-oriented are more likely to use chat rooms on the internet (r=0.23, p<0.05). Further, the family communication scales are correlated with online confidence (positively, for conformity orientation, r=0.08, p<0.05; negatively, for conversation orientation, r=-0.13, p<0.01), though they are not correlated with valuing anonymity online. It seems that those children and teens who have difficulty discussing personal issues with their parents, or who feel their parents to be conformity oriented rather than conversation oriented, may take some greater risks online – visiting chat rooms and meeting online friends offline – and this may be because they feel more confident communicating online than they do offline.

Why do offline characteristics affect online communication? Although the multiple regression analyses do not, strictly speaking, permit causal inferences among the variables, our interpretation is as follows. Among those children and teens who are, for whatever reason, less satisfied with their lives and, perhaps, more sensation-seeking, some have become frequent and skilled internet users. Research Question 4 asked whether those who are more experienced, frequent and skilled internet users engage in a greater range of risky internet-related communications. Frequency of use and internet skills do matter, predicting each type of online communication examined. It seems that among these dissatisfied but skilled youngsters, some have particularly come to value the internet as a communicative environment in which they find conversation more satisfying, and feel more confident, than they do offline. As a result - and this is evident from all five regression analyses - it seems that they come to value the specific characteristics of online communication, such as anonymity, the chance to exchange secrets or be silly or to disclose personal or intimate aspects of their lives.[5] Pew's survey of US teens found that 24% have pretended to be someone else in a chat room (Pew, 2001), while the present survey found 40% to have pretended about some aspect of themselves. On the other hand, as Spears et al (2000) observe, many regard the internet less as an opportunity to pretend as to reveal their 'true self' and this may also result in risky encounters. Note that in the regression equations, the odds ratios for valuing anonymity are high (except when predicting the general frequency of online communication); an increase in this variable causes by far the largest increase in the likelihood of all these activities.

Research question 5 asked whether similar factors explain whether and which children engage in different risky behaviours, or whether each requires a different explanation (and,

therefore, policy intervention). We have summarised the similarities and differences in explanations for the likelihood of the different forms of online communication above. Of particular policy relevance, we suggest, is the importance of low life satisfaction in predicting who will make online friends, go to meetings, seek online advice and give out personal information. Similarly, the tendency of sensation-seeking youngsters to give out personal information and go to offline meetings is noteworthy, and so too is the relative inexperience with the internet of those who go to such meetings. The temptation to see girls and younger children as particularly at risk seems misplaced, since it is the greater confidence that some older children feel in relation to online compared with offline relations that is more important here.

The mediating role of internet skills is thought-provoking: rather than being those lacking online skills, it is precisely the more skilled (though not necessarily more self-efficacious) who encounter more risks – and more opportunities – on the internet (see also Livingstone et al., 2005). Having open communication channels with parents also makes a difference, and could be a valuable focus for practical parental guidance. Last, we note that those formulating policy to raise safety awareness might usefully, therefore, focus on the way in which children at risk appear to value the internet as a particularly enabling environment for intimate or private communication. As noted at the outset, balancing the benefits against the risks of online communication is a difficult task and one must be responsive to the different social and psychological conditions that mediate these outcomes for children living in different circumstances. The present results would suggest that for those particularly likely to take risks online, targeting safety guidance to parents might be less effective than targeting it at young people themselves, including through schools or websites. However, simply blaming (or praising) the internet is not an appropriate strategy: the overall implication of the present findings is that, following up on Jackson et al (2001) (see also Subrahmanyam et al., 2000), it is not so much that internet use makes some young people dissatisfied, unconfident or risk-takers, but rather it seems that those who are already dissatisfied, or sensation-seeking, or with poor relations with parents, are more likely – especially if they are also skilled and confident on the internet – to encounter online communication risks.

Acknowledgements

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Endnotes

[1] In random location sampling, interviewers are given little choice in the selection of respondents. Respondents are drawn from a small set of homogenous streets selected with probability proportional to the population after stratification by their post-code characteristics and region. Quotas are set using characteristics known to have a bearing on individuals' probabilities of being at home and available for interview. Strict rules are given which govern the distribution, spacing and timing of interviews.

[2] For a detailed explanation of the scales, see Livingstone, Bober and Helsper (2005).
Skills scale. This summed the internet-related skills that respondents claimed to be 'good at' (scale 0-6): finding the information you need on the web, setting up an email account, sending an instant message, setting up a filter for junk mail or pop-up adverts, getting rid of a virus on your computer and fixing a problem by yourself when something goes wrong. The reliability coefficient for this scale was acceptable (alpha = 0.70).
Self-efficacy: 4 point scale (beginner-average-advanced-expert), from Eastin & LaRose (2000).
Frequency of use: 8 point scale, from 8 (uses more than once day) through 5 (uses once a month) to 1 (never uses).
Average time per day online: Respondents estimated time spent online on a typical weekday and weekend day. A composite score was calculated for average time spent online per day: 1=none, 2=about 10 minutes, 3=about half an hour, 4=about an hour, 5=1-2 hours, 6=2-3 hours, 7=3+ hours.

[3] Socio-economic status is measured according to the standard UK market research categories: A – Upper middle class (Higher managerial administrative or professional occupations, top level civil servants), B – Middle class (Intermediate managerial administrative or professional people, senior officers in local government and civil service), C1 – Lower middle class (Supervisory or clerical and junior managerial administrative or professional occupations), C2 – Skilled working class (Skilled manual workers), D – Working class (Semi and unskilled manual workers), E – Those at lowest levels of subsistence (all those entirely dependent on the State: long term, casual workers, those without regular income). Socio-economic status is strongly correlated with measures of parental occupation, education and income.

[4] Specifically, these 9-19 year olds say that they have revealed their hobbies (27%), email address (24%), full name (17%), age (17%), name of their school (9%) phone number (7%) or sent a photograph (7%) to someone that they met on the internet.

[5] Across the whole sample, 40% say that they have pretended about themselves online – using, for example, a different name (27%), changing their age (22%), appearance (10%) or gender (5%). And though they often know the safety rules, a minority (7%) admits to forgetting about safety guidelines online while 17% enjoy being rude or silly on the internet (Livingstone & Bober, 2005).