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Attitudes and Behaviors of Adolescents Toward Sunbathing and Sunscreen Use

A Thesis

Presented to

the Faculty of the Department of Psychology

East Tennessee State University

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts in Clinical Psychology

by

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ABSTRACT

ATTITUDES AND BEHAVIORS OF ADOLESCENTS TOWARD SUNBATHING AND SUNSCREEN USE

by

Billie H. Murray

This study explored the attitudes and behaviors of adolescents toward sunbathing and sunscreen use by employing the Theory of Alternative Behaviors (Jaccard, 1981) with adolescent participants and a respective parent co-participant.

Females were found to be more likely to engage in intentional suntanning efforts, to stay in the sun for a longer duration, and to be more likely to use sunscreen yet to report higher incidence of sunburns. Those with a healthy lifestyle attitude are as likely to engage in intentional tanning, although they are more likely to wear sunscreen. Self-report of tanning behavior was positively correlated to parent's observation of adolescent's behavior.

Results of this study support the position that sunscreen partially allows for longer sunlight exposure resulting in higher amounts of UV radiation exposure. Participants who were more likely to wear sunscreen were likewise more likely to spend more time in the sun and to sunburn more frequently.

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CHAPTER 1

INTRODUCTION

According to a publication of the National Cancer Institute (NCI) of the National Institutes of Health, an estimated 40 to 50 % of Americans who live to age 65 will have skin cancer at least once (NCI, 1995). When skin cancer occurs, the orderly growth, division, and repair of healthy skin tissue is altered. At this time, the cells lose their ability to limit and direct normal growth, resulting in an accelerated, chaotic growth pattern that produces excess tissue in the form of tumors (NCI, 1995). Such malignant tumors are capable of invading and destroying nearby tissue. If left untreated, cells break away from the tumor and travel through the blood stream or the lymph system spreading the malignancy to other organs of the body.

Numerous types of skin cancer exist, with the most common types being basal cell, squamous cell, and malignant melanoma (American Cancer Society [ACS], 1997). Basal cell and squamous cell are known as non-melanoma because they come from skin cells other than melanocytes. Approximately one million cases of non-melanoma skin cancer are diagnosed each year. When diagnosed at an early stage, nearly all non-melanoma skin cancers can be cured. As a general rule, 95% are cured. Even so, the ACS has predicted that non-melanoma skin cancer would take the lives of 1,900 individuals in the year 2000 (ACS, 2000).

Basal cell cancer comprises 75% of all skin cancers and forms in the lowest layer of the epidermis, the basal layer. Areas such as the head and neck are more vulnerable to basal cell carcinoma because of their increased sun exposure. Once an individual is diagnosed with this slow growing cancer, a second skin cancer is likely to develop within five years (ACS, 2000).

Squamous cell cancers develop in higher levels of the epidermis and comprise about 20% of all skin cancers. This form of skin cancer is more aggressive than basal cell cancer and invades

tissues beneath the skin. Although squamous cell cancer is more prone to spread than is basal cell carcinoma, less than one percent spread to lymph nodes and/or other organs (ACS, 2000).

Malignant melanoma begins in the melanocytes, which produce the skin pigment (coloring) known as melanin. Melanoma tumors are often brown or black because malignant melanoma cells retain their ability to produce melanin. Comprising only 4% of all skin cancers, melanoma is the most dangerous, resulting in 79% of deaths from skin cancer (ACS, 2000). No other form of cancer is increasing as fast, with incidence of melanoma rising at a rate of 4% every year. In the United States, one person dies per hour from malignant melanoma (American Academy of Dermatology [AAD], 1996). By the year 2000, the lifetime risk for Americans developing malignant melanoma was expected to be one in 74 (AAD, 2000) and for 2001 that risk is estimated to rise to one in 71 (AAD, 2001). Such an upsurge in incidence provokes research into the reasons for the rise in cases of skin cancer, as well as interventions to decrease the occurrence of skin cancer.

UV Radiation as a Risk Factor

Repeated exposure to sunlight has been determined to be the most important risk factor for skin cancer (ACS, 1997). A strong association exists between skin cancer and overexposure to ultraviolet (UV) radiation, which comprises only three percent of the total solar rays reaching the earth (ACS, 1997). UV radiation is subdivided into three groups: 1) UVC rays- considered the most carcinogenic and is absorbed almost completely by our ozone layer of atmosphere; 2) UVB rays-responsible for most sunburns and is also known as a carcinogen; 3) UVA rays-can penetrate the skin to cause damage to the underlying tissue and act synergistically with UVB radiation to cause skin cancer.

In response to UVA and UVB exposure, existing melanocytes (skin pigment) move closer to the skin surface as new melanocytes are produced. A byproduct of this effort is the suntan. Tanning appears to be an adaptive process in which the skin thickens to protect the body from UVA and UVB exposure. The second layer of epidermis (stratum corneum) also thickens in an effort to decrease further UVB exposure. The protective factor provided by this process is evident, in that specimens from tanned skin filter sunburn rays about twice as efficiently as specimens from untanned skin (Kaidbey & Kligman, 1978). Although the tanning process seems to provide some defense against sunburn (DeGruijl, Van Der Meer, and Van Der Leun, 1983), this protection is not achieved without damage to the skin. The eventual cost of tanning far outweighs the minimal benefit (Bargoil & Erdman, 1993). Therefore, the cumulative effect of suntanning over a lifetime damages the skin.

Although most skin cancers do not appear until an individual is over 50 years of age, the damage which caused the cancer probably occurred at an early age. English et al. (1998) conducted a case-control study of 132 individuals with confirmed squamous cell carcinoma (SCC) and reported that sun exposure, especially during childhood and adolescence increases the risk of incidence of this form of skin cancer. Researchers have evidence that non-melanoma cancer is related to cumulative, daily exposure to the UV radiation over the lifetime of an individual (De Gruil, Van Der Meer, and Van Der Leun, 1983; Fears, Scotto, and Schneiderman, 1977).

In contrast to non-melanoma skin cancer, the risk of malignant melanoma appears to be related to annual UV exposure (Fears, Scotto, and Schneiderman, 1977). Malignant melanoma appears to be related to brief exposure to high intensity UV radiation. Such episodic bouts of acute exposure resulting in severe, blistering sunburns place individuals more at risk for malignant

melanoma in adulthood (ACS, 1996; AAD, 2000; Green, Siskind, Bain, & Alexander, 1985; Hill, White, Marks, Theobald, Borland, & Roy, 1992).

According to research, the effects of UV radiation are not typically manifested for 20 years or more (Bargoil, & Erdman, 1993; Vitaliano & Urbach, 1980; Weinstock et al,1989). Given this delay, attention has been directed toward childhood sun exposure. Weinstock et al. has estimated that individuals receive more than 50% of their lifetime dose of ultraviolet radiation as children and adolescents. Furthermore, a significant association between blistering sunburns suffered between the ages of 15 and 20 and the risk of melanoma was found, whereas no significant association was made between melanoma and sunburns after the age of 30. For development of melanoma, the teenage years may be the most important time period (Weinstock et al., 1989). Sunburn indicates that a high level of UV exposure has occurred within the layer of the melanocyte. Those individuals who experience repeated sunburns are more at risk for melanoma. As few as six sunburns in a lifetime may double the average risk for melanoma (Green et al., 1985). These findings suggest that efforts to modify the sunbathing behaviors of children and adolescents should be encouraged because sunbathing at this age is a potentially hazardous behavior.

A retrospective study by Holman & Armstrong (1984) provides evidence that sun exposure in early life could be a risk factor for the development of melanoma in later life. Using a unique sample of migrants to Australia, researchers found that migrants arriving prior to the age of 10 had a skin cancer incidence rate which was similar to that of native born Australians. While among those arriving at the age of 10 to 15 exhibited a significant drop in the odds for incidence of melanoma. For those migrants who had arrived after age 15, the estimated skin cancer incidence rate was one-fourth the rate for native-born Australians. These results suggest that exposure before the age of ten may be crucial in the formation of malignant melanoma in later life.

Damage from sun exposure during the early years of life could be eliminated with preventative behavior in the form of protection from the sun. Regular and appropriate use of sunscreen during these early years could provide that protection. A study by Stern, Weinstein, and Baker (1986) suggests that regular (daily) use of sunscreen with a sun protection factor of 15 during the first 18 years of life would potentially reduce the incidence of basal and squamous cell tumors by 78%. Although this study was particular only to basal and squamous cell, the ACS (2000) recommends daily use of sunscreen as a preventative measure against melanoma as well.

Other Risk Factors for Skin Cancer

Another significant risk factor is the ability to tan. Those least able to tan are at highest risk for basal cell carcinoma, (Vitaliano & Urbach, 1980) as well as for squamous cell carcinoma (Marks, 1996). In general, non-melanoma skin cancer is more likely to occur in individuals with fair skin, especially those who freckle easily. This is because these fair individuals are not protected with an abundance of skin pigment. Other risk factors for non-melanoma skin cancer include a natural hair color of blonde or red, and light colored eyes. Both of these features usually occur along with fair skin (ACS, 1997).

Males are also at greater risk, being twice as likely as women to be diagnosed with basal cell carcinoma, and three times more likely to have squamous cell cancer (ACS, 2000). This is thought to be related to outdoor occupational exposure. Chemical and/or radiation exposure also increases the risk, as does medication used in the treatment of psoriasis. Skin damaged by inflammatory skin disease or severe burns may be more likely to develop skin cancer. Individuals with a weakened immune system may also be more at risk. Finally, there are also inherited or congenital conditions that seem to predispose one to skin cancer.

However, despite all of these risk factors, skin cancer is generally preventable. Even in the absence of the other risk factors, prolonged and/or intermittent overexposure to the sun puts one at risk for skin cancer. Thus, even though skin cancer is the most common form of cancer, it is also the most preventable (ACS, 2000).

Sunscreen

Sunscreen is marketed by a number of manufacturers with various strengths of sun protection factor (SPF). In addition to the regular formulas, sunscreen is available in waterproof and bug proof formulas. Sunscreen is available in colors to make it more attractive and encourage its use by adolescents and children. Even so, the continual increase in incidence of skin cancer suggests that many individuals fail to effectively use sunscreen as a means of protection against skin cancer.

Adolescent Sunscreen Use

A number of studies have examined sunscreen use in adolescents. Banks, Silverman, Schwartz and Tunnessen (1992) found less than one tenth of the adolescents they surveyed reported always using sunscreen, while 1/3 of the sample said they never used such protection. Reynolds et. al (1996) examined a large group of sixth graders finding that over 1/6 denied ever using sunscreen; 17 % reported using sunscreen three quarters of the time, 1/6 more said they used sunscreen only half of the time, while over 40% said their use of sunscreen was limited to one in four exposures to the sun. This study also found a strong association between sunscreen use and skin type, with lighter skinned individuals reporting more use. Similar findings were reported by Mermelstein and Reisenberg (1992). In a sample of over 1770 adolescents, they report that over 30% of the female

subjects and almost 45% of male subjects reported never using sunscreen. Only 1/6 of the females and half as many males identified themselves as using sunscreen most of the time.

In a study of 82 families at the beach, researchers attempted to compare parents who were using sunscreen on their children with parents who were not (Maducdoc, Wagner, Jr., and Wagner, 1992). Children with a history of painful sunburns in the past were significantly more likely to be wearing sunscreen due to parental intervention. Another study that examined sunbathing and sunscreen use during a two-day weekend found that sixth graders who were sunburned on the first day were significantly more likely to use sunscreen on the second day (Reynolds et. al 1996).

In contrast to most research, the AAD completed a survey in which more than half of parents with children ages 12 or under reported using a sunscreen of 15 SPF or above on their children (Robinson, Reigel and Amonette, 1998). However, no assessment concerning the regularity of such sunscreen use was made. Thus, parents' responses may have been influenced by social desirability factors.

In Australia, a country with even greater incidence of skin cancer than the U.S., less than 1/3 of 3200 adolescents surveyed were found to be using sunscreen (Cockburn, Hennrikus, Scott, and Sanson-Fisher, 1989). In an even larger study of 15,169 high school students in Norway, 75% used a sunscreen with an SPF lower than six (Wichstrøm, 1994). In this study, when sunbathing for more than six hours, one third of these students said they used an SPF between 0 and 2, which falls far below recommendations of SPF 15.

Sunscreen Use Among College Students

Vail-Smith and Felt (1993) found that less than 10% of a sample of about 300 college students reported using sunscreen with every intentional UV exposure of 30 minutes or more. Equally disappointing was the finding that six out of 10 males and four out of ten females admitted to minimal use or avoidance of sunscreen. Leary and Jones (1993) examined a group of college students and found that 41% did not understand the meaning of the SPF rating, while almost one fifth were unaware that sunscreens have been demonstrated to reduce the risk of skin cancer. Among this sample, sunscreen use was predicted by factors such as knowing someone who had skin cancer, having a fair complexion, and believing that one has control over one's health. Still another sample of 90 undergraduates reported using sunscreen less than half of their time in the sun (Hillhouse, Stair, & Adler, 1996). In this study, even those students who used sunscreen reported using an SPF below 15. In a sample of 905 participants at an outdoor event, just over 1/3 reported sunscreen use on that particular day (Manion, Cloutier, & Klassen, 1997).

In an Australian sample of over 350 individuals interviewed by telephone, only 12% said that they protect themselves every time they go into the sun. Over half reported such protection at least most of the time, with one fourth protecting themselves only part of the time and another 8% rarely or never protecting themselves from the sun (Clarke, William, and Arthey, 1997).

Sunscreen Use in the General Population

Based on a national survey, an estimated one fourth of white sunbathers in the United States routinely use sunscreen at appropriate levels (Koh et. al, 1997). Sunscreen use was found to be

reported by women more than men. In addition, sunscreen use was found to have a positive relationship with the level of education. As the level of education increased, so did sunscreen use.

A recently completed study (Turrisi, Hillhouse, Gebert, & Grimes, 1999) found a strong relationship between individuals' reported sunscreen behavior and the perceived efficacy of sunscreen use. This research suggests that the use of sunscreen may depend on such variables as perceived differences in sunscreen as well as knowledge of how and when to apply sunscreen. Failure to use sunscreen properly may result in sunburns or skin damage, yet individuals who misuse sunscreen may believe their burns resulted from an inadequacy in the product rather than from their faulty application of the product.

Motives for Tanning

Suntanning is one strategy individuals use to attain greater attractiveness (Miller, Ashton, McHoskey, & Gimbel, 1990). The tanned body is strongly promoted as attractive in magazine advertisements and other media outlets. The positive association between a tanned body and attractiveness has been demonstrated in several recent studies (Broadstock, Borland, Gason, 1992; Hillhouse, Turrisi, Holwiski, & McVeigh, 1998; Johnson & Lookingbill, 1984; Keesling & Friedman, 1987; Lupton & McGaffney, 1996; Miller et al., 1990; Reynolds et al, 1996; Vail-Smith & Felts, 1993; Wichstrøm, 1994). In the Johnson & Lookingbill (1984) investigation, 72% of their 489 subjects believed that tanned skin was more attractive than untanned skin. Similarly, Vail-Smith and Felts(1993) found 73% of 296 adolescents believed tanned skin to be more attractive than pale skin. Therefore, it is not surprising that sixth graders who agreed with the statement that a tan makes them attractive experienced longer sun exposure during a two-day holiday weekend (Reynolds et al.,

1996). In yet another study, when 68 parents were given the statement “A tan makes people better looking,” 6 out of 10 parents agreed or were neutral (Foltz, 1993).

Sunbathers have also been found to perform more appearance-related behaviors than non-sunbathers. Keesling and Friedman (1987) found that having a tan and sunbathing were closely related to the individual’s social networking system. Thus, for these subjects owning a tan was associated with the presentation of an image of an attractive person. Therefore, the desire to have a tanned body may relate more to an individual’s concern with social opinion rather than to self-satisfaction with appearance.

Another motive for tanning appears to be the perception that a tanned individual is healthier than one without a tan (Broadstock et al., 1992; Johnson, & Lookingbill, 1984; Keesling, & Friedman, 1987). In particular, the Johnson and Lookingbill study found that 78% of 489 subjects believed that a suntan looked healthy. When researchers interviewed parents at the beach with their children, over eighty percent of respondents shared the belief that a suntan looked healthy on their children (Maducdoc et al., 1992). In another study conducted in France, mothers used health as a primary reason for exposing their children to the sun (Grob et al., 1993). Broadstock, Borland, and Gason, (1992) note that for the sunbather, the appearance of health may take priority over actual health concerns.

Peer and Parental Influence

An examination of the development and incorporation of an individual’s beliefs, attitudes, and behaviors must include the influence of significant others. From a developmental perspective, parental influence would usually be the initial and predominant influence during early childhood. Rosenstock (1974, p. 379) states that children “learn to adopt many health related habits and

practices which will permanently influence their adult behavior...” during the socialization process. Using a large sample of children ranging in age from third to twelfth grade, Berndt (1979) found that ninth grade or mid-adolescence is the period at which conformity to peers reaches a peak. Moving on into adolescence, behaviors continue to be established that affect health in later life (Evans, Gilpin, Farkas, Shenassa, and Pierce, (1995).

Lau, Quadrel, and Hartman (1990) emphasize that parents render models of both healthy and unhealthy behavior. These researchers found modeling of behavior to be the most significant avenue of parental influence. Parents choose their behavior as a result of the beliefs that they hold. The beliefs held by the parents are thus conveyed to their children intentionally through training efforts or these beliefs may be transferred unintentionally or incidentally. These authors found evidence in a longitudinal study that the parental influence on the health beliefs and behavior of their late adolescent children were relatively consistent over time (three years) after the child left the home. These findings are consistent with the enduring family socialization model which purports that health beliefs and behavior learned during childhood within the family remain stable throughout life.

Lau et al. (1990) stated that any theory concerning the beliefs and behaviors of young adults which neglected peer influence would be incomplete. It is from these interpersonal relationships with both parents and peers that the image of self emerges within the adolescent. Similarly, Langer and Warheit (1990) also theorize that self is constructed based on the beliefs, attitudes, and behaviors of these significant others. Lau et al. (1990) found evidence that modeling is the foremost process through which peers exert influence over each other. Yet, rather than a mere mimicry of behavior, it is through negotiations with parents and peers that adolescents are influenced in their decision-making process (Langer and Warheit, 1990).

Although the influence of friends is a primary consideration, it should be recognized that individuals, adolescents included, ordinarily control the selection of their friends and in so doing may embrace friends with shared beliefs (Langer & Warheit, 1990). As adolescents witness the behavior of others, they make decisions about who they will choose as friends and which behaviors they will endorse. When this happens, the social group which is formed may be self-reinforcing in such behaviors as suntanning, thereby confirming the behavior as positive. Therefore, any study into health beliefs, attitudes, and behaviors should include the perceptions that the adolescent has in regard to the beliefs, attitudes, and behaviors of significant others including most importantly parents and peers.

On Sunbathing and Sunscreen Use

An example of parental influence through the modeling of sunbathing practices is suggested by a study of sixth graders (Reynolds et al, 1996). This study found that those who reported having parents who lie in the sun to get a suntan, had longer sun exposure than those who did not.

An examination of the literature specific to adolescents' use of sunscreen found that adolescents were more likely to use sunscreen if a best friend did or if they had parental guidance (Banks et al., 1992). This finding could have a negative impact on sunscreen use given the findings of Foltz (1993) that while 73% always used sunscreen on their children at the beach, only 3% applied it on their children when they played outside at home. These same parents completed a survey that indicated their knowledge of the need for protection from every type of sun exposure, yet their behavior was not consistent with that knowledge. The personal use of sunscreen by parents appears to be a primary determinant of whether they use sunscreen on their child (Zinman, Schwartz, Gordon, Fitzpatrick, & Camfield, 1995). Continued use by the child may be related to the

modeled use of sunscreen by the parent. It could also be reflected by the adoption of the belief system of the parent in regard to sunscreen use. Perceived parental influence was a significant factor in sunscreen use by the sample of 2029 adolescents in the Cockburn et al. (1989) study. For example, among those using sunscreen, 42.2% used a brand selected by their parents.

In a large Norwegian sample, adolescents sunbathing efforts were strongly related to those of friends, as sunscreen use was predicted by peers' use of sunscreen (Wichstrøm, 1994).

According to a study in the Southeastern United States, tanning behaviors were associated with the perception that the individual's friends were also tanning (Reynolds et al., 1996).

Cockburn et al. (1989) found evidence that teenagers had a desire to maintain an acceptable image among their peers. Responses indicated that noncompliance with sunscreen use was related to the image the adolescent perceived would be portrayed to his/her peers. A positive association existed between those who failed to use sun protective measures and those who perceived their use to promote a negative image of themselves to others.

Adolescents' perception that sunscreen use portrays a negative image among their peers may suggest to them that nonuse portrays a positive image. Because of the positive association between a suntan and attractiveness, the social reward for a suntanning behavior is therefore evident. These immediate rewards tend to distort an adolescents ability to exercise behavioral control. McReynolds, Green, and Fisher (1983) predict that regardless of the promise of future reward, adolescents have difficulty choosing a healthy behavior over a present alternative of social reward.

Sunburn

Because sunburns are associated with potential for future incidence of skin cancer, a number of studies have investigated sunburn occurrence through a variety of methods. By telephone

interview one study found that within a previous two-week period, adolescents aged 11-19 with skin types I and II had experienced an average of three or more sunburns (Robinson, Rademaker, Sylvester, & Cook, 1997). An extensive number of moderate risk skin types reported sunburns at least annually when unprotected by sunscreen. Another telephone based study found seven percent of 285 children had experienced a sunburn on the weekend preceding the study (McGee, Williams, & Glasgow, 1997).

Studies investigating risk factors for squamous cell carcinoma (SCC) have found that blistering sunburns to a particular area of the body have been found to be positively association with SCC (English et al., 1998). Bajdik, Gallagher, Hill, and Fincham (1998) found this to be more profound for sunburns experienced during the ages of 5 to 15 years.

The findings of Green et al. (1985) suggest that individuals who have been subject to repeated sunburns have a higher risk for melanoma. This same study reports that risk for melanoma is more than doubled for those who have experienced six or more sunburns. The results of this study were supportive of the theory that melanoma results from the effect of acute, intermittent, episodic exposures rather than the effect of cumulative exposure. Although the effects of the damage are not diagnosable until 20 or more years later, for melanoma, solar injury is a greater risk factor than age (Epstein, 1983).

It is interesting to note that a study by Reynolds et al. (1996) found that when questioned regarding the previous two days of exposure, sixth graders who used a sunscreen with an SPF of 15 or greater, reported a higher incidence of sunburn. This would appear to negate claims that sunscreen protects against sunburn. On the contrary, this information agrees with other studies that suggest that individuals who use sunscreen may increase their length of time of exposure due to a belief that they are safe from solar injury while using sunscreen. A false sense of security may be

promoted by the marketing tactic which suggests that sunscreen offers a safe tan (Autler et al. 1997). Furthermore, many individuals fail to reapply sunscreen as recommended by the manufacturer. Still others believe that there is no limit to the amount of time they are exposed as long as sunscreen is continuously reapplied. Sunscreen is effective for a specified, yet limited number of hours per exposure no matter how many times it is applied. Therefore, a lack of understanding of the limitations of sunscreen may explain these findings that suggest increased sunburn among sunscreen users.

Longer sun exposure has been reported by adolescents who have a skin type which always burns and who have the option to avoid the sun (Reynolds et. al, 1996). This may suggest a more persistent effort to obtain a tan among this group. These authors make the point that such findings may indicate a desire among lighter skinned adolescents to tan and appear more attractive. According to the International Agency for Research on Cancer (1992), sunscreen allows longer periods of time to be spent in the sunlight resulting in exposure to higher amounts of UV wavelengths. Because melanomas are believed to be related to these brief intense periods of UVR exposure at an early age (Bargoil & Erdman, 1993; Stern et al., 1986), it is alarming to find young adolescents engaged in this type of UV exposure.

Prevention

Prevention may be as simple as the intentional avoidance of sun exposure by a number of means. The decision to tan or not to tan is typically a controllable behavior (Miller et al., 1990; Rossi, Blais, Redding, & Weinstock, 1995). Keesling and Friedman (1995, p. 478) posit that “since most unprotected sun exposure is under an individual’s voluntary control, skin cancer could theoretically be largely preventable by psychosocial influences.” Studies are available that show that

a significant number of individuals intentionally work on a tan (Johnson & Lookingbill, 1984). A publication of the National Cancer Institute (1995) advises that childhood is the time to begin preventative habits because skin cancer is related to lifetime exposure. Recommendations include the avoidance of exposure to the midday sun, use of protective clothing, and the use of sunscreen (NCI, 1995). Use of the appropriate sun protection factor (SPF) of sunscreen is encouraged to protect against the UVA and UVB radiation which causes sunburn and subsequent skin damage resulting in skin cancer later in life. A sunscreen with an SPF of 15 used regularly during the first eighteen years of life could potentially reduce the risk of developing non-melanoma cancer by 78% (Stern et al., 1986).

Studies suggest that regular and appropriate sunscreen use is practiced by only a small percentage of individuals. Some studies have found that nine percent of participants report “always” using sunscreen (Banks et al., 1992) or use with “intentional” sun exposures of 30 minutes or longer (Vail-Smith & Felts, 1993). While Hill et al. (1992) found that 21% of their sample reported use of sunscreen, only 55% had used a SPF of 15 or above. When researchers used a liberal definition of adequate use of sun protection measures, 30% were found to fall in this category (Cockburn et al., 1989). Sunscreen was rated as the first choice for sun protection by this sample, with 53.9% choosing their own brand of sunscreen. This sample exhibited a negative relationship between ease of tanning and use of sunscreen. Sunscreen use in a Norwegian study was 90%, although only 25% of those used an adequate SPF and only half reapplied an adequate number of times (Wichstrøm, 1994).

Results of a national survey show that only a quarter of sunbathers use sunscreen at recommended levels (Koh et al., 1997). Failure of individuals to use sun protection has resulted in

the U. S. Public Health Year 2000 objective which sought to achieve compliance by 60% of the people to use these precautions.

Interestingly, the study by Banks et al. (1992) found that sunscreen was the preferred method of sun protection. Susceptibility to sunburn has been shown to increase the likelihood of the use of sunscreen (Cockburn et al., 1989). This agrees with the finding by Cockburn et al. that skin type correlates with use of protective measures.

In consideration of the failure of a significant number of individuals to use sunscreen in an appropriate manner, it is well to question the reasons for this noncompliance.

Well-informed adolescents and the mothers of young children have reported a belief that the risk of sun exposure is exaggerated by the media (Grob et al. 1993). Leary and Jones (1993) suggest that the public does not appear to be convinced of the seriousness of the problem. Another factor may be the perceptions of individuals concerning the effectiveness of sunscreen (Vail-Smith & Felts, 1993).

Furthermore, there may be a tendency of adolescents to view skin cancer as an adult issue which is not applicable to them (Gillespie, Lowe, Balanda, & Del Mar, 1993, as cited in Lupton & Gaffney, 1996). In addition, it is likely that they value the immediate reward of becoming more attractive in the present to the potential for better health in a future which seems very distant (Jeffrey, 1989). Studies of time perception indicate that time intervals close to the present are viewed with greater importance than time intervals in the future (Cohen, 1964, as cited in Jeffrey, 1989). This is not surprising when you consider that in evaluating long and short-term risks, individuals tend to overvalue short term threats (Svenson, 1977, as cited in Jeffrey, 1989). For this reason, adolescents may have difficulty recognizing the importance of sun protection since they may perceive this as a problem of adulthood which may or may not occur in the far distant future.

Theories of Health Behavior

Health behavior is described as any behavior which affects an individual's condition of health. Much research has been devoted to establish relationships between certain health practices (behaviors) and health status. Once behaviors are established to be either health enhancing or health risky, efforts are often made to examine motivational factors involved in the continuance of such behaviors. Educational interventions are then developed to create awareness and encourage individuals to adopt healthier behaviors as well as to eliminate the behaviors which have been determined to be disease risk factors.

As a part of this process, social scientists gather data about beliefs, attitudes, and motivational factors related to performing or abstaining from health risky behaviors. These researchers evaluate educational resources available to research participants as well as studying parental or peer influences on behavior. The social scientist's goal is to develop programs to facilitate a positive change in health behavior. Due to the numerous variables effecting health behavior, a number of theories have arisen in this area of research. These theories are not always incompatible with each other, but often offer complimentary views which are useful to our understanding of health behavior. The present study attempts to integrate the constructs from several of these theories in the development of an instrument to examine adolescents' beliefs, attitudes, and practices regarding suntanning and sunscreen use behaviors. While the Behavioral Alternative Model provides the theoretical structure for examining these variables, the Health Belief Model (HBM), and the Pre-adult Health Decision-making Model (PAHDM) will be used as well.

The Health Belief Model (HBM)

This model began to be developed in the early 1950s as researchers explored the decision-making process used by individuals regarding whether to accept illness detection and prevention services for health purposes. Variables affecting health related decision-making were discovered to include both perceived susceptibility to illness or disease as well as perceived benefits from both prevention and early detection services. The perceived benefits component of this early model did not consider either costs or barriers. However, the developing model began to accumulate evidence that individuals consider both the cost involved in making a change as well as barriers which have to be overcome. Later studies incorporated the concept of motivation into the model (Rosenstock, 1974). In time, the model's use was extended into various areas of health related research.

The HBM (Rosenstock, Strecher, & Becker 1988) hypothesizes that health-related action depends on the occurrence of the following factors: (1) The existence of health concern (2) The belief that one is vulnerable or threatened by a health problem (3) The belief that following a health recommendation (making a behavioral change) would benefit in reducing that threat at an acceptable cost. According to the HBM, environmental cues must exist which stimulate the individual to make a decision to reduce a health risky behavior. Such environmental cues form a foundation for a change in behavior to occur. These cues might include the illness or death of a friend or family member (Langer & Warheit, 1992) as well as symptoms of disease or even a media message (Cody & Lee, 1990).

The Health Belief Model in Related Studies

The Health Belief Model was evaluated as early as 1952 by Hochbaum in examining what might predispose patients to obtain a chest X-ray for the detection of tuberculosis.

Use of the HBM to examine susceptibility was extended to other areas including: uterine cancer (Flach, 1960), rheumatic fever (Heizelmann, 1962), and influenza (Leventhal, Hochbaum, & Rosenstock, 1960). These researchers studied patients' beliefs of risk of acquiring the specific medical condition in question. As a result, risk became a primary component of the theory.

Kegeles (1963) extended use of the HBM to perceived severity as he studied asymptomatic patients' use of preventative dental check-ups. In studying perceived severity, he looked at whether there was a relationship between the patient's perception of severity and willingness to use these services. For instance, an individual who rated high in his perception of the severity of a toothache might be more likely to attempt to avoid a toothache by using preventative services for early detection of tooth decay.

The use of the HBM continued through the exploration of not only perceived susceptibility to disease, but also perceived benefits from treatment. In 1970, Heinzelmann and Bagley extended the use of the HBM to study the reasons participants might be engaged in physical activity programs (cited in Rosenstock, 1974). The HBM also has been used in researching children's perceptions and health-motivation (Gochman, 1970). More recently, a Children's Health Belief Model has been developed as an adaptation of the HBM (Bush & Iannotti, 1990).

The continued use of the model over many years supports its reliability as a tool for understanding preventative health behavior. From the time when individuals were skeptical about obtaining a chest X-ray to the more recent studies of adolescent sexual behavior in regard to AIDS (Langer & Warheit, 1992), the HBM has been used in understanding public reception to the latest health practices. As new technologies, treatments, and recommendations for self-care have appeared, the HBM has been used to help understand and facilitate the adoption of the latest prevention and detection health practices by the general public.

Pre-Adult Health Decision-making Model (PAHDM)

Langer and Warheit (1992) have proposed a model to study adolescents' health related attitudes and behaviors. This model was the culmination of a study that examined the relationship between adolescent's decision-making processes and AIDS-related knowledge, attitudes, beliefs, behaviors, and interpersonal skills (KABBS) (Langer, Zimmerman, Warheit, & Duncan, 1993).

The PAHDM hypothesizes that human behavior involves interacting cognitive, emotional, and symbolic processes which are "learned, rational, modifiable, and dynamic" (Langer & Warheit, 1992, p. 933). This model assumes that directedness /orientation is fundamental to adolescent decision-making. An individual's directedness can be thought of as the main resource used when making decisions. When an individual's orientation is "inner" directed, personal norms and values are called upon for decision-making, whereas an "other" directed individual would rely more heavily on peers or reference groups to direct his decision-making (peer-directed). Directedness/Orientation is similar to the construct known as self-monitoring (Snyder, 1974).

In a given situation, directedness may be peer-directed, parent-directed, or self-directed according to the individual. While directedness is the main component of the model, the PAHDM specifically focuses on how reference groups guide or direct decision-making as well as strengthen the attitudes, beliefs and behaviors related to risk (Langer & Warheit, 1992). This model assumes that the decision-making style of adolescents may differ from that of adults. While adult decision models assume that adults are free and autonomous, this model proposes that adolescents are constrained by the artificial control of adults (Langer & Warheit). Therefore, models of health behaviors which have been designed to predict behavior in the less restrictive environment of the adult may not be applicable to adolescents.

Three basic theoretical perspectives are used to form a foundation for this model. First, adolescence is the time in which the construction of self takes place (Langer & Warheit, 1992). According to Erickson (1950) construction of self is the central task of mid-adolescence. During this time, the individual begins to differentiate from the self created by his parents, moving toward peer influence and finally integrating these parental and peer influences into his unique personal and social characteristics (Langer & Warheit). An integral part of this process is the influence of the attitudes, beliefs, and behaviors of significant others. This group of influential individuals become the reference used by adolescents as they make decisions. Second, the PAHDM assumes that in addition to a socially interactive process, adolescent decision-making is actually negotiated with others. As adolescents discuss their beliefs with each other, they gain different insights and new perspectives. In the process, their beliefs are either challenged to change or reinforced to remain intact. During this stage of development, they come to better understand what they believe and are able to complete the decision-making process in regard to their behaviors. Third, the theory depicts this decision-making process as the processing of external information (knowledge and beliefs from the environment) as inputs, and the establishment of attitudes and behaviors as outputs.

Although the maturational or developmental perspective from which it views the progression from childhood to adulthood makes it unique, the PAHDM integrates aspects from several current health behavior models such as Social Learning Theory (Bandura, 1977), the Health Belief Model (Rosenstock, 1974), Decision-Making Model (Janis & Mann, 1977), and the Ajzen-Fishbein Model (Ajzen, 1982; Ajzen & Fishbein, 1980).

Behavioral Alternative Model

Using decision theory as its basis, Jaccard (1981) developed a behavioral alternative model of social behavior. The model is used to examine situations in which an individual has the occasion to perform one of several possible alternative behaviors. The performance of one of these behaviors prohibits the performance of any of the other choices. On the most basic level (Jaccard, 1981; Jaccard & Wood, 1988), one can envision two behavioral alternatives, (1) performing a behavior (e.g., using sunscreen) or (2) not performing a behavior (e.g., not using sunscreen). Expanded further, the individual will not only decide whether or not to perform one particular behavior, but will also likely have at least several alternative choices of behavior. This theoretical model considers the decision process involved in making such choices.

The stages of this decision process include: (1) the formation of behavioral alternatives, (2) the examination of these alternatives, and (3) choosing between the alternatives. When making such choices, Jaccard (1981) proposes that the individual will evaluate the alternatives and choose the one toward which he feels most positive. One might envision a scale or affective dimension with positive and negative endpoints. Each choice might be placed in a position according to the individual's evaluation of how positive he feels about that alternative. Several items might be placed in varying positions on that scale, but the individual's chosen behavior would be the alternative which lies closest to the positive endpoint. According to Jaccard (1981, p 289) attitude is defined as, "the location of an attitude object (behavioral alternative) on a bipolar affective dimension." Therefore, the behavioral alternative chosen will concur with the individual's attitude.

Furthermore, these attitudes will be based on the individual's perceptions or cognitions toward the behavior, which evolve from experiences previously encountered, vicarious learning, and influence from other sources (e.g., family members, peers, and media) (Turrisi et al., 1999). Thus, in

a given situation, the individual must choose to perform one alternative from a set of behavioral alternatives and the individual may be thought to possess an attitude toward the performance of each of the alternative behaviors. In regard to its locations on the bipolar affective dimension, the attitudes are directly measurable using standard attitude-scaling techniques. The individual will decide to perform the behavior toward which the most positive attitude is held, and the decision, in turn, influences the individual's actual behavior (Jaccard, 1981).

For clarification, an individual may possess a positive attitude toward watching television, but may have an even more positive attitude toward going to a movie. Given the opportunity to go to a movie, it is not likely that he/she will stay home and watch television, although he/she has a positive attitude toward that behavior. It is assumed that the behavior chosen will be the one to which the most positive attitude is held. The behavioral alternative model is concerned with the attitudes toward a behavioral alternative relative to other behavioral alternatives. When such attitudes are compared, the alternative toward which the most positive behavior is held should represent the predicted behavior (Jaccard, 1981).

Jaccard's (1981) study found that when individuals view their behavioral alternatives as equivalent, these individuals will continue to perform the behavior they have been performing in the past rather than assuming any new behaviors. Individuals may even fluctuate between alternatives resulting in decisions which are unstable over time. Therefore, accurate long-range prediction of behavior is unlikely. Even so, this model allows the researcher to identify those individuals for whom this is the case. In order to make accurate predictions regarding behavioral choices, the behavioral alternative model states that attitudes toward all of the relevant alternatives should be measured (Jaccard).

There are several options available to apply this model in order to evoke change in health risky behaviors: (1) to make the healthier alternative more positive, (2) to make the riskier alternative more negative, or (3) some combination approach. The chosen strategy will be determined by the mean attitude scores for the two alternatives. For example, suppose the attitude toward sunbathing at noon is highly positive, and the alternative of choice is to avoid sunbathing at that time of day. An attempt to make sunbathing at four in the afternoon more positive will not achieve the desired results. First, it would be necessary to lower the attitude toward the first alternative (sunbathing at noon) to some extent. Then, one could proceed to raise the attitude toward the desirable alternative (sunbathing at four in the afternoon) Therefore, the relationship between alternatives may warrant the employment of different strategies to strengthen the attitude toward the desired choice.

When compared to the traditional attitude model, the behavioral alternative model has been shown to be superior (Jaccard, 1981). Traditional models are cumbersome, requiring participants to yield information concerning other variables that might influence behavior. In contrast, the attractive feature of the behavioral alternative model is its ability to predict behavior without information traditionally thought to be essential. It offers good or better accuracy than traditional models as participants are given an opportunity to examine the choice between alternatives. There is no need to know desired outcomes or psychological processes involved in the process. The behavioral alternative model is a clear-cut procedure which appears to accurately elicit the desired information without unnecessary and burdensome information gathering processes (Jaccard).

Behavioral Alternative Model in Health Related Studies

This cognitive approach has been utilized to study a number of health related issues. The behavioral alternative model has been used to study destructive behavior (Piazza, Moes, & Fisher,

1996); alcohol-impaired driving tendencies (Turrisi et al., 1997); drunk driving (Turrisi & Jaccard, 1992); artificial tanning tendencies (Hillhouse et al., 1998); and cognitive variables relevant to sunbathing (Turrisi, Hillhouse, & Gebert, 1998)

More poignant to the current study is a recent study of cognitive variables relevant to sunscreen use (Turrisi et al., 1999). The two hundred thirty subjects of college age were assessed regarding behavioral tendencies and attitudes toward sunscreen use. In addition, the questionnaires administered examined both internal-based and external-based cognitions relevant toward sunscreen use and sunscreen behavioral tendencies. Factors examined were the perceived need to use sunscreen, perceived consequences, perceived efficacy, and social-normative influence. The goal of the study was to define those cognitions underlying the attitudes toward performing the behaviors under investigation, i.e. sunscreen because these cognitions are more responsive to modification in short-term educational settings (Jaccard, Turrisi, & Wan, 1990; Jaccard & Wilson, 1991; Turrisi, Jaccard, & McDowell, 1997).

Most studies have examined one or two variables at a time in relations to sunscreen use. This study differs from other studies by assessing the multivariate influence of variables simultaneously. The first variable studied, perceived need, was placed in the context of externally based information about the weather, temperature, and time of day. It was anticipated that internally based information such as skin type would influence the cognitions relevant to decision making.

Perceived consequences of sunscreen use was assessed for both negative end result (reduces flattering effects of suntanning) and positive outcome (prevents skin damage and skin cancer). Since individuals differ in their perceptions, their decisions concerning suntanning should also differ due to their perceptions. Those who perceive their appearance will be improved by

suntanning will be less likely to use sunscreen. Whereas, those who perceive their skin may be damaged from the effects of the sun will be more likely to protect their skin with sunscreen.

Perceived efficacy of sunscreen was assessed to determine any relationships which existed between the individual's perceptions of the effectiveness of sunscreen and subsequent use. In addition, the study examined general knowledge about sunscreens as well as specific knowledge as demonstrated by sunscreen usage since perceived efficacy would likely be influenced by these factors. Social-Normative influence was examined by studying the potential effect of friends and family on sunscreen use.

Turrisi et al. (1999) found that temperature, weather, and time of day were all significant predictors of sunscreen use. Of particular importance, it was demonstrated by this study that sunscreen use increased as perceived efficacy increased and perceived efficacy increased as general knowledge about sunscreen use increased. As individual's understanding of how and when to apply sunscreen increased, so did sunscreen use.

Statement of the Problem

There is extensive evidence that annual incidence of skin cancer continues to rise although protection from ultraviolet exposure exists in the form of sunscreen. Currently, U.S. citizens can expect that the chances are one in five that skin cancer will develop over the course of a lifetime (AAD, 2000). Damage from ultraviolet radiation incurred during childhood and adolescence is believed to initiate skin cancer growth, although the cancer may not appear until twenty or thirty years later. Therefore, it is important that efforts be made to prevent sun damage from occurring to individuals in this age group. During adolescence, young people begin to assume decision-making responsibility and develop decision-making skills. This is an important age in which successful

interventions can have strong effects on future behavior. In order to develop these interventions, it is critical to better understand the skin cancer related beliefs and behaviors of individuals in this period. For these reasons, this study will focus on the middle school children (11 to 14 years old).

Existing studies in regard to suntanning and sunscreen use among adolescents are limited. As this group may differ in decision making approach, it is important to study the beliefs, attitudes and behaviors of this age group. Therefore, the present study will examine a middle school age sample using the behavioral alternative model.

The following hypotheses were made for the present study:

- (1) Individuals who have the most positive attitudes toward suntanning will be more likely to engage in suntanning behaviors.
- (2) There will be a positive relationship between sunscreen efficacy and sunscreen use.
- (3) There will be a positive relationship between perception that peers and parents have a positive attitude toward sunscreen use and individual's sunscreen use.
- (4) Sunburn incidence will be predicted by sunscreen use and sunbathing behavior.

CHAPTER 2

METHODS

Subjects

One hundred parent-child family units were recruited for this study. To be eligible to participate, one family member had to be in the middle school age group of between 11 and 14 years of age. To complete the family unit, one parent participated.

To avoid an extended screening for middle school students using local phone books, middle school yearbooks were used to obtain the names of potential participants. Surnames were cross-referenced with local phone directories to focus only on surnames found in the middle school directories. Extremely common names were given last priority as a screening tool. This process was completed using yearbooks from a county middle school in Southwestern Virginia and from a city middle school located in East Tennessee.

Phone contacts were made just prior to and after Labor Day weekend in late summer. Once phone contact was made, and it was established that there was a middle school student within the household between the ages of 11 and 14, the interviewer asked to speak with an available parent. The parent was briefed concerning the purpose of the study and asked if he/she would be willing to answer three questions and give permission for his/her child to answer a few similar questions. He/she was advised that the interview with the child would take approximately 5 to 10 minutes and the child would be allowed to decide if he/she wished to participate.

Measures

Parent/Student Questionnaire

The study makes use of a two-part questionnaire. The first part consists of questions to be answered by the parent to assess parent's perceptions of the child's previous years' summer sunburns, as well as current and usual suntanning behavior. Student's questions collect demographics, recent and previous sunburn history, sunscreen use, perceived skin sensitivity, knowledge and beliefs about risk, family history of skin cancer, parental and peer influence, appearance motivation, health motivation, and belief in efficacy of sunscreen. Scenarios were provided to provoke subjects to make decisions as to preferred choices when given behavioral alternatives (see Appendix B).

Demographic Variables. Students were asked to report their gender, age, and skin color. To determine skin color, the student was read a series of responses to complete the statement "My Skin..." These responses ranged from (1) "Always burns, never tans" to (6) "doesn't burn, it's black" on a six-point Likert type scale. These responses were derived from a procedure highlighted by Fitzpatrick (1975) to more accurately differentiate skin types. This method of skin typing is commonly used in research. Its credibility is apparent in that the American Cancer Society (1998) published directives for graduated choices of sunscreen sun protection factor (SPF) based on this typing system. Skin type I includes individuals who have a nature to burn easily, never tan, and who have skin which is extremely sun sensitive. Skin type II includes individuals who also burn easily, but do tan minimally, with skin that is average in skin sensitivity. Skin type III is made up of

individuals who burn sometimes, have light brown tanning, and have sun sensitive skin. Skin type IV includes individuals who have a minimal experience with burning, carry a moderate brown tan, and are minimally sensitive to the sun. Skin type V is made up of those individuals who are not sensitive to the sun, rarely burn, and tan well. The last group, Skin type VI, is insensitive to the sun, never burn, and have darkly pigmented skin.

Recent and Previous Sunburn History. Both parents and students were asked for the adolescents' recent and previous sunburn history. Parents were asked to recall or estimate the number of sunburns the child had the previous summer. In addition to this same question, students were asked the number of sunburns they have experienced within the last month.

Sunscreen Use. Adolescents were asked to estimate the percentage of the time that they used sunscreen over the summer. They were asked to choose the SPF factor of sunscreen they commonly apply using the following scale: 4, 8, 15, 30+, or not sure.

Efficacy of Sunscreen. To more accurately assess the domain of sunscreen use, we investigated perceived efficacy of sunscreen in particular. Using a five point Likert type scale (strongly agree, moderately agree, neither, moderately disagree, strongly disagree), participants were given statements to evaluate regarding the effectiveness of sunscreen (I don't wear sunscreen because I don't think it really works; I don't believe that I will get a sunburn by not using sunscreen; If I continue to go outside without sunscreen, odds are that I will eventually get skin cancer).

Skin Sensitivity. Although skin sensitivity can be determined by the skin type discussed earlier, additional questions were designed to more accurately assess this domain. Adolescents were asked to describe a typical sunburn for them by rating that sunburn on a four point Likert type scale (not at all; slightly; moderately; extremely) as to the amount of burn, painfulness, and difficulty wearing clothes when sunburned. Skin sensitivity along with skin type correlate with future incidence of skin cancer (ACS, 2000).

Knowledge and Beliefs about Skin Cancer. To assess the knowledge and beliefs concerning skin cancer, participants rated their agreement with four statements using a five point Likert scale ranging from strongly agree to strongly disagree. This section assesses the knowledge of melanoma (melanoma is the most serious type of skin cancer), hair color as a risk factor (redheads and blondes are at a greater risk for skin cancer), the safe way to avoid sunburns (the safe way to avoid sunburns during the summer is to get a base tan), and ability to judge sun burning as it happens (it is common for people to fail to feel sunburned even though they are).

Family History. Having a family member with skin cancer may have a bearing on an individual's decision to participate in behaviors which are considered risky. Therefore, students were given a single statement "someone in my family has/had skin cancer," to which they responded with "true", "false", or "don't know."

Social Influence. Adolescents have been found to be influenced in their health behaviors by both their parents and peers (Banks et al., 1992; Langer & Warheit, 1990; Lau et al., 1990). Because these social-normative influences may explain significant amounts of variance in behavior (Turrisi

et al. 1999), questions were randomly placed to assess peer and parental influence (I feel uncomfortable if I am pale and my friends have a tan; Most of my friends try to get a tan; My friends keep their skin healthy by using sunscreen; My friends notice when I have a tan; I only wear sunscreen if my mother/father makes me wear it). Such questions required response on a five point Likert type scale ranging from “strongly agree” to “strongly disagree.”

Appearance Motivation. To assess the association between a tanned body and attractiveness discussed in the literature (Broadstock et al., 1992; Keesling & Friedman, 1987; Miller et al., 1990), the current study asked subjects for their agreement with a number of statements relating to their perceptions about the relationship between a suntan and attractiveness (A tan makes me look good; How you look influences how many friends you have). Again, a Likert type scale was used with responses ranging from “strongly agree” to “strongly disagree.”

Health Motivation. Although inaccurate, it is believed by some that a tanned person is healthier (Broadstock et al., 1992; Johnson & Lookingbill, 1984; Keesling & Friedman, 1987). For these individuals the appearance of health may take priority over actual health concerns (Broadstock et al.). Using the five point Likert-type scale employed in previous questions for agreement with responses ranging from “strongly agree” to “strongly disagree”, adolescents were provided statements to assess their cognitions in regard to health (I think I look healthier with a tan; Being healthy and physically fit is more important to me than most people).

Alternative Behavioral Choices. The theory of alternative behavior recognizes that individuals have a range of choices available to them in any given situation. Consistent with this

theoretical model, this study presented each respondent with three behaviors that they might engage in with their friends on a really hot, summer day (sunbathe, go to the movies, stay inside and watch TV). Respondents were asked to rate how they felt about performing each option using a Likert-type scale (1= very bad to 5= very good).

Following this general rating of the three alternatives, respondents were asked to give ratings on a series of statements concerning the advantages and disadvantages of each of the three alternatives (e.g., “I think watching television is boring,” “My friends like going to the movies,” etc.) using 5-point Likert-type scales (strongly disagree to strongly agree).

Procedure

Prior to recruitment, the present study was reviewed and approved by the Institutional Review Board of East Tennessee State University in Johnson City, Tennessee. Subjects were recruited on a voluntary basis. Subjects were instructed that all information supplied to the study would remain anonymous, that their participation was voluntary, and they were fully instructed in regards to their rights as research participants. Subjects were advised that study results would be available from Dr. Joel Hillhouse or Billie H. Murray after study completion. Subjects were informed that they had the right to discontinue study participation at any time, and were instructed to be honest in completion of questions asked by the researcher. Parent subjects were asked for permission to interview adolescents and adolescents were given the opportunity to accept or decline the invitation to participate even if the parents had given permission for them to participate.

CHAPTER 3

RESULTS

Demographics

There were 100 respondents (71 females; 29 males) who agreed to participate in this study. Participants ranged in age from 11-14 years ($M = 13.09$, $SD = .922$). Skin type was distributed as follows: skin type I = 4% skin type II = 19%, skin type III = 65%, skin type IV = 12%, skin type V = 0%, skin type VI = 0%. A total of 52% reported having been outdoors specifically to tan within the past three weeks (mean self-reported times outside to tan = 2.22 occasions , males = 1.59 occasions, females = 2.48 occasions; $t = -2.617$, $p < .05$).

Adolescents' reports of time spent outdoors during which they were wearing sunscreen ranged from 2% to 100%. As a group, 59% reported using sunscreen 50% of the time or less. Only 24% reported using sunscreen 75% or more of their time outdoors. Only four percent reported using sunscreen every time they went outdoors. Females reported greater sunscreen use than males (females = 54%; males = 33%). Eighty-three percent of participants reported that when they used sunscreen, they applied sunscreen with an SPF of 15 or more.

This study also examined the time duration for each incident of intentional suntanning. Time durations reported ranged from less than one hour to between three to four hours. Females again reported longer time periods spent engaged in intentional suntanning with a mean of 1.4 hours, while the male adolescents spent slightly less with a mean of 1.2 hours.

Reported incidence of sunburns during the prior month ranged from “none” to “twenty,” as did sunburn incidents reported from the previous year. It was interesting to note that 75% reported at least one sunburn during the previous month, while 92% reported the incidence of sunburn the

summer of the previous year. Female adolescents reported a mean of 3.1 sunburns during the prior month, while male adolescents reported 1.2 sunburns during the same period. When recalling sunburns from the previous summer, female adolescents again reported a higher occurrence with a mean of 6.6 sunburns as compared to a mean of 4.4 for male adolescents.

Examination of Gender and Skin Type Differences

Overall gender and skin type differences in suntanning behavior, sunburn history, sunscreen use, skin sensitivity, knowledge and beliefs about cancer risk, social influence (i.e. peer and parental influence), appearance motivation, health motivation, and attitudes derived from behavioral alternative choices were examined using multivariate analysis of variance (MANOVA). Each MANOVA was performed with suntanning behavior, sunburn history, sunscreen use, skin sensitivity, knowledge and beliefs about cancer risk, social influence (i.e. peer and parental influence), appearance motivation, health motivation, and attitudes derived from behavioral alternative choices serving as dependant variables. The MANOVA results indicated an overall significant difference for gender (Pillais = .56, $F [28,64] = 2.91, p < .001$). Examination of results revealed a significant gender difference for the belief that "looks influence the number of friends one has," with male subjects more likely to believe this statement to be true. Areas in which female adolescents were significantly different from males was their belief that most of their friends try to get a tan, that melanoma is the most serious type of skin cancer, and that redheads and blondes are at a greater risk for skin cancer. Females also reported significantly more sunscreen use, times outside specifically to tan, and the difficulty of wearing clothes when they have a typical sunburn. No overall differences on any of the dependant variables appear between skin types.

Examination of Sunburn History and Sunscreen use

Suntanning and sunburn history reports were socially validated by conducting a 2-tailed Pearson bivariate correlation examined the relationship between a parent's and child's responses to the three questions regarding the suntanning/sunburn history. For all three questions, responses of parents and adolescents correlated significantly ($p < .01$). Refer to Table 1.

TABLE 1

PEARSON BIVARIATE CORRELATION OF PARENT/CHILD RESPONSES

	Child Self-report Tan	Child Self-report Hours in Sun	Child Self-Report Sunburns Last Summer
Parent:: Child Tan	.610 $p < .001$.296 $p < .01$.174 $p > .05$
Parent: Child's Hours in Sun	.265 $p < .001$.399 $p < .001$.100 $p > .05$
Parent:: Child's Sunburns Last Summer	.187 $p > .05$.048 $p > .05$.416 $p < .001$

Stepwise hierarchical regression analysis was used to examine both current summer and past summer sunburn history as predictors of suntanning behavior. Demographic variables (age, sex, and skin type) were controlled for by being entered first into the equation. These demographic variables did not contribute significantly to sunburn history variance. Next, attitude and belief predictors were entered including tanning attitudes, attitude toward a healthy lifestyle, attitudes toward sunscreen use, skin cancer knowledge, family member skin cancer experiences, attitude toward

watching television, and attitude toward going to the movies. The regression results were not significant for either current or previous summer sunburn history.

Sunscreen attitudes were also studied using regression analysis, again controlling for the demographic variables (age, gender, and skin type) by entering them into the equation first. Next, attitude and belief variables (tanning attitude, healthy lifestyle attitude, knowledge, family incidence of skin cancer, television attitudes, and movie attitudes) were entered. Although the demographic variables contributed no significant variance, the attitude and belief variables entered in the second step were found to account for a significant 15.3% amount of the sunscreen attitude variance ($\Delta F [3,99] = 51.67, p < .05$). Examination of the regression beta coefficients revealed significant β 's for gender ($\beta = 2.60$), healthy lifestyle attitude ($\beta = .814$), and family member skin cancer experience ($\beta = -1.296$). These results indicate that females are more likely to wear sunscreen, as are those who have healthy lifestyle attitudes. Unexpectedly, it appeared that those who have family members with skin cancer were less likely to wear sunscreen. Refer to Table 2. Therefore we followed up this analysis with an independent t-test examining sunscreen use with family history of the skin cancer as the independent variable. This analysis revealed that respondents who have had a family member with skin cancer were significantly more likely to use sunscreen. Thus, it appears that the negative β in the above regression was due to suppression effects.

TABLE 2

RESULTS OF REGRESSION ANALYSIS TESTING OF SUNSCREEN ATTITUDES

Predictors	b	t	p
Age	-0.069	-0.641	ns
Gender	2.600	2.357	<.05
Skin Type	-1.580	-1.562	ns
Tanning Attitude	-0.176	-1.761	ns
Healthy Attitude	0.308	3.193	<.05
Knowledge	0.036	0.357	ns
Family Member/Skin Cancer	-0.216	-2.225	<.05
Television Attitude	0.123	1.163	ns
Movie Attitude	-0.023	-0.225	ns

$R^2 = .153$; Overall F (9,99)= 51.666 ; $p < .05$

Behavioral Alternative Model Evaluation

Stepwise hierarchical regression analysis was used to examine the attitudes toward the behavioral alternatives presented, as well as the role of these choices as predictors of suntanning behavior. Demographic variables (age, sex, and skin type) were controlled for by being entered first into the equation. Next, the behavioral alternative variables (attitudes toward suntanning, watching television and going to the movies) were entered as a group. Other predictors entered at this time

included attitudes toward healthy lifestyle, attitudes toward sunscreen, skin cancer knowledge, and family member skin cancer experiences. These variables accounted for an additional and significant 16.6% of the variance, beyond the 7.3% accounted for by the demographic variables ($\Delta F [3,99] = 8.44, p < .05$). Overall, 23.9% of the adolescent's suntanning behavior variance was accounted for and was significant ($\Delta F [10,99] = 7.93, p < .001$). Examination of the beta coefficients in the regression revealed significant β 's for gender ($\beta = .218$) and attitude toward tanning ($\beta = .429$), indicating that female subjects and those with a positive attitude toward suntanning reported a greater frequency of going outside specifically to tan. Refer to Table 3.

TABLE 3

RESULTS OF REGRESSION ANALYSIS TESTING OF THE THEORY OF ALTERNATE BEHAVIOR AS "TIMES OUTDOORS TO TAN"

Predictors	b	t	p
Age	0.081	0.790	ns
Gender .	0.218	2.019	<.05
Skin Type	0.095	0.981	ns
Tanning Attitude	0.429	4.461	<.001
Healthy Attitude	-0.016	-0.170	ns
Sunscreen Attitude	0.002	0.015	ns
Knowledge	-0.060	0.636	ns
Family Member/skin cancer	0.167	1.760	ns
Television Attitude	-0.072	-0.715	ns
Movie Attitude	-0.010	-0.100	ns

$R^2 = .239$; Overall $F (10,99) = 7.932$; $p < .001$

In addition to “number of times spent tanning,” we examined suntanning behavior as defined by “hours spent each time tanning” using a stepwise hierarchical regression analysis. Demographic variables (skin type, age, and gender) were controlled for by being entered first into the equation. Next the theoretical predictors of suntanning attitudes, attitudes toward a healthy lifestyle, attitudes toward sunscreen, skin cancer knowledge, family member skin cancer experiences, attitudes toward watching television, and attitudes toward watching movies were entered. These variables accounted for a significant 11.9 % ($\Delta F [10,99] = .72, p < .05$) of hours spent suntanning behavior variance. Refer to Table 4.

TABLE 4

RESULTS OF REGRESSION ANALYSIS TESTING OF THE THEORY OF ALTERNATE BEHAVIOR AS “HOURS OUTDOORS”

Predictors	b	t	p
Age	-0.014	-0.124	ns
Gender	0.071	0.607	ns
Skin Type	0.012	0.120	ns
Tanning Attitude	0.381	3.679	<.001
Healthy Attitude	0.065	0.625	ns
Sunscreen Attitude	0.038	0.350	ns
Knowledge	-0.107	-1.050	ns
Family Member/skin cancer	-0.104	-1.023	ns
Television Attitude	-0.075	-0.683	ns
Movie Attitude	0.004	0.043	ns

$R^2 = .119$; Overall $F (10,99) = .722$; $p < .05$

Tanning Attitudes

Because attitude toward tanning was determined to be the best predictor of suntanning behavior, a stepwise hierarchical regression analysis was performed to examine tanning attitudes as a dependant variable. Demographic variables were controlled for by being entered into the equation first. Next, the predictors of attitudes toward a healthy lifestyle, sunscreen, skin cancer knowledge, having a family member with skin cancer, watching television and going to movies were entered. This analysis accounted for a significant 8.6% of the variance for tanning attitudes ($\Delta F [9, 99] = 53.819, p < .05$). Examination of the beta coefficients in the regression revealed significant β 's for skin type ($\beta = .217$) and healthy lifestyle attitude ($\beta = .256$), showing both as predictors of tanning attitude. Refer to Table 5.

TABLE 5

RESULTS OF REGRESSION ANALYSIS TESTING OF SUNTANNING ATTITUDES

Predictors	b	t	p
Age	-0.023	-0.205	ns
Gender	2.150	1.848	ns
Skin Type	0.217	2.093	<.05
Healthy Attitude	0.256	2.499	<.05
Sunscreen Attitude	-0.190	-1.710	ns
Knowledge	-0.038	-0.368	ns
Family Member/Skin Cancer	-0.061	-0.589	ns
Television Attitude	-0.044	-0.395	ns
Movie Attitude	-0.137	-1.300	ns

$R^2 = .086$; Overall F (9,99)= 53.819 ; $p < .05$

CHAPTER 4

DISCUSSION

Current research suggests that an individual's exposure to the sun during childhood and adolescence is an important risk factor for all skin cancers. Even so, a literature review reveals that a limited amount of research is available in which children and adolescents serve as subjects. Therefore, the present study examined adolescents' suntanning and sunscreen usage behaviors and the role specific beliefs and attitudes have upon their behavioral choices using the Theory of Alternative Behavior as a guiding theory. As well as examining their tanning attitudes, the adolescents in this study were presented with the alternative choices of spending time watching movies or watching television. As expected, suntanning behavior was significantly predicted by the adolescents' attitudes toward suntanning. Guided by the work of Jaccard (1981), attitude-scaling techniques were used to determine relationships between self-reported suntanning behavior and the subjects' beliefs and cognitions related to suntanning.

Parent/Child Agreement

To socially validate the accuracy of the self-reported suntanning activity of the adolescents, parents were asked to answer questions regarding the suntanning behavior of their adolescent children. We found significant positive relationships between the responses of the adolescents and their respective parents' observations. Although significant, the relationships were weak, possibly due to the employment of recall as a measurement tool. Furthermore, not all parents are effective monitors of their children's behavior; therefore parents may not have been present to observe every

incidence of suntanning. Though this positive finding agrees with that of Lower, Girgis, & Sanson-Fisher (1998) who confirmed adolescent self-report to be a viable tool for research, researchers need to be cautious about over-reliance on either recall or parents' observations in future research.

Behavioral Alternatives

The behavioral alternatives of watching television and going to the movies were expected to predict suntanning behavior and sunscreen use above and beyond the attitudes toward suntanning and sunscreen behaviors. However, these expectations were not substantiated by the results of our analysis. We found that while attitudes toward suntanning significantly predicted suntanning behavior, attitudes toward alternative behavioral choices did not.

There are a number of possible explanations as to why the hypothesized relationships between suntanning behavior and the alternatives were not significant. The initial stage of the decision-making process involves the formation of behavioral alternatives. There has been little actual research in which the focus has been the first stage (Jaccard, 1981), but we might expect there to be a great deal of variance in the alternatives individuals perceive to be available at a given time. Behavioral predictions are dependent upon the choices perceived available. Therefore, this process of generating behavioral alternatives is central to the analysis of the attitude-behavior relationship (Jaccard, 1980). We presented the adolescents with three alternatives for spending time on a hot, sunny day, without asking which choices they believe might be available to them. Therefore, it is possible that we may have selected behavioral alternatives which were not predictive of their behavior. Because of the constantly changing choices in today's society, it may be that new, more preferred choices have become available to this age group. Thus, this study may have been more

viable, had the subjects been directly asked to project behavioral choices for spending time on a hot summer day or had different choices been given.

The second step in the decision-making process involves the evaluation of the available behavioral choices. The format in which these choices were presented may have impacted the results. Generally speaking, when one makes a decision, a number of available alternatives will be considered at one time and a choice made. Once the decision is made, should a new choice become available, individuals sometimes change their minds and choose the option presented most recently. In the present study, it is possible the manner in which the options were presented failed to strongly clarify that the options were to be evaluated together as a group, then rated as to how favorable the individual felt about each. Individuals may have oversimplified the decision process by considering each alternative individually rather than evaluating the three choices to determine a preference for how they might spend a hot summer day. While a scenario is a useful tool, it does not replace day to day life. Possibly a different format for questions could more effectively allow individuals to envision what they would actually do on a hot, summer day given alternative choices. For example, if respondents could have read the choices themselves rather than have the choices read to them over the phone, those choices might have been easier to envision as a group of alternatives. It might also be possible to present the alternatives through media such as videos, audio tapes or pictures.

Sunburn History and Sunscreen Use/Attitudes

It was surprising that sunburn history was not a predictor of suntanning or sunscreen attitudes. One possibility could be the existence of the belief that sunburning is a necessary pre-tanning event. Although participants were asked whether a base tan was a safe way to avoid sunburns, they were not asked whether they believe a sunburn is a precursor to a tan.

Future research might query adolescents to determine if this belief exists.

Female adolescents in the study were more likely to wear sunscreen, but were also more likely to spend more time in the sun. This finding also supports the premise that individuals may be spending more time in the sun under the impression they can do so safely with sunscreen protection. Because some forms of skin cancer result from cumulative exposures they may be increasing their risk for these forms of skin cancer. According to the International Agency for Research on Cancer (1992), sunscreen use may allow for increased sunlight exposure resulting in higher amounts of UV radiation exposure.

As attitudes influence behavioral choices, having a healthy lifestyle attitude would be thought to influence choices in suntanning behavior and sunscreen use. Therefore, it was surprising that “healthy lifestyle attitude” failed to be a predictor for incidence or duration of suntanning activity. Yet, it was a predictor of sunscreen behavior. This might seem paradoxical, unless these individuals increase their exposure to the sun because they are wearing sunscreen. Could the general public have a lack of understanding of the limits of protection offered by sunscreen? Certainly results of this study appear to indicate having a healthy lifestyle attitude is not a predictor of limited suntanning activity. Therefore, one might infer that an individual with a healthy lifestyle attitude might believe that wearing sunscreen protects one to engage in more suntanning activity. This misbelief brings attention to a possible flaw in educational efforts. It may be that a focus to encourage sunscreen use indirectly creates the perception that protection from sunscreen is unlimited as long as the protection factor is 15 or above. Among adolescents in this study reporting sunscreen use, significantly more reported using SPF factors of 15 and above. This indicates that the public has an understanding of the strength of sunscreen necessary for adequate protection but possibly difficulty understanding the maximum duration for which that protection exists and the need for reapplication

of sunscreen periodically to maintain protection. Although those adolescents with “healthy lifestyle attitudes” were significantly more likely to wear sunscreen, only four percent of the participants reported daily sunscreen use. Therefore, this study confirms that individuals have difficulty complying with the recommendations for daily use.

Certainly, it is possible that these individuals protect their skin through the use of hats and clothing which covers their skin to protect themselves, as this study did not query these modes of protection. More likely, adolescents may have optimistic bias toward skin cancer becoming a reality in their own life. In other words, they may believe skin cancer is a potential result of unprotected skin exposure, but believe this will happen to someone other than themselves. On the other hand, they may perceive skin cancer to be an insignificant condition which is easily remedied. Therefore, they may consider the benefit of having a tan (an immediate reward) to be greater than the risk of cancer in the future. Furthermore, the inability of children and adolescents to envision themselves as adults could be a barrier. They may perceive skin cancer to be an adult problem and perceive that adulthood is a time very distant from the present. They may even perceive skin cancer as a condition of the elderly. Thus, it is possible that educational material presented by peers who have experienced skin cancer either directly or through family members could have a greater influence on their motivation to take preventative action.

Tanning Attitudes

Interventions to shift the attitudes of children and adolescents away from unhealthy suntanning behavior may be successfully approached through the psychological components of these attitudes (appearance motivation, having friends that tan, and wanting to look healthy). In regard to appearance motivation, educational interventions may assist in helping adolescents

understand that the darkening of skin is indicative of damaged skin. Emphasis on the more visible and immediate effects of sun exposure such as wrinkles and accelerated aging may discourage tanning behavior since attractiveness seems to be a common goal for most individuals. A more effective approach may be rendered through the use of attractive, untanned role models to educate and encourage adolescents to limit sun exposure and use sunscreen appropriately. Other research suggests that this focus on attractiveness in which such negative effects of tanning are emphasized may prove effective (Jones & Leary, 1994; Rossi et al., 1995).

Another possible strategy for improved success in changing perceptions would be to utilize someone in the adolescent's peer group as the facilitator of educational interventions. Adolescents may be more willing to listen to someone with whom they feel a common bond. Furthermore, someone in their peer group may be able to approach the subject in a more appealing way or with more understanding of adolescent's unique decision-making skills. Educational interventions could be implemented in a variety of ways. The peer facilitator could speak to groups to educate them. Another option would be for the peer facilitator to coordinate group sessions in which the adolescents have the opportunity to discuss and negotiate their beliefs together. Since this is the process used by adolescents to process their decision making, it should prove effective. Another alternative would be the use of individual consultation by the peer facilitator of the intervention.

Gender Differences

Our study found adolescent females to be significantly more likely to be outside specifically to tan. These findings support a growing body of evidence indicating that females may be more likely than males to indulge in suntanning behavior (Ambrose, 1997; Leary & Jones, 1993; Robinson et al., 1997; Vail-Smith & Felts, 1993; Wichstrøm, 1994;). Even so, this finding has not been

confirmed by all studies. On the contrary, Johnson & Lookingbill (1984) found the male subjects exhibited more behaviors which exposed them to the UV radiation. In another study, Reynolds et al. (1996) found that among over 500 sixth graders on a particular weekend, males who sunbathed spent longer intervals suntanning than did females. The discrepancy between study results may be because of the lack of uniformity in study questions. Some studies measured frequencies of suntanning behavior while others measured lengths of time exposed to the sun. Our study queried both frequencies of intentional suntanning and average hours spent per exposure. This study found females not only significantly more likely to go outdoors specifically to tan but also to spend more hours involved in suntanning behavior.

Females were also significantly more likely to believe that their friends notice when they have a tan and that most of their friends try to get a tan. The findings reinforce other studies which have found that appearance motivation and having friends who think positively about suntanning to be related to suntanning behavior. These psychological components of attitudes have been previously discussed as an avenue of change. Peer educational interventions directed specifically toward female appearance concerns may be successful at changing appearance motivation to tan. If females were separated from the male adolescents for the intervention, they might feel more comfortable discussing issues and motives related to attractiveness. Furthermore, because many females use makeup to enhance their appearance, discussion could be included to educate individuals on the use of makeup with sun protection factor. An effort toward the use of lighter makeup would be a subtle advance toward making paler skin more desirable. Any of these areas could be addressed more effectively in a female only group.

The current study also found that females reported a significantly higher number of sunburns for the three-week period prior to the study. This is reasonable because they also reported

more incidents of intentional suntanning. Although incurring more sunburns, the females reported more sunscreen use which would support the finding that individuals who use sunscreen may increase their cumulative exposure to the sun, and thereby, increase the risk of skin cancer.

Procedural Limitations

Some procedural limitations do appear in the present study. Because this study was administered by telephone to a parent and an adolescent, in some cases the parent may have been present when his/her child responded to questions. If so, the adolescent subjects may have felt pressure to give responses they thought would be acceptable to their parents. However, any such social desirability effect is most likely minimal as the questions were designed to elicit short, single word responses. Even so, such a possibility should be considered.

Another possible limitation concerns the season in which the data were collected. This survey instrument was administered in the late summer, prior to the return of subjects to school; thus the intensity of the desire for tanning might have been different than in other times of the year. Given the positive attitude toward tanning demonstrated by their responses, these students may have been increasing their tanning efforts because of appearance motivation. Had the survey been administered in the spring, an increased desire to tan because of the weather change may have been apparent. In any case, this survey instrument was designed for administration during a season in which outdoor tanning is possible.

To allow for maximum diversity in a limited regional area, data was collected from subjects living in a rural area in one state and from others living in a city in another state. Even so, a larger sample that included individuals throughout the nation would be desirable to achieve a more heterogeneous sample from which results could be more generalizable to this age group.

Future Research

The results of the present study offer several prospects for future investigations using this research design. Of primary importance in this study was the use of solid theoretical models that have been used over time and have an accumulation of evidence to support their validity. To insure reliability in data collection, research in this area will benefit from the continued use of reliable theoretical models.

To better assess any differences in suntanning beliefs, attitudes, and knowledge from a developmental perspective, a larger adolescent sample would allow statistical analysis between age groups to show any significant differences in attitudes that might exist. Such differences, if found, might be explained by developmental changes. This information could facilitate the effort to provide effective interventions to meet developmental needs and create healthy attitudes.

Given the inconsistency in findings as to whether males or females receive more exposure to UV radiation, a study based on this subject alone would provide a future research opportunity which could shed light on previous study results. In such a study, a survey instrument could address many different scenarios of alternative behaviors in which all alternatives are presented to both male and female participants before they are allowed to favor an alternative.

The Alternative Behavioral Model should also prove useful in future research. Additional research within the adolescent group might also be useful to address the need to change perceptions regarding suntanning behavior.

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APPENDICES

APPENDIX A
PARENT/CHILD AGREEMENT QUESTIONS

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PARENT/CHILD AGREEMENT QUESTIONS

Survey for Parents:

During the past 3 weeks, please tell me how often you think (name of adolescent) has gone outside specifically to get a tan.

- _____ Never
_____ Once or twice
_____ Three or four times
_____ Five or six times
_____ Seven or eight times
_____ Nine times or more

We want to know how much time you think (name of adolescent) spends lying out in the sun.

On a typical day, how many hours would your child spend lying out in the sun?

- _____ Less than 1 hour
_____ 1 to 2 hours
_____ 3 to 4 hours
_____ 5 or more hours

We want you to estimate how many sunburns (name of adolescent) had last summer (of any kind: on his nose, face, shoulders, arms, etc.)

- _____ Sunburn (s)

Survey for Above Parent's Child:

We are interested in your experiences with sunbathing:

1. During the past three weeks please tell me how many times you have gone outside specifically to get a tan.

_____ Never
_____ Once or twice
_____ Three or four times
_____ Five or six times
_____ Seven or eight times
_____ Nine times or more

2. We want to know how much time you spend lying out in the sun. On a typical day, how many hours would you spend lying out in the sun?

_____ Less than 1 hour
_____ 1 to 2 hours
_____ 3 to 4 hours
_____ 5 or more hours

From another section of survey:

3. We want to know how often you have gotten sunburn in the last month (of any kind: on your nose, face, shoulders, arms, etc.)

_____ Sunburn (s)

4. We want to know how many sunburns you had last summer (of any kind on your nose, face, shoulders, arms, etc.)

_____ Sunburn (s)

APPENDIX B
BEHAVIORAL ALTERNATIVE CHOICES

APPENDIX B
BEHAVIORAL ALTERNATIVE CHOICES

Suppose it was a really hot summer day and you were thinking of doing something with your friends.

- 1 = Very Bad
2 = Moderately Bad
3 = Neither Bad nor Good
4 = Moderately Good
5 = Very Good

Given this scenario, how good or bad would you feel about each of these:

1. Intentionally lying in the sun to get a tan.	1	2	3	4	5
2. Doing something indoors with friends (i.e. movie).	1	2	3	4	5
3. Watching television at home.	1	2	3	4	5

Suppose it was a really hot summer day and you were thinking about staying home and watching television. How much would you agree/disagree with each of the following statements.

- 1 = Very Bad
2 = Moderately Bad
3 = Neither Bad nor Good
4 = Moderately Good
5 = Very Good

4. I think watching television is boring.	1	2	3	4	5
5. My friends watch a lot of television.	1	2	3	4	5
6. Sitting around watching television is a waste of time.	1	2	3	4	5
7. I like spending time with my friends when we watch television together.	1	2	3	4	5

Suppose it was a really hot summer day and you were thinking about going to the movies. How much would you agree/disagree with each of the following statements?

1 = Very Bad

2 = Moderately Bad

3 = Neither Bad nor Good

4 = Moderately Good

5 = Very Good

8. I think going to the movies is boring.	1	2	3	4	5
9. My friends like going to the movies.	1	2	3	4	5
10. Going to the movies is a waste of time.	1	2	3	4	5
11. I like spending time with my friends when we go to the movies together.	1	2	3	4	5

APPENDIX C

OPINIONS ABOUT TANS, LIFESTYLES, SUNBATHING, AND SUNSCREEN

APPENDIX C

OPINIONS ABOUT TANS, LIFESTYLES, SUNBATHING, AND SUNSCREEN

In this section we are going to ask your opinions specific to the appearance of tans, lifestyles, sunbathing, and sunscreen, How much would you agree/disagree with each of the following statements?

1 = Very Bad

2 = Moderately Bad

3 = Neither Bad nor Good

4 = Moderately Good

5 = Very Good

12. I feel uncomfortable if I am pale and my friends have a tan.	1	2	3	4	5
13. How you look influences how many friends you have.	1	2	3	4	5
14. My friends notice when I have a tan.	1	2	3	4	5
15. A tan makes me look good.	1	2	3	4	5
16. Being healthy and physically fit is more important to me than most people.	1	2	3	4	5
17. My friends play sports regularly.	1	2	3	4	5
18. My friends keep their skin healthy by using sunscreen.	1	2	3	4	5
19. I think I look healthier with a tan.	1	2	3	4	5
20. I enjoy outdoor activities.	1	2	3	4	5
21. Most of my friends try to get a tan.	1	2	3	4	5
22. My trying to get a tan at this time in my life is not a bad thing.	1	2	3	4	5
23. If I continue to go outside without sunscreen, odds are that I will eventually get skin cancer.	1	2	3	4	5
24. I don't wear sunscreen because I don't think it really works.	1	2	3	4	5
25. I don't believe that I will get a sunburn by not using sunscreen.	1	2	3	4	5
26. I only wear sunscreen if my mother/father makes me wear it.	1	2	3	4	5
27. During the summer, I feel good about using sunscreen every day.	1	2	3	4	5

In this section we would like to measure how much you know about risks. How much would you agree/disagree with each of the following statements?

28. The safe way to avoid sunburns during sun exposure is to get a base tan.	1	2	3	4	5
29. Melanoma is the most serious type of skin cancer.	1	2	3	4	5
30. Redheads and blondes are at a greater risk for skin cancer.	1	2	3	4	5
31. It is common for people to not feel sunburned even though they are.	1	2	3	4	5

APPENDIX D

FAMILY HISTORY, SUNSCREEN HABITS, SUNBURN HISTORY AND DEMOGRAPHICS

APPENDIX D

FAMILY HISTORY, SUNSCREEN HABITS, SUNBURN HISTORY AND DEMOGRAPHICS

Please tell me if the following statement is true, false, or if you don't know the answer.

32. Someone in my family has/had skin cancer.	T	F	DK
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In the last section, we would like to know about your sunscreen habits.

1. Over the summer, I use sunscreen _____ % of the time.

2. When I use sunscreen, I use a sunscreen with a number of

_____ 4

_____ 8

_____ 15

_____ 30+

_____ Not Sure

3. My skin

1 = always burns, never tans

2 = always burns, then tans slightly

3 = sometimes burns, always tans afterward

4 = never burns, always tans

5 = skin doesn't burn, it's brown

6 = skin doesn't burn, it's black

4. We want to know how often you have gotten a sunburn in the last month (of any kind: on your nose, face, shoulders, arms etc.)

_____ Sunburn (s)

5. We want to know how many sunburns you had last summer (of any kind: on your nose, face, shoulders, arms, etc.)

_____ Sunburn (s)

6. Suppose you had a typical sunburn for you. How burned would you be?

_____ Not at all burned

_____ Slightly burned

_____ Moderately burned

_____ Extremely burned

7. For your typical sunburn, how painful would it be?

_____ Not at all painful

_____ Slightly painful

_____ Moderately painful

_____ Extremely painful

8. How difficult would it be to wear your regular clothes with your typical sunburn?

_____ Not at all difficult

_____ Slightly difficult

_____ Moderately painful

_____ Extremely painful

9. _____ Gender

10. _____ Age

VITA

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Memberships &
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One of two state recipients of 1993 VAEOPP Scholarships
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Papers Presented

Poster presented at The Northeast Tennessee Regional Health Council
Conference on Tobacco and Health, 2001: WannaWannaQuit:
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Paper presented at Southeastern Psychological Association
Conference, 1996. Time perceptions in older humans:
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Poster presentation for the Southeastern Psychological Association
Conference, 1995: Finding Success: Multidimensional wellness
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