Tanning and risk perception in adolescents

LENNART SJÖBERG, LARS-Erik HOLM, HENRIK ULLÉN & YVONNE BRANDBERG

Abstract  Skin cancer is a rapidly increasing cancer form in many countries, and tanning is considered to be an etiologic factor of this type of cancer. Tanning is a type of risky behaviour, which has been found to be hard to change, particularly in the groups where it is most risky (children and adolescents). Exposure to ultraviolet radiation (UV), protective behaviour and risk perception with regard to tanning were investigated with a postal questionnaire in a large representative sample of Swedish teenagers 13, 15 and 17 years old (n = 2615). Risky behaviour was most prevalent among girls and older respondents, in spite of their greater awareness of the risks, and the general female tendency towards risk avoidance. Cosmetic and social motives seemed to drive this type of risk taking behaviour. Comparisons of perceived personal risks of tanning and risks to other people as well as perceived control over the risks, showed personal risks to be perceived as smaller than risks to others, and perceived control to be an important factor in this form of unrealistic optimism. Although people may have more or less valid perceptions of the risks to others, they tend to have overly optimistic views of their personal risks when it comes to tanning. Risk communication is particularly difficult in cases like this. The problem of stimulating more prudent behaviour in teenagers with regard to tanning is discussed.

Key words: UV risks, skin cancer, tanning, risk perception, protective behaviour

Introduction

Tanning increases the risk of malignant melanoma, which is one of the most rapidly increasing types of cancer in Sweden and in several other countries. There is a strong association between skin melanoma and intermittent sun exposure, and sunlight-induced acute skin burns are related to the risk of developing malignant melanoma

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knowledge about risks to UV radiation and to risk denial and fatalism (Michielutte et al. 1996). However, knowledge is no guarantee of less risk taking (Donavan and Singh 1998). High levels of knowledge were found in studies of children and youths, yet problematic behaviour was frequent (Alberg et al. 2002; Cokkinides et al. 2001; Wichstrom 1994). In the period 1986–96, knowledge about tanning risks increased in the USA, but so did risk taking (Robinson et al. 1997). In sunny regions, such as California, there seems to be a high frequency of hazardous behaviour in the sun (Hoegh et al. 1999).

In a study of a large representative sample of the Swedish population (Sjöberg in press-a), risky tanning was found to be practised by about 10% of the respondents. Young women were especially likely to behave in this way. Boldeman et al. (2001) reported similar results. It is likely that women are exposed to the suntan risk in particular since they are more concerned with their appearance than are men (Bruch 1981; Hayes and Ross 1987). Tanning is thus a common type of risky behaviour, especially among young people and women. If women take larger risks than men do, it is an exceptional case since women usually take fewer risks than men (Byrnes et al. 1999).

Risk perception and tanning

Risk is involved in tanning, and how people perceive risks has been the subject of many studies; see Slovic (2000). In general, people may have a fairly correct view of risks that are common and everyday, but tend to consider many technology risks as much larger than experts do. Personal lifestyle risks, on the other hand, are often seen as smaller than experts assess them to be. There have been few detailed studies of perceived tanning risks. Sjöberg (1994, 1995) found them to be rated as medium in a large set of different risks relating to lifestyle, environment and technology.

Research on perceived skin cancer risks is limited, and there is a lack, in particular, of data on crucial risk groups consisting of representative samples of youngsters. How do young people perceive the risks that they take while tanning, and how do they protect themselves? Tanning has some unusual features among risk taking behaviours. Cosmetic motives and social acceptance are probably powerful factors, especially for teenage girls. Those more concerned with their appearance have been found to be more interested in tanning (Prentice-Dunn et al. 1997). Although boys take larger risks than girls in most other respects, we have here a case where it can be expected that the opposite is the case. We do not know if such female risk taking is also associated with more unrealistic optimism on the part of the girls, or if they are aware of the risks they are taking. Is there a high prevalence of unrealistic optimism with regard to tanning, and is it related to perceived control, like in the case of other behaviours (Sjöberg in press-b)? Are young women more likely than men to attribute risks to others than to themselves? Eiser et al. 1993 found only a small optimistic bias in the case of tanning, but more work is clearly called for since Sjöberg’s large-sample data gave a very different result: there was clearly unrealistic optimism both for tanning and melanoma (Sjöberg 1994, 1995).

Unrealistic optimism

Unrealistic optimism occurs when people on the average estimate their own risk as smaller than that of others (Weinstein 1980). Smokers and people drinking alcohol commonly underestimate systematically and strongly their own risk (McKenna et al. 1993; Sjöberg 1998; Sutton 1999). Unrealistic optimism has also been well documented with regard to food risks

1. See the WHO web site on health effects of UV radiation: http://www.who.int/peh-uv/.
Unrealistic optimism is probably common and extreme levels of unrealistic optimism have been found among teenagers (Fischhoff et al. 2000; Rutter et al. 1998). Experience has sometimes, but not always, been replicated as a factor in unrealistic optimism (Burger and Palmer, 1992; Welkenhuysen et al. 1997).

Ignoring or under-estimating a risk is a form of wishful thinking² (Kirscht et al. 1966; Lund 1925). In a study of college students, Weinstein (1982) found that controllability and seriousness correlated positively with unrealistic optimism, and experience and probability negatively. Worry was negatively related to unrealistic optimism, but seen as a consequence rather than a cause of unrealistic optimism. Dewberry et al. (1990) have suggested that reduced anxiety is a possible consequence of unrealistic optimism and that since worry seems to be related to precautionary behaviour, unrealistic optimism might be important for protective behaviour through its link with worry, decreasing preventive behaviour.

Weinstein (1984) found unrealistic optimism to be related to a tendency to attribute one’s own low risk to prudent behaviour and cautiousness. These were mostly processes that were seen as being under control. However, objective risk factors were unrelated to perceived risk. The generality of these findings is doubtful, since other researchers (van der Welde et al. 1994) have found relatively veridical risk perceptions. The main determinant of unrealistic optimism with regard to negative events has been found to be control; see the extensive review by Harris (1996). It remains to be seen how prevalent unrealistic optimism is with regard to tanning risks, and if it is related to control also in this field of research.

**Purpose**

The present study was designed to investigate how risky behaviour and unrealistic optimism develops in the age interval 13−17 for boys and girls, how their risk perception develops, and how risk perception and other attitudinal variables and background data account for risky behaviour and risk exposure.

The following hypotheses were examined:

- Risk taking increases with age during adolescence;
- Girls take greater risks than boys do;
- The perceived personal risk of tanning is smaller than the risk to others (unrealistic optimism);
- Perceived control is a factor accounting for unrealistic optimism.

**Method**

A questionnaire was mailed to a random sample of adolescents, aged 13, 15 or 17 years, selected from the central Swedish population database SPAR. Half of the sample received the questionnaire in April and the other half in September of the same year, in order to avoid seasonal effects on tanning and related behaviours. The questionnaire was sent to the parents of each adolescent and they were asked to hand it over to their child, and not to interfere with their responses. One reminder letter was sent after 3 weeks.

The effective sample size was 3997 and the number of respondents was 2615. Thus, the response rate was 66%. Response rates did not differ much between spring and fall, nor among age groups, but it was slightly higher for females than for males.

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² Wishful thinking occurs of course also with regard to positive events, whose likelihood is exaggerated. The case of positive events is not treated in the present paper. See Sjöberg (2002) for a discussion of wishful thinking.
The questionnaire contained 10 pages in A4 format. The number of questions and ratings was 200.

The questionnaire contained the following sections:

- Attitudes to tanning, tanning habits
- Reasons for tanning, and for abstaining from it
- Use of sunscreen, benefit of tanning vs. risk
- Information about tanning, trust in sources
- Perceived risk and protective behaviour
- Knowledge questions
- Self image questions
- Leisure activities
- Expectations about the future
- Background data, including hair colour and smoking habits
- Assessment of the questionnaire, response time

The questionnaire was given positive assessments by most subjects. The information obtained about the respondents can be structured in the following manner:

- Tanning, use of sunbed salons, frequency of erythema, tanning habits
- Background data (educational programme, sex, age, hair colour, skin reactions to tanning, smoking, leisure time habits)
- Region (coastal vs. non-coastal, large city vs. rest of the country)
- Personality and self perception (self esteem, expected future success, self perception factors)
- Trust and information (use of information sources, trust in various sources of information regarding tanning, estimate of own knowledge, desire for more information, factual knowledge score)
- Attitude to tanning (general evaluation, expected future tanning habits)
- Social perception and reasons for tanning (own and others’ reason for tanning, how many young people use sunbeds, traits of those who tan and those who don’t)
- Risk perception (personal and general perceived risk, benefit of tanning, protective behaviour. We included data on tanning risks as well as several other hazards)

Results on self-perception and attitude variables have been reported elsewhere (Brandberg et al. 1998; Brännström et al. 2001). The present report is focused on risk perception.

Data analysis used, in most cases, indices constructed on the basis of several response variables. Results will therefore be given in terms of means, not distributions across response categories as could be done for single variables. Five indices were formed on the basis of several questions: UV risk exposure, attitude to tanning, perceived benefit of tanning, and perceived general and personal risk of tanning. The indices were standardized to mean 5 and standard deviation 2. A 2-way ANOVA was carried out for each index, with the index as a dependent variable and gender and age as independent variables.

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3. Coastal regions have more sun hours than other regions in the country.
4. The variables entering the index were in several cases based on response scales with varying numbers of response categories and therefore standardized before the index was calculated as a mean score of non-missing data.
5. Space limitations preclude detailed reporting of these analyses, but details can be obtained from the first author.
Results

*Gender and age effects on risk behaviour and perception*

There were significant gender and age effects with regard to UV risk exposure, and also a significant interaction. The older respondents exposed themselves to more risk, and there were significantly increasing gender differences as older girls differed more from boys than younger girls did (Figure 1).

Girls had a more positive attitude to tanning, than boys did, and saw its benefit as larger. However, gender and age differences were small in these respects. More pronounced differences were found with regard to perceived general and personal risk of tanning, see Figure 2. Girls perceived larger risks, and so did older respondents, although the age effect was not significant in the case of general risk. There was a tendency towards a widening gender gap with increasing age, significant in the case of personal risk.

Thus, the prevalence of risk behaviour in higher ages and among females occurred in spite of increased risk awareness. The increase in risk exposure furthermore happened without a parallel increase of perceived benefit of tanning, or attitude towards tanning. Apparently, youngsters tan more and more as they grow older in spite of seeing a greater risk and in spite of not seeing anything particularly good about doing so.

In the questionnaire, there were seven reasons for tanning, eight for abstaining from tanning. These were factor analysed, and five factors were interpreted after oblique rotation; factor scores were then computed. The five factors explained 58.5% of the total variance. The factors were:

- Tanning for positive health effects
- Tanning for positive social effects
- Abstaining due to serious health risks, e.g. cancer
- Abstaining due to tiredness from tanning
- Abstaining due to fever from tanning

![Figure 1. UV risk exposure as a function of gender and age.](image-url)
The positive effects (reasons for tanning) were only weakly changing during the age interval studied. Although girls tended to see more positive effects than boys did, the difference was small and even reversed for social effects in the oldest age group. As to the serious negative health effects, girls showed a statistically significant higher awareness. Boys showed only a slight decrease of risk awareness in this respect, and they gave over-all lower risk ratings than girls did. Here, once more, we see the higher risk awareness of girls in combination with their higher risk exposure previously illustrated in Figure 1.

One interesting reason for tanning among youngsters is the cosmetic one. It was represented in one question in our design and did not appear as a separate factor. Both gender and age gave highly significant differences in cosmetic motivation. The interaction was not significant. Girls were more responsive to the cosmetic motive, and that both boys and girls became more sensitized to it, as they grew older.

So far, behaviour and risk perception results have supported the hypotheses. Both genders showed increasing risk taking with age, girls more so than boys. At the same time, they also became more aware of the risks they took. Cosmetic motives seemed to play an important role in this development, especially for girls.

Unrealistic optimism

In the present study, we obtained ratings of personal and general risk of a number of hazards, including tanning. Two items concerned tanning: tanning per se and melanoma. Unrealistic optimism scores were obtained by computing differences between general and personal risk for these variables, but no effects of age or gender could be found on unrealistic optimism. Pooling data across genders and age groups, mean risk ratings were found to differ for personal and general risks (Table 1).

There is no doubt that unrealistic optimism was present in these data. The differences between general and personal risk were very large, about 1 standard deviation for tanning and 0.5 standard deviation for melanoma. These are quite sizable differences according to Cohen’s often-cited norms for categorizing observed differences and correlations (Cohen 1988).

For further analysis, the data were grouped into three groups, viz. sun related, controllable (lifestyle other than tanning) and non-controllable (environment, technology).
Girls rated the sun related risks as relatively high, both personal and general. For them, sun related risks were at the level of non-controllable risks, both in the personal and general mode of judgment. For boys, sun related risks tended to lie in between controllable and non-controllable risks in both modes of judgment. The pattern gives further support to the notion that girls did perceive a relatively high level of risks in the case of sun related hazards, both to themselves and to others. At the same time, there was clearly a high level of unrealistic optimism in the judgments of sun related hazards, for both boys and girls, and for all age groups.

**Protection against sunray risks**

It is usually the case that lifestyle risks are rated as larger in protection possibility than other risks. In the present study, we obtained ratings of protection possibility for all hazards, and they were grouped as controllable, non-controllable and sun related. Separate analyses showed no gender differences for controllable and sun related risks, and no interactions between age and gender. (There were age differences). For non-controllable risks, there was a gender difference but the age trend was the same for both genders. Hence, we have combined the data for boys and girls and plot the three age trends in Figure 3.

Figure 3 shows that perceived protection possibility decreased with age for non-controllable hazards, but increased for controllable hazards. Interestingly, sun related risks were in between and showed no clear age trend. Protection possibility with regard to sun related risks was clearly higher than for non-controllable risks.

Finally, we inquire into actual protection behaviour, as measured by an index. There were clear gender and age differences but no significant interaction. The trends are illustrated in Figure 4. It is seen that girls were more likely to carry out various forms of protective behaviour than boys, but that both gender groups decreased in tendency towards protective action as a function of age.

**Regression analysis of risk exposure**

The level of UV risk exposure is a key aspect of risk taking. In the present section we analyse the level of exposure in relation to a number of explanatory variables, entered in five blocks in the regression analysis. The blocks were:

1. Background data (age, sex, hair colour, skin reaction to tanning, living in a coastal region or not, living in one of the 3 big cities or not, knowledge about tanning risks, self esteem).
2. Risk. (General and personal tanning risk, protective behaviour).
3. Attitude and benefit of tanning.
4. Leisure interests, self image.

<table>
<thead>
<tr>
<th>Risk dimension</th>
<th>General risk</th>
<th>Personal risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Standard deviation</td>
</tr>
<tr>
<td>Tanning</td>
<td>2.96</td>
<td>1.21</td>
</tr>
<tr>
<td>Melanoma</td>
<td>1.26</td>
<td>1.13</td>
</tr>
</tbody>
</table>
(5) Trust, information habits and desire for more information about tanning risks.

The five blocks of explanatory variables produced $R^2_{adj}$'s (cumulated) as follows:

1. 0.202
2. 0.214
3. 0.328
4. 0.349
5. 0.353

Figure 3. Rated possibility of protection as a function of age, genders combined.

Figure 4. Prevalence of protective behaviour as a function of gender and age.
The model was thus reasonably successful in accounting for risk exposure. It is seen that block 3 contributed a major share of variance, as well as background data, and that other blocks gave only minor contributions. However, several predictor variables obtained significant weights, see Table 2.

**Discussion**

Some previous research on risk perception, skin cancer and tanning left some uncertainties as to the prevalence of unrealistic optimism in this particular risk perception dimension. However, the present data confirm earlier results (Sjöberg 1994, 1995). There was clear evidence of very large unrealistic optimism both for tanning and for melanoma, for all age groups and for both genders. Unrealistic optimism tended to stay constant across ages, and this in spite of improved knowledge and greater risk awareness among the older respondents. Since the present study is based on data from large and representative samples it can be safely concluded that there was unrealistic optimism in the population of young people when it came to tanning and skin cancer.

We found the expected increase of risk exposure as a function of age as well as decreased protection behaviour, and also that females exposed themselves to risk more than males did. This happened in spite of the fact that girls were more aware of the risks. It is reasonable to assume that girls expose themselves to the risks of tanning in spite of awareness of these risks, because they believe that a suntan makes for a more attractive appearance. Present notions of beauty are consistent with such beliefs. Being attractive is at the core of one’s identity, and risk

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>T</th>
<th>Sig T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>0.656</td>
<td>0.08</td>
<td>0.164</td>
<td>8.238</td>
<td>0</td>
</tr>
<tr>
<td>Age</td>
<td>0.159</td>
<td>0.022</td>
<td>0.13</td>
<td>7.068</td>
<td>0</td>
</tr>
<tr>
<td>Knowledge</td>
<td>0.047</td>
<td>0.012</td>
<td>0.068</td>
<td>4.064</td>
<td>0</td>
</tr>
<tr>
<td>Coast or not</td>
<td>-0.316</td>
<td>0.073</td>
<td>-0.069</td>
<td>-4.317</td>
<td>0</td>
</tr>
<tr>
<td>Large city or not</td>
<td>-0.136</td>
<td>0.075</td>
<td>-0.029</td>
<td>-1.802</td>
<td>0.072</td>
</tr>
<tr>
<td>Red skin</td>
<td>-0.814</td>
<td>0.083</td>
<td>-0.261</td>
<td>-9.847</td>
<td>0</td>
</tr>
<tr>
<td>Brown skin</td>
<td>-0.414</td>
<td>0.103</td>
<td>-0.105</td>
<td>-4.011</td>
<td>0</td>
</tr>
<tr>
<td>Brown hair</td>
<td>-0.083</td>
<td>0.067</td>
<td>-0.021</td>
<td>-1.236</td>
<td>0.217</td>
</tr>
<tr>
<td>Red hair</td>
<td>-0.063</td>
<td>0.164</td>
<td>-0.006</td>
<td>-0.382</td>
<td>0.703</td>
</tr>
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<td>Self esteem</td>
<td>-0.298</td>
<td>0.084</td>
<td>-0.065</td>
<td>-3.562</td>
<td>0</td>
</tr>
<tr>
<td>Personal risk</td>
<td>0.115</td>
<td>0.019</td>
<td>0.115</td>
<td>6.023</td>
<td>0</td>
</tr>
<tr>
<td>General risk</td>
<td>0.004</td>
<td>0.018</td>
<td>0.004</td>
<td>0.225</td>
<td>0.822</td>
</tr>
<tr>
<td>Prot. behaviour</td>
<td>0.056</td>
<td>0.023</td>
<td>-0.038</td>
<td>-2.373</td>
<td>0.018</td>
</tr>
<tr>
<td>Tanning benefit</td>
<td>0.084</td>
<td>0.018</td>
<td>0.084</td>
<td>4.649</td>
<td>0</td>
</tr>
<tr>
<td>Att. to tanning</td>
<td>0.281</td>
<td>0.019</td>
<td>0.281</td>
<td>14.838</td>
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</tr>
<tr>
<td>Social interests</td>
<td>0.126</td>
<td>0.017</td>
<td>0.126</td>
<td>7.535</td>
<td>0</td>
</tr>
<tr>
<td>Electronic int.</td>
<td>-0.043</td>
<td>0.019</td>
<td>-0.043</td>
<td>-2.231</td>
<td>0.026</td>
</tr>
<tr>
<td>Culture int.</td>
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<td>0.017</td>
<td>-0.052</td>
<td>-3.106</td>
<td>0.002</td>
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<tr>
<td>Sport int.</td>
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<td>0.017</td>
<td>0.055</td>
<td>3.299</td>
<td>0.001</td>
</tr>
<tr>
<td>Tanning. sport</td>
<td>0.003</td>
<td>0.07</td>
<td>0.001</td>
<td>0.048</td>
<td>0.962</td>
</tr>
<tr>
<td>Tanning. adult</td>
<td>0.112</td>
<td>0.058</td>
<td>0.033</td>
<td>1.939</td>
<td>0.052</td>
</tr>
<tr>
<td>Tanning. school</td>
<td>-0.082</td>
<td>0.067</td>
<td>-0.021</td>
<td>-1.232</td>
<td>0.218</td>
</tr>
<tr>
<td>Trust</td>
<td>0.043</td>
<td>0.069</td>
<td>0.01</td>
<td>0.628</td>
<td>0.53</td>
</tr>
<tr>
<td>Is informed</td>
<td>0.914</td>
<td>0.294</td>
<td>0.054</td>
<td>3.113</td>
<td>0.002</td>
</tr>
<tr>
<td>Wants inform.</td>
<td>0.381</td>
<td>0.244</td>
<td>0.028</td>
<td>1.564</td>
<td>0.118</td>
</tr>
</tbody>
</table>
attitudes and related behaviour can be seen as expressions of one’s self image (Mitchell et al. 2001).

The tanning motive is probably related to very strong basic affiliation motives and may be very hard to change. An interesting idea is to inform young women about the risks of photo ageing which occurs much earlier than skin cancer in most cases, and is directly opposed to the beliefs that tanning brings about increased beauty and attractiveness (Jackson and Aiken 2000; Koblenzer 1998; Prawer 1991). Women are relatively likely to be aware of these negative effects of tanning on appearance (Arthey and Clarke 1995).

There is a normal female tendency towards risk aversion (Byrnes et al. 1999; Davidson and Freudenburg 1996), found in Swedish studies previously, and not confounded with ‘race’ or a proxy of economic deprivation (Sjöberg 2003), as in studies reported from the USA (Finucane et al. 2000). The normal gender difference constitutes an interesting contrast to the gender differences found in the present study. Risk taking and risk attitudes seem to be related to gender roles and the function a given behaviour has in such a context. The cosmetic motive, in turn, functions in different ways depending on cultural norms regarding what is attractive. It so happens that our current norms prescribe a ‘healthy’ tan.

It should be noted, that the cosmetic motive was of increasing importance for boys as well so tanning for attractiveness is by no means unique to girls. It is likely, however, that the cosmetic motive is more important for girls, as our data suggest.

Risk perception had many of the features in this study that have been found in previous research on various lifestyle risks. It is interesting to see, however, that sun related risks were seen as something one could not so easily protect oneself from, and that the otherwise typical increase of protection capacity for controllable risks did not occur in this case. This is probably because sun related risks have a dual character: one is always exposed to sunlight whenever outdoors, but one can also to some extent affect how much of such a risk one is exposed to by one’s own behaviour.

We found that both boys and girls became less likely to take protective action when they grew older. Their parents were probably less successful in influencing them towards doing so when they were 17 as compared to when they were 13. This is a natural process and it takes a careful analysis to derive a strategy to influence it so as to decrease the tendency to take risks while tanning. Future work should therefore involve a more comprehensive set of variables, including perceived norms (Jackson and Aiken 2000), which may, in turn, be inconsistent and emanate from both parents and peers.

Risk communication strategies and policy should be seen in the light of empirical studies such as the present one. Arthey and Clarke (1995) noted that campaigns might yield effects on knowledge and attitudes, but that behaviour is harder to change. In addition, self-reported protective behaviour may differ from actual behaviour (Bennetts et al. 1991) and studies of long-term campaign effects are needed. Short-term effects may quite typically taper off after some brief period of time. Straightforward information seems to be an insufficient strategy since knowledge did not have a strong relationship to risk exposure.

An evaluation of mass media campaigns in Australia intended to increase prudent behaviour in the sun showed that the effects were minor and short-lived (Smith et al. 2002). These results may be compared with a major survey carried out in the UK. The UK study found that there was a relatively high level of knowledge about tanning risks and many people reported that they had decreased tanning due to such knowledge. However, this may merely be a socially desirable response. In addition, many still did expose themselves to risks. It is conceivable that

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knowledge of the risks is a necessary but not sufficient cause of more prudent behaviour. In addition, perceived risk in our study was probably a consequence of such exposure and not a counteracting force. Youngsters who perceived a large risk tended to be the ones who most often exposed themselves to the risk.

Carmel et al. (1994) found that age groups differed with regard to how well their reported skin cancer protective behaviours could be modelled. The behaviour of younger groups was harder to model, and they were also harder to influence. In children, parental influence is probably the decisive factor (Donavan and Singh 1999). In future work, it may be interesting to study the qualitative differences between people whose behaviour adheres to a simple model and those who do not show such behaviour. It is particularly intriguing that the latter group may be more difficult to influence towards more prudent behaviour. Buller et al. (2000) found some positive effects with logical and ‘high-intensity’ language messages, but this was with adults.

Our results on unrealistic optimism and risky behaviour suggest that increased knowledge is not always processed so as to lead to more prudent behaviour. Risk awareness was increased as a function of age, both for one’s own person and for others. Others were thus seen to take even larger risks than the respondents saw for themselves. ‘I may take a risk, yes, but others are doing it also, and even more than me’ may be the type of reasoning used to rationalize one’s own risk taking. Others’ perceived risk taking may also serve as a norm—after all, most people behave as they believe others to do and possibly just a little more prudent in the case of risky behaviour. Others’ behaviour may serve as a cue that it is acceptable, expected and not too dangerous to behave that way. There may even be a perceived pressure to take some risks in order not to be seen as a ‘sissy’, perhaps mostly among boys. Alternatively, the level of risk taking that is believed to be characteristic of others may function as an anchor—one’s own risk taking takes others’ risk taking as a reference which is then adjusted downward to some extent. It would be interesting to study in depth the differences between personal and general risk, in relation to risk taking and knowledge (Park et al. 2001).

It would also be interesting to study in detail, which conceptions people have about protective behaviour and its effectiveness. Intentions to sunbathe and intentions to protect oneself have different psychological backgrounds (Jackson and Aiken 2000). Sunscreen is widely believed to be quite effective (Turrisi et al. 1999), but may have the paradoxical opposite effect of contributing to an increased risk, because it enables people to stay longer in the sun. Even sunglasses can have the same effect. The long-term risk of developing melanoma is psychologically similar to smoking and lung-cancer. As the years pass by, and no effects on health are noted, the argument ‘I have been doing this for decades and am still healthy’ becomes more and more persuasive, until it is too late. Coupland et al. (1998) documented the seemingly endless possibilities to twist any health message so as to fit an underlying wish to indulge in continued risk-taking behaviour.

In conclusion, tanning is a form of strongly motivated risk taking. Knowledge about the risks and how to protect oneself has some limited positive effects, but much remains to be done in order to devise efficient risk information, especially among adolescents who constitute the group most exposed to risk in this respect.

Acknowledgement

This study was supported by a grant from the Swedish Institute of Radiation Protection.
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