

## **Implications of an Educational Intervention Program Designed to Increase Young Adolescents' Awareness of Hats for Sun Protection**

By: Marilyn DeLong, Karen LaBat, Sherri Gahring, Nancy Nelson, Lotus Leung

DeLong, Marilyn R., LaBat, Karen L., Gahring, Sherri, [Nelson, Nancy J.](#), & Leung, Lotus. (1999). Implications of an educational intervention program designed to increase young adolescents' awareness of hats for sun protection. *Clothing and Textiles Research Journal*, 17(2), 73-83.

Made available courtesy of SAGE Publications: <http://ctr.sagepub.com/>

**\*\*\*Note: Figures may be missing from this format of the document**

### **Abstract:**

This research examined the content and outcome of an educational intervention program designed to foster sun protective awareness and behaviors among young adolescents. Awareness of sun protection qualities, as well as preferences and stated intention to wear protective clothing, were measured based on young adolescents' responses to selected hat styles both before and after the educational interventions. The educational intervention was well received by this age group (ages 10-12), and a comparison of matched pre- and post-tests (397 girls and boys) indicated an increase in knowledge of sun protective factors in clothing. However, familiarity and past experience with hat styles helped to determine both preference and intent to wear. This finding points to the need to incorporate adolescents' preferences in design and modifications of hats for protection, and to take further measures to encourage protective behaviors in young adolescents' clothing selection. Implementing a standardized sun protection rating system for hats and other types of clothing like those used with sunscreen lotion would begin to familiarize people of all ages with the dangers of sun exposure and the benefits of wearing sun protective clothing.

### **Article:**

Changing young people's perceptions is a research challenge. An even greater challenge is to reach youth with educational messages that promote health and well being, while still considering other issues so vital to this age group. Young adolescents are at an optimal developmental age for intervention programs to adopt protective measures for long and healthy lives. Yet it is unclear how changes in perceptions could actually change behavior, particularly if a change in behavior means altering current adolescent preferences in appearance.

Health issues are important to young adolescents, as Koch, Maney, and Susman (1993) explain: "Periods of rapid change in psychological, physical, and social status provide a window of opportunity for changing adolescents' beliefs and perceptions about their health behaviors, attitudes and values" (p. 243). These researchers suggest that this age is the best time for health education and thus prevention of risk behavior that may lead to unhealthy lifestyles in the future. However, young adolescence is also a time of concern for appearance, peer influence, and need for familiarity in types of clothing preferred.

This research is an exploration of the content and outcome of a specific educational program that was designed for young adolescents and disseminated through the network of Extension education in four southern Minnesota counties. The focus of this research is on young adolescents' response to this multiple intervention program concerning protective measures to avoid skin cancer and the program's effect on specific clothing decisions. LaBat, DeLong, Gahring, Getting, Amir-Fazli & Lee (1996) assessed the effects of an educational intervention program on skin cancer prevention. Results indicated that the intervention influenced participants' intentions to wear protective clothing for skin cancer prevention. However, sun protective clothing was referred to only as a general concept.

In this study, specific clothing was introduced as a sun protective measure and participants were asked to respond to a group of hats presented to them both before and after an educational intervention program. The hats varied in the degree of sun protection offered and popularity of style among the young adolescent population. The intention was to better understand the relationship between young adolescents' health concerns and other age-linked characteristics, such as appearance and clothing preferences.

### *Background*

As the ozone layer in the atmosphere becomes thinner, the risk of damage to the skin from the sun's UV rays, and possible forms of skin cancer, increases dramatically. All forms of skin cancer are increasing, from the non-melanoma skin cancers (basal cell and squamous cell carcinoma) to the more deadly malignant melanoma. The American Academy of Dermatology (1993) estimates a yearly incidence of 32,000 new cases of malignant melanoma and of that group, 25 percent will be age 39 or younger. Most skin cancer, however, can be prevented if individuals learn to cover exposed skin with clothing or sunscreen at an early age (American Academy of Dermatology, 1993). Dermatologists maintain that there is no such thing as a safe tan (Greeley, 1991). Tanned skin is the result of the body's producing melanin to reduce injury to skin cells, and the accumulation of regular sun exposure and tanning yields the possible consequence of skin cancer.

Sunscreen lotion provides useful protection from ultraviolet rays but must be reapplied when outdoors, especially when swimming. Wolf, Donawho and Kripke (1994) report that there is an increased risk of melanoma skin cancer even while using lotion with an SPF of 15 or higher. By preventing sunburn and thus hiding the body's own warning sign of overexposure to sunlight, sunscreen allows the user to stay in the sun longer and leaves the skin unprotected against melanoma growth. However, most skin cancer can be prevented by covering up exposed skin with clothing. Thus, it is important for people to be informed of the ways that clothing can help guard against skin cancer. Current research on the SPF (sun protection factor) of certain fabrics has resulted in an increased awareness of the benefits of clothing used for sun protection. For instance, tightly woven opaque fabrics, such as dark blue denim, have an SPF of up to 1,000, providing the wearer a level of protection that far surpasses the use of sunscreen lotion (Berkeley Wellness Letter, 1993; Davis, 1994).

Research indicates that children and youth receive three times the annual sun exposure of adults (Truhan, 1991). Sun exposure before the age of 20 increases the risk of melanoma more than exposure after the age of 30, according to Weinstock, Colditz, Willett, Stampfer, Bronstein,

Mihen, and Speizer (1991). Recent studies indicate that exposure to the sun before the age of 20 can make up to 50% of lifetime sun damage, and that 50% of all teenagers work on getting a tan, with only 37% reported as using a sunscreen (Mermelstein & Riesenberg, 1992, p. 371). Warning young adolescents about the dangers of sun exposure before they begin tanning is important to create a lifetime awareness of taking precautions in the sun. However, skin cancer is considered a lifestyle disease because a suntan is highly valued in the United States (Marks & Hill, 1988). Further, popular styles of clothing worn outdoors in the sun often leave skin bare and unprotected. Thus, appearance preferences and goals of young adolescents need to be incorporated into intervention programs in an attempt to alter their attitudes and behavior towards sun protection.

### *Health Promotion and the Period of Young Adolescence*

Efforts at health promotion during early adolescent years must consider the goodness of fit between individual characteristics and home, school, community-the contexts in which these characteristics develop (Koch, et al., 1993). Many developmental changes occur that have been categorized as biological, social, and cognitive. Biological development is substantial during adolescence and multiple hormonal changes trigger the development of primary and secondary sex characteristics. These changes occur between 10-15 years for males and 8-14 years for females. With these changes come alterations in expectations, both of adolescents and adults who witness this maturational process and who begin interacting differently with children-turned adolescents. Social development involves redefinition of relationships, self-concept, and degree of independence from parents and other adults. Physical appearance and acceptance by peers impact an adolescent's feeling of self-worth. Risk-taking behavior such as drug and alcohol consumption have been linked to feelings of low self-worth. Finally, the cognitive development of youth is important to consider in understanding the formation of attitudes and beliefs regarding personal health.

In developing health intervention programs that promote prevention of overexposure to the sun, it is necessary to understand the way children's thought processes develop (Lemer, 1993). Jean Piaget's widely known theory of cognitive development (Inhelder & Piaget, 1958) deals with the development of knowledge throughout childhood. Piaget believed that younger children's thought is qualitatively different from that of older children and that cognitive abilities develop from less to more complex stages. According to Piaget, the four developmental stages are the sensorimotor (age 0-2); the preoperational (age 2-7); the concrete operations (age 7-11); and the formal operations (age 11) stages. Though the age varies considerably from child to child when development takes place, the young adolescent in stage 4 should deal effectively with abstract concepts, complex reasoning, and logical conclusions. Thus, a young adolescent can comprehend that an illness may result from one's own actions, and this knowledge of cause and effect may enable she or he to think about health outcomes.

Egocentrism also plays a role in the development of the young adolescent. This period is characterized by self-consciousness and two other concepts that may be at work (Frisk, 1982). One concept is the "imaginary audience," in which adolescents believe everyone is watching them. Another is the concept of the "personal fable," or adolescents' belief that they are immune to unfortunate events, and that such events can only happen to others. Young adolescents begin testing the boundaries of proper behavior, establishing close friendships, and considering peers

very important. It is a time when children begin to define themselves apart from others, and to develop a finely attuned self-presentation.

According to Markus and Nurius (1984), youth between the ages of 6 and 12 begin to form self-concepts through an awareness of their evaluation by others. This middle childhood period is a critical stage in the development of the social self. Similarly, Hartup (1984) suggests that between the ages of 6 and 12 the peer context becomes the central socialization focus in children's lives. The capacity to engage in intimate interaction is just beginning to emerge, and it is a time of consolidating and extending relationships that already exist. In addition, setting standards for one's own behavior, as well as developing strategies for managing one's behavior, are necessary tasks for the formation of the self-concept during this period of adolescence.

### *Appearance and Perception of Suntanning*

Concern with appearance and peer-group conformity increases in adolescence. A report on 17,544 rural Minnesota youth ages 12-18 indicates that their biggest concern is with appearance (54%), with more concerned girls (66%) than boys (42%) (Outlooks and Insights, 1990). Concern with acceptable appearance in teen years may include an increased interest in attaining a tan and avoiding a covered-up look that could provide protection from damaging UV rays.

Broadstock, Borland and Gason (1992) conducted a study of adolescent perceptions of suntanning in Australia. Participants (n = 191), mean age 14, were shown slide pairs of Caucasian models with varying degrees of suntan, including no suntan to dark tan, and were asked to respond to each slide. Suntans were considered a sign of both healthiness and attractiveness by adolescent males and females. A medium level of suntan was regarded as the most healthy and attractive, although males considered a dark suntan more attractive than females did.

The vital role of positive appearance images associated with suntanning were examined by Miller, Ashton, McHoskey and Gimbel (1990). In these experiments participants associated the presence of a suntan with social attractiveness, although females indicated more concern than males about cancer and wrinkling skin from UV exposure. Participants with higher suntanning levels were more likely to consider the attributes of a dark suntan to be positive.

### *Clothing Practices and Satisfaction of Young Adolescents*

Koester and May (1985) studied adolescents aged 9-19 and found that as age increased, so did the influence of media and peers in their selection of clothing. In a study of clothing interests in relation to body satisfaction and eating behavior, Littrell, Damhorst and Littrell (1990) found that 16-year-old female cheerleaders wanted to conform with friends through dress. Adolescents may fear peer disapproval of clothing and have a desire to be dressed appropriately, so as to not stand out on social occasions (p. 86). Concerned with the movement from social isolation to social acceptance for ninth graders, Littrell and Eicher (1973) examined the role that clothing plays in this movement toward acceptance. Movement from social isolation to acceptance was aided by the specific norms of the desired social group, and not so much by individual or overall class norms. Other studies conducted in the late 1960s and early 70s have examined the link between appearance, conformity, and social acceptance (Hendricks, Kelley, & Eicher, 1968; Kelley &

Eicher, 1970), as well as social participation and leadership roles (Kelley, Daigle, LaFleur & Wilson, 1974; Smucker & Creekmore, 1972; Morganosky & Creekmore, 1981).

Early research is being reevaluated for young adolescents today. For example, MacGillivray and Wilson (1997) examined early, middle, and late adolescent use and satisfaction with clothing and found age, gender, and urban-versus-rural differences. It was found that conformity in clothing style was more important for males than females, and for rural compared to urban adolescents.

### *Clothing Preferences: Familiarity and Wearing*

The presentation of stimulus in preference measurement has taken several forms: sketches, verbal suggestion and the actual object. Holbrook (1983) noted that presentation of actual objects allowed the respondent to consider a variety of multisensory cues relevant to evaluation. In research on preferences, the use of actual apparel as a product stimulus allows for both cognitive and affective responses. Contextual associations related to the object, such as gender, have been found essential to such research and thus should be considered.

Two dimensions of clothing preference are the cognitive and affective components, or “knowing” and “liking” (Mandler, 1982). “Knowing” is based on descriptive information inherent in the object and “liking” is tied to the experience and expression of emotion. Zajonc and Markus (1982) suggest that cognitive and affective components may interact; that is, under certain circumstances one or the other dominates. Familiarity, based on knowing, is important in establishing preferences. Respondents often base their preferences on prior experiences with similar products and resulting schemata (Minshall, 1994). A schemata is defined as a mental representation that guides observer perceptions and actions based upon previous observation of the object. Mandler and Shebo (1983) suggest that like and dislike lie on two ends of a continuum based upon the formation of schemata about the object.

Context has been cited as a critical factor in response, including time period, redundancy of presentation, and gender-related properties. DeLong, Salusso-Deonier and Larntz (1981) found that context made a difference in perceptions of garments presented at two time periods. DeLong and Salusso-Deonier (1983) found that repeated presentation of the same products resulted in a change in response, but was more pronounced with affective than cognitive product features. With regard to gender related properties, Worth, Smith and Mackie (1992) found that respondents preferred congruency between the object and their context-based schemata. In other words, a positive evaluation or preference for the object is more likely to be obtained if the product matched the gender characteristics perceived as important.

### *Method*

This research was conducted in six large rural schools from a four-county area in southern Minnesota. These schools were selected because of the ratio of students in the same grade and the school locations. All students were 5th and 6th graders registered to attend an outdoor field day. The procedure for this study involves a multiple educational intervention program designed to increase young adolescents’ awareness of potential skin damage through sun exposure. Two different pre- and post-test questionnaires were developed in a brief one-page format with age-appropriate language and questions spaced for easy reading. The first questionnaire (Questionnaire #1) measures the respondents’ perceptions and attitudes towards the potential for

skin damage caused by the sun and the second (Questionnaire #2) determines respondents' preferences for sun-protective hat styles.

The educational intervention program ("Sun Smart") was presented both in the classroom and outdoors. Because past research indicates the importance of multiple interventions at the age of young adolescence, the program was designed by the researchers to include a classroom intervention delivered by their teacher and another intervention given outdoors by the research team.

Classroom activities illustrated key points and were presented with overheads, a videotape, and an age-appropriate word-find worksheet. The second educational unit, presented by the researchers, was called the "Sun Smart" program, part of an annual outdoor field day for students in 5th and 6th grades. The "Sun Smart" intervention was repeated throughout the day to eight groups of 20-25 students. A total of 1,427 students participated in this program over the course of two weeks. Two main goals identified for the interventions were to educate students about the hazards of exposure to the sun and to give students the knowledge to protect themselves from UV rays and thus the danger of skin cancer. In this program whimsical oversized hats were designed to illustrate key points of sun-safe behavior. Questionnaire #1 was administered as a pre-test prior to the "Sun Smart" program, and again as a post-test following the program to determine the effectiveness of the intervention on students' perceptions and attitudes towards sun protection.

In Questionnaire #1, participants were asked about perceptions and awareness of the risk of skin cancer and knowledge and acceptability of behaviors related to sun protection. This questionnaire was identical to the one used in an earlier study (LaBat, et al., 1996). Participants also reported their attitudes toward sun exposure and possible damaging effects to health in both the pre- and post- tests : (a) Is having a tan cool?; (b) Is having a tan a sign of good health?; (c) Can the sun's rays cause your skin to wrinkle?; (d) Can the sun's rays cause cancer? They were then asked eight questions concerning protective behaviors they had used (pre-test) or might use (post-test) when exposed to the sun:

- Do/Will you wear sunscreen lotion when outdoors in the summer sunshine?
- Do/Will you wear sunscreen lotion when you go swimming outdoors?
- Do/Will you wear a hat that shades your face when outdoors in the summer?
- Do/Will you wear a hat that shades your face, ears, & neck when outdoors in the summer?
- Do/Will you wear long pants outdoors in the sunshine in the summertime?
- Do/Will you wear a long sleeve shirt in the sunshine in the summertime?
- Do/Will you stay in the shade when the sun is hot and bright in the summertime?
- Do/Will you stay inside when the sun is hot and bright in the summertime?

Response categories were "Always," "Sometimes," and "Never." General questions concerned use of clothing as protection. The intervention had a significant influence on participants' stated intent to use protective clothing, including a hat that shades the face; a hat that shades the face, neck and ears; and long pants and long-sleeved shirts. However, these were very general concepts regarding clothing as protection from the sun. In order to expand upon this initial area of inquiry, the researchers developed a second questionnaire (Questionnaire #2). In this

questionnaire, specific hats were shown to the participants as stimuli to identify their perceptions of sun protection benefits, degree of like/ dislike, and their intention to wear the hats.

Questionnaire #2 was developed to assess participants' responses to several hats before and after the multiple educational intervention. On this questionnaire, boys and girls were asked to respond as to their knowledge of and preference for eight different hats. These hats were selected by the researchers to represent a varied degree of sun protection offered by their design. At present, there is no predetermined sun protection factor rating developed specifically for clothing. Thus, the researchers used visual assessment to determine the degree of sun protection offered by each hat based on four factors: (a) type of fabric or material used, (b) extent of crown, (c) extent of brim, and (d) area of brim (i.e., front, back, sides). Opacity of material and full coverage of the top of head by the crown and the face and neck by the brims were primary indicators of hats that provided satisfactory protection.









Hats were also selected to elicit a range of like/dislike responses for this age group. To determine this variation in protection and preferences, two focus group sessions were conducted prior to administering the pre-test, one with girls and the other with boys. Focus group participants were the same age as the targeted group. Initially, fifteen different styles of hats were selected and presented to the groups and were displayed on Styrofoam heads. Each of the focus groups responded verbally to each hat. Their responses revealed some very decided opinions about who would wear the hat, (i.e., what age, gender, for what event). Focus group responses helped narrow the number of hats from fifteen to eight and helped researchers understand a range of hat styles adolescents would consider wearing.

The hat selection was then revised according to focus group responses. For example, one hat, a red bandanna tucked under a baseball cap, offered good sun protection, but responses indicated the color was a cue to gang membership. An acceptable alternative that did not suggest gang identification was a green-blue bandanna with the baseball cap. As color was often a factor in responses, hats were selected that were neutral (i.e., black or light beige). Comments such as, "This is a hat my older brother would wear, not me," also helped researchers revise the hats to be more appropriate for 5th and 6th graders. Based upon the focus group interviews, eight hats were selected from those available at a local retail chain store (see Table 1). The eight hats were rated on a continuum according to the degree of sun protection they provided. Those that provide the least amount of protection (hats #2 and #6) were placed at one end of the continuum; those that provide the most protection (hats #1 and #4) were placed at the other end, with the largest number of the hats located in the middle (hats #3, #5, #7, and #8).

To test the revised hat series, a class of 16 boys and 12 girls of the same age were selected from an elementary school outside of the targeted area. In this pilot the hats were presented one by one and students responded to three questions about each hat based upon a five point scale: (a)



**Table 1. Descriptions of hats used in Questionnaire #2.**

| Hat Number  | Hat Style Description   |
|---|---|
| 1.   | <b>"Legionnaire" Hat.</b> Khaki canvas with front visor and back flap that extends to fully cover ears and neck             |
| 2.   | <b>Visor.</b> Black poplin with front visor only and band with elastic that encircles the head                              |
| 3.   | <b>Wide Brim Straw Hat.</b> Tan natural straw, closely woven, full crown with brim that extends 5" straight out from crown  |
| 4.   | <b>Baseball Cap with Bandanna.</b> Black baseball cap with turquoise print bandanna placed under cap to cover ears and neck |
| 5.   | <b>Camp Hat.</b> Khaki canvas with full crown and 4" brim   |
| 6.   | <b>Baseball Cap.</b> Standard black canvas baseball cap with logo covered, front visor only                                 |
| 7.   | <b>Western Hat.</b> Straw hat with 4" brim with slight curves up at sides of brim   |
| 8.  | <b>Newsboy Cap.</b> Blue Denim, with soft full crown and visor  |

How much sun protection does this hat have?; (b) How much do you like this hat?; and (c) How often will you wear this hat to protect yourself from the sun? This information was used to further refine the series of hats and to revise the questionnaire that assessed knowledge of sun protection, degree of like or dislike, and intent to wear.

During the pilot test the teacher asked the researchers permission for the students to try on the hats. This request was prompted by the obvious enthusiasm of the students. Once permission was granted, the room filled with the excitement of trying on the hats. Students moved from one hat to another, trying each on and asking those around, "How do I look?" "This looks good, don't you think?" "Where can I buy this hat?" "How much does it cost?" " The potential of this spontaneous and positive experience is important to this study and will be further examined in the Discussion and Implications sections.

The revised Questionnaire #2 included reference sketches of the eight hats based on focus group and pilot test feedback and was administered in classrooms approximately one week before the educational intervention. The eight hats were numbered and presented on Styrofoam head forms. Participants evaluated each hat in the pre-test and the posttest according to each of the following questions: (a) How much sun protection does this hat have?; (b) How much do you like this hat?; and (c) How often would you wear this hat to protect yourself from the sun?

The primary purpose of using apparel in this study was to measure responses to wearing selected hats based on "knowing" (i.e., degree of sun protection offered by wearing each hat) and "liking" (i.e., the degree each hat was liked or disliked) given the educational intervention program.



Effectiveness of the intervention program was determined from responses to pre- and post-test questionnaires. Factors involved in knowing, liking, and wearing sun protective hats were determined based on responses to Questionnaire #2. Pre- and post-tests of both questionnaires were matched, resulting in 397 completed tests of 199 boys and 198 girls. Ages ranged from 10 to 13 with the majority (296 students) 11 years old. Responses to Questionnaires #1 and #2 were analyzed using means and correlations and were examined for significant changes at the .05 level in response from pre- to post-test.

### Results

Significant mean differences (Table 2) indicate that the educational program had a significant effect on the participants' attitudes, as measured by Questionnaire #1. Pre-test means indicated that participants already believed that working on a suntan was not cool; however, after the educational intervention participants were even less inclined to believe that having a suntan is cool or that it is an indicator of good health. Participants also related sun exposure with skin damage after the intervention, with significant mean differences indicating that participants realized that sun exposure may cause wrinkles and cancer.

**Table 2. Pre- and post-test comparisons of mean responses on attitude toward sun exposure (1-4) and sun protection (5-12).**

| Questions  | All subjects' mean scores |           | <i>t</i> -value | <i>P</i> -value |
|--|---------------------------|-----------|-----------------|-----------------|
|  | Pre-test                  | Post-test |                 |                 |
| 1. Is having a tan cool?   | 2.83                      | 3.39      | 9.2905          | .0001*          |
| 2. Is having a tan a sign of good health?  | 3.96                      | 4.41      | 7.9674          | .0001*          |
| 3. Can the sun's rays cause your skin to wrinkle?  | 3.04                      | 2.46      | -8.4615         | .0001*          |
| 4. Can the sun's rays cause cancer?  | 2.65                      | 2.31      | -5.8671         | .0001*          |
| 5. Do/Will you wear sunscreen when outdoors in the summer sunshine?                        | 2.66                      | 2.56      | -1.5678         | .1177           |
| 6. Do/Will you wear sunscreen lotion when you go swimming outdoors?                        | 2.46                      | 2.33      | -2.1378         | .0332*          |
| 7. Do/Will you wear a hat that shades your face when outdoors in the summer?               | 2.86                      | 2.54      | -5.5959         | .0001*          |
| 8. Do/Will you wear a hat that shades your face, ears, & neck when outdoors in the summer? | 4.25                      | 3.68      | -9.1558         | .0001*          |
| 9. Do/Will you wear long pants outdoors in the sunshine in the summertime?                 | 4.25                      | 4.09      | -3.0222         | .0027*          |
| 10. Do/Will you wear a long-sleeve shirt in the sunshine in the summertime?                | 4.38                      | 4.06      | -6.0478         | .0001*          |
| 11. Do/Will you stay in the shade when the sun is hot and bright in the summertime?        | 2.92                      | 2.86      | -1.2280         | .2202           |
| 12. Do/Will you stay inside when the sun is hot and bright in the summertime?              | 3.85                      | 3.55      | -5.4093         | .0001*          |

\**p*-value significant at .05 level.

\*Responses are coded as: 1 = always; 2 = often; 3 = sometimes; 4 = seldom; 5 = never.

### *Protective Behavior Intent*

Results from these questions are shown in Table 2. Two questions assessed participants' preferences for use of sunscreen as protective behavior. There was a significant increase after the intervention as to students' willingness to wear sunscreen when swimming, but not in stated intent to wear sunscreen at other times.

Other protective behaviors may include avoiding sun exposure instead of covering the body to shield it from sun. Participants significantly changed their stated intent to stay inside when the sun is intense. Participants were not as inclined before or after the intervention to seek shade when outside, indicating that methods of protection such as sunscreen and clothing were perceived as adequate protection.

### *Responses to Sun Protective Hats*

Evaluation of Sun Protection. Participants significantly changed their evaluation of the positive sun protection provided by some of the hat styles (Table 3). By the post-test, both boys and girls indicated that they knew the potential sun protective benefits for each hat. Knowing the degree of sun protection for each hat was not significantly different between the genders.

**Table 3. Mean scores: How much sun protection does this hat have?**

| Hat          | Mean scores <sup>a</sup> |           | <i>t</i> -value | <i>P</i> -value |
|--------------|--------------------------|-----------|-----------------|-----------------|
|              | Pre-test                 | Post-test |                 |                 |
| Legionnaire  | 3.97                     | 3.68      | -5.0589         | .0001*          |
| Visor        | 1.81                     | 1.62      | -3.3424         | .0009*          |
| Straw        | 3.84                     | 4.00      | 2.6152          | .0093*          |
| Bandanna/cap | 3.64                     | 3.59      | -1.0406         | .2987           |
| Camp         | 3.06                     | 3.18      | 2.0521          | .0408*          |
| Baseball     | 2.85                     | 2.44      | -6.6995         | .0001*          |
| Western      | 3.21                     | 3.41      | 3.4216          | .0007*          |
| Newsboy      | 2.48                     | 2.48      | 0.2184          | .8273           |

\**p*-value significant at 0.05 level.

<sup>a</sup>Responses are coded in a five-point scale: 1 = least protection; 5 = most protection.

**Table 4. Mean scores: How much do you like this hat?**

| Hat          | Mean scores <sup>a</sup> |           | Differences in means <sup>a</sup> (Post-Pre) |                 |       |       |                 |                 |
|--------------|--------------------------|-----------|--|-----------------|-------|-------|-----------------|-----------------|
|              | Pre-test                 | Post-test | <i>t</i> -value                              | <i>P</i> -value | Boys  | Girls | <i>t</i> -value | <i>P</i> -value |
| Legionnaire  | 2.18                     | 2.02      | -2.4358                                      | .0153*          | -0.19 | -0.12 | -0.6046         | .5458           |
| Visor        | 2.22                     | 1.98      | -3.9120                                      | .0001*          | -0.20 | -0.29 | 0.6813          | .4961           |
| Straw        | 2.18                     | 2.23      | 0.7408                                       | .4592           | 0.09  | 0.01  | 0.5844          | .5593           |
| Bandanna/cap | 2.48                     | 2.69      | 3.0601                                       | .0024*          | 0.04  | 0.35  | -2.4231         | .0158*          |
| Camp         | 2.26                     | 2.30      | 0.8073                                       | .4200           | -0.15 | 0.27  | -2.8738         | .0043*          |
| Baseball     | 4.49                     | 4.23      | -4.0635                                      | .0001*          | -0.16 | -0.34 | 1.4281          | .1540           |
| Western      | 2.46                     | 2.48      | 0.3069                                       | .7591           | -0.10 | 0.14  | -2.0727         | .0389*          |
| Newsboy      | 2.56                     | 2.58      | 0.1436                                       | .8859           | -0.05 | 0.07  | -0.8609         | .3898           |

\**p*-value significant at 0.05 level.

<sup>a</sup>Responses are coded in a five-point scale: 1 = you like least; 5 = you like best.

**Table 5. Mean scores: How often will you wear this hat to protect yourself from the sun?**

| Hat          | Mean scores <sup>a</sup> |           | Differences in means <sup>a</sup> (Post-Pre) |                 |       |       |                 |                 |
|--------------|--------------------------|-----------|--|-----------------|-------|-------|-----------------|-----------------|
|              | Pre-test                 | Post-test | <i>t</i> -value                              | <i>P</i> -value | Boys  | Girls | <i>t</i> -value | <i>P</i> -value |
| Legionnaire  | 1.99                     | 1.87      | -1.7513                                      | .0807           | -0.23 | -0.19 | 1.3434          | .1799           |
| Visor        | 1.86                     | 1.77      | -2.1739                                      | .0303*          | -0.07 | -0.16 | 0.8726          | .3834           |
| Straw        | 1.96                     | 2.00      | 0.4543                                       | .6498           | 0.10  | -0.04 | 1.1086          | .2683           |
| Bandanna/cap | 2.42                     | 2.47      | 0.5279                                       | .5979           | -0.15 | 0.23  | -2.8167         | .0051*          |
| Camp         | 2.09                     | 2.20      | 1.7648                                       | .0784           | 0.12  | 0.11  | 0.1137          | .9095           |
| Baseball     | 4.30                     | 4.05      | -3.8338                                      | .0001*          | -0.29 | -0.22 | -0.5325         | .5947           |
| Western      | 2.19                     | 2.24      | 0.7516                                       | .4527           | 0.03  | 0.06  | -0.3189         | .7500           |
| Newsboy      | 2.28                     | 2.39      | 1.5534                                       | .1211           | 0.06  | 0.17  | -0.7782         | .4369           |

\**p*-value significant at 0.01 level.

<sup>a</sup>Responses are coded in a five-point scale: 1 = you'll wear least; 5 = you'll wear most.

Pre- and post-test evaluations of hats for sun protection differed significantly (Table 3). The wide brim straw hat (#3) and the legionnaire's hat (#1) received the highest mean scores, changing position from pre-test to post-test.

Hat Preferences. A significant change in participants' stated liking for hat styles was evident for four hats (Table 4). Participants increased their liking for the baseball cap/ bandanna combination (#4) but reported a decrease in liking the legionnaire (#1), the visor (#2), and the baseball cap (#6). The pre-test mean score (2.22) indicates that the visor was not a favorite before the intervention. The message reinforced by the educational program, that a hat should provide extensive head coverage, may have led to the lower mean score (1.98) in the post-test for

this style. The participants also rated the baseball cap significantly lower in the post-test; however, it continued to be the most preferred hat style. Pre- and post-test mean scores for all other hats fell below the mid-point of 3 on the scale, indicating a less than enthusiastic response to most of the hat styles.

Differences in hat preferences between boys and girls were evident for some styles (Table 4). Girls liked the baseball cap/bandanna (#4) more than the boys did in the post-test. After the intervention, girls reported a greater degree of liking for the camp hat (#5) and the straw hat (#7). Boys' preference for these hats also increased, but to a lesser extent.

**Stated Intent to Wear.** Overall, participants were less likely to wear the visor and the baseball cap after the intervention. However, the baseball cap still received the highest mean scores in the pre- and post-test for liking and intention to wear. Again, all hats with the exception of the baseball cap show mean scores below 3 (Table 5). Gender differences were found among participants' stated intent to wear the baseball cap with bandanna (#4), with girls reporting a greater likelihood of wearing this hat than boys (Table 5).

**Hat Style.** Significant differences in measures for sun protection evaluation, liking, and stated intent to wear provided information on the effect of the intervention program. Overall, these data indicate that the intervention had a positive effect on the students' evaluation of sun protection provided by the hats. The low means for all hats except the baseball cap, however, point to the strong preference for this style among this age group overall.

Because the eight hats were presented together as a group, it is possible that students evaluated each hat in relation to the others when answering each question. However, the responses were based upon each individual hat being evaluated on a five-point scale.

## *Discussion*

In general, the results of this study support research that suggests young adolescents are at an appropriate age for an educational intervention on health-related behaviors (Koch, Maney, & Susman, 1993), particularly when the health message may produce positive results (i.e., skin cancer is preventable). After the intervention program, participants indicated an awareness that there is no such thing as a "safe" tan. Preferences and intent to wear specific protective clothing were related to both girls' and boys' different attitudes toward protective behavior. However, the relationship between knowing about protective measures and liking specific hat styles is more complex and did not differ significantly between the genders.

### *Gender Differences in Responses*

**Attitudes and Protective Behaviors.** Responses to four questions indicated gender differences in pre- and posttests : having a tan as a sign of good health, use of sunscreen when swimming outdoors, wearing a hat that shades the face, and wearing long pants. Girls were more prone to wear sunscreen before and after the intervention, possibly because it is a cosmetic product. However, the boys reported an increase in acceptability of adopting such behavior. Because boys may be less familiar with sunscreen they may have had a more marked shift in adopting it.

More boys than girls changed their responses that having a suntan is a sign of good health. The boys' stated intent to use sunscreen lotion when swimming outdoors \*was so strong after the intervention that it affected the overall difference. Girls' responses did not change concerning this behavior. Girls may have already been using sunscreen as a protective strategy when swimming.

After the intervention, boys and girls were more inclined to wear a hat as sun protection, with girls more strongly inclined to wear one. This result may be due to the range of hat styles presented as well as the possibility that fewer girls regularly wore hats prior to the intervention.

The response to desirability of wearing long pants as protection showed mixed results, with girls showing a dramatic change in the positive direction. Boys' stated intent to wear long pants also changed significantly, but in the negative direction. Apparently, boys were less inclined to choose pants as a protective measure after the intervention. It may be possible that after the intervention boys would select sunscreen more often as an alternative to protective clothing and that one response affected the other. It is also possible that the change reflected different base data, in that boys initially wore long pants more often than girls.

**Preferences and Intent to Wear.** Girls' response to the question, "How much do you like this hat?" (Table 4) shifted more than boys'. Especially evident in the girls' mean responses is the shift of the visor from third position in the pre-test to seventh position in the post-test. The legionnaire hat, which provides very good sun protection, moved to last place in the post-test, whereas the position of the baseball cap with bandanna, the camp, and the western hat received more positive responses relative to the other hats.

Upon examining stated intent to wear (Table 5), the boys' responses did not change, whereas girls were less likely to wear the visor and the wide brim hat. The baseball cap was the most preferred among both boys and girls in the pre- and post-tests. The next hat style in intent to wear for girls was the newsboy hat and for boys the baseball cap/ bandanna, and these positions did not change from pre- to post-test.

Though an effort was made to select hats that were not gender specific, subtle cues from some of the styles may have affected responses. It may be worthwhile to study boys and girls separately in their apparel preferences. It is possible that a different and wider range of styles could have been studied specifically for girls and boys with the potential for increased acceptance of wearing a hat for sun protection.

### *The Educational Intervention and Wearing Hats for Sun Protection*

The mean responses indicate a significant difference from pre-test to post-test with respect to attitudes toward sun protection. According to pre- and post-test responses to Questionnaire #2, the educational intervention had a positive effect on the participants' knowledge of the protective factors of clothing. This finding suggests that these young adolescents could relate to positive health factors resulting from wearing sun protective clothing and applying sunscreen. This finding also supports the idea that youth between ages 10 and 11 exhibit both concrete and formal operational capabilities (Inhelder & Piaget, 1958). Although participants responded

positively to the idea of wearing clothing for sun protection in general, when presented with specific hats, they had very definite opinions about what they intended to wear.

Correlation coefficients were obtained (Table 6) for the relationships between degree of like/dislike and knowledge of sun protection, degree of like/dislike and intent to wear, and knowledge of sun protection and intent to wear for each hat in the post-test. In the third column, knowledge of sun protection and intent to wear for each hat are more strongly related than the first column of degree of like/dislike and knowledge of sun protection. As indicated in the middle column, the degree of like/dislike and intent to wear are most strongly correlated and point to the strong relationship between liking and wearing. This finding is a possible indication of the development of degrees of self-consciousness and the self-concept during this period (e.g., Frisk, 1982; Hartup, 1984), and is likely tied to an increase in this age group's desire to conform.

As suggested by the strong link between preferences and intent to wear, appearance is a major concern for young adolescents, and this finding may be considered in health education interventions. Although after the intervention participants were able to determine which hats offered maximum sun protection, this knowledge did not necessarily alter the likelihood they would actually wear the hat, supporting the notion that either cognitive or affective factors of preference will predominate (Mandler, 1984). An example of this interaction between factors of preference is the baseball cap. According to the responses, this style offers only moderate sun protection. Nevertheless, it was the most preferred hat style for boys and girls both before and after the educational intervention. The baseball hat, depending on how wide the brim is and how it is worn (brim to front or back), provides some protection for the upper part of the face or the back of the neck, but very little for the ears and nose. This kind of hat, however, is widely worn by young people throughout the United States. The baseball hat is very visible within the media, as it is often worn to promote products or to identify with sports teams. The baseball hat modified by the addition of a bandanna increased in popularity in the post-test. The bandanna, when worn under the baseball cap, provided sufficient coverage for the ears and the neck. Thus, the increased preference for this hat may relate to both heightened awareness of health benefits of sun protection, and to familiarity, in that this style is a modification of the already popular baseball cap.

This and other differences in responses to the hats appear to reflect previous experience and familiarity with certain hat styles. Some of the eight hats presented were less familiar to the students than others, and the baseball hat was the style most often worn by the participants at the outdoor field day. The responses to the hats before and after the educational intervention point out that existing schemata and prior contextual experiences with products are important in an attempt to alter preferences for health reasons. This finding is in accordance with other research on the link between schemata and familiarity (Mandler & Shebo, 1983; Minshall, 1984). Thus, to increase the use of hats for sun protection, familiarity with styles of protective apparel products needs to be increased.

To communicate the message of sun protection, hats were used to connect with the individual young adolescent in this study. Clothing elicits multisensory evaluation that includes context and repeated experiences (DeLong, Salusso-Deonier, & Lamtz, 1981; Holbrook, 1984). This connection was evident during the pilot test when students were enthusiastic about trying on the hats

and discovering how an unfamiliar hat looked and felt. Thus, trying on and repeatedly using a product is both a social and individual experience that is one way to increase familiarity with wearing sun protective clothing.

Compared to use of sunscreen while swimming, mean scores for intended use of sunscreen outdoors were higher in both pre- and post-tests. Thus, participants were using sunscreen more often for general outdoor use than for swimming. Although the educational intervention may have convinced participants that sunscreen lotion would be a good protective measure, especially with a swimsuit, it is difficult to know if an educational intervention actually changes behavior. Results may have differed if actual behavior were observed and measured. Although beyond the scope of this study, observation of the actual clothing and sun protective behavior of these young adolescents would be an appropriate next step.

### *Implications*

In Healthy People 2000 (U.S. Department of Health and Human Services, 1991) risk reduction objective #16.9 is to increase the percentage of those people who limit sun exposure, use sunscreens and protective clothing when exposed to the sun, and avoid tanning booths and sun lamps. To attain this objective for all ages, youth must become a targeted audience. Emphasis must be placed upon the development of effective educational interventions of the hazards of sun exposure and the need for sun protection measures. Based upon the results of this study, outreach agendas nationwide may incorporate education for sun protection into youth programs to reduce the incidence of skin cancer.

Working through school settings such as field trips or safety day camps is an excellent way to increase the number of students reached with the desired health message. How best to network through youth programs (e.g., multiple

**Table 6. Post-test correlations between like/know, like/wear, and know/wear.**

| Hat          | like/know | like/wear | know/wear |
|--------------|-----------|-----------|-----------|
| Legionnaire  | .08       | .52       | .18       |
| Visor        | .41       | .64       | .38*      |
| Straw        | .09       | .61       | .15       |
| Bandanna/cap | .22       | .72       | .28*      |
| Camp         | .39       | .66       | .49*      |
| Baseball     | .05       | .47       | .27       |
| Western      | .41       | .59       | .40*      |
| Newsboy      | .45       | .72       | .44*      |

\* $p = .05$ .

interventions, peer-to-peer, adult to youth) is a research question that needs a planned and focused agenda. A type of network operating in the state where this research was conducted is



the model of peers teaching peers. This network has been successful for other health-related issues such as teen alcohol use and could easily be adapted for teaching youth about safe sun exposure.

Within any given educational intervention model, prior contextual experiences could be considered in the future. In this study, students had different experiences with skin cancer, previous education, and attitudes toward cancer in general. A small proportion in this age group reported that they tanned purposely, but many told us they were familiar with purposeful tanning because of experiences with older siblings and parents who do so. If such contextual factors were to be included in further studies, they could be assumed to affect responses about attitudes and preferences related to sun protective measures.

In this study, young adolescents preferred the baseball hat over other styles both before and after the educational intervention. In fact, all other styles shown to students were rated below 3 on a 5-point scale. Adapting the baseball cap by tucking a bandanna under the band was a modification of an already popular hat style, and responses indicated that this was somewhat more acceptable after the intervention. This result illustrates that design strategies for sun protective hats may be more successful when popular hats are modified to increase sun protective attributes. However, very few popular hat styles that provide adequate sun protection are available to consumers of this age. Methods of modifying more popular and more protective (while not necessarily popular) styles need to be further investigated. Given the strong connection between preference and intent to wear within this age group, further investigations could involve the young adolescent in designing such modifications.

A comparison of the students' evaluations before and after the intervention did not indicate much positive change in intent to wear an unfamiliar style that provided good sun protection. Rather, their preference continued to be the unmodified baseball hat. However, this finding does not indicate that the educational intervention was not successful. Instead, it suggests the need to increase awareness of the potential dangers of the sun and to develop learning opportunities for this age group to become familiar with the kinds of protective measures available through clothing.

Sun protective items such as sunglasses are not only accessories of dress related to appearance, but are becoming publicized for their sun protective benefits (Meadus, 1995). Much like the levels of SPF (Sun Protection Factor) available in sunscreen lotion, hats and sunglasses could be labeled based on a similar numerical scale according to the degree of sun protection they provide, taking design features and fabric into account. To further familiarize people, especially young adolescents who are most at risk for sun exposure that leads to skin cancer (Truhan, 1991), advertising and promotion could seek out those who have a high profile among this age group, such as sports figures or actors, to be spokespeople for wearing sun protective clothing.

Increased awareness about skin cancer needs to be accompanied by an understanding of the protection that can be provided by clothing. Just as manufacturers of sunscreens have adopted the SPF message, hats for sun protection might publicize a similar message. The threat of skin cancer from the sun increases every year, leaving young adolescents more vulnerable to repeated exposure to the harmful rays of the sun. Based on the responses before and after the education

intervention program in this study, the development of everyday protective apparel that integrates elements of popular stylistic features with satisfactory sun protection is an area that needs further attention.

## *References*

- American Academy of Dermatology) (1993) Skin cancer fact sheet)
- Broadstock, M), Borland, R), & Gason, R) (1992) Effects of suntan on judgments of healthiness and attractiveness by adolescents) *Journal of Applied Social Psychology*, 22(2), 157-172)
- Davis, S. M) (1995) Relationship of fiber type, mass, and cover to the sun protection factor of fabrics) Unpublished Master's thesis, University of Alberta, Edmonton)
- DeLong, M), & Salusso-Deonier, C) (1983) Effect of redundancy on female observer's visual response to clothing) *Perceptual and Motor Skills*, 57, 243-246)
- DeLong, M), Salusso-Deonier, C), & Larntz, K) (1981) Comparison of visual responses of female observers to clothing over time) *Perceptual and Motor Skills*, 53, 299-309)
- Frisk, D) Q) (1982) Health Beliefs and Health Practices of Children and Youth) Unpublished doctoral dissertation, University of Minnesota)
- From wet t-shirts to blue jeans: How clothes help reduce exposure to UV rays) (1993) *Berkeley Wellness Letter*, 9(11), 7)
- Greeley, A) (1991) No safe tan) *FDA Consumer*, 25, 16-21)
- Hartup, W) W) (1984) The peer context in middle childhood) In W)A) Collins (Ed)), *Development during middle childhood: The years from six to twelve* (pp) 240- 282)) Washington D)C): National Academy Press)
- Hendricks, S) H), Kelley, E) A), & Eicher, J) B) (1968) Senior girls' appearance and social acceptance) *Journal of Home Economics*, 60(3), 167-172)
- Holbrook, M) (1983) On the importance of using real products in research on merchandising strategy) *Journal of Retailing*, 59, 4-20)
- Inhelder, & Piaget, J) (1958) The growth of logical thinking from childhood through adolescence) New York: Basic Books)
- Kelley, E) A), Daigle, C) W), LaFleur, R) S), & Wilson, L) J) (1974) Adolescent dress and social participation) *Home Economics Research Journal*, 2(3), 167-175)
- Kelley, E) A), & Eicher, J) B) (1970) Popularity, group membership, and dress) *Journal of Home Economics*, 62(4), 246-250)
- Koch, P) B), Maney, D) W), & Susman, E) J) (1993) Health promotion for early adolescents) In R) M) Lerner (Ed.), *Early adolescence: Perspectives on research, policy and intervention* (pp. 241-246). New Jersey: Lawrence Erlbaum Associates.
- Koester, A. W., & May, J. K. (1985). Profiles of adolescent's clothing practices: Purchase, daily selection, and care. *Adolescence*, XX(77), 97-113.
- LaBat, K., DeLong, M., Gahring, S., Getting, J., AmirFazli, H., & Lee, M. (1996). Evaluation of a skin cancer intervention program for youth. *Journal of Family and Consumer Sciences*, 88(2), 3-10.
- Lerner, R. M. (Ed.). (1993). *Early Adolescence: Perspectives on Research, Policy and Intervention*. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Littrell, M. A., Damhorst, M. L., & Littrell, J. M. (1990). Clothing interests, body satisfaction, and eating behavior of adolescent females: Related or independent dimensions? *Adolescence*, XXV(97), 77-95.

Littrell, M. B., & Eicher, J. B. (1973). Clothing opinions and the social acceptance process among adolescents. *Adolescence*, 8, 197-212.

MacGillivray, M. S., & Wilson. (1997). Clothing and appearance among early, middle, and late adolescents. *Clothing and Textiles Research Journal*, 15(1),43-59.

Mandler, G. (1982). The Structure of value: Accounting for Taste. In M.S. Clark, & S.T. Fiske (Eds.), *Affect and Cognition*. New York: Academic Press.

Mandler, G., & Shebo, B. J. (1983). Knowing and liking. *Motivation and Emotion*, 7, 125-144.

Marks, R., & Hill, D. (1988). Behavioral change in adolescence: A major challenge for skin-cancer control in Australia. *The Medical Journal of Australia*, 149, 514-515.

Markus, H. J., & Nurius, P. S. (1984). Self-understanding and self-regulation in middle childhood. In W.A. Collins (Ed.), *Development during middle childhood: The years from six to twelve* (pp.147-183). Washington D.C.: National Academy Press.

Meadus, A. (1995, October). Safety meets style: Hats and sunglasses are becoming the most fashionable sunblockers around. *WWD*, 16.

Mermelstein, R. J., & Riesenberg, L. A. (1992). Changing knowledge and attitudes about skin cancer risk factors in adolescents. *Health Psychology*, 11(6), 371-376.

Miller, A. G., Ashton, W. A., McHoskey, J. W., & Gimbel, J. (1990). What price attractiveness? Stereotype and risk factors in suntanning behavior. *Journal of Applied Social Psychology*, 20, 1272-1300.

Minshall, B. (1994). Apparel Preferences: Underlying Dimensions and Measurement. In M. DeLong & A. Fiore (Eds.), *Aesthetics of Textiles and Clothing: Advancing Multi-Disciplinary Perspectives* (142-151). ITAA Special Publication #7.

Morganosky, M., & Creekmore, A. M. (1981). Clothing influence in adolescent leadership roles. *Home Economics Research Journal*, 9(4), 356-362.

Outlooks and Insights: Understanding Rural Adolescents. (1990). A University of Minnesota Document.

Smucker, B., & Creekmore, A. M. (1972). Adolescents' clothing: Conformity, awareness, and peer acceptance. *Home Economics Research Journal*, 1(2), 92-97.

Truhan, A. P. (1991). Sun protection in childhood. *Clinical Pediatrics*, 30, 676-681.

United States Department of Health and Human Services (1991). *Healthy people 2000*. DHHS Publication No. (PHS) 91-50212 Washington, DC: U.S. Government Printing Office.

Weinstock, M. A., Colditz, G. A., Willett, W. C., Stampfer, M. J., Bronstein, B. R., Mihin, M. C., & Speizer, F. E. (1991). Melanoma and the sun: The effect of swimsuits and a 'healthy' tan on the risk of nonfamilial malignant melanoma in women. *American Journal of Epidemiology*, 135, 461-470.

Wolf, P., Donawho, C., & Kripke, M. (1994). Effect of sunscreens on UV radiation-induced enhancement of melanoma growth in mice. *Journal of the National Cancer Institute*, 86(2), 99-105.

Worth, L., Smith, J., & Mackie, D. (1992). Gender schematicity and preference for gender typed products. *Psychology and Marketing*, 9(1), 17-30.

Zajonc, R., & Markus, H. (1982). Affective and cognitive factors in preferences. *Journal of Consumer Research*, 9, 123-131.