
The Bronze Debate: Looking Gold versus Getting Old

AUTHOR(S): Gillian Kemp and Lynne Eagle

ABSTRACT

Although knowledge of links between sun exposure and skin cancer risks is increasing, young adults continue to intentionally expose themselves to high levels of UV exposure without adopting recommended sun protection behaviours. A pilot study of UK university students' attitudes towards sun protection behaviour found that significant challenges must be overcome to achieve a change in social norms relating to the social desirability of a tan. Implications for further research and public policy considerations conclude the paper.

ARTICLE

Introduction

In the UK every year, at least 100,000 cases of non-melanoma skin cancers (NMSC) are diagnosed (Garvin and Eyles 2001; Lower, Girgis, and Sanson-Fisher 1998), constituting over 20% of malignant neoplasms diagnosed annually. Although the survival rate for NMSCs is over 95%, they can metastasise and in 2005 there were 511 reported deaths in the UK from NMSCs (Cancer Research UK 2005). The incidence of malignant melanoma (MM) and NMSC is approximately doubling every 20 years, and this will increase over the next five years as a result of an ageing population (ISD Online 2008).

The UK Department of Health website (www.dh.gov.uk/12/08/08) has specifically identified a number of key areas for health promotion and health prevention, but despite the growing incidence of skin cancer there is no direct reference made to this condition. With the incidence of skin cancer having doubled over the past decade (National Institute for Health and Clinical Excellence 2006), it is surprising that the UK Department of Health has not highlighted sun awareness as a key health promotion and health prevention area. Furthermore, government funding was actually reduced for Cancer Research UK's SunSmart campaign from £150,000 in 2006/07 to £104,000 in 2007/08, a 31% reduction.

Relevant Theoretical Foundations

Theories can be used to guide both the development and implementation of interventions through identification of important influences on actual and potential behaviour (National Cancer Institute 2003), thus guiding "researchers to routes to persuasion and to beliefs to target in persuasive efforts" (Fishbein, von Haften, and Appleyard 2001, p. 228); Theory-driven approaches have been found to lead to more persuasive messages across the range of socio-economic groups (Schneider 2006).

No one theory is superior in every situation; both the Health Belief Model (HBM) and the Theory of Reasoned Action (TRA) and its more recent successors, the Theory of Planned Behaviour (TPB) (Ajzen and Madden 1986), and the Integrative Model of Behavioural Prediction and Change (IM) (Fishbein, 2000) have been used extensively in the past in areas such as health-protective behaviours. They have proven useful in identifying and explaining risk perceptions and underlying attitudes and beliefs (Jones, Abraham, Harris, Schulz, and Chrispin 2001). Although we could not find any specific research detailing links between attitudes and behaviour in the sun protection area, we can speculate: for example it may be the attitude “getting a tan is very important to me” is a good predictor of risky behaviour. On the social norms front, “all my friends have a tan in the summer” may be a good predictor of risky behaviour. Finally, perceived behavioural control perceptions, “I find it difficult to organise myself when preparing for an outdoor trip”, may also predict risky behaviour.

Existing behavioural models are less than perfect in predicting future behaviour, with usually at least 50% of variance unexplained (Jones et al. 2001). This is partly because social cognition models such as the TPB and IM emphasise rational decision making, but do not explain apparently irrational behaviours such as high knowledge of risks associated with unwise behaviours, but widespread failure to act on this knowledge (Horne and Weinman 1999; Jones, Harris, and Chrispin 2000). We know there is a poor correlation between knowledge regarding skin cancer risk from excessive sun exposure and effective protection behaviours, especially among younger age groups (Clarke, Williams, and Arthey 1997). Therefore, we sought models to explain emotive/‘irrational’ behaviours, noting that the word ‘irrational’ is often inappropriate. For example, for young girls, ignoring skin cancer risks is not irrational they have made a choice that makes sense for them. A useful additional theory where subjective and emotional factors may be significant factors in driving behaviour is Leventhal’s Self Regulation Model (SRM: Leventhal, Kelly, and Leventhal 1999), which provides a structure for understanding the way in which both rational and emotional factors operate in parallel and influence how a person perceives threat of illness, the relationship between these perceptions, how illness symptoms are reported, and how these personal beliefs influence decisions about self-care behaviours that lead to either promoting or ignoring threats of illness.

Social cognition models such as the TPB, IM and SRM model should be regarded as complementary to each other as they share many common characteristics, including the concept that motivation to change behaviour or engage in health protecting behaviour stems from perceptions of the significance of the threat, coupled with the strength of desire to avoid potentially negative consequences (Floyd, 2000). These theories thus allow the identification of the determinants of behaviour which may vary across population segments or cultures, thus guiding the development of communication messages appropriate to elicit the desired behaviour change.

Concepts such as self identity are also of possible use. People who have a perception of themselves as ‘grown up’ and ‘sensible’ are far more likely to reduce their risky behaviours (Saad and Peng 2006). People who see themselves as ‘risk takers’ will act accordingly. In the context of sun protection behaviours, the media has a role to play in influencing attitudes towards sun exposure; subjective and emotional beliefs regarding the attractiveness of a tan and the confidence in one’s self image and identity, together with unrealistic optimism regarding personal consequences, may override rational knowledge regarding risks of excessive sun exposure.

In considering the context in which decisions are made in relation to sun protection, the principles of exchange and competition must also be recognised. For example, consistent with the normative beliefs component within the IM model and the emotion pathway of the SRM model, in targeting teenagers and young adults we are asking that behaviours they value be given up and/or behaviours adopted that may not be valued by many within this group – in return for a proposition regarding

potential benefits that must be taken on trust, based on scientific consensus (Peattie and Peattie 2003). The relative strength of the various factors influencing decisions can only be understood by research; however, we have been unable to locate studies that have examined, as opposed to merely noting, the interplay of both rational and emotional decision processes in the specific context of sun protection.

Teenagers / Young Adults

Good sun protection behaviours learned as children do not carry over into adolescence (Lower et al. 1998). In fact, teenagers have the lowest skin protection rate of any age group (Stanton, Janda, Baade, and Anderson 2004). Hence this group must be a primary target. For this group, knowledge of the potential dangers of excessive sun exposure in the form of sunbathing or sunbed use does not generally result in sun protection-related behaviours. In spite of evidence that those under the age of 30 who regularly use artificial tanning devices such as sunbeds have an almost eight-fold increased risk of developing malignant melanoma and an increased chance of developing eye problems such as cataracts (Hillhouse, Adler, Drinnon, and Turrissi 1997), based on their behaviours, young people appear to believe that the results outweigh the potential risks.

The perception is that a tan is 'sexy' (Broadstock, Borlan, and Gason 1992; Lowe et al. 2000), presumably increases perceived attractiveness and raises adolescents' sense of self esteem. Personality traits have been found to predict suntanning behaviours (Saad and Peng 2006). There are several dangerous attitudes prevalent within this group, particularly that it is 'worth' getting sunburnt in order to get a tan (Geller, Colditz, Oliveria, Emmons, Jorgensen, and Aweh 2002) and that less protection is needed as a tan progresses (Hiom 2006).

Adolescents are also prone to optimism bias, believing that they are personally at less risk of ill-health than the general population (Harris, Middleton, and Joiner 2000). This is consistent with Leventhal's model; rational knowledge of risk is shown to be countered, if not over-ridden, by the emotional desire of adolescents to be seen as part of an 'in' group (Harris et al. 2000). In addition, young women have a higher knowledge of skin cancer than do their male counterparts, but are also more likely to sunbathe and to use sunbeds (Abroms, Jorgensen, Southwell, Geller, and Emmons 2003). Conversely, young males see sunscreen as cosmetic and not masculine, leading to a reluctance to apply it when with their peers (Jones et al. 2000).

There are numerous studies indicating that adolescents are aware of risks but that social norms and perceptions over-ride consideration of personal actions if they are not compatible with peer behaviour (Branstrom, Ullen, and Brandberg 2004; Hillhouse et al. 1997; Lowe, Balanda, Stanton, and Gillespie 1999). These studies all highlight the weaknesses inherent in basing interventions primarily on rational aspects, such as the Hillhouse et al.'s (1997) study which used the theory of planned behaviour without considering the impact of emotional factors. Related to this is reported low levels of skin self examination, with both lack of knowledge and lack of motivation evident (Arnold and de Jong 2005).

Sunbeds

There is a large body of literature stressing concerns regarding the use of sunbeds and the lack of effective industry legislation (Autier 2004), coupled with an acknowledgement of a lack of awareness among sunbed users of the dangers of excessive use (Chan 2007). However – and this is very important for our social marketing strategies – even when some knowledge is gained, evidence from both the USA and Europe indicates that behaviour, particularly among a key user group of adolescents, does not change (Lazovoch and Forester 2005). The International Agency for Research

on Cancer (IARC 2006) concluded that there is convincing evidence to support a causal relationship between sunbed use and skin cancer, particularly with exposure before the age of 35 years.

The 2012 Skin Cancer Vision (SCV) (DOH 2007) recognised that despite recent data that show an association between sunbed use and occurrences of MM and NMSC, sunbed use is likely to increase, especially amongst teenagers and young adults. Although the SCV report does not represent UK Government policy, it does provide insight into the proposed development of skin cancer services up to 2012. The report proposed that sunbed use be regulated in terms of restricting use by under-18s, phasing out unsupervised coin operated facilities, providing clear information about hazards and also phasing out sunbed use on local authority premises. The Sunbed Association (www.sunbedassociation.org.uk) supports a ban on under 16s but not under 18s, arguing that there is no proven link between skin cancer and sunbed use. This is despite the fact that it has been estimated that sunbeds cause 100 deaths from melanomas every year in the UK (Diffey 2003). Despite growing awareness of the dangers of sunbeds many men and women continue to use sunbeds regularly (Medical New Today 2005). The term '*tanorexic*' is being used in relation to people who obsessively tan and may have an addiction to the UV rays of tanning beds, even experiencing a 'high', much like a drug addiction (Lazovoch and Forester 2005). In April 2008 the UK Health and Safety Executive (www.hse.gov.uk) set out proposals to ban under 18's from using sunbeds and they also provided guidance for operators on their legal responsibilities.

The proposal to phase out local authority leisure centre sunbeds is not new - a call to ban sunbeds was made at the annual conference of the Chartered Institute of Environmental Health (CIEH) in 2003. Despite this, in 2005 it was reported that over half of local councils were still offering tanning booths in their leisure facilities (Anonymous 2005). However, a preliminary investigation of local authority web sites in the South West of England did not identify any leisure facilities offering UV tanning facilities in April 2008.

As long as the psychological association between having a tan and appearance continues to be reinforced in the promotional materials used by tanning salons, the use of sunbeds is likely to continue to increase, especially amongst teenagers and young adults. In Australia at least, the portrayal of models in magazines contradicts public health messages regarding sun protection behaviour (Dixon, Dobbinson, Wakefield, Jamsen, and McLeod 2007), and in the USA, television programmes glamorising tanning salons, including featuring celebrities who have used sunbeds, have been heavily criticised for failure to include any warnings regarding potential negative effects (Poorsattar and Hornung 2008).

Method

This study was undertaken using a convenience sample of first year undergraduate business studies students in order to illustrate the attitudes, beliefs and behaviours of one specific segment of the target population. The reason for using a sample of university students is that adolescents have the lowest reported skin cancer protection rates of all age groups (Stanton et al. 2004). The point at which adolescents leave home reflects a marked lessening of parental influence regarding sun exposure, coupled with increased time spent in the sun. University students appear to have the highest unprotected exposure levels among adolescent groups (Baranowski et al. 1997).

The study used a four page questionnaire that included open-ended questions that was administered to students in class during April 2008. A total of 205 useable questionnaires was obtained. While they cannot be taken as being generalisable to all young adults, or even all university undergraduates, the results provide a useful indicator of some of the attitudes and behaviours that are likely to be prevalent

among this group. The questions were drawn from the literature, particularly previous studies by Langford, Moulden-Horrocks, Day, McDonald, Batemena, and Saunders (2005) and Jopson and Reeder (2004), and covered a range of topics relating to past sun protection behaviours and future intentions; knowledge, attitudes and beliefs regarding sun protection and skin cancer detection strategies; perceived norms and influences; information sources and preferences; and a critique of existing sun protection/skin cancer prevention and detection material.

Results

The profile of the sample was 48% male (n=90) and 52% (n=100) female, with 15 not stating their gender. Ages ranged between 19 and 28 years, with 70% between 19 and 21 years of age. White respondents constituted 80% of the sample and Asian, Black and other ethnicities each represented approximately 5%. While the number of students from coloured backgrounds is relatively small, it is interesting to note that several of these students accurately indicated that, because of their darker skin pigmentation, the issue of sunbathing was not salient to them and subsequently skin cancer was not a risk factor for their respective groups. In terms of melanoma awareness, only 55% indicated they had heard of melanoma; 44% identified it as a form of skin cancer. Respondents were aware that they had a chance of getting skin cancer (M = 2.6) and that a suntan would not protect them against skin cancer (M = 1.6). No differences were found between males and females on this item.

Table 1 provides a summary of reported past sun exposure behaviour. As can be seen, overall the respondents tended to value acquiring a suntan: 78% of females and 74% of males got a suntan (skin colour changed) the previous summer, with 65% of females and 59% of males deliberately sunbathing. Seventy-six percent of females and 66% of males intended to try to get a suntan in the coming summer.

The results show that in terms of sun protection behaviours, males showed somewhat riskier behaviour, with 40% never staying inside during the middle of the day as a sun exposure reduction strategy compared to 29% of females; similar behaviour was evident in relation to seeking shade during the middle of the day.

Males were also less likely to frequently apply sunscreen, with only 40% of males applying sunscreen sometimes compared to 53% of females, and 28% of males reapplying sunscreen after swimming compared to 71% of females. Similarly, 28% of males compared to 71% of females indicated they wore some form of hat to prevent sunburn; however, only 3% of females and 1% of males always wore a hat outside. Almost all females indicated they wore sunglasses if outdoors for more than 30 minutes; only 77% of men did so. Further, while two-thirds of women wear lip protection if outside for more than 30 minutes, only a quarter of males do so (all these behaviours show statistically significant differences). The increasing significance of body image for men is reflected in the study findings, with 70% of males and 74% of females agreeing that a suntan makes them feel more attractive to others and therefore they feel better about themselves.

In attempting to acquire a suntan, the present study found that behaviour differs between the genders, with 46% of females using oils and lotions to help develop a suntan compared to 32% of males (p=.05). Almost 80% of the females reported using fake tanning lotion compared to 60% of males (p=.05). There was little difference in the use of sunbeds, with 52% of males and 48% of females having used sunbeds at least once in the last twelve months.

Table 1: Sun Exposure Behaviour

Specific questions asked in relation to sun exposure behaviour	Male %	Female %
* Denotes significant difference between groups at $p < .05$; # significant difference between groups at $p < .01$		
Did you get a suntan last summer?	74	78
Did you sunbathe (i.e. deliberately stayed out in the sun) regularly last summer to try to get a suntan	59	65
Do you intend to try and get a suntan this summer?	66	70
To help you get a suntan in the sun last summer, did you use any oils or lotions (baby oil, coconut oil or tanning oil NOT sunscreen)?	32	46
In the past 12 months, have you applied a 'fake tanning lotion' (a product to make you look more tanned than you were)?	60	79
Have you used a sunbed in the last twelve months?	52	48
Last summer, did you get sunburnt (skin went red or pink) after being in the sun?	38	60
Sunburnt more than once	16	16
Sunburnt to point where skin went red, sore and blistered	6	9
Last summer, how often did you stay inside during the middle of the day (11am – 2.00pm) , so as to protect yourself from getting sunburnt? ¹	40	29
How often when you were outside last summer did you choose to stay in the shade during the middle of the day (11am – 2.00) so as to protect yourself from getting sunburnt? ¹	15	30
How often last summer did you wear a hat so as to prevent yourself from getting sunburnt? ^{1*}	28	71
How often last summer did you cover up with clothing as a way of protecting yourself from getting sunburnt? ¹	48	66
Last summer, how often did you use a sunscreen when you were out in the sun? ^{1*}	40	53
Did you ever put sunscreen on some parts of your body which were exposed to the sun but not on other exposed parts? For example, you may have put sunscreen on your face but not on your arms or legs.	76	73
If you went swimming, did you reapply sunscreen after leaving the water?*	28	71
When you are outdoors for more than 30 minutes in the summer sun do you wear sunglasses?*	77	94
When you are outdoors for more than 30 minutes in the summer sun do you wear lip protection?*	23	67

¹ Data given for those who indicated they had done this at least sometimes (categories: never, sometimes, most of the time and always)

The attitudinal factors that underpin actual sun protection behaviours are evident in Table 2. A 5-point Likert scale was used, with anchor points of 1 = strongly disagree and 5 = strongly agree, to investigate the attitudinal factors that underpin actual sun protection behaviours. The findings show that there are significant differences ($p < .05$) between men and women in terms of whether or not they perceive that their friends think having a suntan is a good thing, with women tending towards strong agreement with this statement (Mean 4.2).

Table 2: Attitudes towards Suntanning and Associated Risks

Attitudinal factors	Males n = 90		Females n = 100	
	Me an	Std dev	Mean	Std dev
* Denotes significant difference between groups at $p < .05$; # significant difference between groups at $p < .01$				
a. I like to have a suntan because I feel healthier	3.3	1.2	3.3	1.4
b. A suntan makes me feel more attractive to others	3.8	1.1	3.8	1.2
c. Most of my friends think a suntan is a good thing*	3.9	1.0	4.2	0.8
d. I like to have a suntan because it makes me feel better about myself#	3.6	1.2	3.8	1.2
e. Most of my family think a suntan is a good thing#	3.2	1.1	2.9	1.2
f. A suntan protects you against skin cancer	1.6	1.0	1.6	1.1
g. Having a tan is less fashionable than it used to be	2.5	1.0	2.7	1.1
h. Clothing which covers most of the arms and legs is not fashionable	2.6	1.2	2.5	1.0
i. It's safe to get sunburnt once or twice a year*	1.9	0.8	1.6	0.8
j. There is little chance that I will get skin cancer	2.7	1.1	2.6	1.1

Discussion

The results demonstrate that respondents associate sun exposure with health concerns. Although only 55% of respondents indicated they had heard of melanoma, a majority of respondents did recognise that they had a chance of getting skin cancer and that a suntan would not protect them against this outcome. This suggests that the general perception of adolescents that they are at less risk of ill-health than the general population does not appear to hold true for beliefs relating to skin cancer. The respondents were aware of the possible consequences of their behaviours, but despite this level of knowledge 78% reported that they had actively sought to achieve a suntan in 2007. The failure of people to change their risky behaviour even when faced with knowledge of the associated risks has been reported in previous studies (Horne and Weinman 1999; Jones et al. 2000), and is further supported by these findings.

The results show that there is a tendency towards agreement amongst respondents that having a suntan makes them feel more attractive and that they feel better about themselves with a tan than without. This suggests that where a person's self esteem is involved there is the potential for them to discount or disregard the advice or recommended behaviour in favour of the activity that boosts self esteem (Demaray et al. 2009). These results highlight the problems with basing intervention strategies purely on rational arguments. Furthermore, the emphasis of existing social cognition models such as the TPB and IM on rational decision making makes their application questionable within the context of changing risky behaviour such as sun tanning activities.

Changing social perceptions of the acceptability of tanning has proven difficult and will require considerable resources to be invested over time. The emphasis of any immediate interventions should therefore be on obtaining a tan safely. This segment is not likely to respond to rational information

processing-based interventions, such as those focussing on the risk of developing skin cancer (Hillhouse et al. 2000). Rather, they are more likely to respond positively to interventions with an emotion-driven basis (Elliott 1998). They are most likely to respond to appearance-based appeals, including indicators of premature ageing and wrinkling, for instance (Arthey and Clarke 1995). An intervention that achieved considerable success in Southern California involved the use of UV photography/photo-ageing to illustrate the extent of existing skin damage; this intervention achieved changes in perceptions regarding sun protection and had immediate results in terms of the use of sun protection (Mahler et al. 2006). Similarly, appearance-based interventions, which show the potential damage that can be caused to the skin and the ongoing consequences of sunbed usage have been shown to reduce the use of sunbeds by up to 50% (Hillhouse and Turisi 2002).

In light of these findings, perhaps the message needs to be 'don't burn' rather than 'don't tan', as having a tan for this age group appears to be a positive attribute. If the message is to be 'don't burn', then there is a need to clarify for people the term 'sunburnt'. Within the study the incidence of reported sunburn that resulted in the skin getting went red, sore and blistered was less than 9%. This suggests that young people are aware that such a degree of sunburn is not good for their skin. However, 50% did report that their skin had gone red or pink after being in the sun.

Conclusion

The study results were not unexpected. There were statistical differences in using sun tan oils, lotions and fake tan, with females more likely to use these products than males. Females were also twice as likely as males to have gotten sunburnt at least once the previous summer, reflecting the fact that malignant melanoma is twice as common in young women as in young men (Office for National Statistics 2006). However, there was little difference in the use of sunbeds between males and females.

In an attempt to identify some key social marketing principles for sun protection, the 'Popular' (Smith 2007) concept within the health promotion literature suggests that if the aim is to reach young teenagers with sun protection messages, ideally role models should be linked with local beach interventions to create a social norm of covering up. However, there still remains a vast amount of work that needs to be undertaken to achieve a behavioural change within this age range. Whilst there does appear to be some level of awareness around the dangers associated with excessive sun bathing, the desire to achieve a tan would appear to take precedence over the potential dangers.

Sun protection social marketing suffers from the same set of problems affecting many other health promotion sectors: people are not particularly motivated by being told to cut down on some immediate pleasure (sunbathing) for some possible, remote-sounding benefit at some time in the distant future (you may get skin cancer in 30 years). The potential for people to discount or disregard recommendations (Demaray et al. 2009), relating to sunbathing in favour of achieving a sun tan is highlighted by the results and therefore needs careful consideration when devising intervention strategies.

Sun protection messages compete with a wide variety of other health messages in the UK, and we need to be clear about its relative priority versus other risky behaviours. We then need to be realistic about the priority of all these messages in the lives of our citizens.

References

- Abroms, Lorien, Cynthia M. Jorgensen, B. G. Southwell, A. C. Geller, and K. M. Emmons (2003), "Gender Differences in Young Adults' Beliefs about Sunscreen Use," *Health Education Behaviour*, 30 (1), 29-43.
- Ajzen, Icek and Thomas J. Madden (1986), "Predictions of Goal-Directed Behaviour: Attitudes, Intentions and Perceived Behavioural Control," *Journal of Experimental Social Psychology*, 22 (5), 453 - 474.
- Anonymous (2005), "Skin Cancer – The Next Burning Issue," *Environmental Health Journal* (June), 8 - 10
- Arnold, Marilyn R. and William DeJong (2005), "Skin Self-examination Practices in a Convenience Sample of US University Students," *Preventive Medicine*, 40 (3), 268-273.
- Arthey, Stephen, and Valerie A. Clarke (1995), "Suntanning and Sun Protection: A Review of the Psychological Literature," *Social Science & Medicine*, 40 (2), 265-274.
- Autier, Phillippe (2004), "Perspectives in Melanoma Prevention: the Case of Sunbeds," *European Journal of Cancer*, 40 (16), 2367-2376
- Baranowski, Tom, Lillian S. Lin, David W. Wetter, Ken Resnicow, and Marsha D. Hearn (1997), "Theory as Mediating Variables: Why aren't Community Interventions Working as Desired?" *Annals of Epidemiology*, 7 (7), S89-S95.
- Branstrom, Richard, Henrik Ullen, and Y. Brandberg (2004), "Attitudes, Subjective Norms and Perception of Behavioural Control as Predictors of Sun-related Behaviour in Swedish Adults," *Preventive Medicine*, 39 (5), 992-999.
- Broadstock, Marita, Ron Borland, and Robyn Gason (1992), "Effects of Suntan on Judgements of Healthiness and Attractiveness by Adolescents," *Journal of Applied Social Psychology*, 22 (2), 157-172.
- Chan, Lennard K. W. (2007), "Sunbeds – Still a Hotbed for the Burning Issue," *Burns*, 33 (4), 536 – 537.
- Clarke, Valerie A., Thomas Williams, and Stephen Arthey (1997), "Skin Type and Optimistic Bias in Relation to the Sun Protection and Suntanning Behaviors of Young Adults," *Journal of Behavioural Medicine*, 20 (2), 207 - 222.
- Demaray, Michelle K., Christine K. Malecki, Sandra Y. Rueger, Sarah E. Brown, Kelly H. Summers (2009), "The Role of Youth's Ratings of the Importance of Socially Supportive Behaviours in the Relationship between Social Support and Self-Concept," *Journal of Youth Adolescence*, 38, 13 - 28
- Diffey, B. A. (2003), "Quantitative Estimate of Melanoma Mortality from Ultraviolet A Sunbed Use in the UK," *British Journal of Dermatology*, 149, 578-581
- Dixon, Helen, Suzanne Dobbins, Melanie Wakefield, Kris Jansen, and Kim McLeod (2007), "Portrayal of Tanning, Clothing Fashion and Shade use in Australian Women's Magazines 1987 – 2005," *Health Education Research*, 23, 791 – 802.
- Elliott, Richard (1998), "A Model of Emotion--Driven Choice," *Journal of Marketing Management*, 14 (1/3), 95 - 108.
- Fiala, B., M. Kopp, and Verenna Gunther (1997), "Why Do Young Women use Sunbeds? A Comparative Psychological Study," *British Journal of Dermatology*, 137 (6), 950-954.
- Fishbein, Martin, I. von Haeften, and J. Appleyard (2001), "The Role of Theory in Developing Effective Interventions: Implications from Project Safer," *Psychology, Health & Medicine*, 6 (2), 223 -238.
- Fishbein, Martin (2000), "The Role of Theory in HIV Prevention," *Aids Care*, 12 (3), 273 - 278.
- Floyd, Donna L. (2000), "A Meta-analysis of Research on Protection Motivation Theory," *Journal of Applied Social Psychology*, 30 (2) 407-429
- Garvin, Theresa and John Eyles (2001), "Public Health Responses for Skin Cancer Prevention: The Policy Framing of Sun Safety in Australia, Canada and England," *Social Science & Medicine*, 53 (9), 1175 - 1189.

- Geller, Alan C., Graham Colditz, Susan Oliveria, K. Emmons, Cynthia Jorgensen, and G. N. Aweh (2002), "Use of Sunscreen, Sunburning Rates, and Tanning Bed Use among More than 10 000 US Children and Adolescents," *Pediatrics*, 109 (6), 1009-1014.
- Harris, Peter, Wendy Middleton, and Richard Joiner (2000), "The Typical Student as an In-group Member: Eliminating Optimistic Bias by Reducing Social Distance," *European Journal of Social Psychology*, 30 (2), 235-253.
- Hillhouse, Joel J. and Rob Turrisi (2002), "Examination of the Efficacy of an Appearance-Focused Intervention to Reduce UV Exposure," *Journal of Behavioural Medicine*, 25 (4), 395-409.
- Hillhouse, Joel J., Christine M. Adler, Joy Drinnon, and Rob Turrisi (1997), "Application of Azjen's Theory of Planned Behavior to Predict Sunbathing, Tanning Salon Use, and Sunscreen Use Intentions and Behaviors," *Journal of Behavioural Medicine*, 20 (4), 365-378.
- Hiom, Sara (2006), "Public Awareness Regarding UV Risks and Vitamin D--The Challenges for UK Skin Cancer Prevention Campaigns," *Progress in Biophysics and Molecular Biology*, 92 (1), 161-166.
- Horne, Robert and John Weinman (1999), "Patients' Beliefs about Prescribed Medicines and their Role in Adherence to Treatment in Chronic Physical Illness," *Journal of Psychosomatic Research*, 47 (6), 555 - 567.
- International Agency for Research on Cancer Working Group on artificial ultraviolet (UV) light and skin cancer (2006), "The Association of Use of Sunbeds with Cutaneous Malignant Melanoma and other Skin Cancers: A Systematic Review," *European Journal of Cancer*, 40 (16), 2355-2366.
- ISD Online (2008), Cancer Incidence and Mortality Data. Available at <http://info.cancerresearchuk.org/cancerstats/types/breast/screening/history/>.
- Jones, Fiona, Charles Abraham, Peter R. Harris, Jorg Schulz, and C. Chrispin (2001), "From Knowledge to Action Regulation: Modeling the Cognitive Prerequisites of Sun Screen Use in Australian and UK Samples," *Psychology & Health*, 16 (2), 191 - 206.
- Jones, Fiona, Peter Harris, and C. Chrispin (2000), "Catching the Sun: An Investigation of Sun-Exposure and Skin Protective Behaviour," *Psychology, Health & Medicine*, 5 (2), 131 - 141.
- Jopson, J., and A. Reeder (2004), *Sun Protection in New Zealand Secondary Schools*. Dunedin: University of Otago (Department of Preventive and Social Medicine).
- Langford, Ian H., Ian J. Moulden-Horrocks, Rosemary Day, Anna Louise McDonald, Ian J. Bateman, and Sarah Saunders (2005), *Perception of Risk of Malignant Melanoma Skin Cancer From Sunlight: A Comparative Study of Young People in the UK and New Zealand*. Working Paper PA 98-05, London: Centre for Social and Economic Research on the Global Environment (University of East Anglia and University College London).
- Lazovich, D., and J. Forester (2005), "Indoor Tanning by Adolescents: Prevalence, Practices and Policies," *European Journal of Cancer*, 41 (1), 20 -27.
- Leventhal, Howard, Kim Kelly, and Elaine A. Leventhal (1999), "Population Risk, Actual Risk, Perceived Risk, and Cancer Control: A Discussion," *Journal National Cancer Institute Monograph*, 1999 (25), 81-85.
- Lowe, J. B., Ron Borland, Warren R. Stanton, Peter Baade, V. White, V. and K. P. Balanda (2000), "Sun-safe Behaviour among Secondary School Students in Australia," *Health Education Research*, 15 (3), 271-281.
- Lowe, J. B., K. P. Balanda, Warren R. Stanton and A. Gillespie (1999), "Evaluation of a Three-Year School-Based Intervention to Increase Adolescent Sun Protection," *Health Education Behaviour*, 26 (3), 396-408.
- Lower, Tony, Afaf Girgis, and Rob Sanson-Fisher (1998), "The Prevalence and Predictors of Solar Protection Use among Adolescents," *Preventive Medicine*, 27 (3), 391-399.
- Mahler, Heike I. M., James A. Kulik, Heather A. Butler, Meg Gerrard, and Frederick X. Gibbons (2008), "Social Norms Information Enhances the Efficacy of an Appearance-based Sun Protection Intervention," *Social Science & Medicine*, 67 (2), 321-329.

- Mahler, Heike I. M., James A. Kulik, Meg Gerrard, and Frederick X. Gibbons (2006), "Effects of Two Appearance-Based Interventions on the Sun Protection Behaviours of Southern California Beach Patrons," *Basic & Applied Social Psychology*, 28 (3), 263-272.
- Medical News Today (2005), "Tanning Addiction Exists", August 16. Available www.medicalnewstoday.com/articles/29185.php.
- National Institute for Health and Clinical Excellence (2006), Press Release: *NICE Issues Guidance to Improve Healthcare Services for Skin Cancers*, 21st February.
- National Cancer Institute (2003), *Theory at a Glance: A Guide for Health Promotion Practice*. Available www.cancer.gov/aboutnci/oc/theory-at-a-glance.
- Office for National Statistics (2006), *Mortality Statistics: Cause, England and Wales 2005 London TSO 2006*. Available www.statistics.gov.uk/statbase/Product.asp?vlnk=618.
- Peattie, Ken and Sue Peattie (2003), "Ready to Fly Solo? Reducing Social Marketing's Dependence on Commercial Marketing Theory", *Marketing Theory*, 3 (3), 365 - 385.
- Poorsatter, Solmaz P. and Robin L. Hornung (2008), "Television Turning more Teens towards Tanning," *Journal of the American Academy of Dermatology*, 58 (1), 171-172
- Saad, Gad, and Albert Peng (2006), "Applying Darwinian Principles in Designing Effective Intervention Strategies: The Case of Sun Tanning," *Psychology & Marketing*, 23 (7), 617 - 638.
- Schneider, Tamera R. (2006), "Getting the Biggest Bang for Your Health Education Buck. Message Framing and Reducing Health Disparities," *American Behavioural Scientist*, 49 (6), 812 - 822.
- Skin Cancer 2012, (2007), Department of Health. Available www.doh.gov.uk/skincancer2012.
- Smith, W. (2007), "Why Don't We Ever Ask What Rich People Need?" *Social Marketing Quarterly*, 13 (4), 113 - 116.
- Stanton, Warren R., Monika Janda, Peter D. Baade, and Peter Anderson (2004), "Primary Prevention of Skin Cancer: A Review of Sun Protection in Australia and Internationally," *Health Promotion International*, 19 (3), 369 - 377.