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DEVELOPING AN EDUCATIONAL WEB SITE FOR YOUTH
REGARDING PROTECTION FROM ULTRAVIOLET RADIATION,
AND EVALUATING THAT WEB SITE
VIA THE INTERNET

presented by

Ji-Hyun Kim

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By

Ji-Hyun Kim

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ABSTRACT

DEVELOPING AN EDUCATIONAL WEB SITE FOR YOUTH REGARDING PROTECTION FROM ULTRAVIOLET RADIATION, AND EVALUATING THAT WEB SITE VIA THE INTERNET

By

Ji-Hyun Kim

This study investigates the sun protection knowledge and practices of mid-Michigan youths. In that regard this researcher (Kim) sought to ascertain pertinent details of the relationship between those youths' sun protective practices and predictor variables, including: 1) sun protective knowledge scores, 2) sun protective practices of parents, 3) sun protective practices of friends, 4) ultraviolet (UV) overexposure experiences, and 5) indirect experiences regarding skin cancer. The survey for this study was implemented using a printed- and an online questionnaire.

Based on analysis of data collected and review of literature, the research team planned educational material about UV protection. This researcher created a Web site to disseminate sun protection information for youths, their parents, and other concerned adults. The Web site comprises five sections: sun facts, skin cancer, sun protection, a sun-wise quiz, and a Web evaluation. The Web site was tested via different platforms and browsers, to ensure its functionality.

The Web site was evaluated online by youths and adults, to measure the appropriateness of its informational, functional and aesthetic aspects. Results indicated that, in all aspects mentioned above, the Web site was perceived as appropriate for youth. This provides also a set of potential guidelines for future Web development, and for related educational materials.

To my parents

for their love, support, encouragement,

and, most of all, for their belief in my ability

to achieve my goals.

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CHAPTER I

INTRODUCTION

Sunlight is the source of all life in the world. It lights and warms the world and delivers the solar energy which living organisms require for survival. For example, plants make their own food using sunlight and give off oxygen through photosynthesis. Then human and other animal bio-chemistries utilize the oxygen to live, and also consume plants and other organisms. Sunlight also provides psychological and physiological benefit in several ways: being outdoors in bright or clement weather generally elevates moods; sunlight assists in production of vitamin D in skin cells, which is absorbed by the body and used in calcium uptake from the intestinal tract, and that calcium is essential for healthy bone growth and development; vitamin D also suppresses the growth of skin cancer.

These benefits are acquired by UV radiation exposure which is not excessive (Hilfiker, Kaufmann, Reinert, & Schmidt, 1996; Garland, White, Shaw, & Gorman, 1990). However, large amounts of UV radiation exposure have detrimental effects on human health, and may cause skin cancer, eye cataracts, and other ailments (Hilfiker et al., 1996; Garland et al., 1990).

Negative effects of UV radiation

Human exposure to UV radiation has been shown to be strongly associated with damage to the skin, ranging from aging of the skin (wrinkling at a rate more rapid than, or to a degree greater than, normal skin aging) to skin cancer. UV radiation is an

invisible component of sun energy. With reduced ozone protection, increased levels of UV radiation reach the earth's surface thus increasing the risk of skin cancer, eye cataracts, premature aging, and lesser immunity to disease via reduced immunity of skin cells (Truhan, 1991). Additional damage occurs each time a person is exposed to UV radiation, and more intense exposure, such as sunburn, may increase rapidly the possibility of skin cancer (Farmer & Naylor, 1996).

UV radiation comprises three regions of the electromagnetic spectrum: UVA (320 to 400nm), UVB (290 to 320nm), and UVC (200 to 290nm). The last-mentioned, UVC, is totally absorbed by the atmosphere and does not penetrate the ozone layer to reach the earth's surface. The remaining two, UVA and UVB, are the causes of concern (Threlfall, 1992; Truhan, 1991).

UVA causes little visible reaction on the skin, but recent research indicates it decreases the immunity response of skin cells. UVB is believed to be the cause of skin cancer and eye cataracts. Moreover, some patients undergoing drug therapy and treatment may have photochemical response to UV radiation (Threlfall, 1992; Truhan, 1991) so would need special protection against UV radiations.

Skin cancer is a disease in which cancer cells are found in the outer layers of the skin. Of all cancers, it is the most common. There are two general types of skin cancer: non-melanoma, and melanoma.

Non-melanoma skin cancer includes basal cell skin cancer, and squamous cell skin cancer. It is associated with cumulative sun exposure. Squamous and basal are the most common, and usually may be removable by excision or by topical treatments.

Melanoma skin cancer is associated with short, intense sun exposure (Truhan,

1991). It is less common, but much more serious than, non-melanoma skin cancers and can result in death if not detected and treated early (American Cancer Society [ACS], 1999). An estimate of skin cancer incidence in 1999 in the United States suggests approximately one million new cases of non-melanoma, and 44,200 new cases of malignant melanoma (ACS, 1999). Estimated new skin cancer cases have increased steadily: In 1970, 112,000 cases; in 1980, 400,000 cases; in 1990, 600,000 cases; and in 1999 one million cases (ACS, 1967; ACS, 1968; ACS, 1970; ACS, 1980; ACS, 1990; and ACS, 1999).

Although skin cancer occurs mainly in adulthood, increasing evidence shows that skin cancer takes several decades to develop, and that UV radiation exposure during childhood is the main reason (Holman, Armstrong & Heeman, 1986; Marks, Jolley & Lectsas, 1990; Weinstock, Colditz, Willette, Stampfer, Bronstein, Mihm, & Speizer, 1989).

Melanoma accounts for about four percent of skin cancer cases, but causes about 79% of skin cancer deaths (ACS, 1999). The number of new melanomas diagnosed in the United States is increasing. Since 1973 the melanoma incidence rate (i.e. the number of new melanomas diagnosed per 100,000 people each year) has more than doubled from 6 to 13. In 1999 about 7,300 people in the United States were expected to die of melanoma. In the 1930s, a child born in the United States had a 1 in 1,500 chance of contracting melanoma. With the erosion of the ozone layer, by the year 2000 this risk estimate had increased to 1 in 90 (Truhan, 1991; Capjack, Kerr, Davis, Fedosejevs, Hatch, & Markee, 1994).

Justification

Intense sun exposure prior to age 20 significantly increases the risk factor for all types of skin cancer. In addition, 50% to 80% of one's lifetime exposure to UV radiation occurs before the age of 18 to 20. Some evidence suggests that the risk of developing malignant melanoma may be doubled if a person has had one or more severe sunburns in childhood (Lew, Sober, & Cook, 1983; Mackie & Aitchwason, 1982; Weinstock, et al., 1989).

This research is of particular importance because it may lead to a greater sensitivity to the importance of UV protection in earlier life, and provide information about sun protection, so that the public may gain improved knowledge in this regard. Attitudes and behavior to minimize skin cancer risks and/or overexposure to the sun may thus improve.

In designing the UV protection web site, this researcher may provide to other researchers, teachers and educators also an introduction (or a reminder) of the efficiency of the Internet for educational purposes. A greater understanding of this new communication medium and its efficiency as an educational information channel for youth and their parents, may be achieved also. The unique characteristic of the Web allows this researcher to disseminate educational material about UV protection to all who are willing to access this information, no matter where they are, globally. No pure distance barrier exists in access. Users can simply search for information and access it, whenever or wherever, with the proper Internet connection and computer.

For this study, the youths and parents/ leaders of 4-H youth programs in mid-Michigan are the main target audience for UV protection information. Disseminating

information over the Internet allows maximum publicity and accessibility: once users have proper Internet connections, they can access the information whenever and wherever they wish. Therefore, others in addition to the target audience are expected to participate in the activities regarding UV protection information over the Internet.

<u>Why a Web-based approach?</u>

In the past few years, the Internet and the World Wide Web (Web) have grown phenomenally. The Internet is often referred to as the global network of computers. The Web has become an incredibly powerful and efficient tool for accessing and disseminating information (Sanders, 1999). It is apparent that the Web is an environment where both information sources and information users abound and is a communication channel of which educators should increasingly make use (Sanders, 1999).

Many are the potential benefits to using technologies in education. Negroponte, Resnick and Cassell (1997) suggested that digital technologies would radically change how children learn, what they learn, and with whom they learn. They proposed that digital technologies would encourage children to become more active and independent learners. Due to the "global connectedness" of digital technologies, students will become part of global knowledge communities collaborating with others around the world (Negroponte, Resnick & Cassell, 1997). Using the Internet, students can be exposed to a wider range of information and experts around the world, whenever they want and wherever they are. One of the primary advantages of the Web is that it is compatible with the way students now prefer to learn (Owston, 1997). This preference of children, for using the Internet for education, may increase their learning efficiency and influence their behavior. Papert (1993) called the computer the "children's machine," because

numerous students in K-12 public schools, colleges and universities are so familiar with computer technology. He also mentioned that "it was an integral part of their world: they played with, were entertained by, and learned with the computer and ... tended to be more visual learners than previous generations because their world was rich in visual stimuli."

Statement of Problem

The first purpose of this research is to provide an analysis of baseline data on mid-Michigan youths' sun protection knowledge and practices. This researcher sought the relationship between their sun protective practices and predictor variables.

The second purpose of this research is to design a UV protection web site, and to disseminate educational material about sun protection for youth, for their parents and for other adults. The web site information content will be based on analyses of the youths' sun protective knowledge, attitudes, and practices and on a review of literature.

The third purpose of this study is to implement an online evaluation survey of the UV protection web site, for the purpose of enhancing the site and for providing web design and evaluation guidelines for future study. In the long run this will be helpful in developing online educational materials for youths and adults.

Research Objectives

The objectives of the research are:

1. To describe the trends of mid-Michigan youths' sun exposure knowledge and practices and the relationship between their sun protective practices and other

internal and external variables specifically their: sun protective knowledge scores; sun overexposure experiences; parents' behavior regarding UV radiation; sun protective practices of friends; and indirect experiences about skin cancer;

2. To create a UV protection web site, based on the analyses and a review of literature about web development, and to disseminate sun protection information to the public, specifically to youths associated with the 4-H youth program in mid-Michigan;

3. To evaluate the web site through online questionnaires, and to analyze the informational, aesthetic and functional appropriateness of the web site based on evaluation data collection. Based on that analysis, this researcher will formulate guidelines for development and evaluation of an educational web site.

Research Questions

The following research questions will be tested using the survey:

Analysis of baseline data

1. Is there a relationship between sun protective knowledge score and age?

2. Is there a relationship between sun protective knowledge scores and average weighted sun protection scores of youths?

3. Does a youth's perception toward parent's behavior with respect to sun protection seem to influence youth's sun protective practices?

4. Does peer behavior influence youths' behavior regarding sun protection?

5. Is there a difference in behavior between youths severely sunburned the previous summer, and youths who were not sunburned?

6. If youths know someone who has skin cancer, is their behavior in relation to sun protection more positive than others who do not?

Evaluation of the web site

7. Is information on the web site perceived to be appropriate for youth?

8. Are the graphics and design of the web site perceived as aesthetically appealing and adding interest to the contents?

9. Are the functions (navigations, downloading time) of the web site positively perceived?

10. Are the links perceived as useful in providing more information?

11. Does evaluation vary with demographic background and with level of prior knowledge on sun safety?

Operational Definitions

1. Total knowledge score of youths: Questions about sun protective knowledge were recoded and summed to obtain the total knowledge score of youths regarding sun protection. Range of total knowledge scores was from 0 to 10. Higher total knowledge scores indicate that youths are more knowledgeable about sun protection.

2. Average weighted protection score of youths: Four responses about youths' sun protection practices, the frequency of using protection actions, were weighted on the basis of a 30 day month. The sum of these answers was divided by four to obtain the average weighted protection score. The average weighted protection score indicates the average practices of sun protection per month – across four

activities: wearing sunglasses, wearing a hat, using sunblock, and wearing a long-sleeved shirt. The theoretical range of youths' average weighted protective practice score was 0 to 30 and its actual range was 0 to 22.5. A higher score means more frequent use of sun protection.

3. Targeted youth audience in the development of the educational material was those in grades 5 through 8 in the 4-H youth program in mid-Michigan.

4. Informational mean score: To create an adult informational mean score of the web evaluation, five responses regarding the informational aspect of the web site were summed and averaged. For youth informational mean score, three responses were averaged. Both informational scores indicate the satisfaction and appropriateness of the contents on the web site for youth audience aged 10 to 13.

5. Aesthetic mean score: This researcher created the aesthetic mean score by averaging the design/graphic responses about the web site. Six responses were averaged for the adult aesthetics mean score and three responses were averaged for the youth aesthetic mean score.

6. Functional mean score: Responses, related to downloading time and ease of navigation, were averaged to create the functional mean score. Two responses were averaged for developing the functional scores of both adults and youth.

CHAPTER II

REVIEW OF LITERATURE

The review of literature consists of three major sections. The first discusses the means of reducing UV overexposure. Use of clothing as a means of protection from the sun overexposure, and clothing factors which determine its protective value, are illustrated. Use of sunscreen and headwear are addressed. Recent studies about sun protective knowledge and practices of youths are reviewed.

The second section discusses Web-based research and education, which includes Internet use for education and Internet environment of current users. The review of literature includes discussion and review of recent UV protection web sites and web design and evaluation guidelines.

The third section reviews design process models for web development and evaluation. Koberg and Bagnall's (1981) design process model is reviewed and adapted for the general web development process model. The P process model of Porter, Novelli, and associates (1983) is reviewed and adapted to specify the implementation procedure of web development.

Ways of Reducing UV exposure

Clothing as a Protection against the Sun

When people choose long-sleeves shirts, slacks, and skirts rather than sleeveless or short-sleeved shirts, shorts, and miniskirts, greater protection from UV radiation is

afforded because more skin surface is covered. Although many people know the value of covering their body while exposed to UV radiation, they do not cover up because of thermal discomfort or restricted movement associated with covering their body.

The UV radiation protection of a fabric depends on factors such as fabric construction, fabric finishing and color, existence of UV absorbers, fiber type and fabric weight.

First, the weave or construction of the fabric is the main factor that affects the transmission of UV radiation; closely woven fabrics transmit less UV radiation than loosely woven ones (Gies, Roy, Elliott, & Zongli, 1994). Bech-Thomsen, Wulf and Ullman (1991) stated that direct transmission and scattering through the interstices are more important than transmission through the fibers of the fabric. Woven fabrics usually have higher cover factor than knit fabrics because the yarns in woven fabrics can lie closely together, minimizing the spaces between yarns (Capjack, Kerr, Davis, Fedosejevs, Hatch, & Markee, 1994).

Second, any mechanical finish which causes the yarn to shorten and the fabrics to shrink closes spaces between the yarns. Dye pigments that absorb UV as well as visible light should decrease UV radiation transmission and increase the fabric protection factor (Pailthorpe, 1993). In similar fabric construction, darker shades (black, navy blue, and dark green colors) generally increase the fabric sun protection factor (SPF) value.

Third, absorption and related transmission also can be modified in a controlled way with UV absorbers (Reinert, Fuso, Hilfiker, & Schmidt, 1997). UV absorbers are essentially colorless compounds that absorb in the spectral region 280-400nm. These have been used to protect paints, plastics, and fibers from photo-degradation. Fabrics can

be coated with UV absorbers to increase SPF value. Specially engineered UV absorbers such as Rayosan® c, designed for cellulose and nylon, and Rayosan® p, specially designed for polyester, are available (Australasian Textiles, 1994).

A fourth factor is the fiber of which a garment is made. Polyester fibers are known to absorb more UVB and UVC radiation than cotton or nylon fibers. Davis, Capjack, Kerr, & Fedosejevs (1997) found that all white cotton, linen, acetate, and rayon samples in their experiments had a SPF of less than 15. Davis et al. (1997) stated that polyester fabrics consistently had higher SPF values and offered higher protection than any other fiber types in comparably constructed fabrics. But polyester fabrics are not considered to be comfortable for wear in warm weather. They suggested that polyester blends offer significantly better protection than cotton alone. It provided increased absorbency and thus increased comfort for clothing worn in warm weather. Other studies state the reason why polyester fabrics increase absorption of UV light might be that polyester contains benzene rings in the polymer chains (Davis et al., 1997; Reinert et al., 1997).

Weight of material is a factor regarding UV radiation transmission. If the construction of the fabric is identical, the thicker and weightier fabric transmits less UV radiation (Gies et al., 1994). UV protection could be significantly improved by increasing the warp and weft densities. For example, pigmented viscose filament yarn (Enka Sun) made it possible to achieve viscose fabrics with very good UV protection, fully meeting requirements for very high wear-comfort and low fabric-weight (Hanke, Hoffman, Altmeyer, Bohringer, Schindler, Schon, Wuppertal, & Klotz, 1997).

Lowe, Bourget, Hughes, and Sayre (1995) compared the UV protection offered

by normal summer weight clothing and specially engineered UV protective clothing (Solumbra®). Both tests in vivo, involving light irritation of fabrics placed on human skin, and in vitro, with instruments measuring UV light that passes through fabric, were used to measure UV protection of tightly woven or knitted garments. Lowe et al. (1995) found that summer clothing fabric's opaqueness to visible light may have little relationship with its ability to block UV radiation, although a loose weave may allow more visible and UV light through. A high level of UV radiation may still be transmitted through opaque cotton fabrics. Most summer clothing fabrics in their study appeared to offer inadequate, less than 15 SPF, sun protection for UV sensitive patients or high exposure activities. Only specially engineered UV protective clothing (Solumbra®) was found to offer adequate UV protection to individuals under medical conditions and who have a history of skin cancers. They stated that the broader protective capabilities of fabrics exceed the UVA protective capabilities of all topical sunscreen products.

People wearing special UV protective garments can reduce the risk of skin cancer. Also they can enjoy the appropriate amount of sunlight, and not be fearful of venturing outdoors. However, UV protective garments may be considered too expensive and, in the budgetary calculations of some, this cost implication might offset protective advantage (Capjack et al., 1994).

Hats for UV Protection

Hats can be worn to protect face and neck. A few studies have focused on hats for sun protection. Keeling, Klaus, Pathak, and Sober (1989) compared military baseball caps with full-brimmed jungle hats and found both protected forehead and nose, but the full-brimmed hat offered greater protection, from both direct and reflected radiation, for

chin, cheeks, ears, and neck. Diffy and Cheeseman (1992) studied the protective value of 28 hat styles in relation to UV exposure. Hats with a wide brim, at least three inches, provided reasonable protection for the nose and cheeks.

Sunscreens

Protection from harmful effects of UV radiation is recommended through the use of sunscreen, wearing protective clothing or avoidance of exposure. Sunscreen can effectively protect skin from UV radiation. Sunscreens are rated according to the amount of time, or amount of UVB energy, it takes to produce a skin reddening reaction through the screen, compared with the amount of time or energy required to produce the same reaction without sunscreen. For example, if a sunscreen has a sun protection factor (SPF) of 15, it will take an individual fifteen times as long to develop a skin reddening reaction as it would if not using a sunscreen. It is important to note that a sunscreen's SPF can be decreased by external variables such as humidity, wind, temperature, application thickness, adherence potential of the base, and activities which involve perspiration or water immersion (Groves, 1973). For someone participating in water activities, reapplication of sunscreen is highly recommended to obtain the proper protection from UV radiation, even though the sun protection product is indicated as waterproof or sweatproof. Studies confirm that single applications of an SPF 25 sunscreen were frequently inadequate to prevent skin reddening, and that multiple applications were required to completely suppress skin reddening, even from a single day's sun exposure (Farmer & Naylor, 1996).

Sunscreen may also cause eye and skin irritation and may be perceived as oily, greasy, or unattractive. It must be continuously reapplied while exposed to UV radiation.

It is not recommended for infants younger than six months (Campbell & Birdsell, 1992; Robson & Diffey, 1990; Threlfall, 1992).

Teenagers at highest risk of skin cancer, those with sensitive skins or a positive family history of skin cancer, were not more likely to use sunscreen than other teenagers (Banks, Silverman, Schwartz, & Tunnessen, 1992). The cost of sunscreens may deter their regular use, especially where youth are concerned (Cockburn, Hennridus, Scott, & Sanson-Fisher, 1989).

Recent Studies about Sun Protective Practices or Knowledge of Youth

Some studies about UV protection made particular reference to adolescents' practices and knowledge. LaBat, DeLong, Gahring, Getting, Amir-Fazli, and Lee (1996) found that there were significant differences in fifth and sixth grade students' pretest and posttest after completing the "Sun Smart Program" developed by the faculty, specialists, and a county extension educator of the University of Minnesota. LaBat et al. (1996) delivered the program to 1,500 fifth and sixth grade students and also evaluated the intervention. They concluded: First, although subjects knew the risk of sun exposure, they still perceived that being tanned was attractive. Second, subjects preferred sun protection methods which did not interfere with their appearance. Third, the intervention program was effective in changing subjects' knowledge, beliefs, and attitudes about sun exposure. Fourth, both males and females indicated their willingness to modify their behaviors to protect themselves from the sun.

Banks, Silverman, Schwartz, and Tunnessen (1992) conducted a study of the "attitudes of teenagers toward sun exposure and sunscreen use". Banks et al. (1992) surveyed 220 adolescents who visited multi-physician offices in a Washington D.C.

suburb, to determine the frequency of their sunscreen use. The study took place in late

spring to early summer 1989. Mean age of participants was 15.2 years and ranged from

12 to 19. Most teenagers in that study stated that they spent most weekends in the sun;

however only 9% of the teenagers always used sunscreen, while one third never did. The

results of their study indicated that 33% - 68% of adolescents had suffered at least one

painful, blistering sunburn despite understanding the potential dangers of sun over-

exposure. Their results showed that teenagers were more likely to use sunscreen if their

parents had insisted on their using it in early childhood, and also if their close friends

used sunscreen. Banks et al. (1992) stated that the reasons teenagers gave for not

regularly using the sunscreen, were that they rarely burned or that they forgot to bring it

with them.

Grob, Guglielmina, Gouvernet, Zarour, Noe, and Bonerandi (1993) studied

sunbathing habits of youths and teens in Marseilles (France) and found that less than 40%

of 199 adolescents, age 13 to 14, used adequate sun protection measures, and that more

than 60% of adolescents took inadequate or no precautions against sun exposure. The

main reason adolescents sunbathed was embellishment of appearance. Most mothers in

their study, in answering why they exposed their preschool children to the sun, responded

it was because it was good for their health (Grob et al., 1993). Also many adolescents

and mothers were well informed, but considered the risk of sun exposure to be

exaggerated by the media (Grob et al., 1993).

Fritschi, Green, and Solomon (1992) researched knowledge, attitudes and

behaviors of Australian adolescents toward sun exposure. Fritschi et al. (1992)

conducted a cross-sectional study of a random sample of 972 students aged 13 to 15 from

three different locations in Australia. A standard questionnaire and a diary to describe the activities of the previous weekend were administered to the students in early 1990 (southern hemisphere seasons are opposite to northern hemisphere's). Fritschi et al. found that most adolescents spent more than two hours per weekend in the sun during the time of peak UV radiation, from 11a.m. to 3 p.m. (Daylight Saving Time), despite their high knowledge of the sun's harmful effects on the skin. They found no correlation between adolescents' attitudes, and knowledge or behavior towards sun protection.

Buller, Callister, and Reichert (1995) studied UV protection practices by parents of young children in Arizona. Buller et al. (1995) sought to describe and evaluate parents' UV protection knowledge, sun protection practices for themselves and their children, and use of health information sources. They conducted the study using a self-administered questionnaire during April 1993. Their participants were 205 adults, aged 19 to 56, who had children aged 13 or less. The majority of their sample was Caucasian. More than half the participants were female. They found that parents did not consistently practice comprehensive sun protection for themselves nor for their children. Only 42% of parents used sunscreen most of the time or always and less than one third of them wore protective clothing such as long-sleeved shirts, long pants, and hats most of the time or all of the time. According to Buller et al. (1995), parents' most frequent UV protection strategies consisted of applying sunscreen to children and warning them not to get sunburned; however, parents less frequently limited their children's sun exposure.

Web-Based Research & Education

Using Internet for Education

Since the Internet was introduced, questions about its abilities, boundaries or limitations have been raised. Although anticipated effectiveness or results of the use of the Internet has not been proved, applications or uses of the Internet have been rapidly spread to all social divisions including education. The Web is a new digital media with various functions. The Web environment allows display of all types of digital files, such as text, graphics, audio, or video over the Internet (Sanders, 1999). Moreover, the Web is a hypertext environment, which simply means that any one file may be linked to any other file, thereby allowing access by a click of the mouse (Sanders, 1999). The Web environment provides to us a rich multimedia environment accompanied by easy accessibility to information search. The Internet allows users to connect to a virtually limitless information resource. The number of Internet hosts and users has been increasing dramatically in the1990s (Hamilton, 1998; Owston, 1997).

When users access information, the users' geographical locations are non-issues because data files were linked from sources worldwide (Sanders, 1999). Special software called Web browsers allows users to graphically view and interact with information over the Internet. Web browsers such as Netscape Navigator® and Microsoft's Internet Explorer® have made it remarkably simple to "surf" the Web. The keyword search capability of powerful search engines and directories such as Yahoo, AltaVista, and WebCrawler allows users to locate information on countless topics.

Educational institutions have been quick to exploit the rich, multi-sensory, interactive nature of the Web (Owston, 1997). The number of schools accessing the web

and publishing web sites is growing rapidly. It was estimated that nearly 82 % of all K-12 public schools in the United States are online (Hamilton, 1998) and 98% of all schools own computers (Coley, Cradler & Engel, 1997). A visit to the University of Minnesota's College of Education Web site, known as Web 66, showed how extensively schools are using the Web (Owston, 1997). Owston stated that "although it is impossible to tell how many of them make regular use of the Web for teaching and learning, it is probably safe to say that if a school is motivated enough to establish its own Web site and list it with Web 66, it is making use of the Web in its classroom too."

On the other hand, all kinds of information are available over the Internet, not only educational materials, but also inappropriate or harmful materials for children. Sherman (1998) claimed that the Internet might not be always appropriate for children and the impact of the Web for children is unknown yet. In addition, there is such a vast amount of information available over the Internet, not all of which is always accurate or true. Therefore, parents or guardians should carefully guide children toward appropriate information sources for educational purposes.

Recent UV protection Web Sites

This researcher reviewed and selected web sites regarding skin cancer information and prevention, to provide more detailed information for users through hyperlinks.

The American Cancer Society (ACS) web site provides various kinds of information regarding cancer. This includes all kinds of skin cancer information among which are two specific sections, on melanoma and non-melanoma. In each they specifically explain what it is, types of skin cancer, statistics of skin cancer, prevention and risk factors, detection and symptoms, treatments, and cancer drugs. Skin cancer

information for children is provided. On the UV protection page for youth, they provide

UV exposure information, protection methods, skin cancer information, and a sun quiz

(ACS, 1999).

The Northeast Dermatology Associates (NDA) (1997) provides UV protection

information on its web site. Information on the site is similar to that of the ACS. Its

site's information about medical treatment for skin cancer is well organized.

The Environmental Protection Agency (EPA) has proper information about UV

protection on the EPA web site. Especially, information about the UV index targets

youth and their parents. EPA presents what an UV index is, how it is calculated and

previous lists of UV indexes on its web site (EPA, 1999).

Overall those sites regarding UV protection provide a good quality of information

about skin cancer and related topics. However, eye-catching interactivities are not easily

found. Youths usually are believed to have shorter concentration spans than do adults,

and graphics and animation may encourage youths to obtain information on the site.

Therefore, this researcher believes that supporting graphics and graphic animation

quizzes would benefit pertinent sites.

Web Design & Evaluation Guidelines for Youth Audiences

When creating a web site for youth, guidelines to provide educational information

in an appropriate way need to be considered.

First, the web sites for youth should have title and purpose statement at the

beginning of the site, to enable users to find brief information about each section and

each link (Maddux & Johnson, 1997; Alexander & Tate, 1999). The organization

associated with the web site should be identified (Maddux & Johnson, 1997).

Second, the web site should use the youths' levels of language, content, design, and proper length (Maddux & Johnson, 1997; Clark, Knupfer, Mahoney, Kramer, Ghazali, & Al-Ani, 1997). The best length for a given page is no more than two or three screen for youth audiences (Maddux & Johnson, 1997).

Third, the web site should provide simple and easy navigational interface (Harbeck & Sherman, 1999). This allows users to access the information more easily and faster. Also, links to the home page from every internal page should be provided. This is for users who find a specific internal page by using a search engine and do not have the options of using the BACK button to return to the home page (Maddux & Johnson, 1997; Alexander & Tate, 1999).

Fourth, the overall design and layout of the page should be consistent and appealing (Clark et al., 1997; Kristof & Satran, 1995). "Consistent" does not mean uniform, but rather unity (Kristof & Satran, 1995). Maintain one chosen theme throughout the site but allow some variations on each section or heading as long as it associates with other design components.

Fifth, the use of graphics is focused on increasing users' engagement interactivities, and interesting users in the contents (Kristof & Satran, 1995). The size and numbers of images on a web page should be determined considering reasonable downloading time (Clark et al., 1997; Niederst, 1999).

Sixth, use 8-bit color depth for designing the web site and use the web safe color palette when creating graphics for the web site (Niederst, 1999). The color scheme of the web site also should be harmonious (Clark et al., 1997; Kristof & Satran, 1995).

Seventh, a web site should be tested in other browsers to ensure the appearance

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and functions of the site remain as intended (Maddux & Johnson, 1997; Niederst, 1999; Clark et al., 1997). Because appearance of the web site will differ from browser to browser, it is important that authors view the web pages in as many different browsers as possible. At least, pages should be viewed in the two most popular browsers, Netscape Navigator® and Microsoft Internet Explorer® (Maddux & Johnson, 1997; Niederst, 1999).

Identifying Internet Environment of Users

This researcher reviewed recent statistics of the most frequently used operating system, browser, connection speed, and monitor resolution, to calculate and understand the current Internet environment of common users.

According to StatMarket (1999), 94 % of Internet users use Windows (Windows 98, Windows 95, Windows NT, or Windows 3.x) as their operating system, and only 2.98 % use Mackintosh (Mac). Windows is the operating system of the so-called PC or personal computer.

StatMarket (1999) browser usage statistics indicated that, of Internet users, three quarters use Microsoft Internet Explorer® (Internet Explorer) and less than a quarter use Netscape Navigator®. According to StatMarket (1999), the top 93.18% of Internet users used browser version 4.0 or above of Internet Explorer® or Netscape Navigator®.

Currently for Internet access, modems with dial-up connection speeds of 14.4 Kbps, 28.8Kbps, 56.6Kbps, and network speed T1 (1,544Kbps), 10 Mbps and 100Mbps are available (Niederst, 1999; Ryder, 1997). Most users have dial-up connection speed of 14.4Kbps, 28.8Kbps and 56.6Kbps to access the Internet (Niederst, 1999). The environment of dial-up connection users is an important concern, because those who use

Ethernet - LAN connection instead of modems, have a much faster connection speed. When people use the 28.8 Kbps modem they may expect that 3.5Kbytes of data is delivered in a second, when using 14.4Kbps modem, 1.8Kbytes of data is and using 56.6Kbps modem, 7Kbytes of data is transferred in a second (Ryder, 1997). Many still use 28.8Kbps for accessing the Internet and usually it takes 0.5 to 1 second to download 1 Kbytes of image (Niederst, 1999).

The primary thing for determining the likely size of the web page is to look at the maximum amount of space provided by the computer monitor (Siegel, 1996; Niederst, 1999). Computer monitors come in a variety of standard sizes, such as 13", 14", 17", 19", 20" and 21", typically indicated in inches. A more meaningful measurement is monitor resolution – the total number of pixels available on the screen (Niederst, 1999). Monitor resolution is related to but not necessarily determined by monitor size, and it can be changed by users. For PC monitor resolution, 640 x 480, 800 x 600, 1024 x 870, 1280 x 1024, and 1600 x 1200 (height x width in pixels) are available. For notebook computers, 600 x 800 is commonly set as the default. High monitor resolution may allow the screen to contain more or bigger information, including graphics, than lower resolution; in other words, resolution can be counted as a container (Niederst, 1999). A web site designed based on monitor resolution setting 800 x 600 (pixels), is not appropriately viewable to users who have monitor resolution 640 x 480; that incompatibility necessitates scrolling left to right to view the site. Millions of 640 x 480 monitors are still in use, particularly in schools, households or other institutions without the budget to upgrade (Niederst, 1999).

Design Process Model

This researcher reviewed two conceptual models in planning the UV protection web site. The first conceptual model, 'design process', developed by Koberg and Bagnall (1981), is used in some apparel design classes. The second model, P process, developed by Porter, Novelli and Associates (1983), is used in hypermedia design classes for a media project framework.

Koberg and Bagnall presented (1981) the Design Process in their book, *The Universal Traveler: a soft system guide to creativity, problem solving, and the process of design*. They developed the design process as a way of problem solving and noted "The design process is a sequence of events which demands creative, constructive behavior from its participants. Its activity is to improve existing condition and to find clear path out of dilemmas". The 'design process' describes a series of steps, which must be experienced before completing the design process: acceptance, analysis, definition, ideation, selection, implementation, and evaluation (For the illustration of the design process, see Figure 1).

In the acceptance phase, designers accept the problem and state the initial objectives about the problem (Koberg & Bagnall, 1981). Statement of the problem and the rationale of the research would be identified in this phase.

In the analysis phase, the designer needs to observe and find the related information on the problem and also gather facts and opinions about it (Koberg & Bagnall, 1981). Collecting and analyzing the data of users, and reviewing literature can be included in the analysis phase. This phase is important because it narrows the general statements, so as to establish a good definition of the problem. The ideation phase is to

Linear Format

Feedback Format

Circular Format
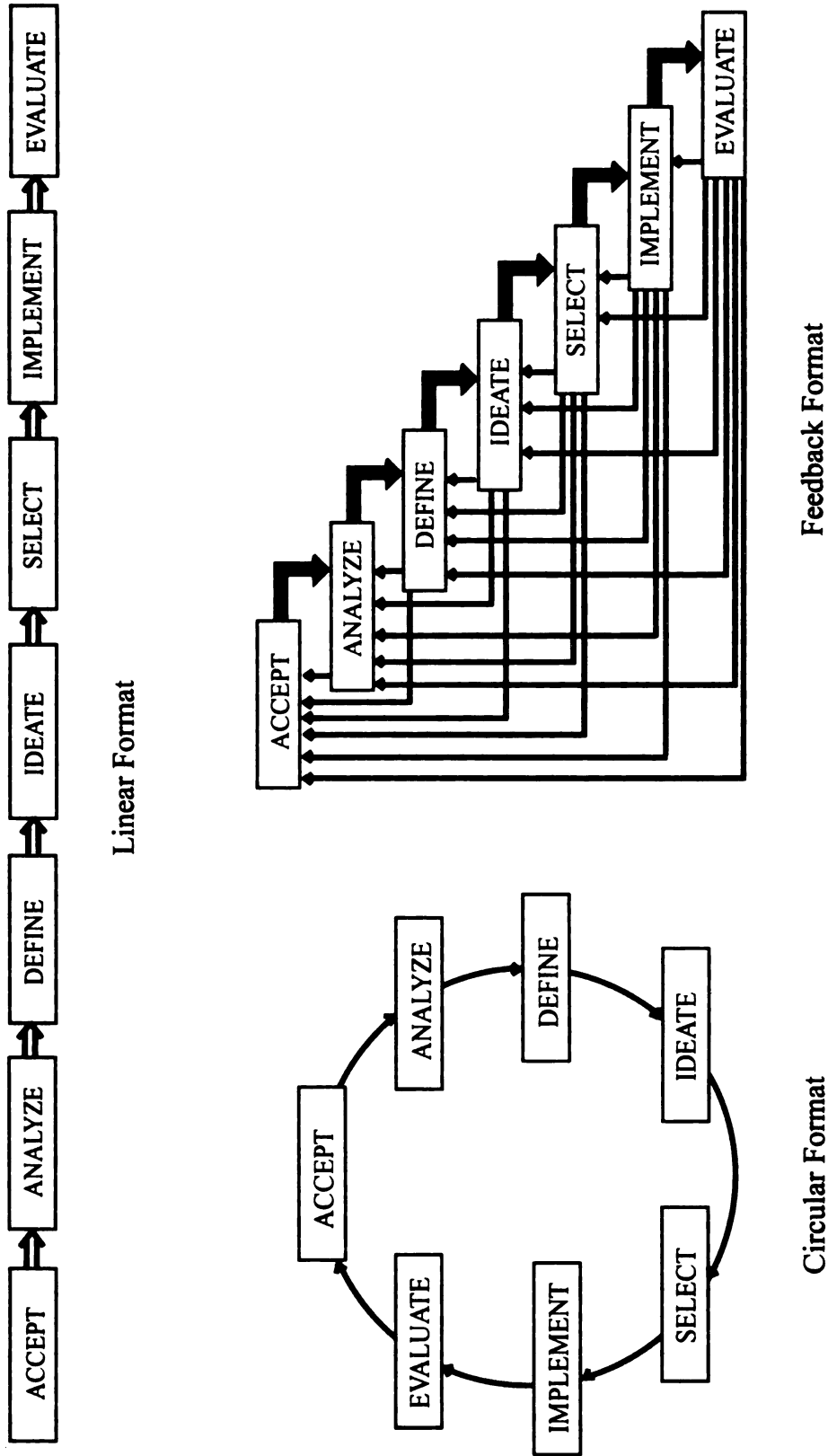
Figure 1. Three possible flow formats of design process (Koberg & Bagnall, 1981 p. 20-21)

search all kinds of possibilities to reach the goals (Koberg & Bagnall, 1981). Designers

may find ways, techniques and procedures to reach objectives and to discover alternative

routes. Making an index of potential plans for resolving the problem may also be done in

this phase.

The idea selection phase is to choose the best ways and procedures from what the

designer has gathered to achieve the goals (Koberg & Bagnall, 1981). It is also to

compare goals and objectives with the means for achieving them and to determine the

way which best fits those needs or demands.

Implementation is actually using the selected ways to achieve the goals, in other

words, taking action on the chosen idea (Koberg & Bagnall, 1974).

The P process was developed by Porter, Novelli and Associates (1983), as a

framework for developing strategic communication programs and it was adapted for the

hypermedia design class as a framework to develop a media project. It has specific,

detailed procedures on development and implementation. The P process consists of 6

levels of procedures (For illustration of the P process, see Figure 2).

For this study, this researcher combined two design processes. Mainly the

Koberg and Bagnall (1981) design process was adopted as web developing framework

and the implementation phase of the P process was adopted (For the adopted design

process model, see Figure 3).

The design process of Koberg and Bagnall (1981) fits the web developing

process. However, the implementation phase is not specific enough. P Process model is

similar to the process model developed by Koberg and Bagnall (1981); it focuses more on

development and implementation. Therefore, the implementation phase of the design
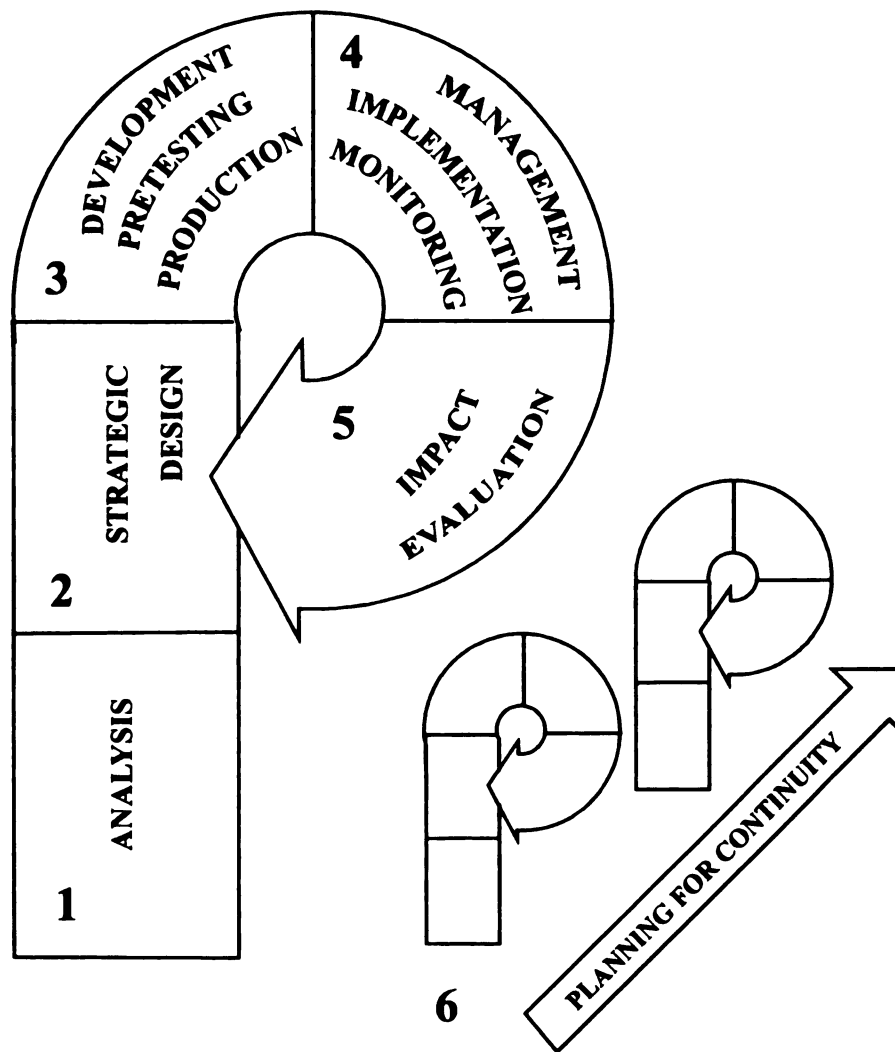
Figure 2. A Systematic Process for Developing Strategic Communication Programs (Porter, Novelli and Associates, 1983)

PHASE I			PHASE II		PHASE III
ACCEPT	**ANALYZE**	**DEFINE**	**IDEATE & SELECT**	**IMPLEMENT**	**EVALUATE**
General Statement of the problem	Analysis of baseline data about sun protective knowledge & practices Review of literature	Specific statement and research objectives	Design criteria of developing a web site ■ Web design environment ■ Information design ■ Interface design ■ Interaction design	Production, Testing/Revision, Dissemination of the Web site	Implementation and Analysis of Web evaluation

Figure 3. Activity / Information flow process for the development and evaluation of UV protection Web site (adapted from Kogberg & Bagnall, 1981 and Porter et al., 1983)

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process was specified and divided into actual production, testing/revision, and

dissemination, which were adapted from the P process (See Figure 3).

CHAPTER III

METHODOLOGY

This study was designed in conjunction with a project developed and directed by Ann C. Slocum, Ph. D. and Joanne Schultink, M. S., Department of Human Environment and Design, at Michigan State University. The Michigan Agricultural Experiment Station (MAES) provided the financial support for the project, *Sun Protective Knowledge, Attitudes, & Practices of Youth, A Web-Based Research and Education Approach* (MAES 9438). That project contributed to one of the objectives of NC 170, *Occupational Safety and Health Through the Use of Protective Clothing.*

The project is divided into three phases. Discussion of method is arranged thus:

Phase one involves collecting and analyzing the baseline data of youths' sun protection knowledge and practices. Selection of participants, instrument development, data collection procedure, data analysis, and measurements of variables are discussed in this phase.

Phase two covers developing information on UV protection and designing a Web site to disseminate this educational information via the Internet. Web development environment settings and web design and development criteria based on the literature review are illustrated in this phase.

Phase three discusses implementing and analyzing the online evaluation survey. Sampling design, instrument development, data collection procedure, and data analysis are discussed in this phase.

Phase I: Sun Protective Baseline Data Collection

In order to deliver the information about UV protection to youth and parents / 4-H leaders, baseline data were collected on youths' sun protection knowledge, behavior and practices. Data were collected in mid-Michigan from January through July 1999.

<u>Instrument Development</u>

A two-page questionnaire was developed for youths aged 10 to 13, by a team of faculty and students in 1998-1999. The questionnaire contains items measuring youths' knowledge about sun exposure and skin cancer, youths' sun protection practices, parents' sun protection practices, peers' sun protection practices, and indirect experience of skin cancer. Questions 2 through 7 were adapted from Gahring (1996). The questionnaire was developed in two versions; one was a printed version, the other was an online version.

The online questionnaire for youths was entered in a survey program available through the Faculty Facility for Creative Computing, and responses were sent to a server on campus from which they were retrieved into the SPSS statistical program package. The online questionnaire was accessed through the home page of one of the project directors, Dr. Ann Slocum (for the printed version of questionnaire, see Appendix B).

<u>Selection of Participants</u>

Intended participants for this study were 4-H youths in 5th to 8th grades living in mid-Michigan. Middle school students were chosen as a target group because they are more exposed to outdoor activities and also participate in the 4-H youth program. Those youths are considered old enough to take responsibility for protecting themselves.

Because Michigan State University Extension provides an established vehicle for

providing educational programs to youth who participate in the 4-H Youth Programs, the survey was distributed through the selected 4-H Youth Programs network during February 1999.

Systematic variation in characteristics of the participants may exist because of the convenience sampling. Therefore care should be exercised in generalizing the results of this study to a population beyond that from which the participants were drawn.

Data Collection Procedures

The printed questionnaire for 5th and 8th graders was distributed to parents or guardians during February 1999 with an explanatory letter which contained the elements of informed consent. The letter for parents indicated that responses would be treated confidentially and that the results would be aggregated and reported as group findings. Parents chose whether to involve their child in the study. Questionnaires were returned in a self-addressed, business reply envelope that accompanied.

Online responses were obtained at a 4-H event at MSU in March 1999. Families of youth registering for one 4-H class that involved using computers, were contacted. Signed written consent forms were obtained from a parent or guardian of youths who participated in this survey before implementing the survey. After responding by clicking in the appropriate boxes, participants clicked the "Send" button, and online responses were sent electronically to the server in the Computer Center at Michigan State University.

Data Analysis

Data from the printed questionnaire were entered in SPSS, and accuracy of data input procedure was double-checked through manually matching the responses of the

survey with the SPSS data. A researcher and student team completed the work in August 1999.

Data from the online questionnaire were imported to SPSS. Descriptive statistics, such as frequency distributions and means were performed. Cross-tabulations, correlations, and t-test were used to analyze the data. Data were analyzed using the following measurements of variables.

Measurements of Variables

Theses variables were created to analyze the data.

1. Youth's knowledge about sun exposure and skin cancer

Part 1 of questionnaire, Sun Facts, consisted of the questions about the youths' knowledge about sun exposure and skin cancer. Responses to the true / false questions were recoded as a dichotomous variable: "0" = "Incorrect" and "1" = "Correct". A total knowledge score was created by summing correct responses to the first 10 questions.

Part 2 of questionnaire, Sun Habits, consisted of two subparts: one for measuring youths' sun protection practices, and the other for measuring parents' sun protection practices.

2. Sun protection practices of youth

Youths were asked how frequently they used four protective practices: wearing sunglasses; wearing a hat; using sunblock; and wearing a long-sleeved shirt. Frequency of using protection practices was reported as "Never", "About once a month", "About once a week", and "Every day". The response on each question was weighted based in a 30-day month so that a response of "Never" was scored as zero, "About once a month" as one, "About once a week" as four, and "Every day" a score of 30. The weighted score

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for the four items was summed and averaged to get a protection score.

The weakness of this measurement is that the responses of youths about their sun protection practices are not based on their actual recorded data but based on their estimation of sun protection frequencies.

3. Sun protection practices of parents

To measure parents' sun protection practices, youths were asked to respond whether or not their parents use sun protection when they go outside. Three items of sun protection, using sunblock, wearing a long-sleeved shirt, and wearing a wide-brimmed hat were asked for both mother and father. The responses on those questions were treated as a nominal variable: "0" = "No", "1" = "Yes". The number of protective practices used by parents, were summed to create a total sun protection practices score for parents. The total sun protection practices scores of parents ranged from 0 – 6 and were treated as interval variables. The weakness of this measurement is that we did not ask youths to respond how often their parents use sun protection practices, and these data are based on youths' perceptions regarding their parental sun protective practices, which might be different from the actual parental sun protective behavior.

Part 3 of the questionnaire, Background, consisted of three questions about experiences, Internet use, and demographic information. Three experience questions, whether they know someone who has skin cancer, whether their friends use sunblock, and whether they suffered severe sunburn the previous year, were asked and these were treated as nominal variables.

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Phase II : Creating a Web site

This researcher designed the Web site based on the guidelines from the review of literature, such as Maddux and Johnson (1997), Harbeck and Sherman (1999), and some web site design references. Also this researcher used Web development software, Macromedia® Dreamweaver 2 to design and develop the Web site, including making the online evaluation form. Generally the graphics for the web site were developed using the graphic development software, Adobe® Photoshop 5. Graphic and animation software, Macromedia® Flash 4 was used to create the Sun Wise quiz and graphics for the quiz.

In ideation and idea selection phases of design process model, considering the users' environment in relation to Internet access, this researcher determined which medium would be used to disseminate the information over the Internet. Based on current statistics and the literature with respect to users' Internet environment, the environment of developing a web site was decided.

General Web Developing Environment

To develop a web site, generally four things are considered before starting the task. Those are: operating systems, browsers, Internet connection speeds, and monitor resolutions.

The review of literature regarding Internet users' environment indicates that, primarily, web design procedures are mainly via the Windows 98 environment, and viewing is via Microsoft Internet Explorer browsers, because most Internet users use Windows (94%) as an operating system, and Microsoft Internet Explorer (75.45%) to browse the Internet (StatMarket, 1999). To maximize the acceptability of the UV protection web site to users, it was viewed and tested on both PC and Macintosh

platforms using two major browsers, Internet Explorer® and Netscape Navigator®.

The top proportion of Internet users (72.09%) adopted Microsoft Internet Explorer® browser version 4.0 or above and 21.09 % of users adopted Netscape Navigator® browser version 4.0 (StatMarket, 1999). These statistics indicate that most Internet common users (93.18%) use browser version 4.0 or above. More interactivities, such as roll over images and layering images, are supported by setting the browser 4.0 or above as target browser. In light of this, this researcher determined to design the UV protection web site based on Internet Explorer® 4.0 browser (Netscape Navigator® 4.0 browser was also highly considered and tested).

Most users use modems with dial-up connection speed of 28.8Kbps or 56.6Kbps to access the Internet (Ryder, 1997). Kbps stands for kilobytes per second. This researcher designed the web site, considering the appropriate download time based on users who have 28.8 Kbps modem speed.

Furthermore this researcher considered screen- or monitor- resolution, which relates to clarity of image, in design of the web site, because the wide range of displays and viewing conditions influence decisions regarding web development. At the time this study was conducted, web designers usually regard as a design standard a monitor resolution of 640 by 480 pixels for common users, because this setting might be the safest way to prevent users from having to scroll horizontally to view a wider design; another factor is that there are millions of 640x480 monitors still in use in schools, households, and other institutions (Niederst, 1999). Accordingly, this researcher followed the general rule and based her web site design on a monitor screen resolution 640 x 480 pixels standard.

<u>Design criteria of creating a web site</u>

1. Target group of the web site is 4-H youth aged 10 -13. The researcher considered users' age, level of language, complexity and length of contents in proposing the content.

2. Contents of the web site included information regarding the questions which elicited a lower rate of correct responses from the baseline data analysis. For example, the statistics of skin cancer, the relationship between weather and the possibilities of being sunburned, the relationship between skin tone and hair color, and the possibilities of getting skin cancer.

3. Use of graphics focused on engaging youth in the contents of the site. The sizes and numbers of images on a web page should be determined with consideration of reasonable downloading times. For facilitating the users' engagement with the contents, the researcher used at least one graphic for each page. For example, for the sun fact page, a smiling sun, wearing sunglasses, was used to convey the importance of wearing sunglasses to protect eyes from sun exposure. To visualize the rapid increase of new cases of skin cancer, this researcher developed a graph based on the review of literature about skin cancer statistics and presented it on the skin cancer page. For the sun protection page, photographs of youths wearing head wear and ski goggles, and graphics of sunscreens, were used.

4. The overall design and layout of the web page were made consistent through the use of color, page layout, and fonts. To control page layout, a table with fixed width of 600 pixels was utilized and it was center aligned. This allows consistent appearance of the site, and provides better readability via line length control, regardless of

monitor size or monitor resolution. The colors of each table background were matched with those of each page background. The tints or shades of page background color were used for table background color to create variety, but balance and unity of colors were considered closely. Different color schemes were used for each section. The borders of table were set up as invisible.

5. This researcher generally used 8-bit color depth for designing the web site and used web safe color palette (216 possible colors) when creating graphics for the web site. Over the entire Web site, blue, violet, orange and yellow were mainly used for general backgrounds and table backgrounds. The families of those colors, i.e. tint or shade colors of those four, were also used to create variety while balance and unity was preserved. The color of each table background matches the color of each page background.

6. To provide easy navigation for users, the navigation bar was set at the top of each page; this achieved a consistent appearance, and gave navigation control to users. Links to other pages were given at the bottom of each page. A navigation bar was consistently positioned at the top of each page to provide random accessibility of information to users. The bar consists of a "Home" button, a "Menu" button, and an "E-mail" button. By clicking the menu button, users can access the menu page to select other sections. By clicking the email button, users are provided with an email composition box. At the bottom of each page, links to other sections are provided to allow direct accessibility to any section from any other section (For the Sun Wise Web site, see Appendix E).

7. To provide users with brief information about each section and each link, the

researcher used "layers" whereby a short description sub-heading of each section is given for users' understanding. These are accessed by users' physical interaction, namely: moving their cursors over the title images of each section on the menu page. When users move the mouse beyond the image, the image-associated message about the section disappears.

8. Proportional fonts, Verdana or Arial of 14pt or larger, were mainly used for readability. Some typography on the web site was developed as graphics, to give more interactivities to users. Major headings of the web site were fully created as graphics, to control the appearance of typography.

<u>Organization of the Web Site</u>

The content of the Sun Wise Web site was divided into five sections: sun facts, skin cancer, sun protection, sun wise quiz, and web evaluation. The content of the site was developed and revised by the researcher and faculty in research meetings. Throughout the web development, the researcher referred to technical tips from these references: *Visual Quickstart Guide Dreamweaver 2 for Windows and Macintosh* (Towers, 1999) and *Web Design in a Nutshell* (Niederst, 1999). Especially for the quiz, this researcher obtained many helpful tips from the reference *Visual Quickstart Guide Flash 4 for Windows and Macintosh* (Ulrich, 1999).

Each page was developed via the design criteria and outline of contents.

<u>Sun Wise Quiz development</u>

The Sun Wise quiz and graphics of the quiz were created by the researcher from December 1999 to March 2000, using the graphic animation software, Macromedia® Flash 4. It was chosen as an authoring tool for developing an interactive quiz because it

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enabled the researcher to develop more interactivities for users. To view and participate in the quiz, users need Flash 4 plug-in, which can be downloaded from the Macromedia® web site. Links to the Macromedia® company web site were provided on the home page, introduction page, menu page, and Sun Wise Quiz page. Contents and the graphics in this quiz were mainly developed and created for youths aged 10 - 13. A research team of faculty and the researcher revised the content of the quiz.

Most graphics for the quiz were developed in Flash® 4 to reduce the graphic file size. Reduction of file size leads to shorter downloading time of the quiz file, so may increase user satisfaction.

The quiz consists of three parts: one introduction scene, seven questions about sun protective knowledge and practices, and an ending scene. The questions were developed and designed based on the data collection analysis (For the outline of the quiz, see Appendix D). Layout of each question is consistent (i.e. layout and font). The question comes first, with or without animated graphics, then multiple choices appear successively. In each question, three or more graphics describe the question or multiple choices.

Furthermore when quiz takers finish the quiz, the ending scene appears to give them the choice of either going back to restart the quiz, or advancing to participate in the web evaluation. At any time during the quiz, users may go to the menu page by clicking the menu button provided at the top of the quiz page, or, by clicking links at the bottom of the quiz page, going directly to other pages which are provided.

Testing and Revision of the Web Site

Testing of the web site was done on both PC and Macintosh platforms in March

2000. Tests were implemented via research in both 102 Human Ecology Computer Lab, where PCs are available, and in 134 Communication Arts and Sciences, Digital Media Arts and Technology (DMAT) lab, where Macintosh platforms are available. The researcher tested the web site using both Microsoft Internet Explore® and Netscape Navigator® browsers.

Accordingly this researcher could assume a high proportion of Internet users use PC. To maximize the acceptability of the web site to target audience, testing the web site on both platforms, PC and Mac, and using two major browsers, Microsoft Internet Explorer® and Netscape Navigator® is required, because what users look at depends on what kind of browsers and monitor resolution they use (Niederst, 1999). These tests supported considerations of reliability of appearance and interactive functions of the web site on each browser, and reduce unpredictability factors in which the web site does not appear as its designer intended.

Appearance of the web site, such as overall design, layout, color, and fonts, was checked based on the reviewed literature and web design criteria (Niederst, 1999; Siegel, 1996; & Pirouz & Weinman, 1997). Navigations and other technical functions (i.e., links, downloading time, layering, and survey format) of the web site were tested based on the literature (Alexander & Tate, 1999; Niederst, 1999; Maddux & Johnson, 1997; Siegel, 1996).

The sun safety project site, Sun Wise Web site, was launched on the AFS space of research project director, Dr. Ann Slocum for disseminating the educational information, and for implementing the web evaluation (For the Sun Wise web site, see Appendix E or visit the URL, http://www.msu.edu/user/aslocum/sun/sunwisehomepage.htm).

Phase III : Evaluation of the Web Site

Instrument Development

       This researcher developed online questionnaires for youth and adults to evaluate

the Web site. These were edited and critiqued by the research team and went through

several revisions from October 1999 to February 2000. Questionnaires covered the

appropriateness of contents, graphics and overall design of the Web site, points

emphasized in the review of literature (Clark et al., 1997; Harbeck & Sherman, 1999;

Maddux & Johnson, 1997). Participants of this web evaluation are able to evaluate the

Web site and submit the evaluation forms online.

       Two versions of the online web evaluation questionnaire were developed, one for

elementary and middle school youths, and the other for adults. The youth web evaluation

questionnaire consists of sections about contents, design, graphics, and functions on the

web site; youths also were asked to indicate their previous knowledge level about sun

protection and their demographic information. The researcher developed five faces

ranging from frowning to smiling, whereby youths would answer each question. (For

youth online web evaluation questionnaire, see Appendix E). Adults were asked: (1) to

evaluate the contents of the web site from a child's perspective, (2) to evaluate the

design, graphics and links/accessibility of the web site from their own adult perspective,

and (3) to indicate their previous knowledge and experience regarding sun safety, and

their demographic information (For adult online web evaluation questionnaire, see

Appendix E). Both web evaluation forms were provided with text field panels, for

respondents to provide comments and suggestions about the web site. Before their

participation in the web evaluation they were informed that their answers are anonymous

and will be aggregated with those of others.

The online web evaluation questionnaires for youth and adults were entered in a survey program available through the Faculty Facility for Creative Computing. Responses were sent to a campus server from which they were retrieved into SPSS on a local computer. The online web evaluation questionnaires were a part of the web site and were accessed from the main menu of the site.

Samples and Data Collection

Youths, their parents, and adult leaders/staff of the 4-H youth program were recruited through the 4-H network to participate in visiting and evaluating the Web site.

Packets of explanatory letters regarding the sun wise web site evaluation were mailed to 132 leaders of 4-H Youth program in March 2000. A packet consists of one explanatory letter for the leader and three letters for parents. A pre-stamped follow-up postcard was attached to each letter. The 4-H youth program leaders were asked to participate in the web evaluation and also to distribute the letters to parents asking them to participate in visiting and evaluating the web site and also encouraging their children to do so. A total of 396 explanatory letters and pre-stamped follow-up post cards were mailed to leaders for distributing and recruiting parents affiliated to the 4-H youth program. Letters to parents contained elements of why they are being contacted, why they need to be concerned about UV protection, and a request that they participate in the online web evaluation. In the follow-up pre-stamped postcards, 4-H leaders and parents were asked to return information about whether they completed the online questionnaire, or whether they have difficulties regarding the Internet connection or the web site. The online web evaluation, for middle school youth, were self-administered and guided by

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parents or guardians.

Twenty-five 4-H staff were contacted by mail, and 18 faculty in apparel and textiles were contacted by mail or electronic mail, for reviewing and evaluating the site. Fifteen undergraduate students were recruited in a protective clothing class, and 73 graduate students in the Department of Human Environment and Design were contacted by electronic mail.

Both youth and adult online evaluation responses were electronically sent to the server in the Computer Center at Michigan State University, after participants responded by clicking in the appropriate boxes for answering questions and the "Send" button.

Data Analysis

Numeric data were directly imported into SPSS but string data were coded into numeric values manually by this researcher. Frequency distributions, means, cross-tabulation, and one-way ANOVA were used to explain respondent tendencies towards the web site. For analysis of web evaluation, information score, aesthetic score, and functional score were created by summing and averaging questionnaire items for each topic (For viewing the results of analysis of the evaluation of the web site, see the Chapter V: Analyses and Findings: Phase III).

CHAPTER IV

ANALYSIS AND FINDINGS

This chapter reports investigation findings. This researcher analyzed survey responses from the baseline data collection in phase one. Youths' sun protection knowledge and practices were correlated with parents' sun protective practices and direct/indirect experiences of youth. Also youths' attitudes toward the use of the Internet, and Internet access environment, were reported.

The result of the web site development was illustrated in phase two. Pretest of the site was reported according to this researcher's self-testing at three different places with different platforms.

Online web evaluation responses were analyzed in phase three. Youths' responses were compared with adults', to describe correspondences with the aesthetic and functional aspects of the web site.

Phase I : Analyses of Baseline Data Collection

Demographic Information

In the initial data collection, 84 youths in mid-Michigan provided information about sun protective knowledge and practices, either online or in paper format. The questionnaire was developed with youths aged 10 -13 in mind. Nearly half of the respondents were between 7 and 12 years of age; 28.5 % of them were between 13 and 15 years of age; and 21.4% of them were 16 to 18. They were predominantly Caucasian

(92.2%, n = 77) and female (83.3%, n = 84) with a mean age of 12.83 years (N = 82).

Youths' Knowledge Regarding Sun Exposure

Over half (58.3%) of the 84 youths correctly answered 8 or more of the 10

questions about "Sun Facts". Youths under 12 showed lower scores on all sun fact

questions, than the whole group (See Table 1). The lowest proportion of correct answers

Table 1. Differences of Sun Protective Knowledge between Two Age Groups

Sun facts Questions	Valid % of correct answer		
	Whole group [1] (N=82)	Age ≤12 (N=40)	Age >12 (N=42)
1. Can the sun's rays make your skin look older and more wrinkled by the time you're 50?	91.7 %	82.5%	100%
2. Do more people get skin cancer than any other kind of cancer?	59.5 %	55.0%	64.3%
3. Can you get a sunburn when it's cloudy?	67.9 %	45.0%	88.1%
4. Are tanning salons bad for your skin?	84.5 %	75.0%	92.9%
5. Are people with red or blonde hair more likely to get sunburns than other people?	61.9 %	45.0%	76.2%
6. Can people die from skin cancer?	90.5 %	82.5%	97.6%
7. Can anyone get skin cancer?	97.6 %	95.0%	100%
8. Can the sun do anything that hurts your eyes?	97.6 %	95.0%	100%
9. When is the sun the strongest?	94.1 %	92.5%	95.2%
10. Good sun block has an SPF number. Which SPF number would protect you the most?	94 %	87.5%	100%

[1] Two respondents did not indicate their age.

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of youth arose from questions about the influence of clouds (# 3), about personal coloring (# 5), and about the incidence of skin cancer (# 2). Therefore, those ideas were emphasized to reinforce the information in the educational material.

The mean knowledge score was 7.7 out of ten questions. This result paralleled the study of Fritschi et al. (1992), which reported Australian adolescents had 76.3% correct answers on knowledge questions.

Research Question 1: Is there a relationship between sun protective knowledge score and age?

Correct responses of question 1 through 10 were summed to create a knowledge score (For questionnaire of baseline data collection, See Appendix B). There was a difference of the means for the two age groups. Older youths, 13 to 18, were more knowledgeable about sun exposure or related facts about skin cancer than those 12 years or younger (See Table 2).

Table 2. Mean Total Knowledge Score by Age Group

Age group	N [1]	Mean	S.D.
Whole group	84	7.74	1.55
Age ≤ 12	40	6.88	1.57
Age >12	42	8.48	1.02

[1] Two respondents did not indicate their ages.

When the total knowledge score was correlated with age, the results were statistically significant at .01 level of significance (r = 0.558), indicating that older youths had higher knowledge scores than younger youths.

Sun Habits and Protective Practices of Youth

Eighty percent of youths responded that they played outside every day, but their

sun protective experience and practices were very limited. For example, less than a third

of youths wore sunglasses, sun blocks, and hats everyday. A large proportion (30% -

70%) reported never using protection or using it only once a month (See Table 3).

Table 3. Percent Reporting Outdoor Activities and Sun Protective Practices

On a sunny day in the summer, how often do you:	Everyday	About once a week	About once a month	Never
Play game or sport outside (N=83)	79.5%	18.1%	2.4%	0%
Wear sunglasses (N=81)	30.9%	38.3%	16.0%	14.8%
Wear a hat (N=81)	17.3%	30.9%	22.2%	29.6%
Wear sunblock (N=83)	27.7%	42.2%	19.3%	10.8%
Wear a long-sleeve shirt (N=80)	0%	22.5%	17.5%	60%

Table 4. Mean Weighted Protection Practice

Questions	Whole group (N = 82 [1])	
	Mean	S. D.
Wear sunglasses	10.95	12.89
Wear a hat	6.64	10.86
Use sunblock	10.19	12.42
Wear a long-sleeved shirt	1.08	1.62

[1] There were two missing data.

The frequency of using protective action was weighted on the basis of 30 days a

month. The mean number in Table 4 indicates the average number of days using sun

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protection per month. For example, the average practice of youths using sunglasses was about 11 days per month. Youths indicated that they rarely wore long-sleeve shirts on a sunny day. The differences in sun protection practices between two age groups, age 12 or less and over 12, are illustrated in Figure 4.
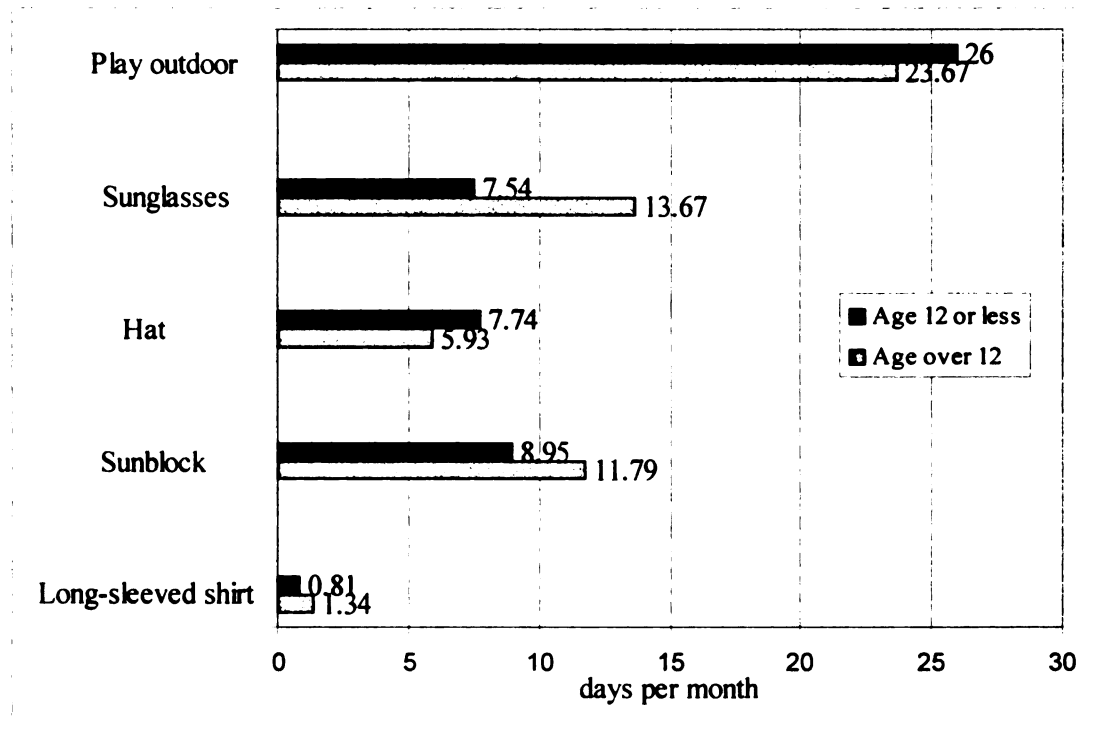
Figure 4. Mean Weighted Protection Practice by Age Group

As shown in Figure 4, younger youth were more likely to go outside and play games every day (82.5%, N = 39) than older youth (76.2%, N = 42), but they were not as likely to use sunglasses and sunblock as those aged 13 –18. They were more likely to wear a hat in the sun than youths over 12. Except for wearing a hat, youths 12 or younger showed lower sun protection practice scores than youths aged over 12.

Mean total protection score (an average of the four practices) of younger youth

was 5.94 (N = 36), and that of older youth was 8.06 (N = 40). The researcher used T-test to compare the difference of mean scores between those age groups; however, the result was not statistically significant (t = 1.71, p = .091).

Research Question 2: Is there a relationship between sun protective knowledge scores and average weighted sun protection scores of youths?

When youths' knowledge scores were correlated with their total weighted sun protection scores, the results were statistically insignificant. This is consistent with Fritschi, et al. (1992) who found that there were no associations between attitudes and knowledge or behavior of Australian adolescents toward sun protective practices.

Tendency of Parental Sun Protective Practices

Youths' responses about their parents' practices with respect to sun protection showed that their mothers were more likely to wear sunblock (73.8%) rather than long-sleeve shirts or brimmed hats, and their fathers were more likely to wear brimmed hats (71.4%) rather than sun block or long sleeve shirts (See Table 5).

Table 5. Youths' Responses about Parental Practices of Sun Protection

What do your mother or father usually do when going outside in the sun?	Mother		Father	
	Yes	No	Yes	No
Use sunblock	73.8%	26.2%	25.0%	75.0%
Wear a long sleeve shirt	21.4%	78.6%	32.1%	67.9%
Wear a hat with a brim	32.1%	67.9%	71.4%	28

It may be that mothers find using sunblock natural because they are used to applying make-up. Fathers may be more likely to wear long sleeve shirts because they work outdoors longer or have more outdoor activities than mothers. It may also be that the use of hats by fathers is not related to sun protection, it may be their sartorial custom or habit of wearing a baseball cap.

Research Question 3: Does a youth's perception toward parent's behavior with respect to sun protection seem to influence youth's sun protective practices?

To obtain sun protective scores of each parent, the researcher summed the numbers of sun protective items that each used outside. There was no statistically significant correlation between total mean weighted protection scores of youths and sun protection scores of their mothers ($r = .124$, $p = .286$) or between the mean weighted protection scores of youths and sun protection scores of their fathers ($r = .186$, $p = .108$).

These results might be because youths may not accurately report parent actions toward sun protection. It may be that the measurements were not precise enough to capture a relationship between them. A detailed measurement about parents' and youths' sun protective behaviors might show a relationship.

Youth perceived that their parents had a low rate of using sun protection. This study did not ask parents about their use of protection practices or whether they encouraged their children to use sun protection. Informing youths and their parents of the importance of sun protection simultaneously, may increase the effectiveness of educational material.

Influence of Peers' Sun Protective Practices

Research Question 4: Did peer behavior influence youths' behavior regarding sun protection?

One-way ANOVA was also used to compare differences in the average total protection scores between those whose friends used sunblock when going outside, and those who did not. Results showed that there was no statistically significant difference between the scores of youths' sun protective practices (F = .410, p = .524). However, when friends used sunblock, the mean protection score was slightly higher.

Table 6. Youth's Total Weighted Sun Protection Scores in Relation to Peer's Use of Sunblock

Answer	N[1]	Mean	S.D.
Youths whose friends wore sunblock	45	7.43	5.37
Youth whose friends did not wear sunblock	30	6.60	5.61

[1] There were 9 missing data.

Direct / Indirect Experiences of Youth

The direct influence of sun overexposure experience and indirect experience with respect to skin cancer were analyzed in relation to protection practices.

Research Question 5: Is there a difference in behavior between youths severely sunburned the previous summer, and youths were not sunburned?

Researchers used the one-way ANOVA to compare the total weighted sun protection scores between youths who suffered a bad sunburn the previous year and those

who did not. There were no statistically significant differences between the scores (F= 2.953, p= 0.090). But there was a trend for youths who had a bad sunburn experience to practice more protection (See Table 7).

Table 7. Difference of Youths' Sun Protection Score in related to Sunburn Experience

Answer	N^1	Mean	S.D.
Youth who had a bad sun burn last year	41	8.15	5.86
Youth who did not have a bad sun burn last year	33	6.00	4.65

[1] There were 10 missing data.

Research Question 6: If youths know someone who had skin cancer, is their behavior in relation to sun protection more positive than others who do not?

One-way ANOVA was used to compare the difference on the two protection scores. There was no statistically significant difference on the protection scores of youths, between those who knew someone who had skin cancer and those who did not (F = 1.432, p = .235). But the trend was in the anticipated direction. Those who knew

Table 8. Youth's Total Weighted Sun Protection Score in relation to Indirect Skin Cancer Experience

Answer	N^1	Mean	S.D.
Youth knew someone who had skin cancer	22	8.24	5.84
Youth did not know someone who had skin cancer	52	6.58	5.30

[1] There were 10 missing data.

someone who had skin cancer had higher score indicating that they took more protective action (See Table 8).

Youths aged 12 or less also showed lower scores on "Do you know anyone who has skin cancer?" (17.5%, N = 40), than the whole group (26.2%, N = 82).

Internet Accessibility and Preference of Youth

Base line data showed that three quarters of youths usually accessed the Internet at school (75.0%, N = 84) and that they also liked to use the Internet (78.6%, N = 84). These were the potential sample group that may visit the UV protection web site and may give their feedback and comments through web evaluation. Only 44 % of youths were able to access the Internet at home; from these we should be able to obtain a sample to provide feedback about the web site, with their parents. Fifteen percent of respondents reported that they did not use the Internet. Only two participants said they did not like to use the Internet.

Phase II: Results of Creating a Sun Wise Web site

The results of the developed Web site are shown in Appendix E. The Sun Wise Web site consists of five sections: Sun Facts, Skin Cancer, Sun Protection, a Sun Wise Quiz and a Web Evaluation.

Sun Facts

The Sun Fact section consists of four sub-sections: what UV radiation is; positive and negative effects of UV radiation; factors influencing UV radiation; and UV index.

In the UV radiation section, this researcher discussed the characteristics of UV

radiation and what it can cause. In the effects of UV radiation section, both positive and negative effects of UV radiation are mentioned. Factors influencing amount of UV radiation are time of the day, season of year, weather condition, and ozone condition of the region.

The UV index, prediction of the next day's level of UV exposure, indicates the degree of caution which should be observed outdoors. The researcher provided a link to the Environment Protection Agency for more information about the UV index.

Skin Cancer

The Skin Cancer section consists of four sub-sections: what skin cancer is, statistics of skin cancer, signs and symptoms of skin cancer, and medical treatments of skin cancer.

More detailed information about types of skin cancer, melanoma and non-melanoma can be found on the links to the American Cancer Society web site, provided for adults. For youth users, a link to the sun protection information page on the American Cancer Society web site is provided. The researcher briefly discussed signs and symptoms of melanoma, ABCD rules and medical treatments for skin cancer.

Sun Protection

The Sun Protection section consists of three sub-pages; general tips for UV protection, UV protective clothing, and sunscreen and sunblock. There are links to the information for adults prepared by other research team members.

In the general tips page, the relationship between sun overexposure and risks of getting skin cancer are discussed. This researcher discussed the necessity of awareness of sun exposure, and of available methods of protection from overexposure. General tips

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for sun protection were provided on this page.

In the UV protective clothing page, clothing, hats, and sunglasses are discussed. The researcher recommends tightly woven and dark colored clothing for summer, especially a long-sleeved shirt. The general idea of covering one's body for sun protection is emphasized. The wearing of a wider brimmed hat (at least 3 inches) shading one's face, nose, ears, and back of neck, is recommended. For selection of appropriate sunglasses for eye protection from the sun, those with labels indicated 95-99% UVA and UVB protection are recommended.

In the sunscreen and sunblock page, this researcher provided information on sunscreen and sunblock, tips for selecting a sunscreen, and appropriate application tips and dosages of sunscreen. Description of the SPF can be obtained by users' mouse-over movements on images on the page; there are both photographs of sunscreen and sunblock or SPF rated sunscreen bottle graphics.

Sun Wise Quiz

The layout of each question is consistent in appearance. The question comes first with or without the graphics, and then choices appear successively. In each question, three or more graphics describe the question or multiple choices. Most of the graphics in this quiz are interactive by the users' mouse-over movement, and showing short descriptions about the answer. These physical interactions of users are required to obtain the results of their choice and confirm the right answers.

Furthermore, interactive buttons, which are located at the bottom of the quiz, have navigational functions to lead users to previous or next questions by users' mouse-clicking actions. When they complete the quiz, they have choices at the ending scene of

the quiz: to go back and restart the quiz, or advance to participate in the web evaluation. At any time during a quiz, users may go to the menu page by clicking the menu button of the navigation bar, provided at the top of the quiz page, and/or to click the links at the bottom of pages, to go directly to other pages. This navigation bar was provided on each page for users' random access to information.

Web Evaluation

In the web evaluation section, two types of evaluation forms are offered, one for youths, the other for adults. The youth's web evaluation consists of questions about the informational, aesthetic, and functional appropriateness, and their satisfaction with those aspects. Viewers also are asked to indicate their previous knowledge level about sun protection and their demographic information.

Adults are asked to evaluate the informational aspects of the web site from a child's perspective, then to evaluate the aesthetic (design and graphics) and functional (links/accessibility and download time) aspects of the web site from their own perspective. They also are asked to indicate their demographic information. Both web evaluation versions provide a text field to provide comments and suggestions about the web site. Furthermore, before they participate in the web evaluation, users are told that their answers are anonymous and will be aggregated with those of others.

Results of Testing and Revision of the Web Site

The functional aspects (i.e. navigations, links, downloading time, layer, and survey format) and aesthetical aspects (i.e. overall design, layout, color, and properties of fonts) were evaluated. Most functions and appearance of the site were shown as the researcher intended for web development, on both platforms using Internet Explorer®

4.0, while some visual inconsistencies with this researcher's intention were shown on both platforms using Netscape Navigator® 4.0. For example, the background image of the table on the menu page looked scattered and incomplete because the table structure interfered with it. This researcher handled this problem by eliminating the rows and columns of the table. The revised web site was updated on March 28, 2000.

Phase III : Analysis of Online Web site Evaluation

Researchers contacted a total of 273 adults: 132 4-H leaders, 25 4-H staff, 18 professionals in Apparel and Textiles, 15 undergraduate, and 73 graduate students, for them to participate in this web evaluation. Three packets for leaders were returned by post office. Seven parents and three leaders reported that they did not have the Internet access through the follow-up post cards. There were 49 adult responses and 53 youth responses.

<u>Demographic Information</u>

Fifty-three youths participated in the online web evaluation. The questionnaire was developed with youth aged 10 –13 in mind. Sixty-two percent of respondents were 10 to 13 years of age; 19% of them were ages 7 to 9; and 18.8% of them were between 14 and 17 years of age. The average age of respondents was 11.61 years. Almost two-third of them were Caucasian (66.0%, n = 53), and about one quarter was Asian (24.5%, n = 53). More than a half of the young respondents were female (58.5%, n = 53).

Forty-nine adults provided responses via the online web evaluation. They were respectively college students (49.0%), concerned parents (18.4%), 4-H leaders (14.3%), faculty (10.2%), and 4-H staff (8.2%). They are predominantly female (87.8%) and

Caucasian (73.5%).

Most youth said that they had no previous knowledge (22.6%) or did not know much (45.3%) about sun safety. In contrast 61% of adults reported being somewhat knowledgeable, while an additional 20% reported they were very knowledgeable (See figure 5). Some 28.6% of adults reported that they had read about, or had attended a program on, sun safety.

Figure 5. Previous knowledge about sun safety of adults and youth
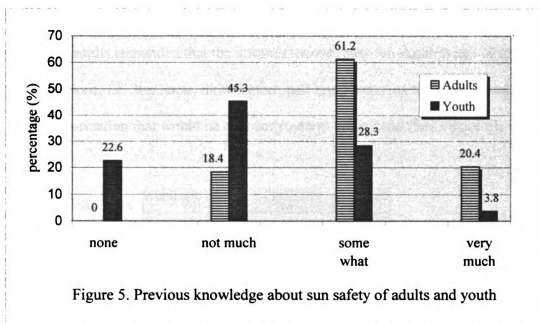
Information Aspect of the Web Site

Research Question 7: Is the information on the web site perceived to be appropriate for youth?

Ninety-five percent of youths visited the Sun Protection and Sun Wise Quiz sections; and about 80% of them visited the Sun Facts and Skin Cancer sections on the web site. Most adults visited all four sections of the web site.

Ninety-eight percent of youth either strongly agreed (58.5%) or agreed (39.6%) to

the question of the easy of understanding information on the web site. More than half the youth and about 75% of adults reported that the Sun Protection section provided the most useful information. Twenty-eight percent of youths answered that Sun Wise Quiz was the most useful.

Most youths indicated that they enjoyed the Sun Wise Quiz (92.3%: agree or strongly agree, n = 52) and that the Sun Wise Quiz helped them understand the importance of sun protection (94.2%: agree or strongly agree, n = 52).

Most adults responded that the information was easy for children age 10 to 13. All three sections, i.e. Sun Facts, Skin Cancer, and Sun Protection were perceived as providing information that would be easy for youth to understand (See Figure 6).

Figure 6. Adult responses on whether information on the web site
is easy for kids to understand
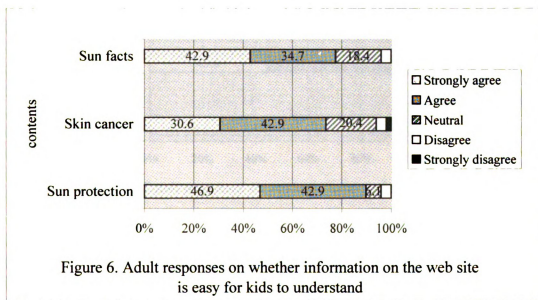
About 87.5% of adults reported that the information on the web site helps children understand the connection between UV protection and skin cancer. Also most of them agreed that the information on the web site is helpful for them to teach children about sun safety. All nine adults who looked at the web site with a child reported that children

seemed to learn how to protect themselves from the sun while they were browsing the web site.

<u>Aesthetic Aspect of the Web Site</u>

<u>Research Question 8</u>: Are the graphics and design of the web site perceived as aesthetically appealing and adding interest to the contents?

Most youths and adults showed that they were satisfied or pleased with the design and graphics, and they perceived that the layout and color of text helped to convey the main message of the site. Most adult respondents reported the graphics supported and added interests to the contents (See Figures 7 and 8).
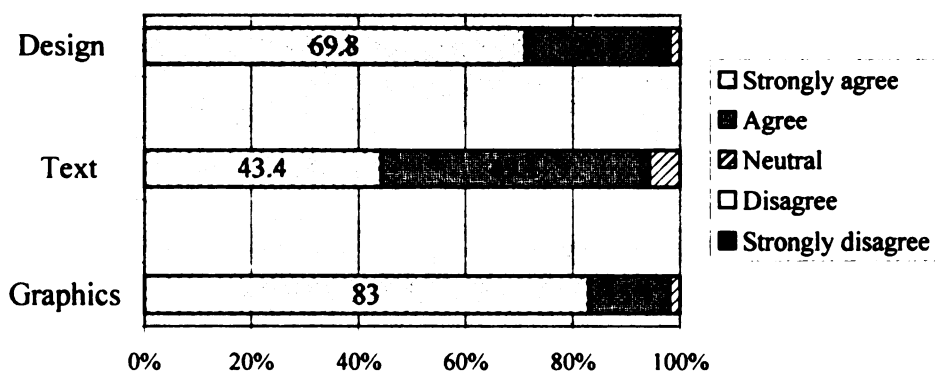
Figure 7. Youth responses on aesthetic aspect of the web site
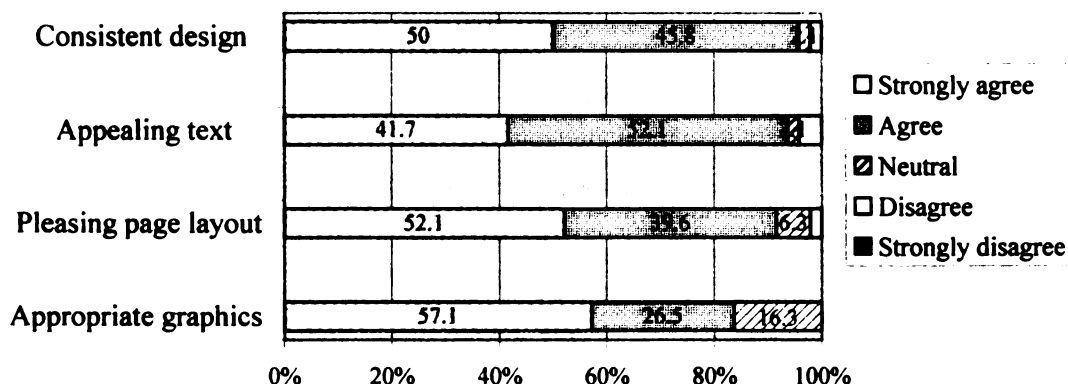
Figure 8. Adult responses on aesthetic aspect of the web site

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Functional Aspect of the Web Site

Research Question 9: Are the functions (navigations, downloading time) of the web site

positively perceived?

More than 80% of adult and youth respondents reported that the navigational

buttons were obvious and easy to use to browse the web site. Both groups reported that

downloading time of the graphics was reasonable (See Figure 9).
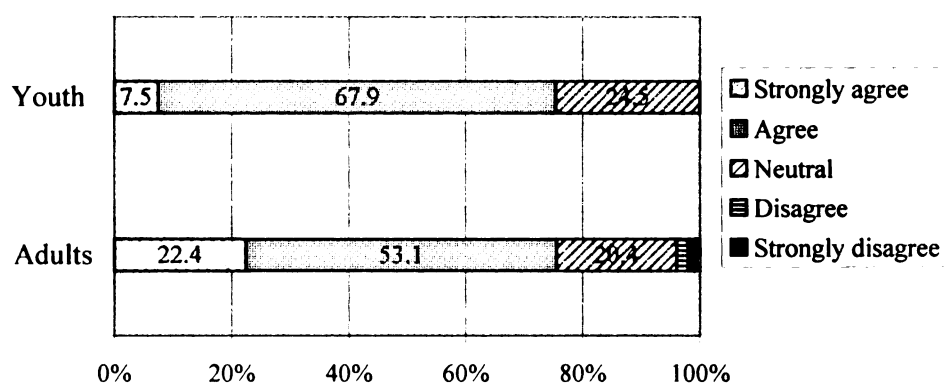
Figure 9. Comparison of two group responses in relation to
satisfaction of downloading time

Research Question 10: Are the links perceived as useful in providing more information?

About three quarters of the youths reported that they visited the link, "Sun

protection for children" provided by the American Cancer Society and about 40 % of

youths visited the link, "UV index" provided by the Environmental Protection Agency.

Less than 20 % of youth visited the link, "Treatments for skin cancer", "Melanoma skin

cancer", and "Non-melanoma skin cancer (See the Figure 10)." Most youth (83.0%, n =

53) reported that information on the links was useful.

Figure 10

	0%	20%	40%	60%	80%	100%
UV index	39.6			60.4		
Sun protection for kids	75.5				24.5	
Melanoma skin cancer	17	83				
Non-melanoma skin cancer	9.4	90.6				
Treatments for skin cancer	20.8	79.2				

◻ visited
◻ did not visit
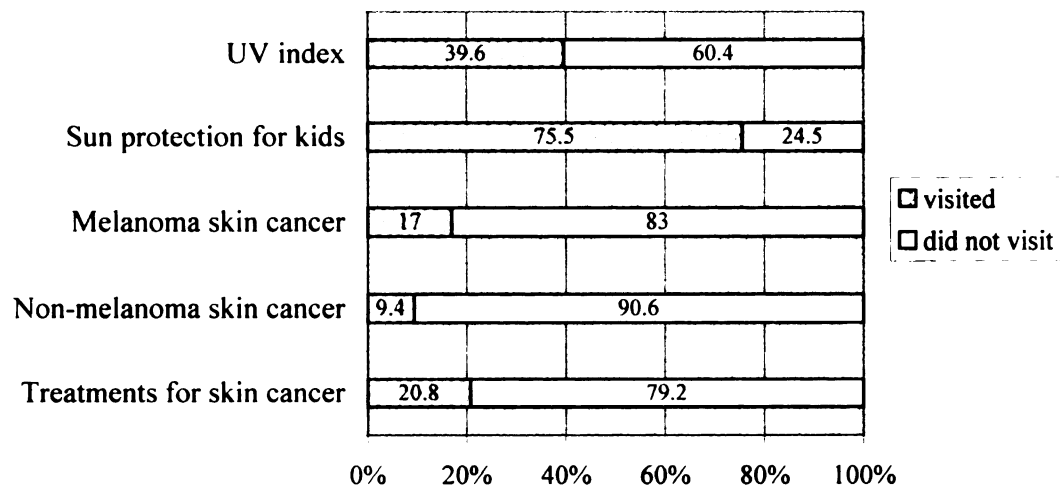
Figure 10. Percentage of youth visiting links

Forty-two to 63% of the adults visited each of the links, which were provided on the web site (See Figure 11). Most adults (97.7%, n = 49) reported that information on the links was useful.

Figure 11

	0%	20%	40%	60%	80%	100%
UV index	63.3			36.7		
Sun protection for kids	63.3			36.7		
Melanoma skin cancer	46.9		53.1			
Non-melanoma skin cancer	40.8		59.2			
Treatments for skin cancer	42.9		57.1			

◻ visited
◻ did not visit

Figure 11. Percentage of adult visiting links

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Variations of the Web Evaluation

Research Question 11: Does evaluation vary with demographic background and with

level of prior knowledge on sun safety?

The researcher averaged the sum of the responses to questions in each section:

content, design and graphics, and navigation and downloading time, to create

informational score, aesthetic score, and functional score. A higher score indicates a

more positive response.

The researcher used one-way ANOVA to see if the evaluation differed by youths'

age, sex, ethnicity, and browser. No statistically significant differences on those scores

were found; however, some trends were in the anticipated directions. Youths aged

between 10 to 13 showed slightly higher information mean score than the other two age
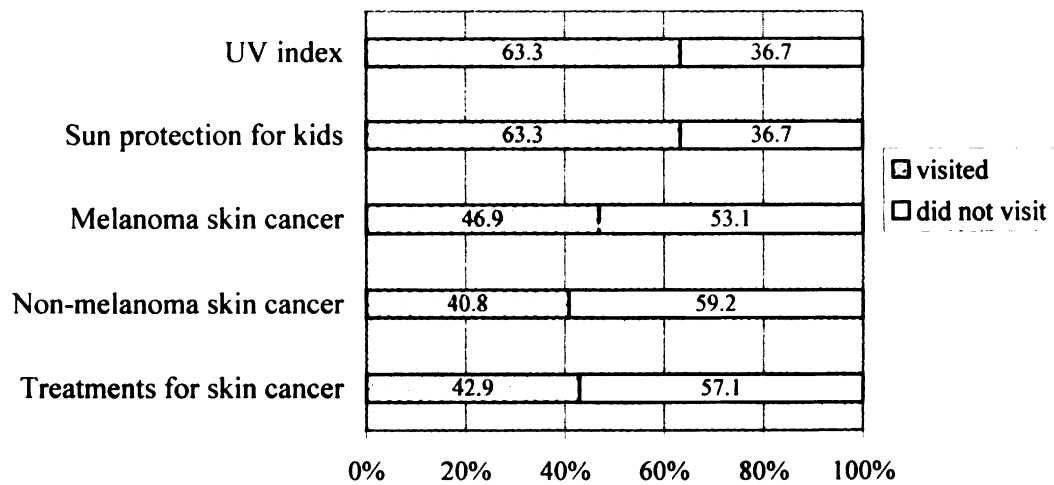
groups, those under 10, and those over 13. Caucasians youth showed a slightly higher

aesthetic score than others. Youths who used Internet Explorer® had a slightly higher

score on the aesthetic aspect of the web site than those who used Netscape Navigator®

(See Table 9).

4-H leaders, staff and professionals in apparel and textiles showed lower

information mean scores and functional mean scores than did concerned parents and

college students indicating a less positive evaluation by leaders and professionals. The

differences of informational score and functional score among these groups were

statistically significant (See Table 10). When the informational mean score was

compared with each level of previous knowledge, youths with the lower level of previous

knowledge evaluated the information on the web site more positively. When

informational scores were correlated with their levels of prior knowledge, the results

were statistically significant at the 0.01 level (r = -.382, p = .007).

Table 9. Informational, Aesthetic, and Functional Mean Scores of Youth in Relation to Demographic Variables and Browser Usage

	Information	Aesthetic	Function
Age			
7 – 9 (n = 10)	4.40	4.53	4.15
10 – 13 (n = 32)	4.63	4.66	4.13
14 – 17 (n = 10)	4.40	4.64	4.14
F	1.24	.28	.01
Significance (p)	.30	.75	.98
Sex			
Male (n = 22)	4.53	4.64	4.09
Female (n = 30)	4.54	4.62	4.16
F	.01	.01	.34
Significance (p)	.92	.91	.56
Ethnicity			
African American (n = 2)	4.50	4.50	4.25
Asian (n= 12)	4.56	4.56	4.12
Caucasian (n=35)	4.50	4.64	4.13
Hispanic (n=1)	4.67	4.33	4.50
Others (n=2)	5.00	5.00	4.00
F	.46	.57	.26
Significance (p)	.76	.68	.90
Browser[1]			
Netscape Navigator (n =14)	4.50	4.53	4.07
Internet Explorer (n =18)	4.67	4.76	4.28
America Online (n = 5)	4.53	4.83	4.10
F	.52	1.92	1.31
Significance (p)	.60	.16	.28

[1] There were 16 missing data.

Table 10. Informational, Aesthetic, and Functional Mean Scores of Adult Groups in relation to Their Demographic Information and Browser Usage

	Information	Aesthetic	Function
Who they are			
Concerned parent (n = 9)	4.71	4.72	4.06
College student (n = 24)	4.23	4.50	4.29
4-H leader (n = 7)	4.06	4.45	3.79
4-H staff (n = 4)	3.60	4.00	3.25
Professional in A&T (n = 5)	3.96	3.96	3.90
F	3.35	1.83	3.13
Significance (p)	.02	.14	.02
Ethnicity			
African American (n = 3)	4.13	4.44	4.33
Asian (n = 10)	4.24	4.55	4.00
Caucasian (n = 35)	4.21	4.42	4.04
F	.03	.18	.30
Significance (p)	.97	.84	.74
Browser			
Netscape Navigator (n = 21)	3.98	4.09	3.89
Internet Explorer (n = 19)	4.46	4.73	4.16
America Online (n = 3)	4.13	4.72	3.67
Others (n = 2)	3.90	4.67	4.75
F	2.38	5.40	1.78
Significance (p)	.08	.003	.17

As shown in Table 10, adults who used Internet Explorer® or America Online®

browsers had higher aesthetic scores than those who used Netscape Navigator®

browsers. One-way ANOVA was used to compare the differences of aesthetic mean

scores among those who used Internet Explorer®, Netscape Navigator®, and AOL®

browsers to view the web site, and the results showed there was statistically significant at

the 0.01 level.

The adult responses were not significantly different from youth's responses. Both groups' responses showed that they are generally satisfied with the contents, design, graphics, and functions of the web site.

Internet and Browser Usage

The youth respondents reported they used respectively Internet Explorer (48.6%, n = 37), Netscape Navigator (37.8%, n = 37) to browse the site. America Online was the third most used browser (13.5%, n = 37) in this study, while adult respondents reported they used Netscape Navigator (46.6%), Internet Explorer (42.2%), AOL (6.6%) and others (5.1%).

About 60% of adults reported that they frequently use the Internet for obtaining information, while 30% reported that they sometimes seek information via the Internet. Only four adult respondents reported that they do not use the Internet much. Follow up postcard responses showed that six of the contacted parents and three leaders of the 4-H youth program did not have an Internet connection at home and could not participate in the online web evaluation.

CHAPTER V

SUMMARY AND DISCUSSION OF FINDINGS

This chapter includes the purpose of the study, the limitations of the study, the conclusions of the findings, and implications for further research and practice.

Summary

The primary purpose of this study was to develop an educational web site on sun protection for 4-H youth. As a first step, the research team investigated the knowledge and practices of youth in mid-Michigan regarding protection from the sun. Eighty-four 4-H youths participated in this procedure. This researcher intended to ascertain the relationship between their sun protective practices and predictor variables such as their sun protective knowledge scores, the sun protective practices of their parents, the sun protective practices of their friends, their previous UV overexposure experiences, and their indirect experiences concerning skin cancer.

Based on the analysis of baseline data and a review of the literature, the researcher developed an educational web site to disseminate information about sun safety to youths, their parents, and other concerned adults via the Internet. The web site consists of five sections: Sun Facts, Skin Cancer, Sun Protection, a Sun Wise Quiz and a Web Evaluation for youths and adults. In addition, external links were provided for further information, including: UV index, sun protection for children, skin cancer information, and treatments for skin cancer. Testing of the web site was carried out by the researcher to ensure the appearance of the site on a different platform and browser prior to

implementing the web evaluation. An online evaluation of the Web site was conducted

to measure the appropriateness of the informational, functional and aesthetic aspects of

the site. Both youth and adults responded.

Limitations of the Study

Generalizations of the findings of phase I are limited to the population represented

by the respondents: 4-H youth who were recruited through the 4-H network in mid-

Michigan. However, it is reasonable to expect some commonality among youths living

in similar subdivisions across the United States.

Evaluation of the web site is limited to a convenience sample of those youths and

adults who are recruited through the 4-H network, and selected undergraduate and

graduate students. A purposive sample of professionals in apparel and textiles was also

invited to make a critical review of the appropriateness of the web site materials for

youths.

Discussion of the Findings

Phase I : Discussion of Baseline Data Collection

Eighty-four youths aged seven through 18 completed the survey about sun

protection knowledge and practices, either online or through a printed questionnaire.

Nearly three quarters of the respondents were between age seven and 15. The majority of

the subjects were Caucasian and female.

Youths aged 12 or less had a lower level of sun protective knowledge and sun

protective practices than those over 12 years of age. There was a statistically significant

correlation between youths' age and sun protective knowledge, however; there was no association between youths' knowledge scores and practices scores. This is consistent with previous findings of Fritschi, Green, and Solomon (1992).

Most youth respondents reported that they played outside every day; however; their sun protection practices were very limited. Only about 30% of youths responded that they wore sunglasses or sunscreen every day. A long-sleeved shirt was the most unlikely worn item by youth. Youths aged over 12 were more likely to wear sunglasses and sunblock than those who were age 12 or less. Other studies also have reported low use of sun protection practices by adolescents. Banks et al. (1992) reported only nine percent of youths (N = 213) in their study used sunscreen all the time, and 33% never used sunscreen. Labat et al. (1996) found that 16.6% of youths (N = 1047) in their study, in grades 5 and 6, answered that they always wore sunscreen, 12.6% of them (N = 1047) stated they always wore a hat for outdoor activities, and 0.8% of them (N =1047) indicated they always wore long sleeved shirts in the sun. The results of the frequency of wearing long sleeved shirts for sun protection in this study, contrasts with those of Fritschi et al. (1992) who stated that Australian adolescents, who on summer weekends spent long periods in the sun, wore shirts for the majority of the time spent outdoors. They did not, however, use hats or sunscreen for more than half their total time in the sun.

The researcher found some differences on the protection score of youths in relation to their direct or indirect experiences, but the differences were not statistically significant. Having a severe sunburn in the previous year, having friends who used sun protection, and knowing someone who had skin cancer, did not explain the protection

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score. The researcher's finding about friend's use of sunblock is inconsistent with the findings of Banks et al. (1992). They (1992) reported that having a best friend who routinely uses sunscreen increases the chances that a teenager would use a sunscreen (odd ratio = 3.0, p = .001). The reason for inconsistent results in this researcher's study might be that the number of observations was insufficiently large to show the difference between two groups. A larger sample would have provided a better indication of the relationship.

The widely held belief that adolescents spend long periods outdoors and do not regularly follow recommended sun protection guidelines was confirmed in this research. Therefore, educators and administrators of health program need to consider this to develop programs or activities regarding sun protection and UV protection. This study did not find an association between parents' sun protective practices and youths' practices although. Banks et al. (1992) reported that adolescents were more likely to use sunscreen if their parents had insisted on its use in early childhood. Therefore, changing parental attitudes and practices toward sun exposure, and providing sun safety information, is important. It is a good idea to provide educational information for both parents and youths to consider the importance of sun protection.

Statistically insignificant findings of the relationships between youths' sun protection knowledge score and protection practice score, and between youths' protection score and parental protective practice, pose questions for conducting research and developing educational materials. Did youths estimate and report accurately the frequencies of their practices and their parental practices regarding sun protection? Was the measurement of this survey sufficiently sophisticated to obtain a good estimate of

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their sun protective actions? Did youths' perceptions about their parental and peers' protective practices match actual practices?

These questions might be resolved by developing a more precise measurement for youths to report their activities regarding sun protection, perhaps using a dairy or daily log chart, or having scales with more response categories. For example, youths who participate in the study may be asked to log the length of time and number of their protection practice items that they wore, such as sunscreen, long sleeve shirt or pants, wide brimmed hat, and sunglasses for a given period, say a month in the summer season. And youths may be asked to write in their sun protective journal their own experiences and feelings about using those protective items. This might provide for a good way in which to reflect on their sun protective behaviors, and might reinforce the importance of sun protection according to their own protective experiences.

An alternative is implementing sun protective practice questionnaire surveys to both youths and parents, to match youths' reports with parents' reports about their practices, and investigate the similarity or differences of two responses, and the reasons for those. In-depth interviews of parents and youths also may help research understanding of their sun protective beliefs, attitude and practices.

Phase II : Discussion of Creating an Sun Wise Web site

Developing a web site was a challenge. Planning the components of the web site, information, design, and functions, was the most important stage for implementing actual production of these components to fit the primal purpose. Graphics were created to add interest to the contents and support them. The researcher created several ideations to

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determine the final ones, and suggests that while developing graphics for the web site, a designer should bear in mind certain guideline requirements: reasonably fast downloading time and high interactivities. If the graphic is too large, it will take longer to download and will lose some of the audience who are not willing to wait. Designers should provide reasons for users to stay at the site and to return to it. Those reasons might be quality of information, an aesthetically pleasing environment, and user-friendly navigation tools.

This researcher prepared the design and evaluation criteria from her own experiences and the literature review, which together suggest that web development criteria for educational purposes should include the following aspects:

1. Identify target audience.

This researcher had baseline data of sun protective knowledge and practices of 4-H youth. This was very useful to develop the contents of the web site. The things that this researcher missed on the baseline data collection were target users' preference in relation to the Internet environment. According to the Internet environment of target users, a researcher or designer may prepare his or her own design criteria for the web site. Users' connection types also affect the usage of graphics and this information was not obtained in the first data collection.

2. Maintain a consistent look to the overall design and layout of the web site.

This researcher set the table width with 600 pixels and center aligned it to improve the readability of text and to manage design and graphics consistently. The overall design of the web site is a set of portals to convey the information to users, and it is as important as the information itself because users will perceive the information via

the page design.

3. Provide easy navigation tools to access information.

This researcher provided control of access information to users, but also guided them by means of a menu page. The top and bottom of each page has the navigational tools which allows them random access and linear access. Whenever users go astray they can come to the menu page and select the information. A site map also may provide visual layout of the information hierarchies of the web site.

4. Test the web site prior to launching it over the Internet.

A designer cannot totally control the user's Internet environment. Notwithstanding provision of consistent appearance of typography using graphics, many things are not controlled by the designer. The researcher discovered a few problems viewing the web site, developed based on Internet Explorer®, while using Netscape Navigator®. This is why testing of the web site is important using other browsers. Ensuring the aesthetic and functional aspects of the site is achieved before finally publishing the site over the Internet. The revision and update of the site can be followed by the testing phase and these are invaluable to keep the web site current and accurate.

Phase III : Discussion of the Online Web Site Evaluation

Fifty-three youths and forty-nine adults participated in the online web evaluation. More than half the youths are Caucasian and female. Adult respondents are predominantly Caucasian and female. Most youth respondents reported that they did not know much about sun safety, or knew nothing at all. Most adults reported being somewhat knowledgeable or very knowledgeable. Most youths and adults visited all four

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sections of the web site before their web evaluation.

Informational aspect of the web site

The information on the web site was highly perceived by youths and adults to be easy for youth. Both groups perceived the Sun Protection section as the most useful information on the web site. This result may be explained by the fact that respondents already perceive the significance of skin cancer and the causal link between sun overexposure and skin cancer. Their previous knowledge might lead them to expect some advice about a practical way to protect themselves from the web site.

Most adults reported that the information on the web site helps children understand the connection between UV protection and skin cancer. Also they agreed that the information on the web site is helpful for teaching children about sun safety. All nine adults who looked at the web site with children reported that children while they were browsing the web site seemed to learn how to protect from the sun. These parental observations were too small in number to make a generalization; however, these results indicate that youth who visited web sites with their parents might learn how to protect, and suggest an educational value of the web site.

Aesthetic aspect of the web site

Most youths and adults reported that the design and graphics of the web site were aesthetically pleasing and supported the contents, and that the properties of the text successfully conveyed the main message of the site. This result was consistent with the researcher's primary purpose of using graphics and text criteria.

Most youths indicated that they enjoyed the Sun Wise quiz and that the quiz helped them understand the importance of sun protection. Adults commented on the

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positive effects of using graphics and animations for educational purposes over the Internet. This result was consistent with this researcher's expectation about youths' reactions towards, and satisfactions with, graphics and animation and this might support expanded use of animation and graphics for the online education environment. Some adults recommended that adding more graphics on the web site would achieve the expectation of youth and then may help them learn more efficiently.

This researcher did not find statistically significant differences on the scores by youths' age, gender, ethnicity, and level of previous knowledge; however, some trend for those scores were found. Most youths ranked highly the appropriateness of the information on the web site. Youths aged ten to 13, target user group of the web site, showed slightly higher information mean score than the other two age groups. This result tends to confirm the appropriateness of the contents on the web site for the target users.

Prior knowledge of adults seems to influence adult rating of the appropriateness of information on the web site. Adults who reported being knowledgeable ranked the information on the web site as easy; and those who reported being somewhat knowledgeable ranked it as highly easy for youth.

The differences in adult evaluation scores for information and function were statistically significant among subgroups. 4-H leaders/staff, and professionals in apparel and textiles had lower scores on information and function than did concerned parents and college students. This difference may be due to the level of expectation or amount of exposure to the web environment.

About 40% of youth and adults used Internet Explorer to browse the site. Adults who used Internet Explorer or America Online browsers had higher aesthetic scores than

those who used Netscape Navigator browsers and the differences on these scores were statistically significant, while youths did not show significant differences on the scores. This result might be explained by the initial web-developing environment which this researcher set up. Current literature at the time of planning the web development showed that most current Internet users used Internet Explorer for browsing the web site. Based on such literature, this researcher determined to use Internet Explorer as the main browser to develop the web site. During testing phase, this researcher found no functional problems using both browsers; however, a few aesthetic problems using Netscape Navigator were detected and revised, but not all were completely solved. The appearance of the site mainly depends on the browsers and platforms that users use and it is extremely difficult to check all kinds of browsers and platforms. This researcher suggests that any researcher who designs and develops an web site should pay attention to testing the site using as many browsers as possible to ensure the appearance of the site.

Most adults reported that they frequently or sometimes use the Internet for obtaining information. Only four adult respondents reported that they do not use the Internet much. Follow-up postcard responses showed that six contacted parents and three leaders of 4-H youth program did not have the Internet connection at home. This result shows that many rural populations, including those in the 4-H youth program, have utilized the Internet technology to obtain information. Further research can find more specific reasons and the Internet environment of users to understand this tendency.

Recommendations for Future Research

The researcher suggests some pilot studies prior to developing an educational web site. Before beginning web site development, it would be helpful to collect information about users. First, collecting demographic information about target users, such as age, education, belief and values toward the topic that researcher is focused to disseminate to the users, may show researcher who the users are and what they believe. Second, information regarding users' Internet environments, such as types of platform, browser, monitor, and modem that they use, would give researcher some clues for determining the web environment for development. Third, information of users' preferences toward types of multimedia, such as video, audio, graphics, and text would present researcher what can be utilized to convey the contents and purpose of the web site to the users successfully. The research team obtained demographic information of the users in the initial survey, however, their Internet environment and preferences regarding types of multimedia was not gathered. Based on these baseline data, researcher may develop his/her own design criteria, which should fit the goal of the web site. This suggestion also might be adopted for other purposive web sites.

After developing a web site, self-pretest of the site on other platforms and browsers are strongly recommended. Researchers may need to test the site with the selected user group who are similar to the target group but who will not participate in the actual evaluation of the site later. Feedback of testing may provide some suggestions for revising the site.

The researcher asked the participants of the online web evaluation about which browsers they used to visit the web site but did not ask about their platform preference.

The reason why such information needs to be indicated is that the aesthetic appearance of the web site may depend on the platform and browser choices of users, i.e. those which they use. A good idea is to identify users' web environments in order to compare the their responses. Differences between their responses may be explained by the differences between their varying platforms, browsers or any other web environments; this information and recognition may point towards the wisdom of revising the web site accordingly.

Electronic mailing contact can be another way to recruit people to participate in the online survey. On electronic mails, this researcher could provide the URL of the web site and asked them to visit and evaluate it for future use. This would eliminate users' efforts in typing the URL, and allow them to visit the site by one mouse click. Potential respondents who have electronic mail address may be more likely to connect to the Internet regularly than others who do not have such addresses. Also this might increase the response rate, compared to printed mail.

APPENDICES

APPENDIX A

RECRUITING LETTER TO 4-H PARENT

FOR BASELINE DATA COLLECTION

April 13, 1999

Dear Parent:

A special invitation.

    We are developing of some exciting new 4-H educational material for kids ages 10-13 and for teens/young adults on the theme of *staying healthy in the sun*. We plan to make the information available through the Internet and other educational programs. The first step in developing the Web site is to find out what kids/teens already know about sun exposure, and what experiences, opinions and questions they have about the topic.

Why we chose sun exposure.

    We chose sun exposure because potential health effects of over exposure can be serious, and negative effects are best prevented when precautions begin in early life. Skin cancer is the most commonly occurring cancer in the United States, and studies generally conclude that all three types of skin cancer are related to sun exposure. Premature aging of the skin and increased incidence of cataracts have also been linked with sun exposure. Kids/teens need to be aware of sun precautions because the effects of sun exposure accumulate throughout life, and the majority of one's lifetime exposure (50 to 80%) occurs prior to age 18.

What we are asking you to do.

    If you are willing to have your child complete the questionnaire, which will take approximately 10-15 minutes, you can direct them to the Internet address below. While we hope that they will answer all questions, they may skip questions or stop without finishing the questionnaire. Answers are given by clicking with the left mouse button. At the end there is a place to click to submit answers. Responses will be anonymous--the questionnaires will not be linked to a name or e-mail address-- and will be combined with those of others. If you have questions please contact us at one of the addresses or phone numbers listed below.

              The URL for the survey for kids ages 10-13 is:
                    http://www.msu.edu/~aslocum/survey/intro.htm

              The URL for the survey for older teens and adults is:
                    http://www.msu.edu/~aslocum/survey/firstpg.htm
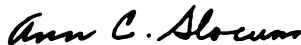
    Thank you so much for your interest and your help,
      Joanne Schultink   Ann C. Slocum, Ph.D.

      Extension Specialist   Associate Professor
      215 Human Ecology Bldg   214 Human Ecology Building
      Phone: 517-355-7704   Phone: 517-355-3779
      E-mail: joannes@pilot.msu.edu   ·   E-mail: aslocum@pilot.msu.edu

APPENDIX B

PRINTED SURVEY QUESTIONNAIRE

FOR BASELINE DATA COLLECTION

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SunWise Questionnaire
for Kids!

a penny for your thoughts!

Part 1 - Sun Facts
Check yes or no

Yes   No

____   ____   1.   Can the sun's rays make your skin look older and more wrinkled by the time you're 50?

____   ____   2.   Do more people get skin cancer than any other kind of cancer?

____   ____   3.   Can you get a sunburn when it's cloudy?

____   ____   4.   Are tanning salons bad for your skin?

____   ____   5.   Are people with red or blonde hair more likely to get sunburns than other people?

____   ____   6.   Can people die from skin cancer?

____   ____   7.   Can anyone get skin cancer?

____   ____   8.   Can the sun do anything that hurts your eyes?

Multiple choice
Circle the best answer to complete the sentence.

1.   The sun is the strongest from
   A.   9 a.m. to 11 a.m.
   B.   10 a.m. to 2 p.m.
   C.   11 a.m. to 3 p.m.
   D.   3 p.m. to 4 p.m.

2.   Good sunblock has an SPF number. Which SPF number would protect you the most?
   A.   SPF 2
   B.   SPF 15
   C.   SPF 8
   D.   SPF 12

Part 2 - Sun Habits
Put a check (✓) by your answer.

On a sunny day in the summer, how often do you:	every day	about once a week	about once a month	never
play games or sports outside				
wear sunglasses				
wear a hat				
use sunblock				
wear a long-sleeved shirt				

Put a check (✓) by all the answers that are true for your mom or dad. If you are not sure, leave it blank

What do your mother or father usually do when going outside in the sun?	MOTHER	FATHER
use a sunblock		
wear a long sleeved shirt		
wear a hat with a brim		

Part 3 - Background
Put a check mark by your answer.

1. Do you know anyone who has skin cancer? Yes _____   No _____

2. When your friends go outside on a sunny day in summer, do they put on sunblock?
   Yes _____   No _____   Sometimes _____   I don't know _____

3. Did you have a bad sunburn, one where the skin peeled, last year? Yes _____ No _____

Check all that are true:

I use the Internet at home _____   I like to use the Internet _____
I use the Internet at school _____   I do not like to use the Internet _____
I do not use the Internet _____

Age _____   Grade: _____   Sex: male _____ female _____

Ethnicity:
   African American _____   Asian _____   Caucasian _____   Hispanic _____   Native American _____

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APPENDIX C

OUTLINE OF THE WEB SITE CONTENT

APPENDIX C

OUTLINE OF THE WEB SITE CONTENT

A. Sun Facts section

    a. What UV radiation is

    b. The effects of UV radiation

    c. Factors influencing UV radiation

    d. UV index

B. Skin Cancer section

    a. What skin cancer is and types of skin cancer

    b. Statistics on skin cancer

    c. Visual symptoms of melanoma skin cancer

    d. Medical treatments for skin cancer

C. Sun Protection section

    a. General tips for sun protection

    b. UV protective clothing – clothing, hats, and sunglasses

    c. Sunscreens and sunblocks – what those are, what to choose, and tips for applying

APPENDIX D

OUTLINE OF THE SUN WISE QUIZ

APPENDIX D

OUTLINE OF THE SUN WISE QUIZ

Question

1. Higher SPF numbered sunscreen provides longer protection from the sun

2. More cover up the body, more protection you get

3. Darker colored clothing provides better protection from the sun

4. Wider brimmed hat provides better protection from the sun

5. The importance of year round protection from the sun

6. Be cautious about the reflection of the sunlight

7. Appropriate sunglasses for eye protection

APPENDIX E

SUN WISE WEB SITE

Welcome to Sun Wise Page!

Click the sun to enter

This site is best viewed using Microsoft Internet Explorer 4.0 or above.
To enjoy the Sun Wise Quiz in this site,
you need to download the Flash 4 plug-in.

APPENDIX E – II

INTRODUCTION PAGE

Hello all,

This site was developed for everyone who wants to learn more about sun safety. You will get information about sun facts, skin cancer, and sun protection while surfing this site and more information can be found in various links. The Sun Wise Quiz was developed with graphic animation. To enjoy this quiz, you need to download the <u>Flash 4 plug-in</u> by clicking on the link.

At the end of your visit, please complete the web evaluation. Your response will be anonymous and will be very helpful to us in revising the site.

Thanks again for visiting the site. We hope you will be sun wise all year long.

MENU ▶

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Welcome to Sun Wise Page!

sun facts

skin cancer

sun protection

sun wise quiz

web evaluation

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sun facts

UV Radiation - Invisible energy

UV (ultraviolet) radiation is an invisible part of the sun's energy. There are different kinds of ultraviolet rays based on their wavelength. Two types that reach the earth are UVA and UVB. UVA rays go deeper into the skin, causing wrinkles and skin aging. UVB rays cause burning and blistering on your skin.

Effects of UV radiation; Good news & Bad news

The sunlight is the source of the all life on earth. It lights up the earth and gives the solar energy to plants and animals to live. Also it assists in the production of vitamin D in skin cells. This vitamin is essential for the growth and development of healthy bones.

Doctors tell us that a small amount (10 - 15 minutes per day) of sun exposure is good for health, but sun overexposure can lead to a number of serious health problems, including malignant melanoma, other skin cancers, eye cataracts, weakening of the immune system, and premature aging of the skin. With reduced ozone protection, increased levels of UV radiation are reaching the earth's surface.

Factors influencing UV Radiation

- Time of day: When the sun is highest in the sky, UV radiation is intense.

- Season of year: The sun is strong in summer, intermediate in spring and fall, and lowest in winter. But even in winter, sun overexposure can occur because ice and snow reflect a large amount of UV radiation.

- Weather conditions: It is true that there is less UV radiation on a cloudy day, but clouds cannot absorb one hundred percent of the harmful rays. Sometimes clouds increase the UV radiation through reflecting it.

· Latitude: **Generally, the further** away from the equator, the less amount **of UV radiation.**

· Altitude: **The amount of UV radiation increases significantly with altitude because there is less atmosphere to absorb the UV radiation.**

· Ozone conditions: **Thicker ozone provides better protection from UV radiation and the thickness of the ozone layer varies by season and latitude.**

UV index

The UV index, developed by the National Weather Service and the Environmental Protection Agency, is a new component for local weather forecasts that predicts tomorrow's likely levels of exposure to UV radiation and also indicates the degree of caution you should take outdoors. The UV index predicts UV levels on a 0 to 10+ scale. The lower number means less exposure.

More information on UV index, what it is, how it is calculated, and UV crossword puzzle, is provided by the Environmental Protection Agency Web site.

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skin cancer

What skin cancer is...

It is a disease in which cancer cells are found in the outer layers of the skin and it is the most common of all cancers. There are two general types of skin cancer: one is non-melanoma cancer, which has been associated with cumulative sun exposure; the other is melanoma skin cancer, which has been associated with short, intense sun exposure.

- The American Cancer Society provides useful information on sun protection for kids. UV exposure, skin cancer, sun basics for kids, and sun quiz are available.

- More specific information about nonmelanoma skin cancer or melanoma skin cancer are found in the American cancer society web site.

Statistics of skin cancer

Non Melanoma Skin Cancer Statistics
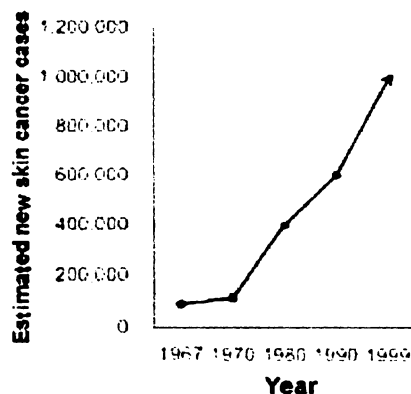
(Sources from the American Cancer Society, 1967, 1968, 1970, 1980, 1990, and 1999)

The American Cancer Society (1999) estimated that about 1 million cases of non-melanoma skin cancer (basal cell skin cancer and squamous cell skin cancer) and 44,200 new cases of melanoma would be diagnosed in the United States during 1999. Melanoma accounts for about 4% of skin cancer cases, but causes about 79% of skin cancer deaths. The number of new melanoma diagnosed in the United States is increasing. About 7,300 people in the US were expected to die of melanoma during 1999.

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Signs & Symptoms of melanoma

Asymmetry: One half of the mole does not match the other half.

Border Irregularity: The edges of the mole are ragged or notched.

Color: The color over the mole is not the same. They may be different shades of tan, brown, or black, and sometimes red, blue, or white.

Diameter: The mole is wider than about ¼ inch, although doctors are finding smaller melanomas in recent years.

Some melanomas do not fit the ABCD rule described above, so be aware of changes in your skin and see a doctor if you have questions.

Medical treatments for skin cancer

Surgery: taking out the cancer in an operation

Chemotherapy: using drugs to kill cancer cells

Radiation therapy: using high-dose x-rays or other high-energy rays to kill cancer cells

Biological therapy: using your body's immune system to fight cancer

- You can find information about treatments for melanoma skin cancer at Northeast Dermatology Associates web site.

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sun protection

- General tips for UV protection
- UV Protective Clothing
- Sunscreen & Sunblock
- More Information about sun protection for adults

General tips for UV protection

Too much sun exposure can lead to skin disease, including skin cancer !

Do you think tanned skin looks good? Many people do. Exercise and activities outdoor are good, but just be careful not to get too much sun exposure. Did you know sun overexposure can lead to skin diseases including skin cancer?

According to scientists, 50 to 80 percent of your lifetime sun exposure to UV rays occurs by the age of 18 to 20 years old. Therefore it is important for young people to protect themselves from sun overexposure.

General tips

- **Stay out of the sun at midday (10 a.m.- 4 p.m.)**

- Wear a **wide (at least 3") brimmed hat**.
- Wear **sunglasses** that provide 99-100% protection from UVA and UVB.
- **Cover your skin** as much as you can with closely woven clothing. Long sleeved shirts are a good idea, too.
- **Use sunscreen/sunblock** whenever you go outside and **reapply** every 2 hours.

- Experts suggest **Avoiding tanning beds and parlors**.

Continued - SUN PROTECTION PAGE

- More information about tanning beds for adults.

- More information about sun protection for kids can be found at the American Cancer Society web site.

Go to **UV protective clothing**

SunFacts I SkinCancer I SunProtection I SunWiseQuiz I WebEvaluation

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sun protection

- <u>General tips for UV protection</u>
- UV protective clothing
- <u>Sunscreen & sunblock</u>

UV protective clothing

Scientists suggested that the best form of protection is avoidance of UV rays and the use of UV protective clothing. Avoidance may not be practical for most of people, especially for kids and teens, who love to play outside.

For your UV protection, you can choose **tightly woven, dark color** clothing from your wardrobe. Dark color may make you hot but it provides you better protection because the dye pigments absorb UV rays and also visible light. If you are looking for more protection or you are sun sensitive, you can wear specially engineered UV protective clothing, which is a good way to enjoy outdoor activities and also protect ourselves from UV rays.

- More information about UV protective clothing for adults.

Hats also can give you protection. The most important thing to consider is how much they will shade you from the sun. The wider brimmed hat (at least 3 inches) shades your face, nose, ears and the back of your neck and can give you more protection than just a ball cap which will just barely cover your face. But remember, wearing any hat provides sun protection!

The overexposure of UV radiation can eventually lead to eye cataracts and other optical problems. Sunglasses can provide you with UV protection. But not all the sunglasses are the same. Select sunglasses labeled 95-99% UVA and UVB protection.

- More information about sunglasses for adults.

Go back to **General tips**   **Sunscreen & Sunblock**

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sun protection

- General tips for UV protection
- UV protective clothing
- Sunscreen & sunblock

Sunscreen & Sun block

Sunscreen can effectively protect your skin from UV rays, when you cannot wear clothing for your protection; for example, swimming at the beach or pool.

Sunscreen is usually a cream or lotion that is SPF rated. Sunscreen reacts with chemicals in your skin to offer you protection by absorbing the UV rays. Since this chemical reaction takes time to occur, you should apply sunscreens 30 minutes before your outside activities.

Sunblock is usually an opaque cream or paste containing zinc oxide or titanium dioxide which provides a physical shield from the sun. Sunblock protects you by reflecting the UV rays before they penetrate your skin.

Tips, Tips, Tips!

- **Reapply sunscreen every 1-1/2 to 2 hour.**

- **The SPF of a sunscreen can be decreased by humidity, wind, temperature, application thickness, sweat and water activities.** So, reapply sunscreen often under these conditions.

- Sunscreen can cause eye and skin irritation and may be oily or greasy. It is not recommended for babies less than 6 months old.

What you should get!

Many dermatologists suggest $\boxed{SPF\ 15}$ for general use. However, sunscreens come in lots of varieties. So, when choosing a product, first consider how much protection you need. If you have fair skin and light-colored eyes or a family history of melanoma, you might need a higher SPF than someone with olive skin or dark eyes. Some illnesses and medicine may increase sun sensitivity and warrant a high-numbered SPF. Some allergies could limit a sunscreen's effectiveness. You need to ask a doctor if you have these conditions.

How much you need to apply (Minimum amount for teens):

- Face and neck (1/2 tsp)

- Arms and shoulders (1/2 tsp. to each side)

- Torso (1/2 tsp. to front and back)

- Legs and tops of feet (1 tsp. to each side)

Thickness of application is important. If not enough is applied to the skin, SPF effectiveness could drop.

- More information about sunscreens for adults.

Go back to **UV protective clothing**

SunFacts I SkinCancer I SunProtection I SunWiseQuiz I WebEvaluation

SUN WISE QUIZ PAGE

Welcome to the SunWise Quiz

We hope you will have fun during your outdoor activities and remember, make sun wise choices!

START ●

All graphics in the Sun Wise Quiz were created by Ji-Hyun Kim. March 7, 2000

If you are unable to view the quiz, you need to download the <u>Flash 4 plug-in</u>.

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SUN WISE QUIZ - Question 1

Question 1

Which number of SPF will protect you the most?

SPF 2   SPF 8

SPF 15   SPF 30

▷

If you are unable to view the quiz, you need to download the Flash 4 plug-in.

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Question 2

Which of these can give you the most protection ?

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SUN WISE QUIZ - Question 3

Question 3

What color of long-sleeved
shirt will give you better
protection from the sun?

If you are unable to view the quiz, you need to download the Flash 4 plug-in.

SunFacts I SkinCancer I SunProtection I SunWiseQuiz I WebEvaluation

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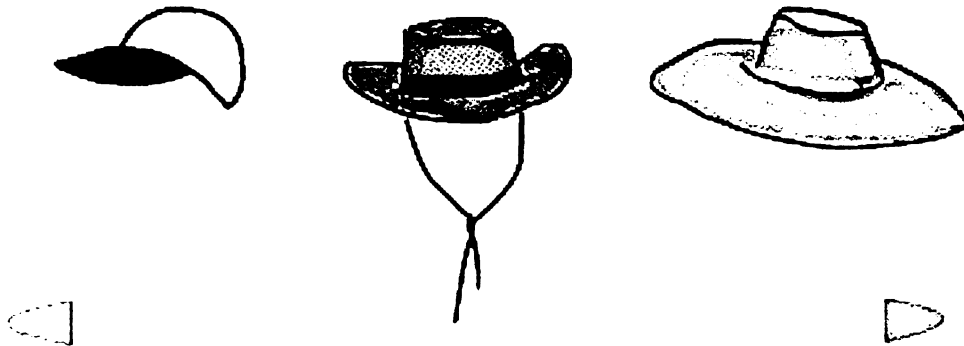
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SUN WISE QUIZ - Question 4

Question 4

Wearing a hat is a great idea for sun protection.

Which of these gives you better protection from the sun?

If you are unable to view the quiz, you need to download the Flash 4 plug-in.

SunFacts I SkinCancer I SunProtection I SunWiseQuiz I WebEvaluation

Disclaimer & Indicia , Project Credits

Question 5

When do you need to protect
you from the sun ?

At night   **Cloudy day**

                         spring summer
Sunny day only   **All season**
                         fall   winter

If you are unable to view the quiz, you need to download the Flash 4 plug-in.

SunFacts I SkinCancer I SunProtection I SunWiseQuiz I WebEvaluation

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SUN WISE QUIZ - Question 6

Question 6

Snow, sand, and water...
How are they alike?

Answer   They are related to fun &
outdoor activities and
also reflect UV rays.
So, when you go outside,
wear your sun protection
and have fun!!!

If you are unable to view the quiz, you need to download the Flash 4 plug-in.

SunFacts I SkinCancer I SunProtection I SunWiseQuiz I WebEvaluation

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Question 7

Wearing sunglasses provide
protection for your eyes.
Which of these can give you
the most protection ?

label indicating
99% of UVA & UVB
blocked

label indicating
UV blocked

No label

If you are unable to view the quiz, you need to download the Flash 4 plug-in.

SunFacts I SkinCancer I SunProtection I SunWiseQuiz I WebEvaluation

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SUN WISE QUIZ - Ending Page

Congratulation!
You successfully finished your Sun
Wise Quiz.
If you want, you may start the quiz
again or you may go and participate
in web evaluation now.

Thanks for visiting the SWQ!
Be sun wise all year long~

SWQ AGAIN   WEB
                         EVALUATION

If you are unable to view the quiz, you need to download the Flash 4 plug-in.

SunFacts I SkinCancer I SunProtection I SunWiseQuiz I WebEvaluation

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APPENDIX E - X

Online Web Evaluation Questionnaire

web evaluation

This Sun Wise Web site provides two evaluation forms, one for KIDS and the other for ADULTS.

Kids   Adults

Click the proper one for you !

SunFacts I SkinCancer I SunProtection I SunWiseQuiz I WebEvaluation

Disclaimer Indicia, & Project Credits

Welcome to our questionnaire on Sun Wise Web site evaluation !

This questionnaire is to evaluate the Sun Wise web site. We would like to hear what you think about the web site. Your feedback will help us revise the information and links for future users. It will take about 10 to 15 minutes and answer the questions below.

Your answers to these questions are anonymous and will be combined with those of others. If you have questions about this project or the web site, please contact us.

Your help is greatly appreciated!

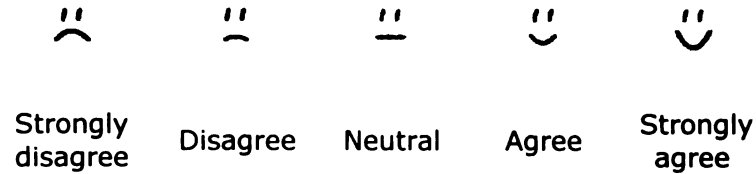Ann Slocum, Joanne Schultink, & Ji-Hyun Kim

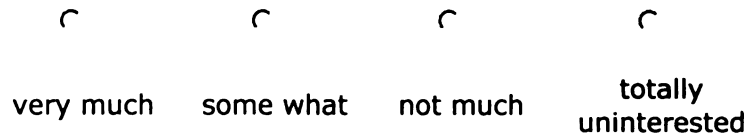aslocum@pilot.msu.edu, joannes@pilot.msu.edu,& kimjihyu@pilot.msu.edu

Click the sun to begin

KIDS WEB EVALUATION FORM

Click above the face that shows how you feel about each question.

''	''	''	''	''
⌒	‿	—	◡	◡
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

---

1. Before you visited this web site, how knowledgeable were you about sun protection?

⌐	⌐	⌐	⌐
very much	some what	not much	totally uninterested

2. Please click the sections you looked at.

⌐	⌐	⌐	⌐
Sun facts	Skin cancer	Sun protection	Sun wise quiz
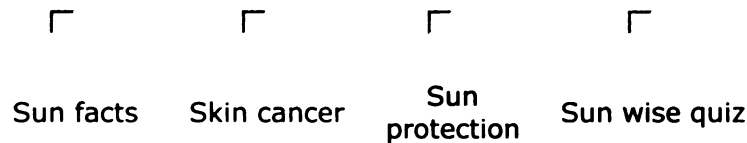
If you did not visit the section, please go back to view the information in it before answering the question. Click below the section to view it.

<u>Sun Facts</u>   <u>Skin Cancer</u>   <u>Sun Protection</u>   <u>Sun Wise Quiz</u>

3. It is easy for me to understand the information about sun facts, skin cancer and sun protection.

⌐	⌐	⌐	⌐	⌐
'' ⌒	'' ‿	'' —	'' ◡	'' ◡

4. I enjoyed the sun wise quiz.

⌐	⌐	⌐	⌐	⌐

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(at top, a row of five faces: angry, unhappy, neutral, happy, very happy)

5. The Sun Wise Quiz helped me understand the importance of sun protection.

    ○   ○   ○   ○   ○

6. The most useful information was ...

    ○   Sun facts

    ○   Skin cancer

    ○   Sun Protection

    ○   Sun Wise Quiz

7. I like the design (color, text and patterns) of the web site.

    ○   ○   ○   ○   ○

8. The layout and color of the text helped me get the main message of the page.

    ○   ○   ○   ○   ○

9. I like the graphics on the web site.

    ○   ○   ○   ○   ○

10. The web page came up quickly enough.

11. The buttons were obvious and easy to use.

12. Please check the links you visited.

☐ UV index

☐ Sun Protection for Kids

☐ Melanoma skin cancer

☐ Non melanoma skin cancer

☐ Treatments for skin cancer

If you checked a link above, was that useful?

○ Yes   ○ No   ○ Didn't work

13. I still have questions about ...

☐ Sun facts

☐ Skin cancer

☐ Sun protection

List questions

14. Please tell us which browser you used to view this site (i.e. Internet Explorer, Netscape Navigator, AOL browser ...) and give any comments or suggestion about the Web site.

| Your age | 7 ▾ | Click the pull-down list to check. |
| Your grade | 1st ▾ | Click the pull-down list to check. |

Your gender   ⊙ Male   ⊙ Female

Your ethnicity   ⊙   ⊙   ⊙   ⊙   ⊙

African American   Asian   Caucasian   Hispanic   Others

Be sure to click on the "Submit the evaluation" button below to **Su**bmit your answers.

Sub

Thank you so much for your participation!

Welcome to our questionnaire on Sun Wise web site evaluation!

This questionnaire is to evaluate the Sun Wise web site. The site has developed to disseminate recent information on sun safety for youth and adults.

We would like to hear what you think about the Sun Wise web site. Your feedback will help us revise the information and links for future users. It will take about 15 minutes and answer the questions below. There are a total of 20 questions arranged in three sections; (1) evaluation of content, design, graphic, and links/accessibility; (2) kids reaction about sun wise quiz; and (3) your background. There is also a place at the end for you to submit questions that you would like to have answered about sun safety or to make comments about web site.

Your answers to these questions are anonymous, your email address will not be associated with your response, and your answers will be combined with those of others. If you have questions about this project or the web site, please contact us.

Your help is greatly appreciated!

Ann Slocum
aslocum@pilot.msu.edu
Associate Professor

Joanne Schultink
joannes@pilot.msu.edu
Extension Specialist

Ji-Hyun Kim
kimjihyu@pilot.msu.edu
Research Assistant

Human Environment & Design

Michigan State University

East Lansing, MI 48824

Click the sun to begin

Adults Web Evaluation Form

Please click the check box(s) below to indicate which section(s) you looked at.

⌐	⌐	⌐	⌐
Sun Facts	Skin Cancer	Sun Protection	Sun Wise Quiz

Section 1. From a child perspective

Please tell us how you think a 10-13 year old would respond to this site.

Content evaluation

1. The information of the web site is easy for kids to understand.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Sun facts	○	○	○	○	○
Skin cancer	○	○	○	○	○
Sun protection	○	○	○	○	○

2. The information on the Web site helps kids understand the connection between UV protection and skin cancer.

○	○	○	○	○
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

3. In general, I think the most useful section for kids is ...

   ○   Sun facts

   ○   Skin cancer

   ○   Sun protection

4. As adults (parents or 4-H leaders), the information on the Web site is helpful for teaching kid(s) about skin cancer prevention.

C	C	C	C	C
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

5. You looked at the web site with child.

C   Yes   C   No -> go to question # 6

If yes, do you think the information in the web site helped kid(s) to understand the importance of UV protection?

C	C	C	C	C
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

If yes, did kid(s) seem to learn how to protect from the sun while surfing in the site?

C	C	C	C	C
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

6. Kids need to know more about ...

Section 2. From your perspective

Please tell us *your opinions* about the web site.

Design Evaluation

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7. The overall design (color, text and patterns) of web pages is consistent.

⌀	⌀	⌀	⌀	⌀
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

8. The properties of the text (font, style, size, color, pattern, etc.) are appealing.

⌀	⌀	⌀	⌀	⌀
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

9. The page layout is consistent and pleasing.

⌀	⌀	⌀	⌀	⌀
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Graphic Evaluation

10. I like the graphics on the web site.

⌀	⌀	⌀	⌀	⌀
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

11. The graphics add interests to the contents.

⌀	⌀	⌀	⌀	⌀
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

12. The graphics was appropriate to support the contents.

⌀	⌀	⌀	⌀	⌀
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

13. Graphics are downloaded with reasonable speed.

      C   C   C   C   C

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Links and Accessibility Evaluation

14. The buttons (navigation tools) are obvious and easy to use.

      C   C   C   C   C

Strongly disagree	Disagree	Neutral	Agree	Strongly agree

15. Please click the check box(s) next to the links that you visited.

☐ UV index

☐ Sun Protection for Kids

☐ Melanoma skin cancer

☐ Non melanoma skin cancer

☐ Treatments for skin cancer

16. Information on the links is useful.

C Yes   C No   C Did not work

Please tell us about your background

17. Were you generally knowledgeable about the topic of this web site, before you visited?

      C   C   C   C

very much   some what   not much   none

18. Have you read about or attended a program on Sun Safety?

C Yes   C No

19. How often do you use the Internet for getting information?

       C   C   C   C

Frequently   Sometimes   Not often   Not at all

20. Please tell us which browser you used to view this site (i.e. Netscape, Internet Explorer, AOL browser...) and any comments about the web site.

You are...   [concerned parent ▼] (Choose one from the pull-down list)

or other, please explain |

Your gender   C Male   C Female

Your ethnicity   C   C   C   C   C

African American   Asian   Caucasian   Hispanic   Others

Sub

Thank you so much for your participation!

APPENDIX F

RECRUITING LETTERS FOR ONLINE WEB EVALUATION

APPENDIX F – I

RECRUITING LETTER TO 4-H PARENT

MICHIGAN STATE UNIVERSITY

COLLEGE OF HUMAN ECOLOGY
DEPARTMENT OF HUMAN ENVIRONMENT AND DESIGN

EAST LANSING • MICHIGAN • 48824-1030

March 24, 2000

Dear Parent,

We need your help!

We have developed a web site which contains educational material about sun safety. In developing the project we used published studies and information collected last year about the sun protective practices of youth in mid-Michigan. Before we advertise the web site and link it to the 4-H web page, we need some feedback from adults and young people. That is why we have contacted you. We hope that you and your child can each take a few minutes to visit the web site and fill out the on-line evaluation questionnaire.

Why we chose sun exposure.

We chose sun exposure because the potential health effects of over exposure can be serious, and negative effects are best prevented when precautions begin in early life. Skin cancer, premature aging of the skin and increased incidence of cataracts have all been linked with sun exposure. Kids need to be aware of sun precautions because the effects of sun exposure accumulate throughout life, and the majority of one's lifetime exposure (50 to 80%) occurs prior to age 18.

How you can help

First, would you please visit the web site and complete the on-line adult evaluation form. Second, would you ask your son or daughter to visit the web site and complete the evaluation form for kids. Looking at the web site and completing the forms will take approximately 15-25 minutes. All responses will be anonymous. Your answers will not be linked to a name or address, and they will be combined with the response we receive from others. Your participation and that of your child is, of course voluntary, but we do hope that you will help us. It is really important for us to receive reactions so that we can make revisions. Also, please fill out the attached post card and drop it in the mail so that we know about any problems you have in making connection. We would appreciate an early response, by the 10th of April if possible. The URL for the web site is:

http://www.msu.edu/~aslocum/sun/sunwisehomepage.htm

If you have any questions or concerns about this project please contact one of us. Our addresses and phone numbers are listed below.

Thanks you so much for your interest and your help,

Joanne Schultink, M.S.	Ann C. Slocum, Ph.D.	Ji-Hyun Kim, B.S.
Extension Specialist	Associate Professor	Research Assistant
215 Human Ecology Bldg	214 Human Ecology Building	404 Human Ecology Bldg.
Phone: 517-355-7704	Phone: 517-355-3779	Phone: 517-355-3779
E-mail: joannes@pilot.msu.edu	E-mail: aslocum@pilot.msu.edu	E-mail: kimjihyu@msu.edu

APPENDIX F – II

FOLLOW-UP POSTCARD TO 4-H PARENT

Please check one or more statements to describe your situation. Then drop this pre-stamped post card in the mail for us.

☐ I/we completed and submitted the online web evaluation.
  Where? ☐ at home   ☐ at school/ work   ☐ at the library   ☐ other

☐ We didn't/couldn't download the quiz ("plug-in").

☐ I/we didn't complete the questionnaire because
  ☐ I don't have access to the Internet.
  ☐ I tried but could not connect to the web site.
  ☐ Sorry, I didn't have time.
  ☐ Kids are not interested.

Thank you so much again for your interest and your help!

APPENDIX F – III

RECRUITING LETTER TO 4-H LEADER

MICHIGAN STATE UNIVERSITY

COLLEGE OF HUMAN ECOLOGY   EAST LANSING • MICHIGAN • 48824-1030
DEPARTMENT OF HUMAN ENVIRONMENT AND DESIGN

March 24, 2000

Dear 4-H Leader,

We need your help!
We have developed a web site for 4-H youth which contains educational material about sun safety. In developing the project we used published studies and information collected last year about the sun protective practices of youth in mid-Michigan. Before we advertise the web site and link it to the 4-H web page, we need some feedback from adults and young people. That is why we have contacted you

Why we chose sun exposure.
We chose sun exposure because potential health effects of over exposure can be serious, and negative effects are best prevented when precautions begin in early life. Skin cancer, premature aging of the skin and increased incidence of cataracts have all been linked with sun exposure. Kids need to be aware of sun precautions because the effects of sun exposure accumulate throughout life, and the majority of one's lifetime exposure (50 to 80%) occurs prior to age 18.

Three ways that you can help.
First, as 4-H leaders, we hope that you will visit the sunwise web site and complete the on-line adult evaluation form. Your feedback will be very helpful to us in revising and enhancing the web site. This will take approximately 15-25 minutes. Your response will be anonymous. The response will not be inked to a name or address and will be combined with others we receive. Also, please complete the enclosed post card and drop it in the mail. This will help us know if you had problems using the system. The URL for the web site is:
                    http://www.msu.edu/~aslocum/sun/sunwisehomepage.htm

Second, please encourage your 4-H youth to look at the web site and complete the evaluation questionnaire for kids. While we prepared the site with kids ages 10-13 in mind, response from kids of all ages is important.

Finally, please help us by distributing copies of the enclosed letter and post card to the parents of 4-H youth with whom you work. We would appreciate it if you did this quickly, as we would like to receive most of the responses by the 10th of April. Feedback from parents, leaders and youth is critical for us to know how to proceed with the project.

If you have any questions or concerns about this project please contact one of us. Our addresses and phone numbers are listed below. Thank you so much for your interest and your help,

Joanne Schultink, M.S.   Ann C. Slocum, Ph.D.   JiHyun Kim, B.S.

Extension Specialist   Associate Professor   Research Assistant
215 Human Ecology Bldg   214 Human Ecology Building   404 Human Ecology Bldg.
Phone: 517-355-7704   Phone: 517-355-3779   Phone: 517-355-3779
E-mail: joannes@pilot.msu.edu   E-mail: aslocum@pilot.msu.edu E-mail kimjihyu@msu.edu

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APPENDIX F – IV

RECRUITING LETTER TO 4-H STAFF

MICHIGAN STATE UNIVERSITY

COLLEGE OF HUMAN ECOLOGY
DEPARTMENT OF HUMAN ENVIRONMENT AND DESIGN

EAST LANSING • MICHIGAN • 48824-1010

March 30, 2000

Dear 4-H Staff,

We need your help!
We have developed a web site for 4-H youth which contains educational material about sun safety. In developing the project we used published studies and information collected last year about the sun protective practices of youth in mid-Michigan. Before we advertise the web site and link it to the 4-H web page, we need some feedback from adults and young people. That is why we have contacted you

Why we chose sun exposure.
We chose sun exposure because potential health effects of over exposure can be serious, and negative effects are best prevented when precautions begin in early life. Skin cancer, premature aging of the skin and increased incidence of cataracts have all been linked with sun exposure. Kids need to be aware of sun precautions because the effects of sun exposure accumulate throughout life, and the majority of one's lifetime exposure (50 to 80%) occurs prior to age 18.

Three ways that you can help.
First, as 4-H staff member, we hope that you will visit the sunwise web site and complete the on-line adult evaluation form. Your feedback will be very helpful to us in revising and enhancing the web site. This will take approximately 15-25 minutes. Your response will be anonymous. The response will not be linked to a name or address and will be combined with others we receive. The URL for the web site is:

- **http://www.msu.edu/~aslocum/sun/sunwisehomepage.htm**

Second, please encourage any youth in your family (children, nieces/nephews, etc) to look at the web site and complete the evaluation questionnaire for kids. While we prepared the site with kids ages 10-13 in mind, response from kids of all ages is important.
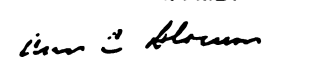
Finally, please help us by distributing the enclosed letter and post card to a parent who has a child 9 years of age or older. We would appreciate it if you did this quickly, as we would like to receive most of the responses by mid April. Feedback from parents, staff, leaders and youth is critical for us to know how to proceed with the project.

If you have any questions or concerns about this project please contact one of us. Our addresses and phone numbers are listed below. Thank you so much for your interest and your help.

Joanne Schultink, M.S.

Extension Specialist
215 Human Ecology Bldg
Phone: 517-355-7704
E-mail: joannes@pilot.msu.edu

Ann C. Slocum, Ph.D.

Associate Professor
214 Human Ecology Building
Phone: 517-355-3779
E-mail: aslocum@pilot.msu.edu

Ji-Hyun Kim, B.S.

Research Assistant
404 Human Ecology Bldg.
Phone: 517-355-3779
E-mail: kimjihyu@msu.edu

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FOLLOW-UP POSTCARD TO 4-H LEADER / STAFF

Please check one or more statements to describe your situation. Then drop this pre-stamped post card in the mail for us. Thank you so much again for your interest and your help!

☐ I/we completed and submitted the online web evaluation.
  Where? ☐ at home ☐ at school/ work ☐ at the library ☐ other

☐ I/we didn't complete the questionnaire because

  ☐ I don't have access to the Internet.
  ☐ I tried but could not connect to the web site.
  ☐ Sorry, I didn't have time.
  ☐ Kids are not interested.

  The earliest date by which I can distribute letters and cards to parents is _____

☐ I can distribute additional letters to parents; please send _____ more.

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