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An Analysis of Electronic Media to Prepare Children for Safe and Ethical Practices in Digital Environments

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Abstract

A range of electronic resources, including video-based instruction, are used to promote cybersafety to young people at school. This evaluation analyzed seven distinct programs that use electronic media in Internet safety initiatives in schools. The findings highlight emerging evidence on successful approaches to engage children in assessing risky cybersafety situations, developing appropriate management techniques, and practicing responsible decision making online. Based on the prevention effectiveness literature and the tenets of behavior decision theory, a rubric was developed to evaluate the effectiveness of online instructional materials in teaching ethical behavior in digital environments. The rubric demonstrates that high quality cybersafety resources are based on a coherent theoretical framework, integrate multiple program components, and allow for skill rehearsal.

Students today are raised in a digital world where communication technologies are common in their everyday lives (Livingstone & Bober, 2006; Rideout, Roberts, & Foehr, 2005; Wang, 2005). These technologies afford tremendous benefits, including access to information, educational resources, entertainment, social support, and opportunities for development and participation. On the other hand, the increased engagement of young people in digital spaces has also produced new participants in, and witnesses to, the translocation of social problems into the cyberworld (Berson & Berson, 2005, 2006a, 2006b; Wolak, Mitchell, & Finkelhor, 2006). Such social problems include the exposure of children to information with questionable legitimacy, ideas that can be contrary to positive behaviors, and messages that are intended to manipulate their actions or beliefs.

Digital communication is increasingly connected with global understanding, multicultural respect, diversity, and tolerance. Growing up in an electronic age, students need education that prepares them to function and participate in this technology-driven society (National Council for the Social Studies, 2006). In order to adequately prepare children for digitally connected environments, curricular approaches to cybersafety must be fully integrated into the school content. These approaches optimize use of teachable moments in school. This study reports on an analysis of the use of electronic media in Internet safety initiatives in schools and includes a discussion of emerging research evidence on successful approaches to engage children in assessing risky situations, developing appropriate coping techniques, and practicing responsible decision making online.

Decision Theory

In order to understand the impact of cybersafety education on children and youth, it is important to look at the developmental theories that affect the decision making, moral reasoning, and risk taking decisions of children. Although limited research exists regarding the *full* dynamics of safety and risk behavior, the behavioral decision theory (Edwards, 1954, 1961) is useful. Edwards' framework explains the stages through which children progress in the context of improving decisions made about risky behaviors and, in so doing, theorizes interventions to prevent and mediate harm. The current research analyzed cybersafety interventions to identify the discrete components that may enhance rational decision making among children in online contexts.

Edwards (1954, 1961) originally formulated the behavior decision theory. The behavioral decision making framework is embedded in traditional models, which posit that all decisions are goal oriented and logically coherent (Reyna & Farley, 2006). In other words, when young people are aiming to achieve a personal goal, they have the ability to think reasonably and are able to make rational decisions that are consistent with their personal goals. Good decision makers often seek relevant information, are better able to see the important cues that lead to good decisions, and generally avoid problem solving in isolation by seeking the input of others.

The behavioral decision theory posits that decisions are made after considering options and evaluating the consequences. The resulting behavior is analyzed in comparison to norms (Beyth-Marom, Austin, Fischhoff, Palmgren, & Jacobs-Quadrel, 1993). This framework underlies a variety of theoretical approaches, such as the problem-solving model (D'Zurilla & Nezu, 1999), an adaptive approach that uses instructive methods to guide individuals in understanding problems, finding effective coping responses, and thereby, reducing aggressive and other risky behaviors.

Many traditional models of decision making (Reyna & Farley, 2006) are based on the belief that a person weighs the evidence and circumstances in ways that allow them to

reach a rational decision. However, this may not apply to situations that involve high levels of stress or emotionally charged events. Fischhoff (2005) concluded that emotional, social, and developmental factors play a role in explaining decision making, and he expanded the behavioral decision theory to involve these factors. Recognizing the effects of emotion might be useful in designing interventions to guide young people in making better decisions. For instance, anticipatory emotions (i.e., hopelessness, anxiety, and suspense) provoke reactive and intuitive decisions among children and youth and are at odds to rational decisions.

Using the behavior decision framework to understand the ways that children make risk taking decisions, interventions can be created and implemented to promote risk avoidance. When risk taking is an intentional behavior, as often occurs within a sensation-seeking context, interventions can focus on modification of expectations by explicitly addressing perceived risks, benefits, and norms. However, many decisions are made without careful consideration of options and consequences (Reason, 1990). These decisions are termed "unintentional." The associated behaviors that result from unintentional decisions may be tempered by adult supervision and mentoring. Supervision and monitoring may mediate impulsive reactions to situations by providing guidance on precautionary measures.

Developmental Considerations

The development of skills associated with effective decision-making are acquired over time. At young ages, decision making in a child's life is primarily managed by their caregivers. During early childhood, children may solve problems based on a learned set of rules. However, autonomous decision-making, based on processes of reasoning and assessment of consequences, evolves with age (Lundberg, Romich, & Tsang, 2007). Gradually adults begin shifting control to the child through a parent-directed process that grants the child increasing independence. This transition to a child's active engagement in decision making emerges between the ages of 9-13 years, and the transfer of autonomous control to the child is typically observed between the ages of 12-17 years (Bumpus, Crouter, & McHale, 2001). This shift of decision making from the parent to the child coincides with the child's development of formal reasoning skills, which are necessary to generate and weigh options (Lundberg et al., 2007).

As children age, other developmental issues emerge. Adolescents tend to take more risks than adults. According to the behavioral decision theory, the perception of risks plays a crucial role in decision making and subsequent risk taking. Adolescent decisions are made in different ways (i.e., deliberately, reactively, and intuitively; Reyna & Farley, 2006). Deliberate decisions involve individuals taking the time to weigh and assess the risks and benefits. The traditional models, such as the behavioral decision framework, best explain decisions that are made deliberately.

Reactive decisions, on the other hand, are driven by perceived benefits. When making reactive decisions, adolescents tend to go along with the majority without thinking through consequences. These responses are driven by both emotional and social factors with emphasis on the benefits of the behavior and negation of the risks. This leads to an overestimation of the benefits of a particular behavior and an underestimation of the risks involved with that same behavior. Conversely, neither risks nor benefits factor into intuitive decisions. These decisions are much less rational and are based on subjective experience. This decision making process is more common among older, more knowledgeable adolescents and adults.

Developmental characteristics of the child may determine whether the necessary skills are present to engage in autonomous decision making. According to behavioral decision theory, the capacity to make rational choices signifies the achievement of independent authority to decide. Although young children have not yet acquired the capabilities to yield rational, independent decisions, the prerequisite skills and strategies for thoughtful action may be fostered through purposeful instructional methods. These skills are critical in a digital age when young children confront novel and challenging situations that necessitate risk assessment and spontaneous problem solving.

The Role of Electronic Media in Decision-Making and Risk Assessment Skill Development

In a survey conducted by the State Educational Technology Directors Association (SETDA; 2007) in cooperation with Cable in the Classroom, states ranked the protection of students from online dangers as their greatest area of need for intervention. Ensuring the online safety of young children is an ongoing process that has become the topic of thought-provoking discussion among caregivers and child-serving professionals. Although programs to promote cybersafety have proliferated as more parents and schools become aware of the potential risks for victimization online, increasing numbers of youth report exposure to threatening behaviors such as online stalking, obscene interactions, spamming, flaming (online verbal abuse), hate speech, threats of violence, unwanted advances, and consumer exploitation. In a recent Pew Internet study (Lenhart, 2007), approximately one third (32%) of all teenagers who use the Internet acknowledged that they have been victims of harassing and threatening online activities.

Merely identifying risks or disseminating a list of practical online safety tips for children to memorize have not been sufficient (Berson & Berson, 2004). Several cybersafety initiatives have evolved to develop relevant and meaningful prevention strategies that connect with the experiences of children online. Just as children are taught to be good citizens of their communities, these resources are incorporating instructional strategies to teach young people to be responsible citizens of cyberspace. Electronic media has become a prevalent tool for integrating key ideas associated with cybersafety into the school curriculum and fostering responsible citizenship on the Internet.

Developmental theories suggest that the most impressionable time for children is between birth and school age (6-years-old) (Rideout, Vandewater, & Wartella, 2005). Consequently, it is important to focus on this age span to interpret the effects of electronic media on teaching moral reasoning, civic skills, and behavior. In the 1960s, electronic media was based heavily on social learning theory (Bandura & Walters, 1963), which fostered the notion that children learn behaviors through observation, especially when there was a reward or no obvious harmful consequence.

The social learning model can be linked to the behavioral decision making framework because, if no consequences are depicted, children are likely to make a decision (reactively or intuitively) based on their current beliefs and knowledge. Intuitions about risky situations arise from social learning and experience. If the benefits outweigh the risks, children tend to imitate prosocial rather than aggressive behaviors. On the other hand, studies have shown that modeling portraying punishment as a consequence will diminish aggressive behaviors in children (Bandura, Ross, & Ross, 1963).

In the 1970s, findings based on studies of social learning theory were translated into practice through curriculum-based television programs, such as *Sesame Street*. Since its first broadcast in 1969, *Sesame Street* has been a successful example of the media's ability

to promote prosocial behavior and support the influential and constructive effects of electronic media on young children's development (Anderson et al., 2000).

This application is consistent with the behavioral decision framework, which encourages information processing and quantitative thinking as a way to improve rational decision making (Reyna & Farley, 2006). The most advanced thinking is conscious and deliberate. *Sesame Street* and other successful children's programs were based on the premise that learning social behaviors, moral reasoning, and civic functions via electronic media is contingent upon knowledge and experience. For example, *Blue's Clues*, a preschool, curriculum-based TV program focuses on the mastery of thinking skills, which are encouraged through the repetition of the same skills used in different contexts (Anderson et al., 2000). Although the show is guided by a thinking-skills curriculum, the approach to content remains consistent with learning theory that emphasizes situated cognition. To learn the concepts presented in the episodes, the children need to pay attention, comprehend (Anderson & Lorch, 1983), and remain interactive. These are also the critical components necessary for developing the capacity for safe and ethical decision making.

Many of the learning processes promoted through educational television programs can now also be supported by technology. Technology serves as a tool and method in knowledge construction (Fischer, Mazurkiewics, Kellough, & Preslan, 2007). High quality interventions can be transmitted through interactive media that involve verbal instruction, role playing, and skills practice (Reyna & Farley, 2006). For example, interaction, or active audience participation, is specifically designed to encourage mastery of thinking and problem-solving skills, as shown in *Blue's Clues* episodes (Anderson, et al., 2000). Through literal and concrete experiences, *Blue's Clues* provides young children with firsthand, direct learning opportunities. Studies have shown that children are more likely to integrate and recall the facts and experiences they have learned while being engaged, and they are more able to apply them to their lives, particularly when conflict or controversy arises (Smith, 2004).

Role play is an example of a way children can become actively involved and have direct experiences with the content, as well as an opportunity to practice or develop new skills. Practicing new behaviors within the context of realistic roles helps children react to social and emotional responses that are the most difficult to manage in real conflict. Role playing in an electronic medium allows children to feel safe to experiment and reflect upon choices that are available to them and, therefore, practice guided and deliberate decision making (based on the tenets of the behavioral decision framework).

Electronic media is an integral part of modern family life, and research has supported its use as an instructional tool to facilitate behavior change and learning. This study explored the success of cybersafety prevention programs in using Web-based video instruction to affect the behavior and decision-making capacity of children through proactive Internet safety instruction.

Preventive Intervention for Safe and Ethical Online Practices

According to Reyna and Farley (2006), when designing a program that incorporates preventive measures (i.e., for risky behaviors), it should be founded on basic interrelated principles:

- Normative (what behaviors should the program promote?)
- Descriptive (how do children normally make decisions in certain circumstances when a program is *not* implemented or available?)

- Prescriptive (do we understand children to help them realize the consequences of their actions?)

The three interrelated principles are useful in designing interventions that may prevent or reduce risky behaviors. However, there are limitations to the application of behavioral decision theory, because it fails to account adequately for a substantial amount of risk taking, which is spontaneous, reactive, and impulsive. Many decisions children make cannot be predicted, because they are based on emotional and social factors that result in decision-making without conscious intention or expectations.

Despite these limitations, a number of models have evolved to promote preventative intervention among children and youth. Yet, teaching problem solving, goal setting, and good decision making strategies alone are not sufficient to remove and navigate threats; the environment in which the child lives must be modified to ensure safety. As Reyna and Farley (2006) suggested, "The implications of recent data are that enhancing the precision and comprehensiveness of information and integrating it more precisely and comprehensively are unlikely to yield anything other than incremental improvements in risk reduction and avoidance." Understanding the physical and social contexts, as well as the emotional developmental process, is critical to programs aiming to help children make good decisions and avoid risky situations.

Luna and Finkelhor (1998) have contrasted the characteristics of effective and ineffective prevention programs. Effective programs are based on a coherent theoretical basis; include active, systematic, and specific skills training; integrate multiple program components (i.e., classroom training combined with parent involvement), including interactive instructional techniques and individualized instruction and lower teacher ratios; are implemented throughout the full program; and provide intensive training, perhaps surpassing 20 hours of exposure repeated over a multiple-year period. Conversely, ineffective programs rely heavily on lectures and presentations targeted at simply increasing knowledge, or they may use fear tactics to change attitudes alone. These programs are often highly generalized, focusing too narrowly on affective measures, and they lack a systematic educational program.

Although many prevention initiatives targeted at school-age children have been scrutinized to determine their effectiveness (e.g., prevention of drug abuse, teenage pregnancy, suicide, obesity, and driving injuries), a limited number of formal evaluation studies have focused on cybersafety initiatives. Given the role that electronic media plays in the lives of children and youth as both an educational and entertainment tool, this study focused on Web-based cybersafety programs that included digital video as one of their central or most important components.

Methodology

Cybersafety electronic resources were identified that integrated video-based instruction. Web sites included Netsmartz, iKeepSafe, Hector's World, iSAFE, Media Awareness Network, Disney Surf Swell Island, and Brain Pop Computer Viruses. Based on the prevention effectiveness literature and the tenets of behavioral decision theory, a rubric was developed to evaluate the effectiveness of online instructional materials in teaching ethical behavior in digital environments. To ensure consistency in the reviews, at least two reviewers assessed each site using the rubric ([see Appendix](#)).

Findings

Across many of the domains, the sites included in the review demonstrated effective approaches in teaching ethical behaviors in digital environments. However, some programs were less developed in specific areas. The two sites that received the lowest reviews were BrainPop and Disney Surf Swell. These programs tended to promote the same basic assumption: that increasing knowledge would result in better choices (see Table 1). However, awareness and education alone do not bring about behavior change. Conversely, the other sites were based on theoretical approaches that included critical components necessary for effectively influencing and changing children’s behavior, such as active skills training that incorporated modeling and rehearsal of desired behaviors.

Table 1
Average Ratings Across Assessed Domains

Name of Site	Based on a Coherent Theoretical Framework	Includes Active, Systematic, and Specific Skill Training	Integrates Multiple Program Components (i.e., Classroom Training Combined with Parent Involvement)	Includes Interactive Instructional Techniques	Provides Intensive Training	Addresses Protective Factors as Well as Risk Factors
BrainPop – Computer Viruses	2.5	1.5	1.2	1.5	1	3
Disney Surf Swell Island	2	2.3	1.7	3.7	2.5	4
Hector’s World	4	3.8	4	3.8	3.8	4
iKeepsafe	4	3	4	2	3	3
iSafe	4	4	4	3.5	3.5	3.5
MediaAware	3	3	4	3.8	3.8	4
Netsmartz	4	3.5	4	3	4	4

BrainPop

The BrainPop site is primarily designed as a content information source centered on disciplines taught in school (i.e., math, social studies, science, language, etc.). Although it contains numerous topics from acne to the Bill of Rights, it is generally an information repository. The topics are discussed through animation with the hosts, a robot named Moby and a young male, Tim. The information is relatively straightforward and appropriate for middle-school-age children.

The site contains a video resource on computer viruses. It includes some good vectors of virus transmission, including file sharing applications. The main types of viruses (i.e., Trojan horses) are reviewed, and symptoms of virus infection are discussed. Fear tactics are relied upon in the video to convey the threat of loss of data or malfunctioning emails, but it is balanced by a clearly articulated rationale for updating virus definitions in order to protect information. Strategies for downloading suspicious attachments are also explored. Citizenry issues are addressed in the discussion on the illegality of virus development and promulgation.

Based on a coherent theoretical framework. The video works on educating users about the nature of computer viruses and includes a narrative about a compromised computer. Via this narrative the actors talk about the nature of viruses, the damage they can do, and how to protect computers from viruses. In this way the program seeks to focus on skill building by educating as to what can be done to prevent risk. It also looks to educate about some basic components of computer security. The resource finishes with a quiz, which promotes some rehearsal of the knowledge behind specific computer security skills and behaviors. A different quiz could be developed to rehearse more directly the applied skills for achieving computer security (e.g., a simulation) rather than relying on knowledge recall.

Includes active, systematic, and specific skill training. The program focuses on increasing knowledge. It does not offer a role-playing opportunity (even virtually) in which one could model behaviors. The framework focuses on information and offers limited opportunities to practice or develop skills. The lack of digital sophistication in the characters of Moby and Tim diminishes the quality of the message. The videos do not capture the attention of the audience, thus, limiting its message and skill training. Also, access to BrainPop requires the registering of information to utilize most of the site's information. Some of the profile information requested by the site runs counter to good Internet practice, which cautions against giving out information like email addresses, names, etc. Contradictory practices could prove ineffective in positively influencing young people's behavior. Finally, the registration process makes entering the site more complicated, thus, limiting the likelihood that young people would take the time to search the site and find the information needed.

Integrates multiple program components (i.e., classroom training combined with parent involvement). Although there are sections for teachers/parents, they provide little in the way of training. There is also little evidence of interactive instruction for the student or teachers/parents. The program, as it stands, focuses on young people. The program could easily be amended to include more if lesson plans were in place.

Includes interactive instructional techniques. The site enables young people to complete a quiz at the end of the video. The quiz can be scored to demonstrate correct and incorrect answers; however, incorrect (or correct) answers are not expanded on by the resources (it receives a simple tick or cross). A further explanatory note would serve to scaffold learning. Additional elements, such as a simulated role play, could be useful to increase interactive instructional techniques.

Provides intensive training. This is designed as a single episode learning experience.

Addresses protective factors as well as risk factors. This project does a great job at balancing risk and protective factors. It highlights the risks (and the fear to be associated with such risks) but does not dwell on them. It puts a lot of effort into explaining how computer viruses can be avoided. It also covers many of the vectors of virus transmission and provides a strong rationale for avoiding risky behaviors.

Disney Surf Swell Island

The Surf Swell Island adventure allows the child to interact with familiar characters like Mickey Mouse and Donald Duck in a playful/interactive way and is effective in addressing both risk factors and protective issues. The site links to iKeepSafe.org that provides more information/training. There seems to be an assumption that parents will be present at the time the child is viewing the site to promote further skill development

and assist with question/answer-seeking on the part of the child. Probably the biggest extraneous variable is the Disney name and its iconic position in Western society.

Based on a coherent theoretical framework. At the beginning of play, the program provides concise directions and articulates the goal of obtaining all the jewels and ultimately being awarded a prize. The theory of change is not explicit in Surf Swell Island, and this program primarily focuses on the reduction of risk factors (although at times, not very clearly). For example, in the VirusCave, the goal of clicking on the viruses and essentially 'killing' them does not give children a chance to read the explanatory messages as they quickly disappear. This Web site does address or foster protective factors and also attempts to include factors that reduce risk. The theoretical framework is inconsistent, as it does not explain the behavior change. However, when questions are posed and the child answers correctly, immediate reinforcement is provided, acknowledging the correct response with a brief explanation as to why the answer was right. Eventually children can earn a jewel for completing the section.

There are no punishments received for wrong answers except for a buzzing sound. Even when Mickey Mouse is climbing a cliff (his final challenge), he remains at his last correct position instead of moving backwards if a child answers incorrectly. Students do have an opportunity to rehearse the same skill set over again through questions posed in a repetitive manner. In the Challenge Chamber within the three skill-set sections, if a child answers the question wrong, a "Please try again" message pops up without explaining why that answer was incorrect.

In these ways children are supposed to learn which activities are risky (although the reasoning for this risk is not provided in the video nor in any of the supporting documentation). The theoretical framework for the site is built on the assumption that a child will ask adults why something is risky and that adults will know about this risk and be able to answer questions related to it. If adults do not know about this risk, Surf Swell assumes adults will know how to find out the answers to these inquiries.

The site could be improved by providing the rationale for avoiding the named risks and offering guidance for adults on addressing these complex topics with children. From the parents guide, the site has a pedagogical focus on using the resource as an opportunity to invite parents/caregivers into discussion with children about risk online. This requires the parent or caregiver to be present. It does not provide the parent or caregiver with specific activities to undertake with their children other than conducting open-ended questioning and dialogue in conjunction with the video. It does, however, provide basic advice on how to ask open-ended questions with a young person, but the necessity of repetitive exposure to the content is overlooked.

The Educational Resource material focuses on three bands of ages/grades: Preschool-K (0-5 years), Grades 1-3 (6-9 years), and Grades 4-6 (10-12 years). The theory of change here is more developed. It relies on the site teaching children the content of the risk messages. To consolidate learning, the lesson plans (for all the age groups) promote a student-led retelling of "the events of Surf Swell Island ." However, the *events* of Surf Swell Island have little to do with cybersafety and everything to do with finishing the challenge by negotiating waterfalls, jungles, temples, and cliff-climbs. Surf Swell Island provides a narrative (obtaining all the jewels and eventually the prize) that is *interrupted* by cybersafety messages.

A pedagogical process relying on children developing their own narratives about cybersafety would be an effective strategy, providing that the following conditions were met:

1. The resource educated people as to why certain activities were risky. A narrative requires a context, in this case the narrative is avoiding risk (and elucidating why that risk exists). Currently the reasons for avoiding risk are unavailable in the resource.
2. The provision of criterion-based guidelines for effective narratives – for instance, a good narrative in this exercise would include the identification of the risky activity, clarification of why the activity is risky, suggested responses if the risk happens, and strategies to avoid the risk.

Includes active, systematic, and specific skill training. Children have some opportunities to practice clear and specific skills. This is seen through the three skill-set sections, where children may reinforce the basic learned skills within the Challenge Chamber. This rehearsal of skills is again presented in the Challenge of Doom, which basically reviews all the concepts/skills learned throughout the program, such as privacy, virus protection, and etiquette online. The program would benefit by having a way in which children can identify alternative solutions to problems posed and providing consequences for the issues presented. Although this may occur with a parent sitting nearby or a teacher in the classroom, the Web site does not provide clear directions or examples to allow for it. The teacher's guide identifies strategies to promote effective peer interactions through various teaching methods for grades pre-K to 6.

The resource discusses specific skills: not sending sensitive information online; talking to a parent or caregiver if something scary happens; deleting (or scanning) unexpected emails and links; using abbreviations online; and offering polite options for online communication. Only the online abbreviation section and polite discussion material provide options for trying out these skills.

The sensitive information material offers options for learning about what sensitive information is; although, as noted earlier, it does not provide a rationale as to why such information should be kept private. In this way the resource does not so much teach about what makes information private but creates a rule for what specific *information* is appropriate to share. Developmentally, a rule like this may be useful for young children, but the site lacks strategies to enhance generalizability of the skill. Subsequently, instruction is limited to the extent that it does not encourage children to think about other risky situations online (e.g., while they may not reveal their sport team name they may not know that giving out their Girl Scout troop name, or their school orchestra name, could be equally as risky).

The material on viruses focuses on the destructive nature and harmful effects to one's computer. Additionally, children are alerted to the dangers of opening unexpected emails or links. This material could be expanded to cover the various categories and means by which files are sent to computers (e.g., instant messages, file sharing files, etc.). As more and more young people use instant messenger, talking about file-sharing as a vector for viruses will become increasingly important.

The remaining material focuses on educating about risks rather than providing specific skills training. It should be noted, however, that the teacher program offers more opportunities to discuss the nature of personal information. The resource uses a question format that is virtually replicated in a cartoon wireless device. However, it may be more helpful to include actual technologies (e.g., instant messenger program) and authentic information in the form in which it could be sent (e.g., specific private statements in the body of an instant message to a friend, in communication in an online game, etc.).

Integrates multiple program components (i.e., classroom training combined with parent involvement). The program includes a resource for parents, identifies rules for parental use, and details options for parental involvement. The program also describes an opportunity for a parent/caregiver evening at school that focuses on recreating Surf Swell and talking about the tasks of the island. As noted earlier, these tasks have nothing to do with avoiding risk, but instead focus on getting through obstacles to a narrative. A better format would engage students in acting out the issues and skills identified by the resource.

Although this Web site focuses on the child, it contains guides for parents as well as teachers, including (Internet) access to further safety information. This program could benefit by providing parents with sample questions, answers, situational examples, and scenarios to further the child's knowledge about online privacy, etiquette, and viruses.

Includes interactive instructional techniques. This program uses a variety of interactive instructional techniques that allows the child to control the steps in order to progress forward into the Web site. Although teaching techniques, such as role-playing, discussions, and small-group activities are mentioned, they are only incorporated when using the program along with the teacher's guide. This program may benefit from the inclusion of a variety of interactive activities for parents, as well (besides the open-ended questions).

Provides intensive training. The resource itself would likely take around 15-30 minutes for children to complete. It is very interactive. Integration of the training into school activities or parental/caregiver interaction would intensify the effect of the resource. There was no mention of repeated exposure to content, and it is questionable whether a child would spontaneously replay the program.

Addresses protective factors as well as risk factors. The project does not explain why the activities are risky, thereby avoiding an overemphasis on a fear-based approach. The program does an excellent job of highlighting protective factors throughout the different stages, as well as addressing risk factors through the quiz method (by way of provision of knowledge). Unfortunately, without inclusion of a justification for specific behavior choices, the approach tends to be legalistic and rule-driven rather than fostering behavior that is motivated by intentional choices and actions for positive engagement online.

Final comments. This resource is comprehensive in its scope, and it addresses diverse areas of cybersafety and citizenry. The resource could be improved by elaborating on the rationale for the risk messages. Moreover, Disney's site is commercial, with ads flashing on the sidebar. The theoretical framework is geared to small children, which are Disney's forte, but the distractions of advertising and sweepstakes may limit the effectiveness of the site.

Media Awareness Network (MNET)

This site has extensive information for children of various ages, teachers, and parents. They have done an excellent job of incorporating throughout the program a theoretical framework that focuses on digital and media awareness. The vast array of resources, articles, and interactive programs offers a great deal of information and multiple ways of reinforcing media awareness. For younger children *Cyberpigs* allows children to explore Internet safety issues through a well-known fairy tale, *The Three Little Pigs*, in an updated world. It does an adequate job of balancing the benefits of the Internet and its potential dangers through the analogous tale of friendship among the pigs versus the big,

bad wolf. The binary of good/bad inherent in most fairy tales connects to the child's frame of reference. For middle school students the engaging *Allies and Aliens* is more complex but provides a good deal of interaction. The programs with *Jo Cool; Jo Fool* move away from animation and use peers as the medium. The individual pods utilize icons and references that younger teens can readily identify with, increasing the effectiveness of the message. There is a large variety of material for parents and teachers to reinforce and enhance the behaviors. Blogs, which have become so popular and commonplace, are a nice addition to a continued dialogue on media issues. In all, MNET has demonstrated strong effectiveness in educating about the digital environment.

Based on a coherent theoretical framework. MNET emphasizes the common dangers of operating in a cyberworld and incorporates that message in a variety of programs aimed at children and teens. They are consistent in applying some general safety measures when using the Internet, such as not giving out personal information, consulting with adults on cybersafety, and being aware of the potential predatory motivations of individuals seeking information online. Throughout the site is a consistent message of awareness and skill building to make the individual a savvy user of the Internet. MNet has clearly developed a comprehensive program for educating the young, as well as giving parents and teachers tools for reinforcing important safety issues. However, this site is also interested in broader Internet use and its relationship to a number of other issues, including protecting Canadian culture, the use of violence in the media, and stereotyping. Although these are significant issues and justifiably important, they may overshadow safety issues involved in Internet use. The site should be applauded for the extensive information provided and the quality of the presentation format, but the theoretical framework as it relates to ethics and safety is not the central articulating factor. Clearly, the activities for younger children and adolescents reinforce and develop the necessary safety skills to operate in a complex cyberworld.

Includes active, systematic, and specific skill training. The skills training is integrated throughout the site's vast array of information, and much of it is rather sophisticated. This site addresses a broad range of issues, with readings geared toward young people, teachers, parents, and laypersons. The skill training is fairly well delineated and specific in orientation, but the number of different components and issues can be daunting. There seems to be a general goal of media awareness defined in broad and generic terms. Developing higher levels of activity also requires higher levels of thinking on behalf of participants. Engaging young people in analytical thinking that involves the synthesis of ideas will have deeper impact on propagating behavioral change. For the erudite reader, this site offers a great deal but only a limited opportunity to rehearse skills in deep and meaningful ways.

Integrates multiple program components. In this area MNet demonstrates a highly effective range of components. It is designed to provide information to all stakeholders: parents, teachers, elementary age children, teens, and the general community. To quote from the site's home page, it provides "resources and support for everyone interested in media and information literacy for young people." There is an array of communication formats, including articles, blogs, and professional development opportunities. As indicated by its top score of 4 on the evaluation rubric, MNET's resources and training program are exceptional.

Includes interactive instructional techniques. The programs designed for the elementary grades allow for a modicum of interaction as the child advances the story by clicking a continue button. This control empowers them to remain at a particular scene for as long as they like and consider the storyline more thoughtfully. Controlling the pace of the episodes allows the child to think about the message and not be controlled by the flow of

the visuals. However, the level of interactive skill building is relegated to quizzes throughout the programming. In the *Cyberpigs* episodes an alien in a spaceship occasionally appears asking the viewer to judge the appropriateness of the character's actions with a yes/no question. This format is replicated more extensively in the programming aimed at teens. These quizzes reinforce the prevailing skills and messages, but the low level of interaction could hinder the inculcation of the overall behaviors being fostered. Despite this potential limitation, the training and skill development has important active components that are more effective than a traditional passive format.

Provides intensive training. MNET offers a variety of training components for teachers, students, and parents. Modules include an overview and presentation on safety, privacy, and ethical issues; development of "Web smart" skills; and workshops on stereotyping, online hate, and cyberbullying. The summaries of the training components give the impression that they are well developed and informative; however, to view the actual training module a licensing fee is required, thereby, limiting accessibility. A grant from BellCanada has made it possible for one training component, *Parenting the Net Generation*, to be available to parents for free.

Addresses protective factors as well as risk factors. One of the strengths of the MNET site is the careful balance developed between identifying risk and promoting protective measures. In all component levels the issue of risk is clearly articulated, from the subjective assessment of media violence to the more direct and specific danger of giving out personal information online. Beyond identifying risk, MNET consistently offers proactive measures to educate the individual about the appropriate and safe use of the Internet. As an example, in the *Cyberpigs* episode the anthropomorphic wolf is the online predator and mildly scary but is quickly dispatched by the adolescent pig's mother. Although the risk is clearly identified through the image of the wolf, the more powerful image is the imposing adult presence that dwarfs the predator. The protective nature of the parental image carries a powerful message in specifically dealing with the Internet and more generally with the larger world.

iSafe

This sophisticated Web site is funded by the Department of Justice and Department of Defense. It provides a great deal of the "411" to teens, parents, and educators but no on-site interactive programs. This site is primarily geared toward training mentors to get the message out into the schools rather than directly influencing behavior. In terms of its framework, training, and integration, this is an excellent resource to develop a program for a school or community.

Based on a coherent theoretical framework. Although this site does not directly influence behavior change, the training modules and mentoring programs lay a foundation for a theoretical behavior change framework. It is clearly articulated in the program activities through a set of online videos, a mentoring program, and a community outreach curriculum.

Includes active, systematic, and specific skill training. Students have various opportunities to learn and rehearse clear and specific skills concerning Internet safety by taking initiating roles in educating others, as well as participating in community awareness programs. Students also may engage in peer mentorship through the I-mentor service activity of the youth empowerment campaign.

Integrates multiprogram components (i.e., classroom training combined with parent involvement). This site incorporates training curricula and outreach programs that actively involve various members of the community, such as law enforcement, parents/guardians, children, educators, and other adults to teach and train about Internet safety issues.

Includes interactive instructional techniques. Although this site does not provide direct interactive programs, it does include community-based intervention training and activities with the potential to incorporate interactive instructional techniques.

Provides intensive training. This site includes current updates on programs that allow for repeated, ongoing exposure to the various skills and content over time through different forms of training and targeting various people throughout the community.

Addresses protective factors as well as risk factors. The training, outreach, and mentor programs implemented on this site include a balance of both risk and protective factors.

iKeepSafe

This is another impressive site, but unlike iSafe it provides tools for younger children to directly explore the benefits and dangers of the Internet. It also incorporates classroom and parental informational programs and downloadable training. This program was started by former Utah first lady Jacalyn Leavitt and has a support network throughout the country. It incorporates a commonly known character, McGruff the Crime Dog, and introduces a new character, FauxPaw the Techno Cat. The graphics and detail are quite good and effectively address the protective factors and the risk factors of Internet safety. Although there are a few games, a couple of passive downloads, and some links to other sites, there is a paucity of interactive instruction. Despite the presence of a kids section, this site seems to be geared more toward informing parents and community members.

Based on a coherent theoretical framework. A theory of behavioral change lays a foundation for the programs on this site by focusing on skill building and active rehearsal of behaviors through different sources. This program focuses on skill building by initially targeting stakeholders, such as parents, and educating them on Internet safety in order to better serve their children. Students have access to games and other links that allow them to rehearse the skills and knowledge gained via educators and parents.

Includes active, systematic, and specific skill training. This program primarily focuses on increasing knowledge about Internet safety; however, students have some opportunity to rehearse clear and specific skills. Although a section is devoted exclusively to children, the games are not targeted toward skill rehearsal. Instead, they emphasize memory and hand-eye coordination with no goal or information regarding Internet safety that should be attained. The site includes a link to Netsmartz and Fun Stuff with McGruff to allow for external venues of skill rehearsal.

Integrates multiple program components (i.e., classroom training combined with parent involvement). The program devotes sections to individuals in specific roles with links leading to various activities and information regarding Internet safety. This site includes parent access to informational online videos, downloadable resources, and viewable PDFs, including material on common questions about Internet safety, spyware, and online fraud. The parent section also offers technology tutorials, videos, and lesson plans to be used with children. Moreover, there is a section dedicated to educators, which includes worksheets and coloring pages to be used with students. The site's Drug Abuse

Resistance Education (D.A.R.E.) activity center includes 14 activities designed to be used by parents, teachers, older children, and law enforcement professionals in their instruction of children.

Includes interactive instructional techniques. This program primarily focuses on teaching about basic rules regarding Internet safety through readings. The D.A.R.E. activity center provides students the opportunity to engage in a few interactive activities, such as creating a hands-on safety guide.

Provides intensive training. This program is designed to allow for specific training at short intervals within different timeframes without repeated exposure to the same skills.

Addresses protective factors as well as risk factors. There is a balance of addressing both protective and risk factors by educating parents and children about Internet safety rules, as well as the dangers associated with online videos and games.

Netsmartz

This site is comprehensive and includes Internet safety sections for diverse stakeholders (i.e., law enforcement, parents, educators, teens, and kids). The kids section is well done with good graphics and animation. Especially nice is the combination of animated characters like Clicky with a child/youth friendly approach. This format should be more appealing to a wider range of young people. Netsmartz is effective in combining a coherent message with a variety of delivery techniques appropriate to various ages. In its teen section, real stories provide a relevant context in which to explore both protective and risk factors. There are also several training components designed for specific stakeholders. The site's user-friendly design and integration of skills and activities make it an effective tool in educating about the digital world.

Based on a coherent, theoretical framework. This program does an excellent job of integrating the behavioral change theoretical framework into its program activities for children between the ages of 5-17. The site is designed to educate children, extend awareness to the community, and prevent victimization online and offline. The activities emphasize that skills and strategies used offline have application to online interactions.

Includes active, systematic, and specific skill training. The program not only focuses on increasing knowledge and extending awareness but also offers training materials and games to model behaviors and foster application of skills to real-world scenarios via videos for parents/guardians and children. There are various opportunities throughout the site to rehearse the skills learned via training modules and readings, such as animations, worksheets, discussion questions, and projects. The site also offers examples and ways students can work in individual or group projects to extend learning.

Integrates multiple program components (i.e., classroom training combined with parental involvement). The site is divided into sections for parents/guardians, educators, law enforcement professionals, teens, and children. Each section is further divided into links to show how to use the activities, gain more information, and engage peers and the community. For example, links and videos connect parents to other stakeholders, such as teachers and a developmental pediatrician, who may respond to questions on how to protect children from victimization. Presentation materials are downloadable, and training modules for use by law enforcement professionals and agencies range from 10 minutes to 2 hours.

Includes interactive instructional techniques. This site includes a variety of interactive and instructional techniques. There are two sections targeted to children, one for kids and the other for teens. Each section contains activities that involve children at a group or individual level. Activities range from worksheets, discussion questions, projects, interactive media, and comic-book style videos that teach about social networking and cyberbullying via animated movie clips. Many of the movie clips feature real-life stories that help teenagers connect to the relevance of the material through peer models.

Provides intensive training. This program has designed age-appropriate activities and learning modules. The individual activities involve a series of interactive, self-paced, 5-10 minute modules. The computer monitors and tracks progress made by each individual student, and the student is given a certificate upon completion, which is then shared with a teacher or parent. All the interactive activities bridge communication between the children and outside stakeholders.

Addresses protective factors as well as risk factors. By addressing real-world safety issues, this site does an excellent job of presenting protective factors and fostering awareness while minimizing the use of fear tactics. The site focuses primarily on promoting awareness and disseminating preventive mechanisms through education.

Hector's World

Of all the sites reviewed, Hector's World is the most visually appealing and inviting. Although there are extensive resources for all stakeholders, the intent is clearly to invite the young person into Hector's World. The animation is superb, and the storylines are compelling and age appropriate. The wide range of information allows adults to mentor the ethical behaviors being taught and provides multiple components for further instruction. The lesson plans coordinate with episodes of Hector's World and should be an excellent extension of the theoretical framework of the site. Hector's World is geared toward younger age children, preschool to early elementary, and nicely balances the protective/risk factors. The number span on the lesson plans themselves correspond to New Zealand school grades, not children's ages. Year 0-2, Year 3-4, and Year 5-6 age groupings are intended for children ages 5-6 years old, 7-8 years old, and 9-10 years old, respectively. The use of friendship as a positive motivational factor should resonant with younger age children. Conversely, there is a paucity of interactive resources for young adults. Most teenagers may be turned off by the curricular style of presentation and probably will not utilize the valuable information provided.

Based on a coherent theoretical framework. A theory of behavioral change is clearly articulated and integrated into Hector's World activities, which include episodes, coloring books (with narration of the episodes), lesson resources (plans) from 0-6 years, online privacy statements, and resources for parents. The episodes (targeted at entering private information online) not only address and foster protective factors through a variety of strategies (mainly conveyed by cartoon characters), but also address risk factors and explain the behavior changes. The behavior changes are acknowledged by the characters in a friendly, narrative form (usually at the end of the episode).

The Web site begins with a child entering his/her name, where a nickname is encouraged, and an explanation is given. This is an effective modeling technique that is infused throughout the program. The active rehearsal of a desired behavior is represented during the episodes, through the coloring books, as well as teacher lesson plans and parent extension activities that can be incorporated into the home.

Consistent feedback is provided, and reinforcement of desired behavior is highlighted in the dialogue among the “friends” of the characters.

Includes active, systematic, and specific skill training. Students have repeated opportunities to rehearse clear and specific skills that promote decision making, perspective taking, alternative solutions, and positive peer interactions via teacher lesson plans, multiple episodes, parent resources, and other Netsafe links. The main skill that is consistent throughout the episodes concerns online privacy and making sure children have repeated exposure to information on when it is okay to share information online and under what circumstances it is not. It allows for children to see different venues and situations in which personal information privacy may come into play and the reasons to be educated about it.

Integrates multiple program components. This program actively involves not only children, but parents, teachers, and the public. The parent resources contain both questions and background answers so that parents can be well educated on topics presented throughout the episodes in order to better assist children in learning about the issues faced online. Teacher lesson plans are grouped by age, and there is a link that allows the community to be connected, as well (through the netsafe.org link).

Includes interactive instructional techniques. This program includes diverse, interactive instructional techniques, such as role playing, discussions, and small group activities that are incorporated primarily through teacher lesson plans, but are also available within parent-directed activities and some of the resources available online.

Provides intensive training. There is repeated, ongoing exposure to online privacy content throughout the episodes. The theme is reinforced in multiple ways so that children receive continuous reinforcement of messages. Each episode is approximately 10 minutes long, allowing the stories to be watched in multiple sessions or one continuous viewing. The storylines carry from one episode to another, creating a nice continuity of plot and message. Frequent use of this site will allow for a focus on different episodes, diverse skills, and extension activities in the classroom as well as home. The variety may help reinforce the basic concepts of online safety and reduce risk factors.

Addresses protective factors as well as risk factors. This program does an excellent job of addressing the protective factors and limiting the focus on the risk factors. Although there is some inclusion of fear imagery (i.e., use of sharks in each episode that may instill a fear that children should not give out their personal information), these tactics are never used in isolation. Justification for making informed and safe decisions is elaborated upon in a constructive manner that empowers children to consider both benefits and consequences of their choices.

Final comments. The high quality presentation of Hector’s World provides great imagery and instructive content. The site has potential application for elementary children in the higher grades, and with the addition of appropriate lesson plans, it could be used with young adolescents.

Conclusion

As children grow older they will increasingly face risky online situations that require spontaneous decision making to ensure their safety and well being. Some potentially problematic activities are unavoidable in a cyber-connected world. For example, at some point children will share their names and details with people online. A prohibition of any

activity will be ineffective to manage these interactive features of digital spaces. Conversely, skills and strategies for risk analysis and deliberate decision making may serve a protective function.

Although information that promotes awareness of risk is critical to safety efforts, the process of fostering behavioral decision-making shares an equal stage. High quality cybersafety resources that are based on a coherent theoretical framework, integrate multiple program components, and allow for skill rehearsal, represent the best instructional materials to engage children in assessing risky situations, developing appropriate coping techniques, and practicing responsible decision making online. These online resources not only foster protective factors through a variety of strategies, but they also address risk factors by promoting and modeling behavior changes with friendly and engaging characters. Students have repeated opportunity to rehearse clear and specific skills that promote decision making, perspective-taking, alternative solutions, and positive peer interactions via high quality instructional resources that can be used by parents, educators, community safety officers, and other child-serving professionals.

The safety resources highlighted in this study have been designed to foster critical thinking skills about when and how to apply rules for cybersafety. In terms of effectiveness, digital worlds that utilize high quality visual animation, real-life video, and representational cultural icons appear most effective in influencing behavior. Conversely, sites that focus on information only without considering the vehicle of transmission may have difficulty actively engaging young people into digital/media safety.

Video-based learning has evolved from television to the Web, and although the media may change over time, programs and characters will continue to engage children in learning and exploration. Jim Henson, creator of the Muppets, recognized the power of characters on a screen to elicit a response from children, and in digital spaces the power to influence a child's behavior is evident when abstract concepts are translated into practice and generalized to a variety of situations. Quality video-based instruction offers a pedagogical approach that resonates with children through scenarios that reflect the challenges and constructive solutions available to them. Simultaneously, children's proclivity for creativity, imagination, and play can be fostered through extension activities that build on concepts introduced in the programs. As Jim Henson noted, "Life's like a movie, write your own ending." There's nothing more powerful than the ability of a child to be empowered with the skills to engage in decision making that prevents or mediates harm.

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Appendix

Rubric to Analyze Electronic Media to Prepare Children and Youth for Safe and Ethical Practices in Digital Environments

Criteria	1	2	3	4
Based on a coherent theoretical framework.	No clear theory of change is articulated and program exclusively emphasizes reduction of risk factors.	Theory of change is articulated but program primarily emphasizes reduction of risk factors.	A theory of behavioral change is implicit but clearly drives the inclusion of program activities focused on skill building and active rehearsal of behaviors.	A theory of behavioral change is clearly articulated and integrated into the program activities.
Includes active, systematic, and specific skill training.	Program focuses on raising awareness only.	Students have limited opportunity to rehearse clear and specific skills.	Students have some opportunity to rehearse clear and specific skills.	Students have repeated opportunity to rehearse clear and specific skills that promote decision making, perspective-

				taking, alternative solutions, and positive peer interactions.
Integrates multiple program components (i.e., classroom training combined with parent involvement).	Program focuses on child only.	Program includes handouts to be sent home (e.g., list of family rules).	Program integrates ongoing updates on lessons learned with extension activities that caregivers can use with their child to reinforce skills.	Program actively involves caregivers, children, and community agencies in the training.
Includes interactive instructional techniques.	Primarily focuses on teaching through lectures with presentations targeted simply at increasing knowledge.	Includes limited interactive techniques with emphasis on lectures.	Includes several interactive instructional techniques.	Includes diverse, interactive instructional techniques, such as role playing, discussions, and small group activities.
Provides intensive training.	Short, one-time training.	Extended, one-time training.	Includes periodic boosters.	Repeated, ongoing exposure to the content over time.
Addresses protective factors as well as risk factors.	Predominance of fear tactics.	Some emphasis of fear tactics.	Balanced inclusion of risk and protective factors.	Emphasizes protective factors with some or limited focus on risk.

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