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Lori L. Presti
Edith Cowan University

Paul Chang
Edith Cowan University, p.chang@ecu.edu.au

Myra F. Taylor
Edith Cowan University, myra.taylor@ecu.edu.au

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Lisa Lo Presti, Paul Chang, Myra F Taylor

Edith Cowan University

RESEARCH

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Corresponding Author:

Myra F Taylor
Edith Cowan University, 270 Joondalup Drive, Joondalup, WA 6027, Australia
Email: myraftaylor@gmail.com

ABSTRACT

Background

Despite two nationwide sun-protection awareness campaigns, young Australian adults continue to sunbathe. Since their primary motivation for tanning is appearance enhancement, it may well be that campaigns that highlight the negative effects of tanning on appearance are more effective than campaigns that emphasise the health risks associated with sun exposure.

Aims

This study aims to explore young adults' reactions to viewing a photoaged photograph of the sun damage already visible in their facial image.

Methods

Semi-structured interviews were conducted with seven females and three males aged 20–30 years. The interview transcripts were transcribed verbatim and were then subjected to Interpretive Phenomenological Analysis (IPA).

Results

Three themes and eight sub-themes emerged from the analysis. Collectively they revealed that participants' fear-

based reaction to their photoaged photographs triggered in them feelings of unattractiveness, which in turn motivated them to change to their existing sun-tanning behaviours.

Conclusion

Although media-popularised representations of suntanned skin being the desired norm were identified as a barrier to skin-protective behavioural change, personalised ultraviolet (UV) photoaged photographs, when accompanied by an explanation of the skin damage that unprotected ultraviolet radiation (UVR) exposure causes, were effective in changing young adults' sun-tanning intentions. Hence, a need exists for positive non-tanning appearance-related messages to be incorporated into sun exposure education campaigns.

Key Words

photoaged photography, young adults sun-tanning intentions, unprotected UVR sun exposure, skin-protective measures

What this study adds:

1. What is known about this subject?

While quantitative research has demonstrated UV photoaged photography increases people's immediate intention to adopt skin-protective measures, qualitative studies are needed to uncover why young people continue to engage in sun tanning.

2. What new information is offered in this study?

This study reveals that although young adults are aware of the cancer risks associated with UVR exposure, the attractiveness benefit of having a suntan acts as a social barrier to behavioural change. Personalised UV photoaged photographs can be effective in overcoming the temporal cause-and-effect-delay by instantly revealing short-term skin damage.

3. What are the implications for research, policy, or practice?

In exposing young adults' appearance-enhancement motive for engaging in sun tanning, this study highlights the

necessity for designers of future public health skin-protective campaigns to incorporate positive non-tanning appearance-related messages into their interventions.

Background

While exposure to ultraviolet radiation (UVR) is beneficial and necessary for the production of vitamin D, overexposure is associated with skin cancer.¹ Skin cancer rates are on the rise globally; for instance, in the United Kingdom (UK) 13,348 people were diagnosed in 2011 with malignant skin cancers, which resulted in 2,209 deaths.^{3–4} In the United States (US), skin cancers constitute nearly half of all diagnosed cancers in any one year, one in five Americans will be diagnosed with skin cancer, and, of these, approximately 10,000 individuals will die.^{5–6} Australia has one of the highest rates of skin cancer in the world, with approximately 440,000 new cases diagnosed annually possibly due to the country's hot, dry climate, outdoor sporting culture, and globally high levels of UV radiation.^{4,7,8} Changing the Australian populace's positive attitudes towards sun tanning is hampered somewhat by the temporal delay which exists between the cause (UVR) and effect (skin damage) of unprotected sun exposure.⁹

In an attempt to change the nation's pro-tanning attitudes two nationwide public health campaigns have been launched: "Slip! Slop! Slap!" and "SunSmart".^{7,10} Collectively, these campaigns have been effective in increasing the populace's skin cancer awareness.^{10–14} Yet, it could be argued that this improved knowledge has not necessarily translated into the desired behavioural change as many young Australians continue to sunbathe and melanoma rates continue to increase. What is particularly concerning is that young Australians consider that the social benefits derived from having a suntan outweigh any future cancer risk reduction benefit. Indeed, a degree of skin cancer fatalism exists within this age cohort.¹⁶ Thus, since the primary motivation for UV exposure in young adults is to obtain a suntan, and the primary motive for sun tanning is appearance enhancement, it is reasoned that public health campaigns that highlight the negative effects of sun exposure on appearance might be more effective than those emphasising health risks.

UV photoaged photography

One appearance-based prevention initiative that has been tried in relation to changing people's sun-tanning behaviours is the use of ultraviolet (UV) photoaged photographs.^{17–18} Unlike regular photographs, UV photographs reveal evidence of existing skin damage that is not yet visible to the human eye (e.g., pigment alterations,

vascular skin changes).^{5,19} The premise behind its usage is that the visualisation of skin damage has the potential effect of arousing people's feelings of susceptibility/threat to such an extent that any accompanying educational message become persuasive.^{18,20–21} Indeed, a number of studies, predominantly by Mahler et al., have demonstrated that UV photoaged photographs are effective in promoting skin-protective practices.^{5,22–27} Such studies suggest that appearance-based UV photoaged photographic interventions have the potential to motivate the kinds of skin-protective practices that ultimately will produce the desired health benefit of a reduction in skin cancer rates.

While researchers have predominantly used quantitative experimental methodologies (e.g., randomised^{22,24,26}/non-randomised^{23,27} control designs and self-report measures) to evaluate sun-tanning intentions and skin-protective behaviours of participants' post viewing their UV photoaged image, no studies (as far as the authors are aware) have explored the impact of UV photoaged photography on behaviour from a qualitative perspective. Hence, it is posited that this qualitative study will enrich the existing quantitative findings by focusing explicitly on people's perception of self within their social context. Therefore, the guiding questions posed in this study were: 1) What reaction does the viewing of a UV photoaged photograph of themselves alongside a non-photoaged current photograph produce in young adults?; and 2) How does viewing a personalised UV photoaged photograph impact on young adults' intentions to engage in skin-protective practices in the future?

Method

Research Design

Since attitudes towards sun tanning and sun-protective behaviours develop within a sociocultural context, they are a phenomenon that can be construed as being socially constructed.^{28–29} An interpretive phenomenological analysis (IPA) approach was adopted due to the exploratory nature of the research.^{30–31} IPA requires the "elimination of the (researchers') natural attitudes and biases of everyday knowledge as the basis for truth and reality".³² Therefore, the present authors strove to suspend their own preconceptions on sun tanning so as to open up their receptivity to the participants' narratives.

Participants

Participants were recruited—based on two selection criteria—from the Edith Cowan University's School of Psychology volunteer register, which comprises undergraduate psychology students. The first criterion was

that participants be between 20 to 30 years old given that the health, trendiness, and attractiveness of a suntan is often perceived as desirable amongst adults in this demographic. The second criterion was that participants were Caucasian due to this population cohort being at the highest risk for the development of skin cancer.¹⁻² Recruitment continued until saturation was reached in terms of participants' responses.

Procedure

Following approval from the Human Research Ethics Committee of Edith Cowan University, a semi-structured interview schedule was developed and piloted. This piloting process resulted in a list of interview questions (Table 1) that were purposely constructed in a conversational format so as to encourage participant disclosure. The principal researcher subsequently phoned potential participants on the university's research volunteer register and discussed the requirements and procedure of the experiment. No participation inducement was offered. If the potential participant met the selection criteria and agreed to participate, a mutually agreed time and place to meet was organised. On arrival, participants were guaranteed confidentiality and informed that they could withdraw at any time from the study without penalty.

Once a prospective participant had indicated a willingness to participate in the study and had completed a consent form, his/her photoaged and non-photoaged photographs were taken with a Canfield Science UV Reflec camera using Polaroid film. The photographs self-developed in two minutes and the researcher displayed both photos side by side for the participant. Participants were informed that any dark or freckled areas in the UV photo were indicative of skin damage due to sun exposure.

The photos were left visible to the participant during the course of the interview. The interviews lasted for approximately 25 minutes and were audio recorded. The interview questions were asked in conjunction with other prompting questions in a conversational manner. Participants were encouraged to elaborate upon and add any information they felt was necessary to communicate their experience of viewing a personalised UV photoaged photograph. The recordings of the interviews were later transcribed verbatim and checked against the audiotapes for accuracy.

Table 1: Interview questions

Q#	Questions
1	What is it like for you to view your natural photograph and then to see your face photoaged?
2	How does seeing the UV photoaged picture of your face make you feel?
3	How would you describe your initial reaction first to seeing your natural face and then your photoaged face?
4	Now you have seen your face photoaged, will the picture motivate you to change your current sun protection behaviours? If yes, why? If no, why not?
5	If yes to Q4, in what way will you change your sun protection behaviours?
6	Having seen your photoaged picture, how do you feel about tanned skin now? For example, do you think tanned skin makes someone more or less attractive? Why is that?
7	What are your views on exposing your skin to the sun, and what are your views on showing young adults their UV photoaged photographs?
8	Do you think UV photoaged photographs are an effective means of informing young people of the damage they may be doing to their skin? If yes, why? If no, why not?

Analysis

Data analysis occurred concurrently with data collection in so far as each interview was transcribed soon after completion. The Miles and Huberman³³ conceptual framework, which consists of three linked stages (i.e., data reduction, data display, and data conclusion-drawing/verifying), was used to guide the analysis. IPA was used to discern repetitive themes reoccurring within the descriptive data.³³⁻³⁴ Clustering themes together condensed the information further into three themes and six subthemes. These themes and subthemes were then organised in a question ordered matrix. This visual format provided a methodical and coherent mode for further refinement and abstraction.³³ In addition, by presenting quotations for each theme and subtheme in the matrix, the display process assisted with the validation of the analysis and provided a research interpretational audit trail.

Issues of credibility and transparency were addressed by having a second rater independently validate the themes and subthemes by independently analysing data displayed in the matrix. A third researcher acted as an adjudicator in instances of thematic disagreement. This process helped to prevent the imposition of the authors' viewpoints into the data analysis process, and, thus increased the overall

reliability of the research.^{28,33} The rigor of the analysis was further enhanced by the three researchers engaging in a continuous process of self-reflection so as allow for the identification of any previously held personal beliefs or biases.³⁵

Results

The overarching theme that emerged from the study and which captured the participants' reactions to viewing both a normal and a UV photoaged photograph of themselves was "I've got to take care of my skin!" This core theme comprised three themes:

- 1) *"It's a big shock... the photo just looks horrible."*;
- 2) *"Seeing this photo makes me want to change my behaviour."*; and
- 3) *"I think the photo works... as that picture of me is burnt into my head now."*

These themes and their six subthemes are presented in Table 2. While each theme is discussed separately, they are not mutually exclusive, and, therefore, some overlap can occur.

Table 2: Component themes and subthemes of the study's core theme: "Now I know I've got to take care of my skin!"

#	Themes	#	Subthemes
1	<i>"It's a big shock... it just looks horrible."</i>	1	Shock and fear
		2	Unattractiveness
2	<i>"Seeing this photo makes me want to change my behaviour."</i>	3	Increased awareness
		4	Adopting sun-protective measures
		5	Perceptions of tanned skin
3	<i>"I think the photo works... as that picture of me is burnt into my head now."</i>	6	Participants' assessment of the effectiveness of UV photoaged photographs

Theme One: "It's a big shock... it just looks horrible."

Subtheme 1: Shock and fear

Most of the participants perceived tanned skin as attractive, however, upon viewing their natural photograph alongside their UV photoaged photograph (which revealed the effects of UV radiation not visible to the naked eye) for the first time participants experienced two consistent reactions,

shock and fear. These emotive reactions occurred in relation to participants' initial assessment of the visual unattractiveness of their face in the UV photoaged photograph. The most commonly expressed emotions were those of feeling scared, worried, concerned, and mortified at the changes that were evident between their non-photoaged and their UV photoaged photographs. For example:

"When you look at the natural one and when you look at the real one, it's quite a big difference. It's scary... It spins me out... It just looks really gross."

Subtheme 2: Unattractiveness

Participants were not only shocked and horrified at the damage to their skin made visible in the UV photoaged photograph, but also voiced their concerns about their present and future attractiveness. In this regard, after viewing the UV damage evident in their photoaged photographs, participants typically expressed some degree of personal body loathing. Typical comments included:

"If I looked like the UV photo I wouldn't be walking around in public... It looks so unattractive."

"It's a shock now, but I wonder what I'll look like in years to come, if I don't protect my skin more. I didn't think I'd had sun damage already, I'm only 20. I'm going to be all wrinkly and gross. I would hate to imagine what my arms are like."

Theme Two: "Seeing this photo makes me want to change my behaviour."

Subtheme 3: Increased awareness

Emotions and feelings, such as fear and loathing, are not just simple reactions to a given event, such feelings serve to facilitate awareness in the affected individual of the likely factors in their lives that either initiated or contributed to the event. This increased awareness characteristically initiates the types of behavioural change actions, which allow the individual to seek to neutralise or overcome the source of the threat. In this study, participants disclosed that after viewing their UV photoaged photograph they had a far stronger awareness of the potential risks and effects of sun exposure. This increased awareness translated into the following cognitive affirmations for future behavioural change actions:

"Seeing this photo it makes me want to change my behaviour... I will definitely be more mindful about the amount of sun that I am exposed to."

“I will definitely be more conscious of sun damage now... I will probably think back to this UV photo.”

Subtheme 4: Adopting sun-protective measures

All of the participants indicated that they had a general awareness as a result of Australia’s extensive sun-protection public health promotion campaign on how they could protect their skin from harmful UV rays (e.g., slipping on long sleeve clothing, using sunscreen lotion, avoiding going out in the heat of the day when the UV index was at its highest, and wearing sunglasses and a broad brimmed hat). Moreover, after viewing their UV photoaged photograph and reflecting on their own knowledge of Australia’s SunSmart awareness campaigns, participants indicated they would reconsider their current sun-protective behaviours and take some additional measures that they had not previously routinely employed (e.g., not sunbathe on the beach during peak sun hours, increase the window shading in their car, or use a fake tan) so as to lessen the potentiality for causing further damage to their skin. For instance, they stated:

“I think I would have a bit of sun damage from driving and stuff like that.”

“If I am going to the beach I’ll put sunscreen on.”

“I’ll definitely put more sunscreen on when I am in the sun as well as wearing UV makeup when I put makeup on.”

“I have realised that I’ve got to take care of my skin because it just gets burnt too easily. I think I’ll try a fake tan.”

“I think I’ll use fake tan instead of getting roasted.”

“It reminds me to put it (sunscreen) on my legs and everywhere else because if that has happened to my face God knows what has happened to the rest of my body. Yeah, I’ll definitely be more careful.”

Subtheme 5: Perception of tanned skin

Participants revealed that their overall perception of tanned skin was that it depicted physical attractiveness. Indeed, having a tanned appearance was considered to be the stereotypical bronzed Australian beachgoer image. However, despite admitting their awareness of the link between skin cancer and unprotected sun exposure, and despite just being shown a UV photoaged photograph showing the damage to their skin, participants still maintained the belief that tanned skin was attractive.

However, they qualified this belief, as exemplified in the following quote, by stating that they preferred a light bronze tan as opposed to a dark tan:

“I think that tanned skin is beautiful... I think a tan is nicer than pale white... I’ve never wanted to be overly dark, but still want a bit of a glow of brown.”

Moreover, as exemplified in the next quote, pale white skin was overwhelmingly considered unattractive:

“Our (Australian) society has saturated us with (images of) tanned skin and attractiveness and so we are conditioned to find that sort of thing attractive... I’ve gotten pretty cynical in regard to what society had led us to believe is attractive, but yeah, I do still find tanned skin attractive as opposed to white.”

Theme 3: “I think the photo works... as that picture of me is burnt into my head now.”

Subtheme 6: Participants’ assessment of the effectiveness of UV photoaged photographs

The use of UV photoaged photographs to capture and reveal skin damage is gaining traction in the health promotion sun protection field. As such, participants’ views on the effectiveness of UV photoaged imaging as an interventional means of decreasing deliberate sun exposure among young people was canvassed during the interviews. The participants’ overarching assessment of the effectiveness of UV photoaged imaging intervention was that their own photograph had a more powerful effect on them than any other vivid anti-sunbathing shock materials currently used in the country’s SunSmart campaigns. They reasoned that this was because their own photographic image personalised the damage. As such, skin damage ceased to be some hypothetical outcome of unprotected sun exposure and reinforced the stark reality that skin damage is something that had already happened to them. As one participant explained:

“Photoageing would definitely work because it’s showing the person exactly what’s wrong with them, not targeting them as a whole group, if you know what I mean. They can see the picture of themselves, they can see the damage. My picture illustrates why we are told to do it (use sunscreen). Seeing this picture makes me think, ‘Oh my goodness, this is me.’ It’s a lot more confronting.”

Although all participants felt showing individuals a personalised UV photoaged photograph would alter a young person’s outlook on excessive sun exposure, they concluded

that the most effective deterrent to unsafe sun tanning was an accompanying explanation of their photo and not being presented with the UV photoaged photograph alone. This viewpoint was captured in the following quote:

"It's interesting to see and know that tanning damages your skin... I think it would be a good intervention strategy... because we are told to 'slip slop and slap' and all that, but we're not really shown why or explained why. We're just told that the sun is bad for us, but then you know it's just: 'Okay, whatever.'"

And was summated in another:

"Now, I know I've got to take care of my skin!"

Discussion

Previous research on attitudes towards tanning indicate that the primary motivation for sun exposure in young adults is to enhance their physical appearance by emulating the media-projected images of attractive people being individuals with tanned complexions.^{5,9,13,15} Despite being the beneficiaries of two extensive public health campaigns on skin damage and cancer risks associated with unprotected UVR exposure, young adults continue to engage in tanning activities. Their predilection for a tanned appearance is perplexing to public health authorities given there is growing recognition that UVR is the primary cause of skin cancers and that the rate of the annual increase in the number of newly reported cases now outstrips any other form of cancer.⁶

One of the main difficulties in promoting skin-protective practices is that there is a temporal delay between cause and effect.⁹ A small but growing number of empirical studies have evidenced that photoageing photography can alter people's tanning intentions.^{5–6,23,26,35,36} UV photoaged photographs provide a way of shortening the delay by visualising the damage that has already occurred. For example, in this study participants expressed shock over the amount of skin damage already evident in their UV photograph and consequently voiced a fear-driven intention to change their sun-tanning behaviours. Fear, being defined in this context as a negatively-balanced emotion, which when accompanied by a high level of personal arousal, has the potential to initiate behavioural change.²⁰ As such, the behavioural change role of fear is commonly used in health promotion strategies to persuade people to adopt healthier behaviours. Indeed, the degree of attitude change is typically proportional to the degree of fear aroused.^{18,20,37} In this study the fear triggered by viewing their UV photoaged

photograph was sufficiently arousing to trigger an intention to employ new or increased skin-protective practices.

The fear component embedded in the Australian educative "Slip! Slop! Slap!" and SunSmart health campaigns undoubtedly have increased the public's awareness of the dangers of overexposure to the sun;⁷ however, this study demonstrates that the media's projected image of tanned skin being a highly desirable attribute appears to counteract health messages embedded in such campaigns.¹⁵ As such, future campaigns need to be aware that for young adults appearance-enhancement desires can supersede their stated skin-protective intentions.^{12–13,15} Accordingly, it is posited that the future educative goal of skin-protective intervention programs may need to focus on making unattractive what currently adults hold to be attractive—namely, a tanned skin appearance—if the current rates of skin cancer are to be reduced.²²

Future directions

The qualitative nature of the study allowed participants to describe their feelings and behavioural change intention reactions that emerged following their viewing of their own UV photoaged photograph, without the response choice options restrictions often imposed by quantitative survey designs. This allowed for a depth and richness of data that traditional quantitative questionnaires by their design generally fail to generate. Future research needs to consider investigating whether UV photoaged photography leads to sustained behavioural change in ethnically and culturally diverse population groups.

Conclusion

This study's findings extend the existing body of sun exposure literature by demonstrating the potential efficacy of an appearance-based approach to strengthen young adults' intentions to engage in skin-protective behaviours. In particular, we reveal that although young adults are aware of the cancer risks associated with UV exposure and the strategies that can be used to lessen these risks, the perceived attractiveness benefit of having a suntan acts as a social barrier to their behavioural change. Therefore, it is suggested that future interventions reinforce the appearance benefits to be had from abstaining from sun tanning. In addition, personalised UV photoaged photographs appear to effectively overcome the longstanding temporal cause-and-effect delay barrier to young people adopting sun-protective measures through the process of making visual the skin damage that has already occurred to their face, but is not yet visible to the naked eye.

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PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

ETHICS COMMITTEE APPROVAL

Faculty of Community Services, Education & Social Sciences
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