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Teaching Children about Internet Safety: An Evaluation of the Effectiveness of an Interactive Computer Game

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Teaching Children about Internet Safety:

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Abstract

The effectiveness of an interactive computer game designed to alert children to dangers on the Internet and to encourage them to develop their own guidelines for Internet safety is assessed. Pre- and post-test data were collected from a treatment (n = 181) and comparison group (n = 157) of Grade 6 and 7 students from 8 elementary schools in and around a large Western Canadian city. Reported frequencies of risky online behaviours, Internet safety-related attitudes, and number of Internet safety guidelines were measured in a questionnaire format. Initial frequencies of risky online behaviours and attitudes were quite low, making it difficult to demonstrate change due to playing the computer game. Subjects who had played the game, however, wrote more Internet safety guidelines than did those who had not. These positive results for the safety guidelines provide promising initial evidence that this computer game can be used effectively as part of an Internet safety program in schools. Methodological limitations are discussed to provide direction for future research in this area.

Table of Contents

List of Tables

Teaching Children about Internet Safety:

An Evaluation of the Effectiveness of an Interactive Computer Game

Internet victimization of children and youth has become a serious concern in today's society, particularly for parents, educators, counsellors, and law enforcement officials. In fact, it has been reported that 57% of parents, whose children between the ages of 12 and 17 go online, worry about their children being contacted by a stranger on the Internet (Lenhart, Rainie, & Lewis, 2001). In contrast, 52% of these same children say they do not worry at all about this (Lenhart et al., 2001). Some concern, however, is justified by the reality of the online world for young people. The anonymity of the Internet provides sexual predators with a setting in which to build a relationship of trust with a child who is found to be willing to share personal information (Dombrowski, LeMasney, Ahia, & Dickson, 2004). After creating a sense of trust, sometimes by pretending to be a same-aged peer with similar interests, it may be possible for an online predator to lure a child away from his or her home (Dombrowski et al., 2004). Of American youth aged 10 to 17, 19% reported having received an unwanted sexual solicitation over the Internet, that is unwanted requests to engage in sexual talk or activities (Finkelhor, Mitchell, & Wolak, 2000). Thus, online victimization of children and youth is not uncommon.

Concern about such online victimization has led to the creation of many programs designed to teach young people about Internet safety. For example, two such large-scale programs are "Netsmartz" (www.netsmartz.org), an interactive, educational safety resource created by the National Center for Missing and Exploited Children and the Boys and Girls Clubs of America and "Be Web Aware" (www.bewebaware.ca), a national Canadian public education program on Internet safety supported by several Canadian organizations. Smaller

initiatives have also been developed. In the current study, the effectiveness of an interactive computer game that was created to encourage 11- to 14-year-olds to be safe while they are online was evaluated.

Online Behaviours – Open Chat Rooms

An essential component of Internet safety is learning not to disclose personal information over the Internet (Dombrowski et al., 2004). Disclosure or posting of personal information on the Internet is considered risky because it creates the opportunity for Internet predators to form exploitive relationships with children and to initiate real-life contact, with or without the child's consent (Dombrowski et al., 2004). Chat rooms are key online settings for the exchange of personal information because they are designed to permit live conversations among many people at the same time. Chat rooms can either be monitored for appropriate content (by software or by a real person) or unmonitored; they may also include private areas where people can chat without being seen by others in the chat room (Media Awareness Network, 2004). Unmonitored chat rooms are also referred to as open chat rooms. Chatting in open chat rooms is an activity of particular concern because young people may feel that they can be more open and honest in these anonymous, unmonitored rooms (Media Awareness Network, 2004). Simply chatting in open chat rooms increases the risk of online victimization. Young people who use chat rooms are four times more likely than those who do not to receive an unwanted sexual solicitation (Finkelhor et al., 2000). Thus, it is extremely important that young people learn to not disclose personal information in open chat rooms that could allow others to locate them or to exploit their vulnerabilities.

This message seems to run contrary to the purpose for which some young people engage in online activities. From an investigation of teen chat room content, the researchers

(Subrahmanyam, Greenfield, & Tynes, 2004) concluded that a primary motivation for chat room users was to present their own age, sex, and location and to learn the age, sex, and location of others in order to enter into conversation with a peer, often to explore issues of identity and sexuality. These conclusions appear to be supported, at least in part, by the self-report literature. In a nationally representative Canadian study, over 40% of youth aged nine to 17 years reported that someone on the Internet had asked for personal information (Environics, 2001). Furthermore, 41% of these young people reported disclosing at least some of the requested information. Of even greater concern, in a nationally representative American study, 12% of youth reported sending a picture of themselves to someone they met online, 11% reported posting personal facts such as their last name, and 27% reported posting their email addresses (Finkelhor et al., 2000). These results are generally consistent with those of other researchers (Stahl & Fritz, 2002), that indicate that 25% of teens acknowledged sharing identifying information online. Anyone in possession of this identifying information may be able to contact the child in real life. Alternately, disclosure of personal facts in an open chat room may lead to the disclosure of more intimate information that could also lead to exploitation. Young people need to learn about these dangers and how to protect themselves when they are online.

Associations have been reported that indicate that the young people who visit chat rooms may be a particularly vulnerable population. Young people with major depressive-like symptoms frequent chat rooms at twice the rate of young people with mild or no symptoms (Ybarra, Alexander, Mitchell, 2005). Talking with strangers online also occurred more frequently among youth reporting major depressive-like symptoms (Ybarra et al., 2005). Of even greater concern, disclosing personal information occurred more frequently

among young people with depression. More specifically, depressed males were more likely to post personally identifiable information and depressed females were more likely to post photos of themselves than were their peers with mild or no symptoms of depression (Ybarra, 2005). Chat room use has also been reported to be associated with risky behaviours, such as substance use, psychological distress, and difficulties with parents (Beebe, Asche, Harrison, & Quinlan, 2004). Furthermore, among youth aged 10 to 17, the formation of a close online relationship with someone met on the Internet was more likely to occur among highly troubled girls with high conflict with their parents and among highly troubled boys with low levels of communication with their parents compared to other girls and boys (Wolak, Mitchell, & Finkelhor, 2003). Troubled young people are also those who are at higher risk for receiving unwanted sexual solicitations online (Mitchell, Finkelhor, & Wolak, 2001). These findings highlight the critical need for strong Internet safety programs in order to protect youth who are at greatest risk. Hopefully, if effective Internet safety programs are delivered to students in their pre-teen years, these young people will develop safe online habits that will protect them from becoming victims.

The literature cited above indicates that somewhere between 75% and 60% of young people do not report disclosing personal information when they are online. An alternative to restricting disclosure of personal information is to develop a fake online persona to protect one's real personal information. Interestingly, research indicates that this does not occur very frequently. Gross (2004) reported that 51% of 7th through 10th graders admitted that they had pretended to be someone else online, but only 16% had done so either to protect their privacy or to avoid age restrictions. The majority of these young people pretended to be someone else online as a prank (Gross, 2004). Other research with 11- to 16-year-olds

indicates that pretending to be someone else online, such as pretending to be older, is actually associated with lower self-esteem, higher social anxiety, poorer social skills, and higher aggression (Harman, Hansen, Cochran, & Lindsey, 2005). The authors suggest that young people using online personas may be creating an ideal self due to low self-esteem (Harman et al., 2005). Thus, it appears that young people who wish to protect themselves and their privacy when they are online are more likely to do so by restricting disclosure of personal information than by pretending to be someone else.

Online Behaviours – Personal Web Page Design

Exposure to risk occurs not only in the context of interpersonal online communication, but also in the context of personal Web pages. Many young people today have their own Web pages. It is estimated that approximately one in four Americans aged 12 to 17 (Lenhart et al., 2001) and just over one in five Canadian aged 9 to 17 (Environics, 2001) have their own Web pages. Given that personal Web pages typically can be accessed by anyone on the Internet, it is important to note that, of those Canadian youth surveyed who had a Web page, 57% reported that they posted their email address, 26% posted their real name, 22% posted a photograph of themselves, and 21% posted the name of their school (Environics, 2001). Results of a content analysis (Stern, 2004) of 233 personal Web sites created by young people between the ages of 14 and 18 indicate that the numbers may be even higher. This author reported that 92% of Web sites contained the author's email address, 45% of young people posted a photo of themselves, and 24% posted a link to their school's Web site. Posting this type of information makes it possible for anyone on the Internet who sees the site to contact the young author of the Web page. The methodology of Stern's research emphasizes this point. She obtained her sample simply by scanning

Yahoo's directory of personal home pages and using the Web pages themselves to determine the age of the author. Anyone else looking for Web sites of teenagers could easily do the same and would, in most cases, according to Stern's study, be able to contact teens directly via email. Stern (2004) also reports that 94% of the personal Web sites contained a descriptive biography of the author and typically contained information concerning the author's interests or hobbies (Stern, 2004). Thus, in addition to personal facts, personal Web sites can also provide online predators with the information necessary to claim similar interests to the child in a bid to develop a more intimate relationship (Dombrowski et al., 2004). Thus, it is important that young people learn about the dangers of posting identifiable and personal information on their Web pages.

Online Behaviours – Gender Differences

Gender differences in online activities indicate the possibility for gender differences in the level and type of risk encountered by youth using the Internet. The evidence, however, for gender differences in risky online behaviours is mixed. In a study of youth between the ages of 10 and 17, no gender differences were reported in disclosing personal information on the Internet (Finkelhor et al., 2000). In addition, the authors of a study of undergraduate students reported that there were no gender differences in levels of trust on the Internet (Jackson, Ervin, Gardner, & Schmitt, 2001). Thus, there is some evidence that males and females are exposed to similar risks.

It has been reported, however, that males use the Internet overall more than do females (Durndell & Haag, 2002; Jackson et al., 2001; Schumacher & Morahan-Martin, 2001; Subrahmanyam, Greenfield, Kraut, & Gross, 2001). Furthermore, high school males have been found to be more likely to have a personal Web page and to be more likely to go

to age-inappropriate Web sites (Environics, 2001). In fact, young people who report feeling unsafe as the result of a Web site they've visited are more likely to be male, to use chat rooms, and to have visited a porn site (Stahl & Fritz, 2002). For a variety of risky behaviours, not only on the Internet, it has been found that males are more likely to take risks than are females and to take more risks even when it is clear that it is not a good idea to do so (for a review, see Byrnes, Miller, & Schafer, 1999). Thus, it is possible that due to their greater use of the Internet and greater tendency toward risk-taking, males may engage in more risky online behaviour than do females. This may be particularly true for risks that result from the creation of personal Web pages and frequenting adult-only Web sites.

In contrast, females have been reported to use email more often than do males (Environics, 2001; Jackson et al., 2001; Subrahmanyam et al., 2001). Consistent with this focus on the Internet as a communication tool, in a study of youth aged 10 to 17, females were more likely to report having formed both casual and close online friendships than were males (Wolak, Mitchell, & Finkelhor, 2002). Furthermore, females reported being targeted for sexual solicitations and approaches on the Internet at almost twice the rate of males (Finkelhor et al., 2000). Youth who report feeling unsafe because of a person they have been in contact with through the Internet are more likely to be female and more likely to have shared identifying information (Stahl & Fritz, 2002). In addition to these Internet-related risk factors, females in a variety of situations have been found to self-disclose more than do males and to self-disclose more to strangers (for a review, see Dindia & Allen, 1992). Therefore, females may be at risk for online victimization because of their tendency to disclose personal information, their greater use of the Internet for communication purposes, and perhaps merely because they are female.

Attitudes Toward Internet Safety

Research evidence concerning young people's attitudes toward online risks is more limited than that available concerning their online behaviours. There is some evidence that concerns about Internet safety are present not only among adults, but also among young people. Results from a sample of 7th to 10th grade students indicate that 25% reported feeling unsafe on the Internet (Stahl & Fritz, 2002). Those students who reported feeling unsafe were more likely to be female, to spend time in chat rooms and emailing, to communicate with strangers, and to disclose identifying information. Although not exactly an attitude toward the likelihood of encountering danger online, this finding does indicate an awareness, unfortunately from personal experience, among some young people that there are dangers on the Internet. The majority of teens (79%) agree that young people are not careful enough about the personal information they disclose about themselves (Lenhart, 2005). This suggests that the majority of young people hold the attitude that a certain amount of caution concerning personal disclosure on the Internet is necessary. Yet, as mentioned earlier, 52% of young people reported that they were not at all worried about being contacted by a stranger on the Internet (Lenhart et al., 2001). Perhaps young people see the need to be careful but not to be afraid.

Younger children appear to have less cautious attitudes toward Internet safety than do older children. "Correct" or safe responses to questions about whether it is safe to post various types of personal information on the Internet ranged from 56% to 89% for 6- to 12-year-olds and from 79% to 92% for youth aged 13 to 18 (Branch Associates, 2002). Overall, the majority of young people appear to hold safe attitudes toward the disclosure of personal information online. Somewhat more equivocal results are available in terms of young

people's attitudes toward the credibility of information on the Internet. Five in ten high school students agree that only some of the information on the Internet can be trusted, but nearly four in ten believe that you can trust most of the information on the Internet (Environics, 2001). This question was not focused directly on interpersonal interactions, but it does suggest that some scepticism exists among young people concerning the credibility of what they see online. Overall, these results suggest that youth generally have a cautious attitude toward Internet safety.

Teaching Internet Safety – Research Evidence

The focus of one type of approach to reducing Internet victimization of youth is *prevention through education.* The results of an evaluation of the NetSmartz Workshop program have been reported (Branch Associates, 2002). The NetSmartz Workshop program is an interactive program available online with several separate activities tailored to the developmental needs of children between the ages of 5 and 18 (www.NetSmartz.org). The evaluators assert that knowledge and awareness about Internet safety increased significantly after participating in the NetSmartz program (Branch Associates, 2002). Unfortunately, they do not report any significance tests to support this conclusion. The majority of the participants in the NetSmartz program, however, did report that the program would change their online behaviour and that they would be more careful. No measurements of actual online behaviour were reported. Interestingly, after the NetSmartz training, children aged 6 to 12 reported a lower level of Internet safety knowledge than did youth aged 13 to 18. This suggests that it may be very important to focus increased training efforts on this younger age group in order to prepare them for their future online activities. The authors also indicate that although training may have changed awareness of Internet safety, online behaviours

may not have changed. This evaluation presents some interesting initial findings concerning the effectiveness of Internet safety training programs, however, no rigorous analyses were reported that would allow for confidence in the results.

The Missing Program – An Interactive Computer Game

An interactive computer game, entitled *Missing*, has been developed for youth aged 11 to 14 to encourage them to become safer users of the Internet (Livewwwires, 2000). The computer game and kit have been distributed to libraries and ministries of education across Canada, to many schools in the United States, and are also available in 42 states through programs run by Web Wise Kids, a non-profit organization dedicated to ensuring child Internet safety (Web Wise Kids, 2001).

The computer game, which is based on a true story, illustrates some of the tactics used by people who use the Internet to victimize children. Players of the game have the chance to watch how an Internet predator successfully capitalizes on a teenager's vulnerabilities and uses various tactics to gain the boy's trust during conversations in an open chat room and eventually via email. This unsuspecting boy is lured from his home and agrees to leave the country with this man whom he has never met in person. Children playing the game assume the role of a police officer investigating the boy's use of the Internet and his subsequent disappearance and are required to solve a series of puzzles in order to find him and return him safely to his parents.

The computer game contains the message that revealing personal information about oneself on the Internet can make one vulnerable to victimization. In addition, by showing children how this Internet predator misrepresented himself, the lesson is conveyed that one cannot necessarily trust people on the Internet. The action of the computer game and the

messages about online safety focus on four Internet-related situations: (1) open chat room conversations, (2) personal email communication with someone met on the Internet, (3) personal Web page design, and (4) meeting in person with someone met on the Internet.

The objectives of the *Missing* program include demonstrating to children that: for safety reasons, they should not (1) disclose personal information in open chat rooms, such as their real name, the city they live in, school, and information concerning their feelings and private lives; (2) disclose their email addresses to strangers on the Internet, (3) post personal information on their Web pages, such as real name, the city they live in, school, and information concerning their feelings and private lives, and (4) meet in person with someone they met on the Internet.

To accomplish these goals, the computer game contains examples of risky online behaviours and their consequences. The teenager in the game visits an open chat room and gives personal information to a stranger. He builds a Web site that contains information about his feelings and private life. He gives his email address to a stranger and then uses email to communicate plans he wants to keep secret from his father. These risky behaviours result in the teenager being lured into a dangerous situation in which he is held against his will by this Internet predator. Providing these concrete examples opens up opportunities for specific guided discussions with children who have played the computer game. In addition, support activities further encourage children to identify the risky behaviours that they should avoid in order to stay safe on the Internet. These support activities include the creation by each child of an individualized personal Internet safety plan with their own guidelines for safe online behaviour.

The *Missing* program includes a number of elements which may be used to

supplement the computer game (Livewwwires, 2000). The *Missing* Kit contains a documentary video concerning Internet crimes, which may be used by teachers and parents to gain a better understanding of the problem in preparation for using the game with children. A poster and brochure are included, which may be strategically posted around computers to serve as reminders about Internet safety. A companion Guidebook for parents and teachers is also included. A valuable resource for use with the computer game, the Guidebook highlights the key lessons learned at each stage of the game and provides points for discussion. The *Missing* Web site, which can be used in tandem with the game, is also a valuable resource on Internet safety. This interactive Web site is set-up in a game-like fashion and allows youth to have fun exploring additional aspects of Internet safety. Educators can also find additional teaching ideas on the Web site, which is updated with new suggestions received from users of the game.

The interactive, non-prescriptive approach of this computer game may be particularly effective because young people are encouraged to develop their own guidelines for safe use of the Internet. This student-centered approach may be contrasted with approaches in which students are presented with a list of important rules to follow. These traditional approaches are sometimes criticized for failing to emphasize critical thinking skills (Hannafin & Land, 1997). The *Missing* program may be considered an example of problem-based learning because it possesses many of the characteristics identified by researchers as necessary to this approach (Dochy, Segers, Van den Bossche, & Gijbels, 2003). For example, learning is student-centered, learning occurs in small student groups, authentic problems are used to convey knowledge, and new information is acquired though self-directed learning. One of the advantages of problem-based, student-centered learning is

that students have been found to have better recall of the knowledge they gain (for a review, see Dochy et al., 2003). The present study represents one of the first assessments of the effects of a student-centered approach to teaching Internet safety.

The Present Study

The purpose of the present research is to evaluate whether an interactive computer game is successful in encouraging youth in Grades 6 and 7 to decrease the frequency of their risky online behaviours and to develop their own safe guidelines for using the Internet. This evaluation was performed within a pre-post design, using both a treatment and comparison group. It was predicted that playing the computer game would have a positive effect on both the reported frequency of risky online behaviours and the number of Internet safety guidelines. Due to their greater tendency toward risk-taking compared to females (Byrnes et al., 1999), it was also predicted that males would engage in riskier online behaviours than would females. With respect to safe guidelines, because young males have been reported to be more likely to have a personal Web page than are females (Environics, 2001), males were expected to list more safe guidelines concerning personal Web pages. Due to females' interest in using the Internet for communication (Environics, 2001; Jackson et al., 2001; Subrahmanyam et al., 2001; Wolak et al., 1999), it was predicted that they would list more safe guidelines concerning emailing strangers and using open chat rooms than would males.

Method

Participants

Data were collected from 338 students in Grade 6, Grade 6/7, and Grade 7 classes in eight elementary schools in a large western Canadian city. In six of the eight schools, one class formed the treatment group and one class formed the comparison group. One school

provided three treatment classes and the remaining school provided two comparison classes. Therefore, there were nine treatment classes (n = 181) and eight comparison classes (n = 157).

According to information collected from the teachers at the post-test, approximately half of the subjects (45%) in the treatment class had received classroom instruction in Internet safety at some time prior to their involvement in the present study. In contrast, none of the teachers in the comparison classes reported giving any instruction in Internet safety to their classes. Students in the treatment classes had access at school to, on average, 18 computers per class (range 2 to 30); students in the comparison classes had access at school to, on average, 19 computers per class (range 0 to 36).

The participants ranged in age from 10 to 14 years (M = 11.8). In the treatment group there were 83 females and 98 males; in the comparison group there were 79 females and 78 males. Canada was the country of birth for 70% of the participants and English was the principal language spoken in the home for 64%. The other countries of birth and languages were primarily Asian.

Measures

Pre- and post-test questionnaires were developed to assess risky online behaviours, attitudes, and Internet safety guidelines for the situations targeted in the computer game. In addition, basic demographic questions and items concerning general Internet usage similar to those used in previous surveys (e.g., Environics, 2001) were included.

Initial formulations of the survey questionnaire were developed by reviewing the literature available in the *Missing* game kit (Livewwwires, 2000) and on the Web site and by playing the computer game. Items were organized into sections based partially on the action

of the game (i.e., open chat room behaviour, personal Web page design, and emailing strangers). First, focus groups were conducted with children similar in age to those in the current sample in order to determine how children of this age speak and think about the Internet and Internet safety. Second, several versions of the survey questionnaire were then piloted with small groups of children who completed a pre-test questionnaire, played the computer game, and completed a post-test questionnaire. Third, modifications were made to the survey instruments following the pilot sessions in order to make the language more readily understood by children in Grades 6 and 7. Fourth, the questionnaire was piloted with several classrooms of children. In order to address the tendency for subjects to endorse socially desirable responses, filler items were included that represent Internet behaviours that are typical and safe for children of this age. Final versions of both the pre-test (see Appendix A) and post-test questionnaire (see Appendix B) were developed through this iterative process of pilot testing and modification.

Demographic items. The pre-test questionnaire included basic demographic questions, as well as questions concerning computer and Internet access at home and general Internet usage. These items are similar to those used in questionnaires reported in previous literature (e.g., Environics, 2001). Questions were either in a *Yes/No* format or subjects were asked to check-off the online activities in which they had engaged.

Risky online behaviours. Both the pre- and post-test questionnaires contained a question assessing the frequency of going to open chat rooms ("Do you go to open chat rooms?") and a question assessing the frequency of engaging in email conversations with people met on the Internet ("Do you use your personal email address to email people you have met online?"). The response format for these items was on a 5-point scale ranging from

5 = *very often* to 1 = *never*.

Correlations were computed between scores on each of the pre-test variables and scores on the associated post-test variable to provide a rough estimate of the test-retest reliability of the measures used in the current study. For the treatment group, playing the *Missing* game clearly intervened between the pre- and post-test, making this estimate of test-retest reliability very approximate. If playing the game was effective, at least some subjects would have high scores at the pre-test and low scores at the post-test, possibly reducing the size of the correlations. For the comparison group, however, the only intervening event that may have occurred between the pre- and post-test is the transmission of some knowledge concerning the *Missing* game from the treatment to comparison classes within the same school. This would be added to any impact that responding to the pre-test questionnaire may have had on responses to the post-test questionnaire in terms of subjects becoming sensitized to Internet safety issues. Correlations between the pre- and post-test scores for going to open chat rooms are presented in Table 1 separately by group (treatment and comparison) and gender. The values range from .60 to .72, providing a preliminary indication of moderate test-retest reliability for this measure.

Participants who indicated that they had visited open chat rooms were asked to respond to questions concerning the frequency at which they chatted about various topics involving the disclosure of personal information. These items were also answered on a 5-point scale with higher scores indicating a higher frequency of the behaviour. The questionnaire contained filler items, such as favourite music and TV programs, which were not included for analysis. The items were grouped into two categories. The first category of personal information contained seven items concerning personal experiences and feelings,

for example personal feelings and thoughts and happy and unhappy experiences both at home and at school. Cronbach's alphas of internal consistency reliability for disclosing personal experiences and feelings in open chat rooms are presented separately by time of testing (pre-test and post-test), group, and gender in Table 2. The alphas ranged from .82 to .92. Correlations between pre-test and post-test scores for disclosing personal experiences and feelings in open chat rooms ranged from .41 to .82 (see Table 1). It was for males in the comparison group that this correlation was particularly low. No explanation for this indication of poor test-retest reliability for males on this variable is readily apparent.

The second category of personal information contained nine items concerning disclosure of personal facts in an open chat room, such as name, age, gender, and address. The alphas of internal consistency reliability for disclosing personal facts in open chat rooms are presented in Table 2 and ranged from .72 to .90. The correlations between pre- and post-test scores on this variable ranged from .55 to .89 (see Table 1), indicating moderate to strong preliminary estimates of test-retest reliability.

In both the pre- and post-test, subjects were asked to report the frequency with which they had communicated via email with someone they had only met on the Internet. Correlations between the pre- and post-test scores for this item are presented in Table 1 and range from .53 to .68. These relatively low correlations may have been due, in part, to some misunderstanding of this question which was observed during administration of the questionnaires. Some subjects had difficulty understanding that this question referred exclusively to people they had not previously met in real life.

Similar to open chat rooms, participants who indicated that they had used email to communicate with someone they had originally met online were asked to indicate the

frequency at which they had disclosed personal experiences and feelings in those email conversations. It was assumed that divulging one's email address represented an important level of risk in terms of disclosure of information that could be used to identify the child because it allows the individual to enter into personal contact with the child. Thus, only the six items concerning personal experiences and feelings were included because disclosure of this type of information reflects greater risk because it provides the stranger with personal information that could be used to manipulate the child. Again, the response format for these items was on a 5-point scale with higher scores representing higher frequencies of disclosing personal experiences and feelings. The alphas of internal consistency reliability for disclosing personal experiences and feelings in email to strangers are presented in Table 2 and range from .84 to .93. Correlations between the pre- and post-test scores for this variable ranged from .65 to .82 (see Table 1).

In addition, the pre- and post-test questionnaires contained a question concerning the likelihood of posting 13 personal facts on a personal Web page ("Would your Web site/page include the following?"). The 13 personal facts included real name, street address, school, and email address. All subjects answered the questions concerning disclosure of information on a personal Web page whether or not they had a personal Web page. If subjects did not have a personal Web page, they were instructed to consider how likely they would be to post each piece of personal information if they did have a Web page. The question concerning personal Web pages was answered on a 5-point scale (5 = *yes*; 4 = *quite likely*; 3 = *somewhat likely; 2 = quite unlikely*; 1 = *no*). The alphas of internal consistency reliability for posting personal information on a personal Web page are presented in Table 2 and range from .80 to .85. Correlations between the pre- and post-test scores for posting personal

information on a personal Web page ranged from .69 to .84 (see Table 1).

Attitudes toward Internet safety. Both the pre- and post-test questionnaires included items assessing students' attitudes concerning the safety of disclosing personal information online, trusting people met online, and the likelihood that someone on the Internet would try to lure children away from home. A 5-point response format was used with labels that varied according to the stem of the question, for example, "In general, how truthful do you think people are when they talk online?" 1 = *very truthful* to 5 = *not at all truthful.* Negatively worded items were reverse scored so that higher scores represent safer attitudes for all items.

To determine if these individual attitudes items could be meaningfully grouped into variables, an exploratory factor analysis was conducted using all subjects for which complete data were available at the pre-test (n = 318). The pre-test questionnaire responses were analyzed because it was assumed that subjects from the treatment and comparison groups would respond most similarly to one another at the pre-test. Although it is possible that males and females might display different patterns of response to these attitude items, the sample size was not large enough to permit separate analyses by gender. Generally, a sample size of at least 300 is considered necessary for factor analysis (Tabachnick & Fidell, 2001). Maximum likelihood extraction with Promax rotation was performed because this form of rotation allows correlations between variables (Gorsuch, 2003). The resulting factors would be expected a priori to be correlated due to the similarity among the attitudes items. Furthermore, with Promax rotation, uncorrelated factors will result if appropriate (Gorsuch, 2003).

The decision of how many factors to retain was based on a combination of several

criteria. First, the scree test suggested the retention of a two factor solution. The scree test has been found to be one of the better methods for deciding how many factors to retain (Gorsuch, 2003). Unfortunately, the residual correlation matrix for the two factor solution had 11 residuals (24%) with an absolute value greater than .05, including four residuals greater than .10. This is an indication of the existence of an additional factor (Tabachnick & Fidell, 2001). Extracting factors with eigenvalues greater than one produced a three factor solution. The eigenvalues greater than one criterion is commonly used, but not considered to be a good criterion (Gorsuch, 2003). Furthermore, the third factor included only two items. Interpretation of factors with only one or two items is considered hazardous (Tabachnick & Fidell, 2001). A two item factor may be reliable if the two items are highly correlated with one another and relatively uncorrelated with other items (Tabachnick & Fidell, 2001). In this case, the two items were highly correlated with one another ($r = .72$), but also moderately correlated with several other items (rs from .18 to .46). The two items in question had almost identical sentence structure and concerned attitudes toward how long one should talk to someone on the Internet before this person can be trusted either a little or a lot. This identical sentence structure may have been responsible for the strength of the correlation between the two items causing them to load together on a separate factor. Therefore, given the possible lack of reliability of two item factors and moderate correlations between these two items and several other items, it was decided to retain the two factor solution.

One item concerning how safe it is to disclose personal information in email to someone met on the Internet failed to load on either factor. This may have occurred because communicating via email with a stranger met online is risky in the first place. Thus, subjects may have responded differently to this question than to the questions about disclosing

information in open chat rooms and on personal Web pages. Therefore, the factor analysis was re-run without this item. The rotated two factor solution produced a simple structure in that several items loaded highly (> .30) on each factor and each item loaded highly on only one factor. Factor 1 consisted of six items that concerned attitudes toward the presence of risks on the Internet. Factor 2 consisted of four items that concerned attitudes toward trusting people on the Internet. Factor loadings from the rotated factor pattern matrix are presented in Table 3. The eigenvalues for factor one and two were 3.99 and 1.75, respectively; the percentages of variance explained by the factors were 39.90% and 17.49%, respectively. The squared multiple correlations (SMCs) of factor scores predicted from observed item scores indicated that the observed variables accounted for moderate variance in the factor scores. All but one SMC (.12) were greater than .30. The two factors were moderately correlated with one another, $r = .39$.

The alphas of internal consistency reliability for attitudes related to the presence of risk on the Internet are presented in Table 2 and range from .78 to .90. Those for attitudes related to trusting people on the Internet are also presented in Table 2 and range from .67 to .81. The correlations between the pre- and post-test scores on these two attitude measures are presented in Table 1. For attitudes related to the presence of risk on the Internet, the correlations ranged from .64 to .73; those for attitudes related to trusting people on the Internet ranged from .56 to .79.

Internet safety guidelines. In the post-test questionnaire only, students were asked to report their personal Internet safety guidelines in four Internet-related situations. The four situations were: (1) open chat room conversations, (2) email communication with someone originally met on the Internet, (3) personal Web page design, and (4) meeting in person with

someone originally met on the Internet. To address the possibility of order effects, this section was counterbalanced among students in each class, in that it occurred either at the beginning or at the end of the post-test questionnaire.

A coding system was developed in order to classify the Internet safety guidelines into four levels of safety (see Appendix C). Safety levels were 1 = *safe*, 2 = *somewhat safe*, 3 = *somewhat unsafe*, and 4 = *not safe*. The large majority of the Internet safety guidelines written by students were considered to be safe; 90% of the guidelines were rated as safe and 5% as somewhat safe. Both types of rules were used in subsequent analyses. Guidelines rated as somewhat unsafe (2%) and not safe (3%) occurred infrequently; thus, analyses were not conducted on the unsafe guidelines.

The Internet safety guidelines for all subjects were classified according to the coding system by two independent raters who remained blind to the group membership of the subjects. For each guideline for which there was disagreement between the two coders, a group decision was made in order to classify the guideline within the coding system. Inter-rater reliability was calculated by dividing the total number of agreements by the sum of the agreements and disagreements. The inter-rater reliability was 87.9% for open chat room conversations, 90.4% for personal Web page design, 83.9% for emailing strangers, and 83.1% for meeting in person with someone originally met on the Internet.

Procedure

The pre-test questionnaire was administered to both the treatment and comparison groups before the computer game was played. Within the next three weeks, treatment classes played the game in groups of two to five students as determined by the teachers; whereas the comparison classes did not. The time to complete the game varied from class to

class (approximately three to four class sessions of 40 to 50 minutes). Approximately three weeks following the administration of the pre-test questionnaire, the post-test questionnaire was administered to both groups. The pre- and post-test questionnaires were administered by the same experienced female researcher, with the help of a male assistant for the post-test questionnaire.

There was variability across treatment classes in the support activities used. Three teachers ($n = 61$) used an activity in which students created their own Internet safety plans. One teacher ($n = 64$) used the discussion questions in the parent/teacher Guidebook. One teacher ($n = 15$) used The Legal Dilemma workshop. This is an activity in which a police liaison officer is brought in to discuss the application of the Canadian criminal code to catching the Internet predator depicted in the *Missing* game. Two teachers ($n = 41$) did not use any supplementary classroom activities while playing the game. Thus, 23% of the students in the treatment group had not yet taken part in any additional classroom activities at the time of the post-test survey.

Teachers in the comparison classes had the opportunity to play the computer game with their classes at their convenience following the administration of the post-test questionnaire.

The treatment of research participants was in accordance with the ethical standards of the Canadian Psychological Association.

Results

Computer Access in the Home and General Internet Usage

The treatment and comparison groups had very similar levels of computer and Internet access in the home, as indicated by the results of chi-square analyses (see Table 4).

Approximately 90% of the sample reported having Internet access in the home and, of those, approximately 90% used the Internet at home at least once a week. These numbers are somewhat higher than those reported for a nationally representative sample of Canadian youth aged nine to 17 years (Environics, 2001); in this study 79% of youth reported having Internet access in the home and, of those, 71% reported using the Internet at home at least once a week. It has been estimated by Finkelhor et al. (2000) that 64% of 11 year olds and 77% of 12 year olds in the United States use the Internet at least once a month. In the present study, there was a gender difference on Internet access in the home, χ^2 (1, N = 338) = 5.63, $p < .05$, with males (95%) being more likely than were females (88%) to report having Internet access.

Patterns of general Internet usage were also very similar between the treatment and comparison group (see Table 4). With the exception of personal Web page construction, there were no significant differences in the percentages of subjects in the treatment and comparison group engaging in various types of Internet activities. The treatment group (36%) was more likely to report having constructed a personal Web page than was the comparison group (24%), χ^2 (1, N = 338) = 5.44, $p < .05$. The percentages of students going to open chat rooms, searching for information other than for school, and constructing a personal Web page were similar to the percentages reported in the Environics study (2001). For the other five Internet activities assessed, however, the subjects in our sample indicated substantially higher participation rates.

There were gender differences on four of the eight Internet activities (see Table 4). Females (89%) were more likely than were males (77%) to use email, χ^2 (1, N = 338) = 8.69, $p < .01$. This result is consistent with several studies indicating that females use email

more than do males (Environics, 2001; Jackson et al., 2001; Subrahmanyam, et al., 2001). Females (96%) were also more likely than were males (82%) to use the Internet to search for information for school, χ^2 (1, N = 338) = 14.94, p < .01. In contrast, males (38%) were more likely than were females (21%) to go to open chat rooms, χ^2 (1, N = 338) = 11.75, p < .01; and males (85%) were more likely than were females (71%) to use the Internet to play or download games, χ^2 (1, N = 338) = 9.22, p < .01. This gender difference for going to open chat rooms was in contrast to the results of the Environics study (2001), whereas the gender difference favouring males for playing or downloading games was consistent with their results.

Correlations

To provide additional information about the variables measured in the present study, correlations were computed between the behaviour and attitudes variables at the pre-test, the behaviour and attitudes variables at the post-test, and between the Internet safety guidelines variables at the post-test. These correlations are presented separately by group and gender in Tables 5 to 9. A few interesting observations can be made concerning these correlations. For example, it appears that, especially for males, attitudes related to trusting people on the Internet enters into more significant correlations with the behaviours variables than does attitudes related to the presence of risks on the Internet. These correlations could be considered to be preliminary evidence of concurrent validity. Both of these attitudes variables would be expected to correlate negatively with each of the behaviour variables, thus it may be that the attitude variable related to trusting people on the Internet is the better measure of Internet safety-related attitudes in the present study. Also of interest, the two attitudes variables appear to be more highly correlated with one another for females (range

from .45 to .68) than for males (range from .15 to .39). This provides some indication that males and females responded somewhat differently to the attitudes items.

Main Analyses

To assess whether playing the *Missing* computer game resulted in changes to the behaviours and safety-related attitudes assessed at the pre- and post-test, eight separate mixed analyses of variance (ANOVAs) were conducted with group membership and gender as between-subjects variables and time of testing (pre-test and post-test) as the within-subjects variable. The dependent variables were the frequency of the risky online behaviours and the attitudes concerning Internet safety. To assess whether subjects who had played *Missing* could generate more Internet safety guidelines at the post-test than could subjects who had not played the game, five separate ANOVAs were conducted with group membership and gender as the independent variables and number of Internet safety guidelines in the four situations as well as overall as the dependent variables.

Assumptions. Data were screened separately for each group in the analysis (males and females in the treatment and comparison groups) to detect the presence of univariate outliers. Following the guidelines suggested by Fidell and Tabachnick (2003) for samples smaller than 100, a *z* score with an absolute value of 2.58 was set as the cut-off for determining that a case was an outlier. For the cases determined to be outliers, scores were changed to a score one unit (in the case of Internet safety guidelines) or one tenth of a unit (for all behaviour and attitude items) larger or smaller than the next most extreme score in the distribution as suggested by Fidell and Tabachnick (2003) in order to reduce the impact of the outliers on the results of the analyses. The assumption of normality for grouped data can be assumed to be acceptably met with samples of adequate size because this assumption

applies to the sampling distribution, which approaches normal as sample size increases (Fidell & Tabachnick, 2003). Because all of the analyses involved grouped data and had more than 20 degrees of freedom for error (Fidell & Tabachnick, 2003), normality was considered to be met.

A further assumption for ANOVA is homogeneity of variance, that is, the population variances are assumed to be equal at the different levels of the independent variable. According to Fidell & Tabachnick (2003), ANOVA is robust to violations of the homogeneity of variance assumption if there are no outliers, if the ratio of the largest to the smallest sample size in each analysis is not more than 4 to 1, a two-tailed hypothesis is tested, and the ratio of the largest to smallest sample variance between levels is not more than 10 to 1. The ratios of largest to smallest group sample size were computed for each ANOVA and none exceeded a ratio of 4 to 1 (range 1.23:1 to 2.00:1). The ratios of largest to smallest sample variance (F_{max} statistic) were computed for each ANOVA and in no analysis did this ratio exceed 10 to 1 (range 1.58:1 to 5.15:1). Thus, given that outliers had been adjusted, two-tailed hypotheses were tested, and the ratios of largest to smallest sample size and variance were within tolerable limits, it was assumed that all of the ANOVAs conducted would be robust to any violation of the assumption of homogeneity of variance.

The assumption of independence of errors (that errors of measurement are unrelated to one another) is likely violated in within-subjects designs due to some amount of consistency in individual differences that is not removed by calculating variance due to subjects (Fidell & Tabachnick, 2003). The result of violation of this assumption in within-subjects designs is that the F test is too liberal (Fidell & Tabachnick, 2003). Thus, due to the possibility of a violation of the assumption of independence of errors and due to the

relatively large number of statistical tests conducted a more conservative significance level was adopted for both the mixed ANOVAs and the completely between subjects ANOVAs. Findings are not discussed unless they are significant at the .01 level.

The assumptions of homogeneity of variance/covariance matrices and sphericity normally required in a within-subject design do not apply when there are only two levels of the repeated measure (e.g., pre-test and post-test as is the case in the mixed ANOVAs presented here) (Fidell & Tabachnick, 2003).

In the presentation of results that follows, means are presented in parentheses.

Risky online behaviours. There was no evidence that playing the *Missing* game had an effect on the disclosure of personal information on the Internet for the specific variables assessed in the present sample.

For frequency of going to open chat rooms, there was a significant effect of gender, $F(1, 334) = 8.20, p = .004, \eta^2 = .02$. F values and significance levels for the ANOVA are reported in Table 10; means and standard deviations are reported in Table 11. Males (1.90) reported higher frequencies of going to open chat rooms than did females (1.60). It should be noted that this mean is very low for both males and females. A score of 1 indicated never going to open chat rooms.

There were no significant differences for frequency of chatting about personal experiences and feelings. F values and significance levels for the ANOVA are reported in Table 12; means and standard deviations are reported in Table 11.

The only significant effect for frequency of disclosing personal facts in open chat rooms was again for gender, $F(1, 106) = 9.44, p = .003, \eta^2 = .08$.. Males (2.30) reported higher frequencies of disclosing personal facts in open chat rooms than did females (1.85). F

values and significance levels for the ANOVA are reported in Table 13; means and standard deviations are reported in Table 11.

For frequency of emailing strangers originally met online, there were significant effects for both treatment group ($F(1, 330) = 7.96, p = .005, \eta^2 = .03.$) and gender ($F(1, 330) = 8.68, p = .003, \eta^2 = .02.$). F values and significance levels for the ANOVA are reported in Table 14; means and standard deviations are reported in Table 11. The comparison group (1.81) emailed strangers more frequently than did the treatment group (1.52). Males (1.81) emailed strangers more frequently than did females (1.51). Again, it should be noted that these means are very low and a score of one represented never emailing strangers.

There were no significant effects for frequency of emailing strangers concerning one's personal experiences and feelings. F values and significance levels for the ANOVA are reported in Table 15; means and standard deviations are reported in Table 11.

Finally, there were no significant effects for frequency of posting personal facts on a personal Web page. F values and significance levels for the ANOVA are reported in Table 16; means and standard deviations are reported in Table 11.

Attitudes toward Internet safety. There was no evidence that playing the *Missing* game had an effect in the present sample on the specific Internet safety-related attitudes assessed. For attitudes related to the presence of risks on the Internet, there were significant effects of treatment group ($F(1, 313) = 16.39, p < .001, \eta^2 = .05$), gender ($F(1, 313) = 10.15, p = .002, \eta^2 = .03$), and time of testing ($F(1, 313) = 34.25, p < .001, \eta^2 = .10$). F values and significance levels for the ANOVAs are reported in Table 17; means and standard deviations are reported in Table 18. The treatment group (3.43) reported safer attitudes related to the presence of risks on the Internet than did the comparison group (3.01).

Females (3.39) reported safer attitudes than did males (3.06). Subjects reported safer attitudes related to the presence of risks on the Internet at the post-test (3.36) than at the pre-test (3.10).

For attitudes related to trusting people on the Internet, there were significant effects of gender ($F(1, 325) = 19.16, p < .001, \eta^2 = .06$) and time of testing ($F(1, 325) = 14.64, p < .001, \eta^2 = .04$). *F* values and significance levels for the ANOVA are reported in Table 19; means and standard deviations are reported in Table 18. Females (4.17) reported safer attitudes than did males (3.83). Subjects reported safer attitudes related to trusting people on the Internet at the post-test (4.07) than at the pre-test (3.93).

Internet safety guidelines. In the post-test only, students in both the treatment and the comparison group indicated their personal Internet Safety Guidelines in four Internet-related situations: (1) open chat room conversations, (2) email communication with someone originally met on the Internet, (3) personal Web page design, and (4) meeting in person with someone originally met on the Internet. *F* values and significance levels for the ANOVAs conducted on the Internet Safety Guidelines are reported in Table 20. Means and standard deviations are reported in Table 21. In the discussion that follows, average number of safe guidelines per group are reported in parentheses.

When the safe guidelines were summed across the four specific situations, subjects in the treatment group (7.79) wrote significantly more guidelines than did subjects in the comparison group (5.56); $F(1, 334) = 20.61, p < .001, \eta^2 = .06$. Subjects who played *Missing* were able to formulate more safe rules overall for their behaviour on the Internet than were subjects who did not. There was also a significant effect of gender, $F(1, 334) = 48.00, p < .001, \eta^2 = .13$. Females (8.37) wrote more Internet Safety Guidelines in total than

did males (4.97).

For open chat room conversations, there was a significant interaction between group membership and gender, $F(1, 334) = 7.86, p = .005, \eta^2 = .02$. Females in the treatment group (3.49) wrote more safe guidelines than did females in the comparison group (2.22). There was, however, no significant difference between the number of safe guidelines written by males in the treatment group (1.67) compared to males in the comparison group (1.50). Thus, in the specific situation of open chat room conversations, it appears that the game had an effect for females but not for males. In both the treatment group and the comparison group, females (2.86) wrote significantly more safe guidelines concerning their open chat room conversations than did males (1.59).

For email conversations with strangers, there was a main effect of group, $F(1, 334) = 13.92, p < .001, \eta^2 = .04$. Subjects in the treatment group (1.81) wrote more safe guidelines than did subjects in the comparison group (1.22). There was also a significant main effect of gender, $F(1, 334) = 11.40, p = .001, \eta^2 = .03$. Again, females (1.78) wrote more safe guidelines for emailing someone met online than did males (1.24).

For guidelines concerning personal Web page design, there was a significant effect of group, $F(1, 334) = 11.78, p = .001, \eta^2 = .03$. The subjects in the treatment group (2.09) wrote significantly more Internet Safety Guidelines than did subjects in the comparison group (1.40). There was again a significant effect of gender, $F(1, 334) = 31.53, p < .001, \eta^2 = .09$; females (2.31) wrote more safe Web page guidelines than did males (1.19).

Finally, for guidelines concerning meeting in person with someone originally met on the Internet, although subjects in the treatment group (1.35) demonstrated a trend toward writing more guidelines concerning meeting with strangers than did those in the comparison

group (1.11), this difference was not significant at the .01 level. There was, however, a main effect of gender, $F(1, 334) = 22.54, p < .001, \eta^2 = .06$. Females (1.49) wrote more safe guidelines than did males (0.98).

Discussion

One of the principal findings of the present study is that students in the treatment group wrote more safe guidelines for their Internet use than did students in the comparison group. This effect occurred for the total number of safe guidelines, as well as for the number of safe guidelines in the Internet situations of open chat rooms, emailing someone originally met online, and personal Web page design. The size of these effects was small (Cohen, 1992). Each of these situations formed an important part of the action of the computer game. It is encouraging that subjects in the treatment group could recall these messages because developing one's own safe guidelines can be considered to be the outcome that is most directly tied to the goals of the *Missing* program. It is important to note, however that knowledge about safe behaviour does not necessarily lead to safe behaviour itself. Further evidence is necessary to more strongly establish the effectiveness of the *Missing* program. Nevertheless, these significant results provide promising preliminary evidence that playing the *Missing* game may encourage children to develop their own safe rules for using the Internet.

Interestingly, the effect favouring the treatment group for number of safe guidelines for open chat room conversations occurred only for females. Furthermore, there was some indication of this same interaction for emailing strangers, although the interaction did not reach significance. In general, the results indicate that females wrote more safe guidelines than did males in each situation and these main effects were small to medium in magnitude

(Cohen, 1992). Perhaps females are simply interested in writing more complete answers to such questions than are boys. As for the interaction between group and gender, females may be more interested in using the Internet as a communication tool and thus the open chat room component of the computer game may have been more salient for females than it was for males. In previous research (Environics, 2001), it has been reported that when asked to state the largest benefit of the Internet, high school females were twice as likely as were males to choose social benefits such as communicating with people. Thus, the computer game appears to be effective in encouraging young females to develop safe rules for the types of communication-related Internet activities that may be particularly valued by them. Given our results indicating that males in Grades 6 and 7 may be going to open chat rooms more often than are females and the previous findings that males are more likely to engage in risk-taking behaviour in general (Byrnes et al., 1999), it is of particular concern that males who had played the computer game did not write more safe guidelines for chat rooms than did males who had not played the game.

The fact that there was no significant group effect for number of safe guidelines about meeting with a stranger originally met online likely does not indicate that *Missing* failed to adequately send the extremely important message that this is a dangerous activity. In contrast, it may be that many students of this age are aware that it is dangerous to meet with someone originally met on the Internet and therefore both the treatment and the comparison groups may have known what to do in this situation prior to testing. Furthermore, it was observed at the time of coding the Internet safety guidelines that many subjects simply wrote one rule for this situation, which was some variation on, "Never meet with someone originally met online." Thus, even for subjects in the treatment group, one

guideline for this situation was often considered by subjects to be enough. Guidelines for emailing strangers and for constructing personal Web pages may be less well known, therefore it is very promising that a group effect was observed for these guidelines.

For the specific risky online behaviours and attitudes measured within a pre-post format, results do not allow us to conclude that playing the computer game had an effect for the treatment group, in that the interactions between treatment group and time of testing were not significant. Several main effects for treatment group, gender, and time of testing were significant; although these effects can not be attributed to playing the computer game, they are briefly discussed below.

The treatment group was somewhat safer, irrespective of time of testing, than was the comparison group in reporting a lower frequency of emailing strangers and in reporting safer attitudes related to the presence of risk on the Internet. These effects were quite small (Cohen, 1992). At the time of data collection, it was noted that four of the nine treatment classes had previously completed classroom activities concerning Internet safety, whereas none of the eight comparison classes had done so. This raises the possibility that prior to playing the *Missing* game, the treatment group may have already been more knowledgeable about Internet safety than was the comparison group. Fortunately, this effect was observed only for two of the behaviours and attitudes measured. Another possible explanation for these two effects involves the possibility of group differences in socially desirably responding. The students in the treatment classes were aware that they were going to play a game about Internet safety and that there would be a questionnaire related to this activity. Prior to the administration of the pre-test questionnaire, awareness of the computer game and the questionnaire was much more limited within the comparison classes. This could

have contributed to a tendency among subjects in the treatment group to endorse safer behaviours and attitudes in both the pre- and post-test questionnaire.

In addition to group effects, there were five gender effects demonstrating that males in our sample reported engaging in riskier online behaviour and reported riskier attitudes toward Internet safety than did females. Again, these effects were quite small (Cohen, 1992). Males reported going to open chat rooms, disclosing personal facts in open chat rooms, and emailing strangers originally met online more frequently than did females. There is mixed support in the literature for these gender differences in risky online behaviours. In a Canadian study (Environics, 2001), high school males were more likely than were females to report visiting age-inappropriate Internet sites and saying things they would not say in real life when they visit chat rooms. In an American study (Finkelhor et al., 2000), however, there was no indication of gender differences among youth aged 10 to 17 on the same types of risky behaviours that were assessed in the present study. Consistent with the Environics study, our results suggest that, compared to females, males in Grades 6 and 7 are taking more risks on the Internet.

Another trend was for attitudes to be safer at the post-test than at the pre-test regardless of group membership and gender. Reported attitudes toward the presence of risk on the Internet and attitudes toward trusting people online were safer at the post-test than at the pre-test. These were small to medium-sized effects (Cohen, 1992). This could be the result of repeated testing, whereby subjects become sensitized to the purpose of the study from pre- to post-test questionnaire and try to respond in what they believe to be a more socially acceptable way. Another possible explanation for the general increase in the safety of reported attitudes from pre- to post-test is that a *diffusion of treatment* may have occurred

from treatment to comparison classes that were located in the same schools. Because playing the computer game was an enjoyable and unique classroom experience, students in the treatment classes may have talked about the game and its messages with students in the comparison group. Diffusion of treatment and repeated testing both could have operated to influence the students to report safer attitudes in the post-test questionnaire. Perhaps attitudes are more susceptible to these types of effects than are behaviours.

Limitations

There are several limitations in the present study that should be considered when evaluating the results and in planning any subsequent work to evaluate the *Missing* program or any similar psychoeducational interventions concerning Internet safety. It may be that our measures of online behaviours and safety-related attitudes were not sensitive enough to detect changes in this sample of subjects in Grades 6 and 7. Low pre-test levels of risky behaviours and safety-related attitudes may indicate that we were not adequately sensitive to developmental issues. For example, few of our subjects were engaging in the risky online behaviours, thus making it somewhat difficult to affect a decrease in these behaviours. In addition, it was noted at the time of the survey administration that these students in Grades 6 and 7 had difficulty understanding and responding to the items concerning safety-related attitudes. Researchers might consider asking only the Internet Safety Guidelines questions at both the pre- and post-tests. This pre-post-test format would allow stronger conclusions to be drawn concerning the effectiveness of the *Missing* program in encouraging children to produce their own safe guidelines for online behaviour.

The necessity for standardization of the research process was also highlighted in the present study. The failure to find treatment differences on the behaviours and attitudes

measures might have been more conclusive if students in the treatment classes had not had greater awareness, prior to the study, that they were going to play a game about Internet safety and answer a questionnaire. Due to scheduling difficulties, the treatment classes had been anticipating the computer game for weeks and in some cases even had promotional posters for the game displayed in their classrooms. It is possible that attempts by the subjects in the treatment classes to appear to be conscious of Internet safety on the pre-test questionnaire may have contributed to a masking of the effect of playing the *Missing* game. One might argue that such attempts do not reflect a real or lasting understanding of Internet safety, but simply the ability to figure out the purpose of the questionnaire measures given that they had considerable time to reflect upon the topic prior to testing. It is necessary for future researchers to keep subjects' awareness of their involvement in an Internet safety study to a minimum and to take care that this knowledge is similar in the treatment and comparison groups. Furthermore, it is difficult to have confidence in the generalizability of the positive results concerning the Internet safety guidelines given that subjects in the treatment classes had, on average, greater in-school exposure to Internet safety education prior to playing the *Missing* game. An important part of standardization would be to ensure that the treatment and comparison classes have similar levels of past classroom exposure to Internet safety education, as was not the case in the present study or to find means of controlling for this past exposure. Only anecdotal evidence concerning previous Internet safety instruction was available in the current study and thus, it was not possible to control for this. Improvements on these limitations might allow for stronger conclusions to be drawn concerning the effectiveness of the *Missing* program.

The use of classrooms as the units of assignment and the failure to randomize

assignment to treatment and comparison groups are also important limitations. The use of classrooms as the unit of assignment often results in increasing the likelihood of Type I error in nested cohort designs (Murray & Hannan, 1990). Given that no significant effects indicating the effectiveness of the game were found in the repeated measures analyses, it is unlikely that this limitation had an important effect on the results. As mentioned above, however, the failure to randomize assignment of classes to treatment conditions does decrease confidence in the positive results of the Internet safety plan analyses. Practical considerations at the time of testing made it impossible to achieve random assignment of classes to treatment conditions. Regardless, the current study represents one of the few evaluations of an Internet safety intervention that is available and offers important insights for future research.

As noted previously, there was considerable variability in the support activities used by teachers in the treatment group, with 23% of subjects not receiving any support activities at all prior to the post-test questionnaire. It is possible that this variability in the support activities used by the teachers may have contributed to the results. Perhaps the effectiveness of the game is complemented by the classroom activities and discussions surrounding the playing of the game, to which 23% of the treatment group had only limited access. Based on informal feedback from the teachers, it appears that the opportunities for guided discussion dealing with specific situations involving Internet safety that are facilitated by playing the *Missing* game may contribute substantially to the success of the *Missing* program. Future researchers must ensure that all classes in the treatment group spend a similar amount of time on support activities and that each class completes the same activities. Alternately, the different support activities could also be compared. It is important to note, however, that

even with the variability in support activities found in the present sample, significant results favouring the treatment group were found for the behaviour of creating a number of safe rules in their Internet Safety Plans.

Methodological Implications

Sample implications. The majority of the Grade 6 and 7 students in our sample were not engaging in the three types of risky online behaviours measured and those who were, did so infrequently, making it difficult to produce an overall decrease in these behaviours. These low levels of risky online behaviours indicate that a slightly older age group might be developmentally more appropriate. In the Environics study (2001), it was found that generally students in high school engaged in higher frequencies of various online behaviours than did students in elementary school. It would be informative to evaluate the effectiveness of this computer game with students in Grade 8; at this age students may be somewhat more active on the Internet and the *Missing* game would still be age appropriate. There may simply be more room for change at this age and thus treatment-related decreases in risky online behaviours might be more likely to be observed. Alternately, only "at-risk" youth, who reported going to open chat rooms, disclosing personal information, and emailing strangers could be included for analysis. If results indicated a significant effect of playing the game, it could be concluded that *Missing* is effective in reducing the risky behaviour and attitudes of so-called at risk youth. These analyses were attempted in the current study, but there was insufficient sample size to draw any firm conclusions. A larger sample size would be required to test this hypothesis.

Measurement implications. The results of the present study suggest that a pre-post format may be too stringent to detect change in risky online behaviours, especially with

young students. Researchers (Stake & Mares, 2001) have suggested that it is frequently difficult to obtain differences with pre-post measures because there is often minimal room for change on the variables of interest, as was the case in the present study. Furthermore, the results of pre-post measures may not indicate significant differences even when subjects report having experienced change in themselves (Stake & Mares, 2001). An alternative to employing pre-post items to measure change in risky online behaviours is the use of perceptions of change items after the intervention. Students would rate the extent to which they perceive the likelihood of engaging in specific behaviours had changed from before to after the intervention. This method was employed in the evaluation of the NetSmartz Workshop (Branch Associates, 2002). Another alternative is a retrospective pre-test methodology (Pratt, McGuigan, & Katzev, 2000). This method has been developed to avoid response-shift bias, that is, the tendency of subjects to use a changed frame of reference after treatment to respond to measures concerning their attitudes and knowledge (Pratt et al., 2001). For example, as the result of participating in an Internet safety program, subjects may realize that they had riskier attitudes or behaviours at the pre-test than they originally reported. To counteract this, at the post-test, subjects can be asked to report not only their current attitudes and behaviours, but also to re-evaluate their pre-test attitudes and behaviours (Pratt et al., 2000). This method has been found to produce more accurate assessments of change (Pratt et al., 2000). Perceptions of change items and retrospective pre-test methodology may be more sensitive to the small changes in behaviour possible with subjects in this relatively young age group with limited experience with the Internet.

Applied implications. The current results indicate that playing the computer game in classrooms helps students to develop their own rules for safe use of the Internet. The

Missing program is designed for use by both schools and parents. Therefore, it seems likely that this program could also be effective when used by parents. In fact, it is important that parents become more involved and more knowledgeable concerning safe online practices. It has been reported that most young people rarely discuss their online behaviours with their parents and that their parents have provided them with few specific rules about using the Internet (Environics, 2001). Young people's experiences on the Internet are likely to occur predominantly in the home (Environics, 2001) and their experiences with harassment and sexual solicitation are also most likely to occur at home (Finkelhor et al., 2000). Thus, it is important that parents are able to reinforce safe online behaviours learned at school.

The positive results concerning Internet safety guidelines indicate that the computer game can be used effectively to teach Internet safety to children in Grade 6 and 7. These significant findings further suggest that the construction of personal Internet Safety Plans is an important support activity for teachers, counsellors, and parents to employ when using this computer game. This is a self-directed activity that allows students to feel that they are in control of their own online safety. In addition, although students of this age appear to be engaging in minimal risky behaviour on the Internet, writing their own guidelines may help them to remember the lessons of the computer game as they begin to explore further the Internet.

Overall, the results of the present study suggest that when teachers, counsellors, and parents use the *Missing* program, they need to place particular attention on ensuring that the messages are effectively conveyed to male students. Females appear to be using the Internet somewhat more safely than are males and may benefit more from playing the computer game. Thus, it is important that adults using the game help males to see that online

victimization is not only an issue for females and that they too must learn to be careful while online. Teachers, counsellors, and parents may use a number of the support activities that accompany the game or they may develop their own activities in order to encourage discussions with the children. During these discussions it would be possible to highlight further the messages of the computer game, particularly to male students.

Directions for Future Research

The long-term effectiveness of the *Missing* program has yet to be assessed. We recommend that subsequent studies incorporate a follow-up assessment. The current positive results concerning the development of safety rules may indicate that the *Missing* game is effective as a prevention method. Perhaps the strength of the *Missing* program is in keeping children from engaging in dangerous online activities and developing risky attitudes toward Internet safety rather than in reducing the frequency of risky behaviours and attitudes. Follow-up assessments would allow for this hypothesis to be evaluated. In addition, we recognize that, as with other programs such as the Head Start program (Lee, Brooks-Gunn, Schnur, & Liaw, 1990), booster sessions may be necessary to increase the probability that positive changes related to safe online behaviour are maintained. The necessity for booster sessions could also be evaluated with a follow-up assessment.

A comparison of *Missing's* student-centered, interactive approach with other existing approaches to teaching Internet safety would also be informative. Using the *Missing* program requires a fair amount of classroom time (three to four class sessions) and also classroom computer resources that are not always readily available, thus, it would be useful to ascertain if *Missing* represents an improvement over existing approaches employed in schools. It is likely, however, that multiple approaches to teaching Internet safety will be

useful for schools because Internet safety is an issue that will be addressed at a number of grade levels.

Conclusions

Internet safety for children is an important issue for educators, counsellors, parents, and researchers. Our extant knowledge in this area is based predominantly on studies that provide a descriptive picture of Internet use among young people (e.g., Environics, 2001; Finkelhor et al., 2000). Researchers need to be supported in their efforts to conduct applied research in this relatively new and evolving area.

Teaching young people not to reveal key pieces of personal information about themselves in open chat rooms and on personal Web pages, not to communicate via email with people they meet on the Internet, and not to meet in person with people they meet on the Internet is extremely important in teaching them to become safe users of the Internet. Those who have used the *Missing* program with children indicate that the game is very effective in stimulating children's enjoyment of and interest in learning about Internet safety. The ability of children who have played the computer game to formulate more safe guidelines for their risky online behaviour than can children who have not played the game provides some promising initial evidence that this interactive computer game may be used effectively as part of an Internet safety awareness program.

References

Beebe, T. J., Asche, S. E., Harrison, P. A., & Quinlan, K. B. (2004). Heightened vulnerability and increased risk-taking among adolescent chat room users: Results from a statewide school survey. *Journal of Adolescent Health, 35,* 116-123.

Branch Associates. (2002). *NetSmartz evaluation project: Internet safety training for children and youth ages 6 to 18.* Atlanta: GA: Boys & Girls Clubs of America and National Center for Missing & Exploited Children. Retrieved April 26, 2005 from http://www.netsmartz.org

Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender differences in risk taking: A meta-analysis. *Psychological Bulletin, 125,* 367-383.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Dindia, K., & Allen, M. (1992). Sex differences in self-disclosure: A meta-analysis. *Psychological Bulletin, 112,* 106-124.

Dochy, F., Segers, M., Van den Bossche, P., & Gijbels, D. (2003). Effects of problem-based learning: A meta-analysis. *Learning and Instruction, 13,* 533-568.

Dombrowski, S. C., LeMasney, J. W., Ahia, C. E., & Dickson, S. A. (2004). Protecting children from online sexual predators: Technological, psychoeducational, and legal considerations. *Professional Psychology: Research and Practice, 35,* 65-73.

Durndell, A., & Haag, Z. (2002). Computer self efficacy, computer anxiety, attitudes toward the Internet and reported experience with the Internet, by gender, in an East European sample. *Computers in Human Behavior, 18,* 521-535.

Environics Research Group. (2001, October). Young Canadians in a wired world: The students' view. Retrieved April 26, 2005 from http://www.media-

awareness.ca/english/
resources/special_initiatives/survey_resources/students_survey/students_survey_report.cfm

Finkelhor, D., Mitchell, K. J., & Wolak, J. (2000). Online victimization: A report on the nation's youth. Retrieved April 26, 2005 from http://www.unh.edu/ccrc/Youth_Internet_info_page.html

Fidell, L. S., & Tabachnick, B. G. (2003). Preparatory data analysis. In I. B. Weiner (Series Ed.) & J. A. Schinka & W. F. Velicer (Vol. Eds.), *Handbook of Psychology: Vol. 2. Research Methods in Psychology* (pp. 115-141). Hoboken, NJ: John Wiley & Sons.

Gross, E. F. (2004). Adolescent Internet use: What we expect, what teens report. *Applied Developmental Psychology, 25,* 633-649.

Hannafin, M. J., & Land, S. M. (1997). The foundations and assumptions of technology-enhanced student-centered learning environments. *Instructional Science, 25,* 167-202.

Harman, J. P., Hansen, C. E., Cochran, M. E., & Lindsey, C. R. (2005). Liar, liar: Internet faking but not frequency of use affects social skills, self-esteem, social anxiety, and aggression. *Cyberpsychology & Behavior, 8,* 1-6.

Jackson, L. A., Ervin, K. S., Gardner, P. D., & Schmitt, N. (2001). Gender and the Internet: Women communicating and men searching. *Sex Roles, 44,* 363-379.

Lee, V. E., Brooks-Gunn, J., Schnur, E., & Liaw, F-R. (1990). Are Head Start effects sustained? A longitudinal follow-up comparison of disadvantaged children attending Head Start, no preschool, and other preschool programs. *Child Development, 61,* 495-507.

Lenhart, A., Rainie, L., Lewis, O. (2001). Teenage life online: The rise of the instant-message generation and the Internet's impact on friendships and family relationships. Retrieved April 24, 2005 from http://www.pewinternet.org

Livewwwires. (2000). Missing [Computer game and guidebook]. Retrieved April 26, 2005 from http://www.livewwwires.com

Media Awareness Network. (2004). Internet 101. Retrieved April 24, 2005 from http://www.bewebaware.ca/english/internet101.aspx

Mitchell, K. J., Finkelhor, D., Wolak, J. (2001). Risk factors for and impact of online sexual solicitation of youth. *Journal of the American Medical Association, 285,* 3011-3014.

Murray, D. M., & Hanna, P. J. (1990). Planning for the appropriate analysis in school-based drug-use prevention studies. *Journal of Counseling and Clinical Psychology, 58,* 458-468.

Pratt, C. C., McGuigan, W. M., Katzev, A. R. (2000). Measuring program outcomes: Using retrospective pretest methodology. *American Journal of Evaluation, 21,* 341-349.

Schumacher, P. & Morahan-Martin, J. (2001). Gender, Internet and computer attitudes and experience. *Computers in Human Behavior, 17,* 95-110.

Stahl, C., & Fritz, N. (2002). Internet safety: Adolescents' self-report. *Journal of Adolescent Health, 31,* 7-10.

Stake, J. E., & Mares, K. R. (2001). Science enrichment programs for gifted high school girls and boys: Predictors of program impact on science confidence and motivation. *Journal of Research in Science Teaching, 38,* 1065-1088.

Stern, S. R. (2004). Expressions of identity online: Prominent features and gender differences in adolescents' World Wide Web home pages. *Journal of Broadcasting*

& Electronic Media, 48, 218-243.

Subrahmanyam, K., Greenfield, P., Kraut, R., & Gross, E. (2001). The impact of computer use on children's and adolescents' development. *Applied Developmental Psychology, 22,* 7-30.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Boston, MA: Allyn & Bacon.

Web Wise Kids. (2001). Web site accessed April 26, 2005 http://www.webwisekids.com

Wolak, J., Mitchell, K. J., & Finkelhor, D. (2002). Close online relationships in a national sample of adolescents. *Adolescence, 37,* 441-455.

Wolak, J. Mitchell, K. J., & Finkelhor, D. (2003). Escaping or connecting? Characteristics of youth who for close online relationships. *Journal of Adolescence, 26,* 105-119.

Ybarra, M. L., Alexander, C., & Mitchell, K. J. (2005). Depressive symptomatology, youth Internet use, and online interactions: A national survey. *Journal of Adolescent Health, 36,* 9-18.

Table 1

Correlations between the Pre- and Post-Test Assessments for each Measure by Group and Gender

Treatment		Comparison	
Male	Female	Male	Female
Going to open chat rooms			
.60 (98)	.68 (83)	.72 (78)	.72 (79)
Disclosing personal experiences and feelings in open chat rooms			
.73 (34)	.62 (23)	.41 (29)	.82 (26)
Disclosing personal facts in open chat rooms			
.55 (32)	.73 (23)	.72 (28)	.89 (32)
Emailing strangers			
.68 (95)	.53 (83)	.55 (77)	.60 (79)
Disclosing personal experiences and feelings in email to strangers			
.65 (23)	.82 (13)	.76 (34)	.79 (22)
Posting personal information on a personal Web page			
.71 (93)	.75 (78)	.69 (75)	.84 (74)
Attitudes related to the presence of risk on the Internet			
.64 (91)	.66 (79)	.67 (74)	.73 (73)
Attitudes related to trusting people on the Internet			
.65 (94)	.73 (83)	.56 (74)	.79 (78)

Note. All correlations significant at $p \leq .001$, with the exception of disclosing personal experiences and feelings in open chat rooms for females in the treatment group, $p < .01$ and for males in the comparison group, $p < .05$. Values in parentheses represent sample sizes.

Table 2

Cronbach's Alphas of Internal Consistency Reliability by Time of Testing, Group, and Gender

Pre-Test				Post-Test			
Treatment		Comparison		Treatment		Comparison	
Male	Female	Male	Female	Male	Female	Male	Female
Disclosing personal experiences and feelings in open chat rooms							
.83	.92	.82	.89	.83	.92	.88	.86
Disclosing personal facts in open chat rooms							
.88	.90	.82	.88	.83	.86	.72	.87
Disclosing personal experiences and feelings in email to strangers							
.92	.93	.91	.84	.88	.88	.89	.86
Posting personal information on a personal Web page							
.85	.81	.83	.82	.85	.80	.82	.85
Attitudes related to the presence of risks on the Internet							
.82	.78	.86	.87	.90	.86	.83	.90
Attitudes related to trusting people on the Internet							
.78	.69	.75	.79	.77	.67	.77	.81

Table 3

Factor Loadings for the Final Two-Factor Solution for Internet Safety-Related Attitudes

Internet safety-related attitude items	Factor loading
Attitudes related to the presence of risks on the Internet	
1. How likely is it that someone you might meet online would try to fool or manipulate you?	.83
2. How likely is that someone you might meet online would try to lure you away from your home?	.74
3. How likely is it that someone you might meet online would pretend to be someone they are not?	.72
4. How likely is it that someone on the Internet would try to lure someone your age away from home?	.71
5. In an open chat room, how risky do you think it is to tell things about yourself to someone you might meet online?	.57
6. On a personal Web page, how risky do you think it is to tell things about yourself?	.45
Attitudes related to trusting people on the Internet	
1. How long would you have to talk with someone you might meet online before you would trust them a little?	.90
2. How long would you have to talk with someone you might meet online before you would trust them a lot?	.82
3. How much do you think you could trust someone you might meet online?	.51
4. How truthful do you think people are when they talk online?	.31

Table 4

Percentages of Subjects with Computer and Internet Access in the Home and Subjects Engaging in General Internet Activities

Variable	Treatment Group	Comparison Group	Males	Females
Computer and Internet Access in the Home				
Computer in the home	98	99	98	99
Internet access in the home	91	92	95_a	88_b
Computer of his/her own in home	28	34	35	26
Internet access on "own" computer	22	27	28	21
Use Internet at home at least once a week [c]	90	94	90	94
General Internet Usage				
Go to open chat rooms	28	32	38_a	21_b
Use email	81	85	77_a	89_b
Use Instant Messaging (e.g., ICQ, MSN)	70	72	68	74
Search for information for school	87	91	82_a	96_b
Search for information other than for school	64	64	68	57
Download/play games	77	79	85_a	71_b
Download/play music	74	71	70	75
Construct a personal Web page	36_a	24_b	33	28

Note. Percentages with different subscripts differ significantly, $p < .05$.

[c] Based on subjects with Internet access in the home.

Table 5

Correlations between Variables at the Pre-Test for Subjects in the Treatment Group

Variable	1	2	3	4	5	6	7	8
1. Going to open chat rooms	--	.37 (25)	.45[a] (26)	.24[a] (83)	-.38 (18)	.26[a] (82)	-.18 (80)	-.18 (83)
2. Disclosing personal experiences and feelings in open chat rooms	.16 (44)	--	.66[c] (25)	-.04 (25)	.52 (10)	.38 (25)	-.34 (24)	-.41[a] (25)
3. Disclosing personal facts in open chat rooms	.23 (43)	.49[c] (42)	--	.23 (26)	.37 (10)	.70[c] (26)	-.36 (25)	-.43[a] (26)
4. Emailing strangers	.45[c] (96)	.28 (44)	.62[c] (43)	--	-.24 (18)	.30[b] (82)	-.19 (80)	-.33[b] (83)
5. Disclosing personal experiences and feelings in email to strangers	-.13 (36)	.69[c] (25)	.32 (24)	.28 (36)	--	.35 (18)	-.22 (17)	.07 (18)
6. Posting personal information on a personal Web page	.31[b] (95)	.36[a] (43)	.80[c] (42)	.39[c] (93)	.17 (35)	--	-.15 (79)	-.19 (82)
7. Attitudes related to the presence of risks on the Internet	-.08 (94)	-.30 (41)	-.25 (40)	-.09 (92)	.11 (34)	-.32[b] (91)	--	.54[c] (80)
8. Attitudes related to trusting people on the Internet	-.25[a] (96)	-.39[b] (44)	-.37[a] (43)	-.42[c] (94)	-.15 (36)	-.41[c] (94)	.15 (92)	--

Note. Correlations above the diagonal are for females and those below the diagonal are for males. Values in parentheses represent sample sizes. For attitudes, higher scores reflected safer attitudes, whereas for behaviours, higher scores reflected higher frequency of risky behaviours.

[a] $p < .05$; [b] $p < .01$; [c] $p \leq .001$

Table 6

Correlations between Variables at the Pre-Test for Subjects in the Comparison Group

Variable	1	2	3	4	5	6	7	8
1. Going to open chat rooms	--	.12 (32)	.48[b] (33)	.45[c] (79)	.05 (25)	.37[c] (78)	-.36[b] (73)	-.27[a] (79)
2. Disclosing personal experiences and feelings in open chat rooms	-.07 (37)	--	.65[c] (31)	.57[c] (32)	.42 (18)	.11 (31)	.06 (29)	-.26 (32)
3. Disclosing personal facts in open chat rooms	.03 (37)	.20 (37)	--	.65[c] (33)	.35 (18)	.49[b] (32)	-.16 (30)	-.36[a] (33)
4. Emailing strangers	.50[c] (77)	.25 (37)	.69[c] (37)	--	.32 (25)	.27[a] (78)	-.19 (73)	-.22 (79)
5. Disclosing personal experiences and feelings in email to strangers	-.15 (34)	.63[c] (25)	.50[b] (25)	.30 (34)	--	.18 (24)	.18 (21)	-.41[a] (25)
6. Posting personal information on a personal Web page	.27[a] (76)	.28 (36)	.68[c] (36)	.53[c] (75)	.16 (32)	--	-.41[c] (72)	-.49[c] (78)
7. Attitudes related to the presence of risks on the Internet	-.04 (74)	.23 (35)	-.10 (35)	-.07 (73)	.08 (33)	-.25[a] (72)	--	.45[c] (73)
8. Attitudes related to trusting people on the Internet	-.14 (.24)	-.17 (36)	-.38[a] (36)	-.24[a] (74)	-.33 (33)	-.35[b] (73)	.31[b] (73)	--

Note. Correlations above the diagonal are for females and those below the diagonal are for males. Values in parentheses represent sample sizes. For attitudes, higher scores reflected safer attitudes, whereas for behaviours, higher scores reflected higher frequency of risky behaviours.

[a] $p < .05$; [b] $p < .01$; [c] $p \leq .001$

Table 7

Correlations between Variables at the Post-Test for Subjects in the Treatment Group

Variable	1	2	3	4	5	6	7	8
1. Going to open chat rooms	--	.02 (32)	-.09 (32)	.07 (83)	-.35 (24)	.12 (82)	-.12 (82)	-.08 (83)
2. Disclosing personal experiences and feelings in open chat rooms	.07 (39)	--	.28 (32)	.05 (32)	.73[b] (13)	.07 (31)	-.42[a] (31)	-.54[c] (32)
3. Disclosing personal facts in open chat rooms	.21 (38)	.53[c] (37)	--	.35 (32)	.52 (13)	.56[c] (31)	-.44[a] (31)	-.59[c] (32)
4. Emailing strangers	.41[c] (97)	.15 (38)	.41[a] (37)	--	.07 (24)	.10 (79)	-.40[c] (82)	-.43[c] (83)
5. Disclosing personal experiences and feelings in email to strangers	-.25 (30)	.88[c] (22)	.48[a] (22)	.06 (30)	--	-.08 (23)	-.20 (23)	.03 (24)
6. Posting personal information on a personal Web page	.20[a] (96)	.39[a] (39)	.65[c] (38)	.24[a] (95)	.50[b] (29)	--	-.13 (78)	-.15 (79)
7. Attitudes related to the presence of risks on the Internet	-.11 (94)	.09 (37)	.09 (36)	-.15 (93)	.21 (29)	-.07 (92)	--	.68[c] (82)
8. Attitudes related to trusting people on the Internet	-.35[c] (95)	-.38[a] (39)	-.46[b] (38)	-.47[c] (94)	-.37[a] (29)	-.30[b] (93)	.23[a] (91)	--

Note. Correlations above the diagonal are for females and those below the diagonal are for males. Values in parentheses represent sample sizes. For attitudes, higher scores reflected safer attitudes, whereas for behaviours, higher scores reflected higher frequency of risky behaviours.

[a] $p < .05$; [b] $p < .01$; [c] $p \leq .001$

Table 8

Correlations between Variables at the Pre-Test for Subjects in the Comparison Group

Variable	1	2	3	4	5	6	7	8
1. Going to open chat rooms	--	.18 (33)	.36[a] (32)	.34[b] (79)	-.25 (31)	.37[c] (75)	-.30[b] (79)	-.35[b] (78)
2. Disclosing personal experiences and feelings in open chat rooms	.23 (33)	--	.54[c] (32)	.37[a] (33)	.83[c] (21)	.49[b] (31)	-.10 (33)	-.36[a] (32)
3. Disclosing personal facts in open chat rooms	.22 (31)	.22 (30)	--	.24 (32)	.38 (20)	.75[c] (30)	-.13 (32)	-.53[b] (31)
4. Emailing strangers	.55[c] (78)	.12 (33)	.32 (31)	--	.22 (31)	.33[b] (75)	-.31[b] (79)	-.23[a] (78)
5. Disclosing personal experiences and feelings in email to strangers	.23 (35)	.75[c] (27)	.19 (25)	.24 (35)	--	.39[a] (29)	-.09 (31)	-.22 (31)
6. Posting personal information on a personal Web page	.41[c] (77)	-.06 (33)	.69[c] (31)	.37[c] (77)	.16 (35)	--	-.46[c] (75)	-.66[c] (74)
7. Attitudes related to the presence of risks on the Internet	-.17 (78)	.00 (33)	-.30 (31)	-.23[a] (78)	.09 (35)	-.31[b] (77)	--	.54[c] (78)
8. Attitudes related to trusting people on the Internet	-.34[b] (77)	-.17 (32)	-.54[b] (30)	-.52[c] (77)	-.24 (34)	-.54[c] (76)	.39[c] (77)	--

Note. Correlations above the diagonal are for females and those below the diagonal are for males. Values in parentheses represent sample sizes. For attitudes, higher scores reflected safer attitudes, whereas for behaviours, higher scores reflected higher frequency of risky behaviours.

[a] $p < .05$; [b] $p < .01$; [c] $p \leq .001$

Table 9

Correlations between Number of Internet Safety Guidelines in Four Internet Situations by Group and Gender

Variable	1	2	3	4
		Treatment Group		
1. Open chat rooms	--	.46[c] (78)	.26[a] (78)	.20 (78)
2. Emailing someone originally met online	.44[c] (98)	--	.34[b] (78)	.28[a] (78)
3. Personal Web page design	.51[c] (98)	.63[c] (98)	--	.35[b] (78)
4. Meeting in person with someone originally met on the Internet	.42[c] (98)	.29[b] (98)	.35[c] (98)	--
		Comparison Group		
1. Open chat rooms	--	.32[b] (79)	.46[c] (79)	.23[a] (79)
2. Emailing someone originally met online	.47[c] (83)	--	.33[b] (79)	.34[b] (79)
3. Personal Web page design	.64[c] (83)	.58[c] (83)	--	.42[c] (79)
4. Meeting in person with someone originally met on the Internet	.38[c] (83)	.39[c] (83)	.30[b] (83)	--

Note. Correlations above the diagonal are for females and those below the diagonal are for males. Values in parentheses represent sample sizes.

[a] $p < .05$; [b] $p < .01$; [c] $p \leq .001$

Table 10

Mixed ANOVA for Frequency of Going to Open Chat Rooms

Source	*df*	*F*	η^2	*p*
		Between subjects		
Group (Gr)	1	2.61	.01	.11
Gender (G)	1	8.20 *	.02	.004
Gr X G	1	0.33	.00	.57
Error	334	(1.82)		
		Within subjects		
Time of testing (T)	1	0.00	.00	.97
T X Gr	1	0.23	.00	.63
T X G	1	2.70	.01	.10
T X Gr X G	1	0.10	.00	.75
Error	334	(0.36)		

Note. Group refers to Treatment and Comparison Group. Values enclosed in parentheses represent mean square errors.

*$p < .01$.

Table 11

Means and Standard Deviations for Frequency of Risky Online Behaviours by Group, Time of Testing, and Gender

	Treatment				Comparison			
	Pre-Test		Post-Test		Pre-Test		Post-Test	
	Male	Female	Male	Female	Male	Female	Male	Female
	Going to open chat rooms							
	1.87	1.45	1.83	1.53	2.01	1.68	1.90	1.75
	(1.11)	(0.73)	(1.22)	(0.74)	(1.26)	(0.89)	(1.22)	(0.99)
n	98	83			78	79		
	Disclosing personal experiences and feelings in open chat rooms							
	1.72	1.52	1.61	1.30	1.96	1.69	1.77	1.70
	(0.79)	(0.78)	(0.65)	(0.41)	(0.85)	(0.78)	(0.77)	(0.79)
n	34	23			29	26		
	Disclosing personal facts in open chat rooms							
	2.30	1.64	1.99	1.63	2.35	2.02	2.54	2.09
	(1.06)	(0.65)	(0.76)	(0.66)	(0.90)	(0.84)	(0.69)	(0.91)
n	32	23			28	27		
	Emailing strangers							
	1.73	1.32	1.52	1.51	1.95	1.60	2.05	1.62
	(1.16)	(0.65)	(0.90)	(0.91)	(1.28)	(0.99)	(1.39)	(0.90)
n	95	83			77	79		
	Disclosing personal experiences and feelings in email to strangers							
	1.61	1.50	1.63	1.42	1.95	1.83	1.93	1.86
	(0.75)	(0.68)	(0.67)	(0.52)	(1.18)	(0.83)	(0.94)	(0.70)
n	23	13			26	22		
	Posting personal information on a personal Web page							
	1.96	1.67	1.78	1.64	1.85	1.92	1.84	1.91
	(0.84)	(0.60)	(0.69)	(0.56)	(0.72)	(0.71)	(0.66)	(0.74)
n	93	78			75	74		

Note. Responses range from 1 (*never*) to 5 (*very often*). Values enclosed in parentheses represent standard deviations.

Table 12

Mixed ANOVA for Frequency of Disclosing Personal Experiences and Feelings in Open Chat Rooms

Source	*df*	*F*	η^2	*p*
		Between subjects		
Group (Gr)	1	3.62	.03	.06
Gender (G)	1	2.75	.03	.10
Gr X G	1	0.11	.00	.74
Error	108	(0.90)		
		Within subjects		
Time of testing (T)	1	4.17	.04	.04
T X Gr	1	0.48	.00	.49
T X G	1	0.15	.00	.70
T X Gr X G	1	1.50	.01	.22
Error	108	(0.21)		

Note. Group refers to Treatment and Comparison Group. Values enclosed in parentheses represent mean square errors.

Table 13

Mixed ANOVA for Frequency of Disclosing Personal Facts in Open Chat Rooms

Source	*df*	*F*	η^2	*p*
	Between subjects			
Group (Gr)	1	5.97	.05	.02
Gender (G)	1	9.44 *	.08	.003
Gr X G	1	0.18	.00	.67
Error	106	(1.16)		
	Within subjects			
Time of testing (T)	1	0.05	.00	.82
T X Gr	1	5.40	.05	.02
T X G	1	0.28	.01	.46
T X Gr X G	1	1.82	.02	.11
Error	106	(0.22)		

Note. Group refers to Treatment and Comparison Group. Values enclosed in parentheses represent mean square errors.

*$p < .01$.

Table 14

Mixed ANOVA for Frequency of Emailing Strangers Originally met Online

Source	*df*	*F*	η^2	*p*
		Between subjects		
Group (Gr)	1	7.96 *	.03	.005
Gender (G)	1	8.68 *	.02	.003
Gr X G	1	0.80	.00	.37
Error	330	(1.72)		
		Within subjects		
Time of testing (T)	1	0.27	.00	.60
T X Gr	1	0.45	.00	.50
T X G	1	2.31	.01	.13
T X Gr X G	1	5.31	.02	.02
Error	330	(0.46)		

Note. Group refers to Treatment and Comparison Group. Values enclosed in parentheses represent mean square errors.

*$p < .01$.

Table 15

Mixed ANOVA for Frequency of Disclosing Personal Experiences and Feelings in Email to Strangers

Source	*df*	*F*	η^2	*p*
	Between subjects			
Group (Gr)	1	3.98	.05	.05
Gender (G)	1	0.49	.01	.48
Gr X G	1	0.04	.00	.84
Error	80	(1.22)		
	Within subjects			
Time of testing (T)	1	0.04	.00	.85
T X Gr	1	0.07	.00	.80
T X G	1	0.02	.00	.89
T X Gr X G	1	0.27	.00	.60
Error	80	(0.19)		

Note. Group refers to Treatment and Comparison Group. Values enclosed in parentheses represent mean square errors.

Table 16

Mixed ANOVA for Frequency of Posting Personal Information on a Personal Web Page

Source	*df*	*F*	η^2	*p*
	Between subjects			
Group (Gr)	1	2.47	.01	.12
Gender (G)	1	0.98	.00	.32
Gr X G	1	3.83	.01	.05
Error	316	(0.85)		
	Within subjects			
Time of testing (T)	1	4.13	.01	.04
T X Gr	1	3.05	.01	.08
T X G	1	1.41	.00	.24
T X Gr X G	1	1.52	.01	.22
Error	316	(0.13)		

Note. Group refers to Treatment and Comparison Group. Values enclosed in parentheses represent mean square errors.

Table 17

Mixed ANOVA for Attitudes Related to the Presence of Risk on the Internet

Source	*df*	*F*	η^2	*p*
		Between subjects		
Group (Gr)	1	16.39 **	.05	.000
Gender (G)	1	10.15 *	.03	.002
Gr X G	1	1.79	.01	.18
Error	313	(1.65)		
		Within subjects		
Time of testing (T)	1	34.25 **	.10	.000
T X Gr	1	0.14	.00	.71
T X G	1	0.24	.00	.63
T X Gr X G	1	2.61	.01	.11
Error	313	(0.33)		

Note. Group refers to Treatment and Comparison Group. Values enclosed in parentheses represent mean square errors.

*$p < .01$. **$p < .001$.

Table 18

Means and Standard Deviations for Internet Safety-Related Attitudes by Group, Time of Testing, and Gender

	Treatment				Comparison			
	Pre-Test		Post-Test		Pre-Test		Post-Test	
	Male	Female	Male	Female	Male	Female	Male	Female
	Attitudes related to the presence of risk on the Internet							
	3.10	3.47	3.29	3.85	2.77	3.01	3.07	3.21
	(1.01)	(0.92)	(1.06)	(0.86)	(1.08)	(1.08)	(0.92)	(1.01)
n	91	79			74	73		
	Attitudes related to trusting people on the Internet							
	3.86	4.15	3.92	4.35	3.68	4.04	3.85	4.15
	(0.88)	(0.74)	(0.83)	(0.58)	(0.92)	(0.76)	(0.81)	(0.69)
n	94	83			74	78		

Note. Responses range from 1 to 5. Higher means represent safer attitudes. Values enclosed in parentheses represent standard deviations.

Table 19

Mixed ANOVA for Attitudes Related to Trusting People on the Internet

Source	*df*	*F*	η^2	*p*
		Between subjects		
Group (Gr)	1	3.03	.01	.08
Gender (G)	1	19.16 **	.06	.000
Gr X G	1	0.03	.00	.87
Error	325	(1.02)		
		Within subjects		
Time of testing (T)	1	14.64 **	.04	.000
T X Gr	1	0.02	.00	.89
T X G	1	0.28	.00	.60
T X Gr X G	1	2.07	.01	.15
Error	325	(0.21)		

Note. Group refers to Treatment and Comparison Group. Values enclosed in parentheses represent mean square errors.

**$p < .001$.

Table 20

ANOVAs for Number of Internet Safety Guidelines in Four Internet Situations and Overall

Source	*df*	*F*	η^2	*p*
Total number of Internet safety guidelines				
Group (Gr)	1	20.61 **	.06	.000
Gender (G)	1	48.00 **	.13	.000
Gr X G	1	2.29	.01	.13
Error	334			
Open chat rooms				
Group (Gr)	1	13.58 **	.04	.000
Gender (G)	1	41.39 **	.11	.000
Gr X G	1	7.86 *	.02	.005
Error	334	(3.26)		
Emailing someone originally met online				
Group (Gr)	1	13.92 **	.04	.000
Gender (G)	1	11.40 **	.03	.001
Gr X G	1	3.20	.01	.08
Error	334	(2.11)		
Personal Web page design				
Group (Gr)	1	11.78 **	.03	.001
Gender (G)	1	31.53 **	.09	.000
Gr X G	1	0.16	.00	.69
Error	334	(3.43)		
Meeting in person with someone originally met on the Internet				
Group (Gr)	1	4.81	.01	.03
Gender (G)	1	22.54 **	.06	.000
Gr X G	1	0.85	.00	.36
Error	334	(0.97)		

Note. Group refers to Treatment and Comparison Group. Values enclosed in parenthesis represent mean square errors.

*$p < .01$. **$p \leq .001$.

Table 21

Means and Standard Deviations for Number of Internet Safety Guidelines by Group and Gender

Treatment		Comparison	
Male (n = 98)	Female (n = 83)	Male (n = 78)	Female (n = 79)
Total number of Internet safety guidelines			
5.71	9.86	4.23	6.89
(4.43)	(5.41)	(3.33)	(4.50)
Open chat rooms			
1.67	3.49	1.50	2.22
(1.54)	(2.19)	(1.62)	(1.84)
Emailing someone originally met online			
1.40	2.22	1.09	1.34
(1.46)	(1.76)	(1.21)	(1.30)
Personal Web page design			
1.49	2.69	0.88	1.92
(1.69)	(2.25)	(1.29)	(1.93)
Meeting in person with someone originally met on the Internet			
1.14	1.55	0.81	1.42
(1.00)	(0.89)	(0.81)	(1.19)

Note. Values enclosed in parentheses represent standard deviations.

Appendix A

Pre-Test Questionnaire

A SURVEY OF STUDENT

ONLINE BEHAVIOURS AND ATTITUDES

For your information, a brief definition of open chat rooms:

Open chat rooms are Internet areas where you can have live conversations with several people at the same time.

- An open chat room can be entered by anyone (examples: chat rooms connected to music, sports, or computer game Web sites).
- This **does not include** ICQ, MSN, or AIM.

School #: _____ Class #: _____ Date: (day/month/year) _____

Code #:_____ Grade: _____

Background Information

On this page, please **circle** the answer that applies to you.

1. How old are you? 10 11 12 13 14 15 16

2. Please indicate your gender: male female

3. What language is most often spoken in your home? _____

4. How long have your parents lived in Canada?	less than 1 year	1 to 2 years	3 to 5 years	6 to 10 years	more than 10 years
5. Is there a computer in your home?	yes	no			
6. **If yes**, is this computer connected to the Internet?	yes	no			
7. Is there a computer in your home that you consider to be **your own**?	yes	no			
8. **If yes**, is your computer connected to the Internet?	yes	no			
9. How often do you go online at **home**?	once or twice per month or less	once a week	several times a week	once a day	several times a day
10. How often do you go online at a **friend's house**?	once or twice per month or less	once a week	several times a week	once a day	several times a day
11. How often do you go online at **school**?	once or twice per month or less	once a week	several times a week	once a day	several times a day
12. How often do you go online at a **public library**?	once or twice per month or less	once a week	several times a week	once a day	several times a day
13. How well do you understand the Internet?	very well	quite well	somewhat	a little	not at all

14. How often are your parents around when you are online?	never	maybe a few times	sometimes	quite often	very often	
15. Do your parents ask you about the things you do when you are online?	never	maybe a few times	sometimes	quite often	very often	
16. Do your parents check the history function (cookies) on your web browser to see what sites you have visited on the Internet?	never	maybe a few times	sometimes	quite often	very often	I don't know
17. Do your parents use blocking or filtering software to control the type of Internet site you are allowed to visit?	yes	no	I don't know			

18. For what kinds of things do you use the Internet?

Check as many as apply to you.

- ☐ open chat rooms (for example, chat rooms connected to music, sports, or computer game Web sites)
- ☐ e-mail
- ☐ Instant Messaging (ICQ, MSN, AIM)
- ☐ looking up information for school
- ☐ looking up information **not** for school
- ☐ play or download games
- ☐ play or download music
- ☐ surf
- ☐ posting a personal Web page/ Web site
- ☐ shopping
- ☐ other: _____

A. Open Chat Rooms

Open chat rooms are Internet areas where you can have live conversations with several people at the same time.

- An open chat room can be entered by anyone (examples: chat rooms connected to music, sports, or computer game Web sites; this **does not include** ICQ, MSN, AIM).

Please, circle the answer that applies to you. Circle **one answer** for each question.

1. Do you go to open chat rooms?	**very often**	**often**	**sometimes**	**at least once**	**never**

If you circled never for Question 1 on this page, please go to page 6.

2. When you go to open chat rooms, do you chat about:	very often	often	sometimes	at least once	never
a. your hobbies?	5	4	3	2	1
b. your personal feelings and thoughts?	5	4	3	2	1
c. your favourite sports?	5	4	3	2	1
d. happy experiences at school?	5	4	3	2	1
e. unhappy experiences at school?	5	4	3	2	1
f. a boy or girl you like?	5	4	3	2	1
g. secrets?	5	4	3	2	1
h. your favourite books?	5	4	3	2	1
i. things that are bothering you?	5	4	3	2	1
j. fashions?	5	4	3	2	1
k. your favourite music/band?	5	4	3	2	1
l. happy experiences at home?	5	4	3	2	1
m. unhappy experiences at home?	5	4	3	2	1
n. video/computer games?	5	4	3	2	1
o. sex?	5	4	3	2	1
p. TV programs?	5	4	3	2	1

A. Open Chat Rooms

Please, circle the answer that applies to you. Circle **one answer** for each question.

3. When you go to open chat rooms, how often do you exchange the following information with people there:	very often	often	sometimes	at least once	never
a. what you look like (for example, height, weight, hair colour)?	5	4	3	2	1
b. the e-mail address you share with your family?	5	4	3	2	1
c. your full name?	5	4	3	2	1
d. the name of your school?	5	4	3	2	1
e. your personal e-mail address?	5	4	3	2	1
f. the name of the city you live in?	5	4	3	2	1
g. your age?	5	4	3	2	1
h. whether you are male or female?	5	4	3	2	1
i. your ICQ/MSN number/nickname?	5	4	3	2	1

B. Personal Web Site or Web Page(s)

6

We are asking about your own personal Web site or Web page(s) **posted on the Internet.**
If you do not have a personal Web site or Web page(s), please go to the next page.

1. _____ number of Web sites you have designed and posted on the Internet?

2. _____ number of Web pages you have designed and posted on the Internet?

2. Does your Web site/page(s) include(s) or are you thinking of including the following?	Yes, I include this	quite likely	somewhat likely	quite unlikely	No
a. your full name?	5	4	3	2	1
b. the name of your school?	5	4	3	2	1
c. your personal e-mail address?	5	4	3	2	1
d. your personal feelings and thoughts?	5	4	3	2	1
e. your age?	5	4	3	2	1
f. whether you are male or female?	5	4	3	2	1
g. the e-mail address you share with your family?	5	4	3	2	1
h. pictures/cartoons/art?	5	4	3	2	1
i. a description of how you look (for example, height, weight, hair colour)?	5	4	3	2	1
j. ICQ/MSN number/nickname?	5	4	3	2	1
k. what you like to do?	5	4	3	2	1
l. what you don't like to do?	5	4	3	2	1
m. a photograph of you?	5	4	3	2	1
n. a photograph of your family?	5	4	3	2	1
o. the name of the city in which you live?	5	4	3	2	1
p. your street address?	5	4	3	2	1
q. your phone number?	5	4	3	2	1

Now that you have completed this page about your personal Web site/page(s), go to page 8.

B. Personal Web Site or Web Page(s) 7

This page is for people who <u>do not have</u> a personal Web site/page(s).

If you have a personal Web site/page(s), go back and complete page 6.

If you had the chance to design your own Web site or Web page(s) **to be posted on the Internet**, what would you include?

1. Would your Web site/page(s) include(s) the following?	Yes	quite likely	somewhat likely	quite unlikely	No
a. your full name?	5	4	3	2	1
b. the name of your school?	5	4	3	2	1
c. your personal e-mail address?	5	4	3	2	1
d. your personal feelings and thoughts?	5	4	3	2	1
e. your age?	5	4	3	2	1
f. whether you are male or female?	5	4	3	2	1
g. the e-mail address you share with your family?	5	4	3	2	1
h. pictures/cartoons/art?	5	4	3	2	1
i. a description of how you look (for example, height, weight, hair colour)?	5	4	3	2	1
j. ICQ/MSN number/nickname?	5	4	3	2	1
k. what you like to do?	5	4	3	2	1
l. what you don't like to do?	5	4	3	2	1
m. a photograph of you?	5	4	3	2	1
n. a photograph of your family?	5	4	3	2	1
o. the name of the city in which you live?	5	4	3	2	1
p. your street address?	5	4	3	2	1
q. your phone number?	5	4	3	2	1

C. Your Personal E-mail Address

8

On this page we are asking about emailing someone <u>you met online</u> and *<u>do not know in real life</u>*.

	very often	often	sometimes	at least once	never
1. Do you use your personal e-mail address to e-mail <u>people you have met online</u>?					

If you circled <u>never</u> for Question 1 <u>on this page</u>, please go to page 9.

2. When you e-mail <u>people you have met online</u>, how often do you:	very often	often	sometimes	at least once	never
a. talk about homework?	5	4	3	2	1
b. talk about things that are bothering you?	5	4	3	2	1
c. talk about hobbies and things you are interested in?	5	4	3	2	1
d. talk about sex?	5	4	3	2	1
e. talk about sports?	5	4	3	2	1
f. talk about happy experiences at school?	5	4	3	2	1
g. talk about unhappy experiences at school?	5	4	3	2	1
h. talk about music?	5	4	3	2	1
i. send photographs?	5	4	3	2	1
j. talk about your personal feelings or thoughts?	5	4	3	2	1
k. talk about a boy or girl you like?	5	4	3	2	1
l. talk about happy experiences at home?	5	4	3	2	1
m. talk about unhappy experiences at home?	5	4	3	2	1

	a day or less	a few days	a few weeks	a few months	a year or more
3. <u>How long</u> after meeting someone online <u>do you wait</u> before you give them your personal e-mail address?					

Your Opinions about Being Online and Using the Internet

In this group of questions we are asking **what you think** about the Internet. We **are <u>not</u>** asking you about what you do on the Internet.

Please, circle the answer that best describes <u>your opinion</u>.
Circle **one answer** for each question.

1.	Do you think the Internet is useful?	very useful	quite useful	somewhat useful	a little useful	not at all useful
2.	In general, how much do you think you could trust someone you might meet online?	very much	quite a lot	somewhat	a little	not at all
3.	In general, in an **open** chat room, how risky do you think it is to tell things about yourself to someone you might meet online?	very risky	quite risky	somewhat risky	a little risky	not at all risky
4.	In general, how likely do you think it is that someone might meet online would pretend to be someone they are not?	very likely	quite likely	somewhat likely	a little likely	not at all likely
5.	Do you like using the Internet?	very much	quite a lot	somewhat	a little	not at all
6.	In general, how likely is it that someone you might meet online **would try** to lure **you** away from your home?	very likely	quite likely	somewhat likely	a little likely	not at all likely
7.	In general, how long do you think you would you have to talk with someone you might meet online before you would trust them **<u>a little</u>**?	a day or less	a few days	a few weeks	a few months	a year or more
8.	In general, how likely is it that someone you might meet online **would try** to fool or manipulate you?	very likely	quite likely	somewhat likely	a little likely	not at all likely

9. In general, in personal e-mail, how safe do you think it is to tell things about yourself to someone you might meet online ?	very safe	quite safe	somewhat safe	a little safe	not at all safe
10. Do you have fun when you go on the Internet?	very much	quite a lot	somewhat	a little	not at all
11. In general, on a personal Web page/Web site, how risky do you think it is to tell things about yourself?	very risky	quite risky	somewhat risky	a little risky	not at all risky
12. In general, how long would you have to talk with someone you might meet online before you would trust them **a lot**?	a day or less	a few days	a few weeks	a few months	a year or more
13. In general, how truthful do you think people are when they talk online?	very truthful	quite truthful	somewhat truthful	a little truthful	not at all truthful
14. In general, how likely is it that someone on the Internet **would try to lure someone your age** away from home?	very likely	quite likely	somewhat likely	a little likely	not at all likely

Your contribution to the study is greatly appreciated.
Thank you very much!

Please look over your questionnaire again to check if you missed anything.
Thank you.

Appendix B

Post-Test Questionnaire

A SURVEY OF STUDENT

ONLINE BEHAVIOURS AND ATTITUDES

For your information, a brief definition of open chat rooms:

Open chat rooms are Internet areas where you can have live conversations with several people at the same time.

- An open chat room can be entered by anyone (examples: chat rooms connected to music, sports, or computer game Web sites).
- This **does not include** ICQ, MSN, or AIM.

School #: _____ Class #: _____ Date: (day/month/year) _____

Code #:_____ Grade: _____

A. Open Chat Rooms

Open chat rooms are Internet areas where you can have live conversations with several people at the same time.

- An open chat room can be entered by anyone (examples: chat rooms connected to music, sports, or computer game Web sites; this **does not include** ICQ, MSN, AIM).

Please, circle the answer that applies to you. Circle **one answer** for each question.

1. Do you go to open chat rooms?	**very often**	**often**	**sometimes**	**at least once**	**never**

If you circled never for Question 1 on this page, please go to page 4.

2. When you go to open chat rooms, do you chat about:	very often	often	sometimes	at least once	never
a. your hobbies?	5	4	3	2	1
b. your personal feelings and thoughts?	5	4	3	2	1
c. your favourite sports?	5	4	3	2	1
d. happy experiences at school?	5	4	3	2	1
e. unhappy experiences at school?	5	4	3	2	1
f. a boy or girl you like?	5	4	3	2	1
g. secrets?	5	4	3	2	1
h. your favourite books?	5	4	3	2	1
i. things that are bothering you?	5	4	3	2	1
j. fashions?	5	4	3	2	1
k. your favourite music/band?	5	4	3	2	1
l. happy experiences at home?	5	4	3	2	1
m. unhappy experiences at home?	5	4	3	2	1
n. video/computer games?	5	4	3	2	1
o. sex?	5	4	3	2	1
p. TV programs?	5	4	3	2	1

A. Open Chat Rooms

Please, circle the answer that applies to you. Circle **one answer** for each question.

3. When you go to open chat rooms, how often do you exchange the following information with people there:	very often	often	sometimes	at least once	never
a. what you look like (for example, height, weight, hair colour)?	5	4	3	2	1
b. the e-mail address you share with your family?	5	4	3	2	1
c. your full name?	5	4	3	2	1
d. the name of your school?	5	4	3	2	1
e. your personal e-mail address?	5	4	3	2	1
f. the name of the city you live in?	5	4	3	2	1
g. your age?	5	4	3	2	1
h. whether you are male or female?	5	4	3	2	1
i. your ICQ/MSN number/nickname?	5	4	3	2	1

B. Personal Web Site or Web Page(s) 4

We are asking about your own personal Web site or Web page(s) **posted on the Internet.**
If you <u>do not</u> have a personal Web site or Web page(s), please go to the next page.

1. _____ number of Web sites you have designed and posted on the Internet?

2. _____ number of Web pages you have designed and posted on the Internet?

3. Does your Web site/page(s) include(s) or are you thinking of including the following?

	Yes, I include this	quite likely	somewhat likely	quite unlikely	No
a. your full name?	5	4	3	2	1
b. the name of your school?	5	4	3	2	1
c. your personal e-mail address?	5	4	3	2	1
d. your personal feelings and thoughts?	5	4	3	2	1
e. your age?	5	4	3	2	1
f. whether you are male or female?	5	4	3	2	1
g. the e-mail address you share with your family?	5	4	3	2	1
h. pictures/cartoons/art?	5	4	3	2	1
i. a description of how you look (for example, height, weight, hair colour)?	5	4	3	2	1
j. ICQ/MSN number/nickname?	5	4	3	2	1
k. what you like to do?	5	4	3	2	1
l. what you don't like to do?	5	4	3	2	1
m. a photograph of you?	5	4	3	2	1
n. a photograph of your family?	5	4	3	2	1
o. the name of the city in which you live?	5	4	3	2	1
p. your street address?	5	4	3	2	1
q. your phone number?	5	4	3	2	1

Now that you have completed this page about your personal Web site/page(s), go to page 6.

B. Personal Web Site or Web Page(s) 5

This page is for people who <u>do not have</u> a personal Web site/page(s).

If you have a personal Web site/page(s), go back and complete page 4.

If you had the chance to design your own Web site or Web page(s) **to be posted on the Internet**, what would you include?

1. **Would** your Web site/page(s) include(s) the following?	Yes	quite likely	somewhat likely	quite unlikely	No
a. your full name?	5	4	3	2	1
b. the name of your school?	5	4	3	2	1
c. your personal e-mail address?	5	4	3	2	1
d. your personal feelings and thoughts?	5	4	3	2	1
e. your age?	5	4	3	2	1
f. whether you are male or female?	5	4	3	2	1
g. the e-mail address you share with your family?	5	4	3	2	1
h. pictures/cartoons/art?	5	4	3	2	1
i. a description of how you look (for example, height, weight, hair colour)?	5	4	3	2	1
j. ICQ/MSN number/nickname?	5	4	3	2	1
k. what you like to do?	5	4	3	2	1
l. what you don't like to do?	5	4	3	2	1
m. a photograph of you?	5	4	3	2	1
n. a photograph of your family?	5	4	3	2	1
o. the name of the city in which you live?	5	4	3	2	1
p. your street address?	5	4	3	2	1
q. your phone number?	5	4	3	2	1

C. Your Personal E-mail Address

On this page we are asking about emailing someone <u>you met online</u> and *<u>do not know in real life</u>*.

1. Do you use your personal e-mail address to e-mail <u>people you have met online</u>?	**very often**	**often**	**sometimes**	**at least once**	**never**

If you circled <u>never</u> for Question 1 <u>on this page</u>, please go to page 7.

2. When you e-mail <u>people you have met online</u>, how often do you:	very often	often	sometimes	at least once	never
a. talk about homework?	5	4	3	2	1
b. talk about things that are bothering you?	5	4	3	2	1
c. talk about hobbies and things you are interested in?	5	4	3	2	1
d. talk about sex?	5	4	3	2	1
e. talk about sports?	5	4	3	2	1
f. talk about happy experiences at school?	5	4	3	2	1
g. talk about unhappy experiences at school?	5	4	3	2	1
h. talk about music?	5	4	3	2	1
i. send photographs?	5	4	3	2	1
j. talk about your personal feelings or thoughts?	5	4	3	2	1
k. talk about a boy or girl you like?	5	4	3	2	1
l. talk about happy experiences at home?	5	4	3	2	1
m. talk about unhappy experiences at home?	5	4	3	2	1

3. <u>How long</u> after meeting someone online <u>do you wait</u> before you give them your personal e-mail address?	**a day or less**	**a few days**	**a few weeks**	**a few months**	**a year or more**

Your Opinions about Being Online and Using the Internet

In this group of questions we are asking **what you think** about the Internet. We **are <u>not</u>** asking you about what you do on the Internet.

Please, circle the answer that best describes <u>your opinion</u>.
Circle **one answer** for each question.

1. Do you think the Internet is useful?	very useful	quite useful	somewhat useful	a little useful	not at all useful
2. In general, how much do you think you could trust someone you might meet online?	very much	quite a lot	somewhat	a little	not at all
3. In general, in an **open** chat room, how risky do you think it is to tell things about yourself to someone you might meet online?	very risky	quite risky	somewhat risky	a little risky	not at all risky
4. In general, how likely do you think it is that someone might meet online would pretend to be someone they are not?	very likely	quite likely	somewhat likely	a little likely	not at all likely
5. Do you like using the Internet?	very much	quite a lot	somewhat	a little	not at all
6. In general, how likely is it that someone you might meet online **would try** to lure **you** away from your home?	very likely	quite likely	somewhat likely	a little likely	not at all likely

7. In general, how long do you think you would have to talk with someone you might meet online before you would trust them **a little**?	a day or less	a few days	a few weeks	a few months	a year or more
8. In general, how likely is it that someone you might meet online **would try** to fool or manipulate you?	very likely	quite likely	somewhat likely	a little likely	not at all likely
9. In general, in personal e-mail, how safe do you think it is to tell things about yourself to someone you might meet online ?	very safe	quite safe	somewhat safe	a little safe	not at all safe
10. Do you have fun when you go on the Internet?	very much	quite a lot	somewhat	a little	not at all
11. In general, on a personal Web page/Web site, how risky do you think it is to tell things about yourself?	very risky	quite risky	somewhat risky	a little risky	not at all risky
12. In general, how long would you have to talk with someone you might meet online before you would trust them **a lot**?	a day or less	a few days	a few weeks	a few months	a year or more
13. In general, how truthful do you think people are when they talk online?	very truthful	quite truthful	somewhat truthful	a little truthful	not at all truthful
14. In general, how likely is it that someone on the Internet **would try to lure someone your age** away from home?	very likely	quite likely	somewhat likely	a little likely	not at all likely

MY INTERNET SAFETY PLAN

On this page, write down your own ideas about keeping yourself safe on the Internet.

Please write down only **the guidelines that you do use or would use** to keep yourself safe on the Internet.

Put each guideline on a separate line. You do not have to use all of the lines.

1. **When I go or if I would go to open chat rooms**, I have the following guidelines for my open chat room conversations:

_____

_____

_____

_____

_____

_____

I have no guidelines. ☐

2. **For any personal Web page/Web site I will design or have designed to be posted on the Internet,** I have the following guidelines:

_____

_____

_____

_____

_____

_____

I have no guidelines. ☐

3. **When I use or if I would use my personal e-mail address to talk with people I have only met online** and ***do not know in real life***, I have the following guidelines:

_____

_____

_____

_____

_____

_____

I have no guidelines. ☐

4. I have the following guidelines about pornographic (sexual) images online:

_____

_____

_____

_____

_____

_____

I have no guidelines. ☐

5. If someone I have met online asks me to meet in person, I have the following guidelines:

_____

_____

_____

_____

_____

_____

I have no guidelines. ☐

Your contribution to the study is greatly appreciated.
Thank you very much!

Please look over your questionnaire again to check if you missed anything.
Thank you.

Appendix C

Coding Protocol for Internet Safety Guidelines

Internet Safety Guidelines for Open Chat Room Conversations

Code	Variable Description	Examples	Safety Level*
c1	- no response		none
c2	- checked "no guidelines"		none
c3	- I don't go to chat rooms or I don't use the Internet - not phrased as a guideline, it is a fact of their life	- I'm not allowed to do this	none
c4	- do not go to chat rooms - phrased as a guideline	- don't go to open ones - I don't go to chat rooms	1
c5	- only chat with people I know - don't chat with people I don't know - compare to c7 and c55	- not to listen to people talking to you that you've never met before - I wouldn't talk to people who I don't know - I don't talk to anyone I don't know	2
6	- does not apply to chat		n/a
c7	- do not disclose information to people I don't know - only disclose information to people I know - compare to c12 and c55	- don't give them personal information only if I know them - do not give personal information unless it is a friend or a relative - I wouldn't tell my feelings to people I don't know	2
c8	- do not disclose (DND) "personal information" about self - exact words	- do not tell personal information - I do not wander away from topic to personal information	1
c9	- DND personal info self - general	- don't talk about anything personal - don't talk about personal issues - I wouldn't tell anyone something private - don't tell them really personal stuff - don't talk about personal details	1

Code	Variable Description	Examples	Safety Level*
c10	- only talk about something vague/ambiguous - don't talk about something vague/ambiguous - **gives the sense that it is about safety but doesn't specifically identify the information - compare to c68	- do not share any info - don't tell information that you don't want to - don't say anything about myself - I wouldn't give out too much information about myself - I wouldn't tell anything that would give information about me - not telling about myself	1
c11	- DND "feelings"/ "thoughts" - exact words		1
c12	- DND information - (any kind of info) - with a sense of the passage of time or a time constraint - compare to c7 and c57	- don't disclose unless I've known them for a year - I wouldn't tell them anything about myself until know them really well - tell things a little at a time	3
c13	- DND information – specific (low frequency)	- grade - personality - house - don't tell what my house looks like - country - province - postal code - credit card number - possible contacts	1
c14	- DND traceable information - information that might lead to someone finding them - in comparison to "where I live" (c27) these rules suggest that the subject will not disclose a group of pieces of information	- don't give out any info where they might find you - don't say anything that would help others come and find me - don't use language that suggests where I live - don't give out any information that people would be able to trace me with - don't say any information that leads to my house	1
c15	- DND information on family or family life	- don't talk about family problems - don't talk about my family - keep away from family facts	1
c16	- DND information on friends		1

Code	Variable Description	Examples	Safety Level*
c17	- DND secrets – self, family, ...		1
c18	- DND or talk about interests, hobbies, sports teams, ...	- don't tell interests - don't tell sports teams I am on - don't talk about my opinions	1
c19	- Only talk about or talk about: interests, hobbies, sports, ... - compare to c35	- only talk about movies - talk about sports - only talk about opinions - talk about downloading movies	2
c20	- do not talk about sex		1
c21	- DND description of self	- do not talk to people about what you look like - don't tell people the colour of my hair etc. - don't give away a description of myself	1
c22	- DND first name		1
c23	- DND last name/full name/ name - only tell my first name	- do not say who I am - I will not say my true name - tell my first name but not last (1 rule)	1
c24	- DND age		1
c25	- DND gender		1
c26	- DND "address" or "street"		1
c27	- DND "where I live" or "location"		1
c28	- DND city/town		1
c29	- DND school		1
c30	- DND hangouts		1
c31	- DND phone number		1
c32	- DND email address		1
c33	- DND IM nickname or number		1
c34	- DND MSN/IM password		no responses
c35a	- only disclose province		1
c35b	- only disclose city		2
c35c	- only disclose age or gender		3
c35d	- only disclose name or email		4
c36	- use fake info - specific idiosyncratic		no responses
c36x	- lie in general	- lie about personal information	1

Code	Variable Description	Examples	Safety Level*
c37	- use fake description of self	- lie when I tell them how I look	1
c38	- use fake name		1
c39	- use fake age		1
c40	- use fake gender		1
c41	- use fake address		1
c42	- use fake city		no responses
c43	- use fake phone number		no responses
c44	- use fake email address - if it sounds like email address does not really exist		no responses
c45	- use alternate email address to contact		no responses
c46	- no photos general	- don't give any pictures - won't send any photos	1
c47	- no photos self	- don't give a picture of me - don't send a picture - don't send a photo - if someone asks for a picture, I will say no	1
c48	- no photos family		1
c49	- no photos friends		1
c50	- no photos house		1
c51	- no photos school		1
c52	- ask parents if okay or discuss content/experiences with parents		1
c53	- don't get too involved with people	- don't become buddy-buddy - don't get too close to people - just say hi and say nothing else - be careful what I say	2
c54	- do not "trust/believe" people - exact words		1
c55	- do not "trust" people unless you know them - compare to c5 and c7	- don't trust others unless you know them a lot	2
c56	- implies don't trust people - compare to example in c59 and to examples in c72	- never listen to what they want you to do	1

Code	Variable Description	Examples	Safety Level*
c57	- do not "trust" believe - with a sense of the passage of time or a time constraint - compare to c12	- wouldn't trust anyone for a few months - don't trust anyone for a long time	3
c58	- rules that suggest that you can determine when someone is lying	- don't talk to people who seem to be lying	4
c59	- rules that suggest (1) you can tell when to trust and (2) that you should have information about people online	- must know age group and where they live - ask for his/her name - have to have same hobbies - see if we have common interests - have to have same personality - try to see if he likes the same thing that I like	4
c60	- do not agree to meet		1
c61	- only agree to meet after a long time or a specified amount of time		no responses
c62	- leave or stop chatting if uncomfortable/ inappropriate content - specific content not stated	- leave if nasty detail - if there is a topic raised I don't like, I'll leave - if someone tries to get me to talk to them in a way I don't want to - if someone goes to a point when it is not right, I leave and delete them.	1
c63	- leave or stop chatting if uncomfortable/ inappropriate content - specific content stated	- if someone tries to lure me, I'll leave the chat room - I would never talk to someone that tries to lure me somewhere - I would leave the chat room if someone is bribing me to go somewhere far - if anyone starts talking about sex or sexual images, I leave immediately - I wouldn't talk to people who ask me questions about my life - do not respond to sexual conversations	1
c64	- never go back to the chat room if ... - specific or general	- if someone tries to lure me, I'll never go back to the chat room	1
c65	- talk to (only talk to) people my own age		3

Code	Variable Description	Examples	Safety Level*
c66	- do not go to pornographic chat rooms		1
c67	- go to "children's" or "appropriate" or "safe" or "known" chat rooms	- go to appropriate chat rooms - beware of sites that seem to contain inappropriate materials	3
c68	- meaning is not clear and therefore it cannot be determined whether the guideline is safe or concerns safety	- talk about appropriate things - talk about the right topic - keep it safe - don't go/talk often - be truthful	none
c69	- meaning is not clear - group decision REQUIRED		none
c70	- not related to safety	- check for viruses	none
c71	- netiquette	- no swearing - no harassment - no racism	none
c72	- safe rule - idiosyncratic	- change name often - never let anyone lure me to websites	1
c73	- indeterminate safe rule - idiosyncratic	- don't talk to people on whisper	none
c74	- not safe rule - idiosyncratic		4

*Safety levels range from 1 = safe to 4 = not safe. Guidelines coded at safety level 1 and 2 were used in the analyses.

Internet Safety Guidelines for Personal Web Page Design

Code	Variable Description	Examples	Safety Level*
w1	- no response		none
w2	- checked "no guidelines"		none
w3	- I don't have a web page or I don't use the Internet - not phrased as a guideline, it is a fact of their life	- I'm not allowed to do this - I don't have a web page	none
w4	- do not make a personal web page - phrased as guideline		1
5	- does not apply to web		n/a
6	- does not apply to web		n/a
7	- does not apply to web		n/a
w8	- do not disclose (DND) "personal information" about self - exact words	- do not post any "personal information"	1
w9	- DND personal info self - general	- don't put anything personal on there - don't talk about personal issues - don't post anything private - don't post really personal stuff - don't put any personal details on my web page	1
w10	- only post something vague/ ambiguous - don't post something vague/ ambiguous - **gives the sense that it is about safety but doesn't specifically identify the information - compare to examples in w74 - compare to w68	- only post appropriate things - be careful what I put on it - don't post anything about myself - don't post too much information about myself - don't post anything that would give information about me - don't post anything that could identify me	1
w11	- DND "feelings"/"thoughts" - exact words		1
12	- does not apply to web		n/a

Code	Variable Description	Examples	Safety Level*
w13	- DND information - specific (low frequency)	- grade - personality - house - don't tell what my house looks like - country - province - postal code - credit card number - possible contacts	1
w14	- DND traceable information - information that might lead to someone finding them - in comparison to "where I live" (w27) these rules suggest that the subject will not disclose a group of pieces of info.	- don't post any info where they might find you - don't put anything that would help others come and find me - don't use language that suggests where I live - don't post information that people would be able to trace me with - don't put any information that leads to my house	1
w15	- DND information on family or family life	- don't post any information about family problems - don't post anything about my family - don't post any facts about my family	1
w16	- DND information on friends		1
w17	- DND secrets – self, family, etc		1
w18	- DND or post interests, hobbies, sports teams, etc	- don't post interests - don't post sports teams I am on - don't post my opinions	1
w19	- only post interests, hobbies, sports, etc. - compare to w35	- post my opinions - post my hobbies - post what I like - post my interests	2
w20	- do not post sexual images		1
w21	- DND description of self	- do not post what you look like - don't put the colour of my hair etc. on my page - don't post a description of myself	1
w22	- DND first name		no responses
w23	- DND last name/full name/name - only post my first name	- do not post who I am - I will not post my true name	1

Code	Variable Description	Examples	Safety Level*
w24	- DND age		1
w24	- DND gender		1
w26	- DND "address" or "street"		1
w27	- DND "where I live" or "location"		1
w28	- DND city/town		1
w29	- DND school		1
w30	- DND hangouts		1
w31	- DND phone number		1
w32	- DND email address		1
w33	- DND IM nickname or number		1
w34	- DND MSN/IM password		1
w35 a	- only disclose province		no responses
w35 b	- only disclose city		no responses
w35 c	- only disclose age or gender		no responses
w35 d	- only disclose name or email		4
w36	- use fake info specific idiosyncratic		1
w37	- use fake description of self	- lie when I say how I look	no responses
w38	- use fake name		1
w39	- use fake age		no responses
w40	- use fake gender		no responses
w41	- use fake address		no responses
w42	- use fake city		no responses
w43	- use fake phone number		no responses
w44	- use fake email address - if it sounds like email address does not really exist		no responses
w45	- use alternate email address for contact info		1

Code	Variable Description	Examples	Safety Level*
w46	- no photos general	- don't post any pictures - no photos	1
w47	- no photos self or a single photo	- I will not post a picture of me - don't post a photo	1
w48	- no photos family		1
w49	- no photos friends		1
w50	- no photos house		1
w51	- no photos school		no responses
w52	- ask parents if okay or discuss content/experiences with parents		1
several rules (53-67) are not included because they don't apply to web			
w68	- meaning is not clear and therefore it cannot be determined whether the guideline is safe or concerns safety	- I don't have that many people on my site - don't post stupid stuff	none
w69	- meaning is not clear - group decision REQUIRED		none
w70	- not related to safety	- register/copyright site - have a guest book - only about the things that I want on my page - put on what I like to put on - very beautiful	none
w71	- netiquette	- no swearing - no harassment - no racism - don't hurt someone	none
w72	- safe rule - idiosyncratic		1
w73	- indeterminate safe rule - idiosyncratic		none
w74	- not safe rule - idiosyncratic	- put on photos of my family	4

*Safety levels range from 1 = safe to 4 = not safe. Guidelines coded at safety level 1 and 2 were used in the analyses.

Internet Safety Guidelines for E-mailing Someone Only Met Online

Code	Variable Description	Examples	Safety Level*
e1	- no response		none
e2	- checked "no guidelines"		none
e3	- I don't use email or I don't use the Internet - not phrased as a guideline, it is a fact of their life	- I'm not allowed to do this - I don't have an email account	none
e4	- do not email people you don't know - phrased as a guideline - meaning of know is clear	- do not email them - you should only email people you know in real life	1
e5	- email them if you "know" them or only email if a friend of a friend - for this rule the meaning of the "know" is not entirely clear	- only talk if my friend knows them - I only email people I know - I only email friends	2
e6	- do not email them until you have "known" them for a long time or a specified time - with a sense of the passage of time or a time constraint	- I wouldn't email them until I had talked to them for a long time or knew them well - I wouldn't email them until I talked to them for a year or more	3
e7	- do not disclose (DND) information to people I don't know - only disclose information to people I know - compare to e12 and e55	- don't give them personal information only if I know them - do not give personal information unless it is a friend - I wouldn't tell my feelings to people I don't know	2

Code	Variable Description	Examples	Safety Level*
e8	- DND "personal information" about self - exact words	- don't talk about personal information - I do not wander away from topic to personal information	1
e9	- DND personal info self - general	- don't talk about anything personal - don't talk about personal issues - I wouldn't tell anyone something private - don't tell them really personal stuff	1
e10	- only talk about something vague/ambiguous - don't talk about something vague/ambiguous - **gives the sense that it is about safety but doesn't specifically identify the information - compare to e68	- do not share any info - don't tell information that you don't want to - don't say anything about myself - I wouldn't give out too much information about myself - I wouldn't tell anything that would give information about me - not telling about myself - don't tell anything that could identify me	1
e11	- DND "feelings"/ "thoughts" - exact words		1
e12	- DND information (any kind of info) - with a sense of the passage of time or a time constraint - compare to e7 and e57	- I would not disclose ... until a couple of months later - don't disclose unless I've known them for a year - I wouldn't tell them anything about myself until I know them really well - tell things a little at a time	3

Code	Variable Description	Examples	Safety Level*
e13	- DND information – specific - (low frequency)	- grade - personality - house - don't tell what my house looks like - country - province - postal code - credit card number - possible contacts	1
e14	- DND traceable info - information that might lead to someone finding them - in comparison to "where I live" (e27) these rules suggest that the subject will not disclose a group of pieces of info.	- don't give out any info where they might find you - don't say anything that would help others come and find me - don't use language that suggests where I live - don't give out an information that people would be able to trace me with - don't say any information that leads to my house	1
e15	- DND information on family or family life	- don't talk about family problems - don't talk about my family - keep away from family facts	1
e16	- DND information on friends		1
e17	- DND secrets – self, family, etc.		1
e18	- DND or talk about interests, hobbies, sports teams, etc	- don't tell interests my opinions - don't tell sports teams I am on	1
e19	- talk about or only talk about interests, hobbies, sports, etc. - compare to e35	- only talk about movies - talk about sports - only talk about opinions - talk about downloading movies	2
e20	- do not talk about sex		1

Code	Variable Description	Examples	Safety Level*
e21	- DND description of self	- do not talk to people about what you look like - don't tell people the colour of my hair etc. - don't give away a description of myself	1
e22	- DND first name		no responses
e23	- DND last name/full name/name - only tell my first name	- do not say who I am - I will not say my true name - tell my first name but not last (1 rule)	1
e24	- DND age		1
e25	- DND gender		1
e26	- DND "address" or "street"		1
e27	- DND "where I live" or "location"		1
e28	- DND city/town		1
e29	- DND school		1
e30	- DND hangouts		1
e31	- DND phone number		1
e32	- DND email address		1
e33	- DND IM nickname or number		no responses
e34	- DND MSN/IM		1
e35a	- only disclose province		1
e35b	- only disclose city		no responses
e35c	- only disclose age or gender		3
e35d	- only disclose name or email		4
e36	- use fake info - specific idiosyncratic		1

Code	Variable Description	Examples	Safety Level*
e37	- use fake description of self	- lie when I tell them how I look	no responses
e38	- use fake name		1
e39	- use fake age		1
e40	- use fake gender		no responses
e41	- use fake address		1
e42	- use fake city		no responses
e43	- use fake phone number		1
e44	- give a fake email address - if it sounds like email address does not really exist		1
e45	- use alternate email address to contact		no responses
e46	- no photos general	- don't give any pictures - won't send any photos	1
e47	- no photos self or a single photo	- don't give a picture of me - don't send a picture - don't send a photo - if someone asked for a picture, I would say no	1
e48	- no photos family		1
e49	- no photos friends		no responses
e50	- no photos house		no responses
e51	- no photos school		no responses
e52	- ask parents if okay or discuss content/experiences with parents		1
e53	- don't get too involved with people - compare to examples in e68	- just say hi and say nothing else - don't become buddy-buddy - don't get too close to people - don't talk to him that much	2

Code	Variable Description	Examples	Safety Level*
e54	- do not "trust" "believe" people - exact words		1
e55	- do not "trust" people unless you know them - compare to e5 and e7	- do not trust others unless you know them a lot	2
e56	- implies don't trust people - compare to example in e59 and to examples in e72	- never listen to what they want you to do	1
e57	- do not "trust" believe - with a sense of the passage of time or a time constraint - compare to e12	- wouldn't trust anyone for a few months - don't trust anyone for a long time	3
e58	- rules that suggest you can tell when someone is lying	- don't talk to people who seem to be lying - try to email him/her to see if they're lying	4
e59	- rules that suggest (1) you can tell when to trust and (2) that you should have information about them	- be sure they are trustworthy - get information about them - have to have same hobbies - have to have same personality - try to see if he likes the same thing I like	4
e60	- do not agree to meet	- I would never want to meet that person	1
e61	- only agree to meet after a long time or a specified amount of time		4
e62	- block or stop communicating - the reason for doing so is not stated	- don't keep in touch with the person - change email address right after	1
e63	- block or stop communicating - gives reason for doing so	- change email if not comfortable - if they start talking about sex don't respond and block them - if they ask me to meet them, don't talk to them anymore	1
64	doesn't apply to email		n/a
e65	- talk to (only talk to) people my own age		3

Code	Variable Description	Examples	Safety Level*
e66	- do not receive pornographic images		1
e67	doesn't apply to email		n/a
e68	- meaning is not clear and therefore it cannot be determined whether the guideline is safe or concerns safety	- be careful what I say - try to make friends - I will use caution at all times - keep it safe	none
e69	- meaning is not clear - group decision REQUIRED		none
e70	- not related to safety	- put email security high - check for viruses - have a firewall	none
e71	- netiquette	- no swearing - no harassment	none
e72	- safe rule - idiosyncratic		1
e73	- indeterminate safe rule - idiosyncratic		none
e74	- not safe rule - idiosyncratic		4

*Safety levels range from 1 = safe to 4 = not safe. Guidelines coded at safety level 1 and 2 were used in the analyses.

Internet Safety Guidelines for Meeting People Only Met Online

Code	Variable Description	Examples	Safety Level*
m1	- no response		none
m2	- checked "no guidelines"		none
m3	- I don't use the Internet or - I don't use the Internet to communicate - not phrased as a guideline, it is a fact of their life	- I only talk to someone I already know - I don't chat with people I don't know	none
m4	- don't communicate online with people you don't know - phrased as a guideline		1
m5	- do not agree to meet	- don't go - say no - I would don't want to meet person in online	1
m6	- don't respond to the request to meet	- don't listen to them - I'll ignore them	1
m7	- give an excuse or lie	- I would say I'm quite busy - say I don't feel comfortable with this - say let's just be friends online	1
m8	- block, stop chatting, emailing	- don't talk to them again - block them - shut the computer off - quickly go offline	1
m9	- change online name or change email address or delete MSN password or change MSN name		1
m10	- do not "trust" them		1
m11	- tell or ask parents		1
m12	- tell police		1
m13	- go if you "know" them or - go if someone else "knows" them	- go if someone you know knows them - meet them if I know them	4

Code	Variable Description	Examples	Safety Level*
m14	- go if talked to person for long time/specified time - rules with a sense of the passage of time or a time constraint - compare to examples in m59	- must know for a year - after talked for 5 months	4
m15	- go with parent/adult	- stay with parents at all times	1
m16	- go with friend or go with someone you trust	- only if we were not alone	2
m17	- meet at public place		3
m18	- meet at school	- meet at a safe place like school	4
m19	- meet at my home		no responses
m20	- meet in some location - vague as to exactly what that location is	- nowhere out of my city - not going anywhere I don't know	4
m21	- do not disclose (DND) personal information - a type of specific information is indicated	- don't disclose personal information - don't tell my real name - don't tell them where I live	1
m22	- DND personal information - vague - don't know what the information is	- make sure no info I gave person could cause me danger - don't tell information that you don't want to	1
m58	- rules that suggest that you can determine when someone is lying	- don't meet with people who seem to be lying - I'll try to see if they're lying or not	no responses
m59	- rules that suggest (1) you can tell when to trust and (2) that you should have information about them	- say no unless I know for a fact that they won't harm me - to make sure they are a safe person - find out more about them before trusting them - talk to them longer to know them more	4
m64	- never go back to the chat room		1
m68	- meaning is not clear and therefore it cannot be determined whether the guideline is safe or concerns safety	- pick morning - I don't know if I do - meet him or her 2 times 3 times - only if they are in my school	none
m69	- meaning is not clear - group decision REQUIRED		none

Code	Variable Description	Examples	Safety Level*
m70	- not related to safety	- have a firewall	none
m71	- netiquette	- no swearing - no harassment - no racism	none
m72	- safe rule - idiosyncratic		1
m73	- indeterminate safe rule - idiosyncratic		none
m74	- not safe rule - idiosyncratic	- only go if I've seen his picture	4

*Safety levels range from 1 = safe to 4 = not safe. Guidelines coded at safety level 1 and 2 were used in the analyses.