The impact of an appearance-focussed facial-ageing intervention on adolescents' attitudes towards sun protection and UV exposure

Abstract

The study investigated British adolescents' experiences of an appearance-focussed, facial-ageing, morphing intervention designed to increase sun protection intentions. The study population consisted of 237 adolescents, 60 of whom were randomly allocated to participate in the appearance-focused intervention condition and 176 to a control condition. Participants completed questionnaires at baseline and immediately post-intervention. Adolescents who had participated in the appearance-focussed intervention had significantly greater intentions to use sun protection, significantly more negative sun risk beliefs, lower sun benefit attitudes and higher perceived sun damage susceptibility after viewing the information given than participants in the control group. It is concluded that appearance-focussed interventions may be a useful tool to use when educating young people about the importance of protecting their skin from UV exposure.

Key Words: UV Exposure; Sun Protection; Intervention; Adolescents; Appearance; Ageing

UV exposure and sun protection use are two issues of vital importance. It has been suggested that exposure to ultraviolet (UV) radiation, including exposure to the sun and sunbeds, are the primary causes of all melanomas, leading to skin cancer (World Health Organization, 2018). Malignant melanoma is the second most common cancer in 15-34-year olds, and at least two young people in Britain receive this diagnosis every day (Cancer Research UK, 2018).

Adolescents have been found to have poor sun protection practises (Paul et al 2008), with authors finding that suggest that as children progress into adolescence they are less under observation by their parents, so they need to take additional responsibility for their UV protective behaviours, a task that was left to their parents before this (Berneburg and Surber 2009). Health promotion messages, therefore, need to be aimed directly at adolescents themselves. This makes adolescents a vitally important group to target for interventions that encourage safer UV exposure behaviours and better sun protection behaviours.

Williams, Grogan, Clark-Carter and Buckley (2013a) carried out research using open-ended questionnaires and focus groups, looking at adolescents' awareness of the important of protecting their skin from UV exposure. Their findings indicated that on the whole, adolescents were aware of sun protection, and felt that there were both advantages and disadvantages to the use of sunscreen, as well as advantages and disadvantages of UV exposure. However, the authors concluded that there is a need for interventions that inform adolescents about the potential impact of UV exposure due to some of their ambivalent attitudes towards sun protection use and their positive attitudes towards UV exposure.

Dobbinson et al. (2008) suggest that few studies have targeted adolescents' sun protection behaviours and that, typically, these few previous interventions have used educational strategies and had limited effect on sun protection behaviours. Livingston, White, Ugoni and Borland (2001) suggest that young people, particularly adolescents, have little motivation to change their sun safety behaviour and that new ways are needed to engage adolescents. One such way that may have the potential to engage them would be appearance-based studies, where, rather than focussing on the effect of UV exposure on their health, the key focus is on the effect of UV exposure on their appearance. Asvat, Cafri, Thompson and Jacobsen (2010) found that appearance-related reasons to tan among adolescents are associated with greater intentions to sunbathe and fewer intentions to engage in sun protection behaviours. Therefore appearance-based interventions may be particularly effective with adolescents.

Systematic reviews and meta-analyses of the literature on appearance-based interventions concluded that appearance-focused interventions are an effective way of encouraging people to practise safer sun protection and sun exposure behaviours (Persson et al., 2017; Williams et al., 2013b). Very few appearance-based, sun protection interventions have been performed on adolescents, but a couple have shown promise in the past. Olson et al. (2007) carried out a multi-component intervention with adolescents that included an appearance-focussed element, as well as health-focussed elements. The appearance-focussed element involved participants viewing their face under UV light to see whether they had any existing UV damage. The authors found that two years after the study, adolescents who had taken part in the intervention were more likely to use sun protection, and apply it more thoroughly than controls. Olson et al. (2008) carried out an intervention on adolescents that again

included an appearance-focussed element involving UV light. All participants received a single educational class that included personal viewing of skin changes visible under UV light. Post-intervention, one-third of students who had not previously intended to use sun protection in the next month now intended to use it. Among the students who had seen damage to their skin under the UV light, 59% reported intentions to use sun protection in the next month, compared to 35% of the students who had not seen any visible skin changes or damage under the UV light.

The current study was designed to investigate the impact of engaging in an age-appearance facial morphing programme on sun protection and UV exposure attitudes and behavioural intentions in British adolescents, compared with a control group that did not receive the intervention. The morphing software has been previously used in a qualitative intervention with adolescents (Williams et al 2013c), which found that the adolescents were shocked at the difference in ageing between if they had been protecting their skin and if they hadn't, and many expressed intentions to change their protective behaviours in the future. The present intervention was carried out on both males and females, and the data were analysed both as a whole, and separately, to see whether there were any gender differences in response to the intervention. The study is the first appearance-focussed quantitative intervention encouraging sun protection use in British adolescents, and also differs from previous studies with adolescents in that it looks directly at effects of UV exposure on future appearance rather than examining existing damage which is revealed under UV light. The authors hypothesised that those who had taken part in the intervention condition would have more positive sun protection and UV exposure attitudes and intentions following exposure to the intervention than those who had taken part in the control condition.

Materials and Methods

Design

The study used a pre-post, two group design, with two levels of time (baseline and immediately post-intervention) and two conditions (intervention and control condition), with participants being randomly assigned to conditions. Those in the intervention group were exposed to the APRIL® Age Progression Software (APRIL® 2018). See Figure 1 for a flow chart indicating the study procedure for both groups.

Participants

The final study sample consisted of 237 male (n = 125) and female (n = 112) Secondary School students, aged 11- to 14-years-old, with 60 in the appearance-focused condition and 176 in the control condition. Due to time constraints, it was not possible to carry out the intervention on more than six people per class (due to each class being one hour in length), therefore a larger number of participants took part in the control condition than the intervention condition. There were 238 students in the classes altogether, but the parent/carer of one student did not give consent for their child to participate in the study. Participants came from ten classes from one school situated in Wales, UK, and all spoke and understood English at a native level. Five of the classes were school year 7 (aged 11 and 12), and five of the classes were school year 9 (aged 13 and 14). The average age of the participants was 12.42 (*1.17*). The participants were all Caucasian. The authors based the number of participants on previous research using the APRIL software (Grogan et al. 2011), who based their sample size on finding a medium effect (η^2 = .10; Copeland et al. 2006), with a power

of .80 and $\alpha = .05$. As a result, it was necessary to have a minimum of 35 participants in each condition.

Software

A computer program called APRIL® Age Progression Software was used for the intervention. APRIL® is used to create a series of images of a person's face as it changes with age. The software has been used previously on UV exposure interventions with adults (Williams et al 2012; Williams et al 2016), as well as for smoking (Grogan et al. 2010; Flett et al. 2017). The software is based on the results of a five-year study of the faces of over seven thousand people of different ethnicities, ages and lifestyle habits (APRIL® 2018). It displays the progression of facial ageing in two-year intervals up to the age of 72, and allows the viewer to see the comparison of their face with and without damage from UV exposure. There is also a 3D setting which allows the viewer to see the ageing of their faces from a side view.

Questionnaire

The baseline questionnaire was made up of fifteen statements and three informational questions (based upon current/previous behaviour), and the immediate post-intervention questionnaire was made up of the fifteen statements, with the informational questions removed. A five point Likert scale next to each of the statements was labelled from 'Strongly Disagree' to 'Disagree' to 'Neither Agree or Disagree' to 'Agree' to 'Strongly Agree', and participants were asked to tick the label they agreed most fitted the statement. For the informational questions, numbers were provided for the participants to tick. The measures were chosen based on previous UV

exposure and sun protection intervention research (Mahler et al 2008; Olson et al 2008; Stapleton et al 2010).

Baseline UV Exposure and Sun Protection Use. Baseline sun protection behaviour and UV Exposure was assessed at the first session using the following informational questions: "How much time have you spent sunbathing with the aim of getting a sun tan in the past six months?", "How many times in the past six months have you used sun tan lotion?" and "How many times in the past three months have you used a sunbed?" (Stapleton et al. 2010).

Sun Benefit Attitude Statements. Participants' attitudes towards the benefits of sun exposure were measured through three statements: "Being in the sun is relaxing", "A tan looks good" and "Tanned people look healthy" (Olson et al. 2008).

Sun Protection Knowledge. Two statements were used to measure different aspects of the participants' knowledge of using sun protection: "I do not need to wear sun tan lotion if it is cold outside" and "No sun tan lotion is needed after being sunburned".

Sun Risk Belief. Beliefs towards the risk of sun exposure were measured through the statement: "Bad sunburns are unhealthy" (Olson et al. 2008).

Future Sun Protection Intentions. Intention to use sunscreen in the future was measured using two statements: "In the future I plan to use sun tan lotion every day" and "I intend to use sun tan lotion within the next six months" (Mahler et al. 2008).

Perceived Behavioural Norms and Perceived Behavioural Control. The statements "Other people my age wear sun tan lotion" and "It is up to me to decide whether I wear sun tan lotion" were used to measure participants' perceived

behavioural norms and perceived behavioural control related to the use of sun protection.

Perceived Sun Damage Susceptibility. Perceived susceptibility of sun damage was measured using five statements: "Too much sun exposure can cause skin cancer", "Sun damage can cause wrinkles", "I don't think that I am going to have many wrinkles when I am older", "Tanning makes people look older" and "I am too young to spend much time thinking that I might get wrinkles" (Mahler et al. 2008; Olson et al. 2008).

Ethical approval and consent

Prior to the commencement of the study, ethical approval was granted by the University Ethics Committee, and the British Psychological Society (2009) ethical Code of Conduct and the Revised Ethical Guidelines of the British Educational Research Association (BERA 2004) were followed throughout the study. The intervention took place at a British secondary school. Prior to the intervention taking place, participants were given letters to take home to their parent/carer detailing the proposed intervention and containing a form for the parents/carers to return if they did not wish their child to take part in the research. As mentioned earlier, one parent/carer did not consent to their child taking part.

Procedure

The study was carried out on two separate days, as part of the Personal, Social and Health Education curriculum. At the beginning of each session the experimenter introduced herself to the entire class, and gave some background information about herself and the study, outlining that she was carrying out research looking at young

people's sun protection and UV exposure behaviours. She then asked participants whether they had any questions, and gave all participants a consent form to sign. Informed consent was obtained from all individual participants included in the study. All participants then completed the baseline questionnaire.

Experimental Condition. For the intervention group, simple randomisation was used to decide which participants took part in the intervention, with six participants being chosen using random number sampling from the school class register to take part (males and females were separated in order to get equal numbers of each). The participants chosen were taken to a quieter area to carry out the intervention. The participants began by having a group discussion about their awareness and attitudes towards sun protection and UV exposure (see Control Condition section below for full details of the topics discussed). These data are reported in a separate study (Williams et al., 2013a).

The experimenter then took a photograph of each participant's face, and uploaded the photograph onto the APRIL® Age Progression Software. The experimenter explained that the photographs on the left-hand side of the screen would show their face aged if they had been using sun protection and not using sunbeds, and on the right-hand side of the screen they would see their face aged with UV exposure and no sun protection. The experimenter then clicked the play button on the screen, and the photographs moved through the ages from the participant's current age, in two year intervals, up to the age of 72, the maximum age. The experimenter also put the photographs on the 3D setting which enabled the adolescents to see the photographs from the side view, which showed further wrinkling to the side of the face.

After all of the participants in the group had participated in the intervention, they took part in a brief discussion about the intervention and their thoughts on the software. Participants were then given the post-intervention questionnaire to complete. After completing the post-intervention questionnaire the participants were given the debrief sheet which outlined that they had taken part in a study looking at people's sun protection behaviours and gave the web addresses of the NHS and Cancer Research UK organisations, should they have any concerns about their past or future sun protection or UV exposure behaviours. The debrief sheets also contained the experimenter's contact details, and made it clear that participants could contact her should they have any queries or concerns. None of the participants or their parents contacted the experimenter.

Control Condition. In the control condition, after completing the baseline questionnaire, participants were given an open-ended questionnaire to complete containing questions about their sun protection and UV exposure behaviours. The open-ended questionnaire contained the following questions: "When I say sun protection, what does that mean to you?", "What do you think is the most important benefit you get from sun protection (for example sun tan lotion)?", "Are there any negatives to using sun protection? Or things that you don't like?", "Who do you think is in control of whether you wear sun protection (i.e. yourselves, your parent/carer, brother/sister, friends)? Why do you think this?", "Do you ever sunbathe with the intention of getting a sun tan?", "Have you ever used a sunbed? What are your thoughts on sunbeds?" and "Have you ever used fake tan? What are your thoughts on fake tan?". There was space underneath each question for the participants to write their responses. These questions were the same as were asked of participants in the

experimental condition, before viewing their photographs. Participants were given 45 minutes to complete the questionnaire (the amount of time that it took for the participants to complete the appearance-focussed intervention). After completing and handing in their open-ended questionnaire, the students were allowed to talk to each other in small groups. Participants were then given the follow-up questionnaire to complete, and were then given the debrief sheet.

Results

Analysis

Preliminary analyses were performed at baseline to check for initial equivalence between the intervention and control groups. In addition, checks of the reliability of the measures were conducted. A one-way, between-subjects ANOVA for each dependent variable was carried out, with time as the independent variable. The two groups were then compared using a series of one-way, between-subjects ANCOVAs, which allowed us to examine whether there was a difference in results of the variables between the intervention and the control groups. The drop-out rate between baseline and follow-up was 10.13% (24 of the participants in the control group handed in blank questionnaires at follow-up. When tested using a missing values analysis, there were no significant differences between these participants and the rest of the control group). There were no missing data other than the missing follow-up data from those 24 participants, and the analysis was carried out on the completed questionnaires. The male and female data were then analysed separately, again using a series of one-way, between-subjects ANCOVAs to see if there were any differences between the male and female participants' responses to the intervention.

Preliminary Analyses

At baseline, 40.7% of participants had sunbathed with the intention of getting a sun tan in the past six months, and 11.9% of participants had used a sunbed at least once in the past three months (14.3% of females and 3.2% of males). In terms of sun benefit attitudes, 61.9% of participants felt that a tan looked good, and 67.4% of participants felt that being in the sun was relaxing.

Prior to the intervention, only just over half of participants had used sun tan lotion within the past six months (51.7%). Only 12.3% of participants intended to wear sun tan lotion every day in the future, and just over half (52.5%) said that they intended to use sun tan lotion within the next six months (the study was carried out in March, so the next six months covered the summer months in the United Kingdom). A total of 70.8% of participants felt that it was up to them to decide whether they wear sun tan lotion, and 71.2% agreed that other people their age wear sun tan lotion. Participants did appear to have good knowledge of the possible dangers of UV exposure, with 94.1% of participants agreeing that too much sun exposure could lead to skin cancer, 86.4% agreeing that bad sunburns are unhealthy and just 21.2% believing that they did not need to wear sun tan lotion if they had been burnt. However, only 17.8% of participants felt that they needed to wear sun tan lotion if it was cold outside.

The internal consistency of the sun protection intentions, perceived sun damage susceptibility and sun benefit attitudes questionnaire subscales was checked. The subscale for sun risk belief was not checked as the subscale had just one item ('Bad sunburns are unhealthy').

All subscales had fairly low Cronbach's Alpha and Guttman's Lambda 2 levels (sun benefit attitudes had a Cronbach's Alpha of .592 and Guttman's Lambda of .594, sun protection intentions had a Cronbach's Alpha of .406 and Guttman's Lambda 2 of .406, and perceived sun damage susceptibility had a Cronbach's Alpha of .282 and Guttman's Lambda 2 of .311), with just the sun benefit attitudes subscale having a Cronbach's Alpha value that fell within Nunnally's (1967) guidelines, that Cronbach's Alpha values of between 0.5 and 0.6 are adequate. The sun protection intentions and perceived sun damage susceptibility measures were below 0.5, but Pedhazur and Schmelkin (1991) suggest that the user of the measure has the ability to determine how reliable the test should be depending on the circumstances of the study. Sijtsma (2009) discusses the limited usefulness of Cronbach's alpha, and points out that there are a number of flaws in using it as a reliability estimate and as a measure of internal consistency, for example by suggesting that it can be easily shown that alpha is unrelated to the internal structure of the test. It was therefore decided to include these measures in the analysis as the measures were still felt to be important. However, it is important to bear the lower alpha levels in mind when drawing conclusions from the results of these subscales.

To determine the initial equivalence of the conditions, separate one-way analyses of variance (ANOVAs) were performed on the demographic and sun protection and sun damage variables (See Table 1). The results indicated that there were no significant differences in terms of age, sun benefit attitudes, sun protection intentions, perceived behavioural norms and perceived behavioural control and sun risk belief. However it was found that there was a significant difference in terms of perceived sun damage susceptibility, with participants in the appearance-focussed intervention group having

significantly higher perceived sun damage susceptibility scores than those in the control group at baseline ($F_{(1,235)} = 13.27$, $p<.01$, eta-squared = .05). This difference was controlled for in the subsequent analyses, in the ANCOVA on perceived sun damage susceptibility.

Primary Analysis

Analyses were carried out to investigate whether there was a significant difference between the two conditions. Table 2 shows the means and standard deviations for baseline sun protection use, and the means and standard deviations for the total of the subscales at each of the two time points, at baseline (T1) and at the second time point (T2: after the APRIL® intervention for the appearance-focussed condition and after completing the open-ended questionnaire for the control condition). Again, a higher score indicated more positive attitudes towards safe sun protection and UV exposure behaviours.

An ANCOVA was conducted on each of the variables, to assess whether there was a difference in post-intervention scores between the control condition and the appearance-focussed intervention condition. Table 3 shows the results of the ANCOVA analyses and the estimated marginal means and confidence intervals for all participants, and for the males and females separately. The results for the analyses for sun risk and perceived sun damage susceptibility subscale are taken from the analysis which included the interaction term (between condition and the covariate) for the analyses with all the participants. In terms of effect sizes for all participants, the sun benefit measure had a large effect size, sun protection intentions and sun risk beliefs

both had a medium effect size and perceived sun damage susceptibility had a small effect size.

Those in the appearance-focussed intervention had significantly higher scores post-intervention compared to the control condition in sun benefit attitudes, sun risk belief, sun protection intentions and perceived sun damage susceptibility.

Secondary Analysis

After discovering that there was a significant difference between the appearance-focussed and control conditions in all measures, the dataset was split so that further ANCOVAs could be conducted on each of the variables, examining males and females separately. As with the previous analyses, the baseline value was treated as the covariate, to assess whether there was a difference in post-intervention subscale scores between the intervention condition and the control condition. For both the males and females, the results for the analyses for the sun risk subscales are based on the analysis which included the interaction term, and for perceived sun damage susceptibility for females only, the analysis included the interaction term (See Table 3*)*.

Both indicated that there were significant differences in both the male and female participants in all four subscales, again with those in the appearance-focussed intervention having significantly higher scores post-intervention compared to the control condition. There did not appear to be any significant gender differences, however the females had a large effect for the sun benefit measure, and medium effects for the other measures. Males had a large effect for the perceived sun damage susceptibility measure, and medium effects for the other three measures.

Discussion

Education about safe UV exposure and sun protection use is a vital area of current study, with the rising levels of skin cancer and high rates of diagnosis (World Health Organization 2018; Cancer Research 2018) The results of the present study suggest that appearance-focussed interventions do hold some promise in regard to changing attitudes and intentions towards sun protection and UV exposure behaviours. There were significant differences in both male and female participants between those who participated in an appearance-focussed intervention compared to controls, in terms of their sun benefit attitudes, sun risk belief, sun protection intentions and perceived sun damage susceptibility. Those who participated in the intervention had significantly higher scores (and therefore more positive attitudes towards safer UV exposure and sun protection behaviours) following the intervention than control group participants did at post-test.

The results indicated that participants felt motivated to intend to change their sun protection and/or their UV exposure behaviours after viewing the photographs. The results were similar for males and females, with significant differences at baseline and post-intervention on all measures. There was a difference in terms of effect sizes, with the females having a large effect for the sun benefit measure, and medium effects for the other measures, whereas the males had a large effect for the perceived sun damage susceptibility measure, and medium effects for the other measures. This is an interesting finding, and indicates that the intervention was particularly effective in changing perceived sun damage susceptibility in young men.

When looking at previous work with adolescents, Olson et al. (2007) found that the intervention effect was greater for females, and suggested that this was because appearance is particularly important to females, who are more likely to actively seek a tan than males. However, it did not appear that there were any differences in appearance concerns between the males and females in this study, with both seeming to be concerned about the possible effect of UV exposure on their ageing. It is possible that this may link with recently increased male concerns over appearance. Choma et al. (2010) found that concerns about body image can affect males as much as females, and males suffer as many issues regarding their appearance concern.

At baseline, more females than male participants had used a sunbed in the past three months. This finding is consistent with other research that has shown that females are more likely to use sunbeds than males; for example Mayer et al. (2011) surveyed the extent of tanning in adolescents in different cities in America, and found that over 17% of females had used indoor tanning within the last year, compared to 3% of males. This finding emphasises the need for interventions that encourage adolescents to practice safer UV exposure behaviours in terms of indoor tanning, as research has found that using a sunbed during adolescence is associated with an increased risk of early-onset melanoma (Cust et al., 2010). Having one indoor tanning session per year in secondary school or college increases the risk of basal cell carcinoma by ten percent, and that risk is increased to 73 percent if the person has indoor tanning sessions six times per year (Zhang et al., 2012).

Participants appeared to have good knowledge of the possible dangers of UV exposure at baseline, with the majority of participants agreeing that too much sun exposure could lead to skin cancer and 86.4% agreeing that bad sunburns are

unhealthy. This indicates that there is a need for interventions that focus on other effects of UV exposure, rather than just the health effects, as even though participants were aware of this, just under half of participants had not used sun tan lotion within the past six months, and did not intend to wear sun tan lotion over the next six months (at baseline).

The baseline data indicated that the adolescents had a positive attitude towards tanned skin, with over half of participants feeling that a tan looked good and a number of participants having sunbathed with the intention of getting a sun tan in the past six months. Again, this finding is consistent with previous work, with Dobbinson et al. (2008) finding that 60% of adolescents stated that they like to get a tan and 32% reporting that they actively try to get a suntan. This suggests that in the future, work needs to be done to change the perception which links a tan with looking good.

Methodological / Interpretive Issues

Participants in the present study were Caucasian British school students aged 11 to 14-years-old. This means that the findings need to be generalised with caution to other groups. Furthermore, the study was conducted at just one site at a British Secondary School. Thus it is not possible to determine whether the intervention would have had different effects had it been conducted in different places, for example areas where there is a sunnier climate.

A methodological issue may be that after completing either the intervention or open-ended questionnaire, participants in the classes had the opportunity to talk and take part in discussion with each other. This has implications in that the participants may have spoken about the intervention or responses to the open-ended questionnaire. In

future, it would be better to not allow discussion between participants until after they have completed the follow-up questionnaire and have been debriefed, however this was not possible in the current study.

A further issue is that of the unequal sample sizes. Due to the time restraints of the study, we were only able to have two days of data collection with the school, so had to make the decision to just take six children out of each class to take part in the intervention condition, with the rest of the class taking part in the control condition. It would have been far more ideal to have equal sample sizes in each condition, and in future, it would be beneficial to do this.

Future Research

In future, it would be useful to carry out longitudinal research looking at the software with adolescents, with a longer term follow-up (for example six months or a year) than just immediately post-intervention, as it was not possible to draw any long-term conclusions about the effectiveness of the intervention.

Recommendations for health promotion in schools:

This intervention could certainly be used in educational settings, including in schools where school nurses could discuss the importance of protecting one's skin from the sun and engaging in safer UV exposure behaviours. The intervention is easy to carry out and is not especially time consuming, so could be carried out in classes. In terms of cost of the intervention, it would involve a one-off payment for the intervention software, as well as a trained experimenter to carry out the intervention, for example a school nurse.

Conclusions

The present study suggests that an appearance-based intervention using computer software to show adolescents their own faces aged with and without UV damage has an effect on their sun protection intentions, sun benefit attitudes, perceived sun damage susceptibility and sun risk beliefs. Appearance-based interventions may be a useful step forward in improving adolescents' sun protection and UV exposure behaviours.

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Table 1. Table showing the results of the ANOVAs on the demographic and sun protection and sun damage variables.

Measure	F[1]	p	Eta-squared
Age	1.67	.20	.01
Sun benefit attitudes	1.83	.18	<.01
Sun protection intentions	.05	.83	<.01
Perceived behavioural norms and perceived behavioural control	1.67	.20	<.01
Sun risk belief	.04	.85	<.01
Perceived sun damage susceptibility	13.27	<.01	.05

[1] df: 1.235

Table 2. Table Showing the Means and Standard Deviations for the measures at Baseline and Post Intervention for all participants

Measure	**Intervention Condition**		**Control Condition**	
	T1 Mean (*SD*)	**T2 Mean (*SD*)**	**T1 Mean (*SD*)**	**T2 Mean (*SD*)**
Sun Benefit Attitudes	8.07 (*1.97*)	9.28 (2.66)	7.64 (*2.18*)	7.78 (*2.45)*
Sun Protection Intentions	5.75 (*1.55*)	6.92 (1.98)	5.81 (*1.78*)	6.03 (*1.77*)
Perceived Sun Damage Susceptibility	17.37 (*1.73*)	19.60 (*2.25*)	16.21 (*2.24*)	16.28 (*2.31*)
Sun Risk Belief	4.28 (*.90*)	4.57 (*.77*)	4.31 (*.78*)	4.36 (*.91*)

Key: T1: Baseline, T2: Follow-up

Table 3. Table showing results of the ANCOVA for each of the four variables and the adjusted means, standard errors and confidence intervals for each of the four variables for all participants, and males and females separately

Measure	ANCOVA for each of the variables			Appearance-focussed Intervention Condition		Control Condition	
	F	p	$\eta_p 2$	Mean *(Standard Error)*	95% Confidence Intervals	Mean *(Standard Error)*	95% Confidence Intervals
Sun Benefit Attitude: All participants	16.77	<.01	.55	9.00 *(.23)*	8.55, 9.45	7.90 *(.14)*	7.62, 8.12
Sun Benefit Attitude: Females	11.24	<.01	.10	8.60 *(.25)*	8.10, 9.10	7.59 *(.16)*	7.27, 7.91
Sun Benefit Attitude: Males	7.28	<.01	.06	9.38 *(.33)*	8.63. 10.13	8.18 *(.23)*	7.72, 8.64
Sun Protection Intentions: All participants	14.52	<.01	.07	6.95 *(.21)*	6.54, 7.35	6.02 *(.13)*	5.77, 6.28
Sun Protection Intentions: Females	5.29	.02	.05	7.04 *(.28)*	6.48, 7.60	6.26 *(.18)*	5.90, 6.62
Sun Protection	10.95	<.01	.09	6.94 *(.30)*	6.35, 7.54	5.77 *(.19)*	5.40, 6.14

Intentions: Males							
Perceived Sun Damage Susceptibility: All participants	6.75	.01	.03	19.46 *(.28)*	18.90, 20.02	16.47 *(.16)*	16.15, 16.80
Perceived Sun Damage Susceptibility: Females	7.13	<.01	.07	19.98 *(.38)*	19.23, 20.73	16.78 *(.23)*	16.32, 17.23
Perceived Sun Damage Susceptibility: Males	32.07	<.01	.23	18.71 *(.38)*	17.96, 19.46	16.17 *(.23)*	15.72, 16.63
Sun Risk Belief: All participants	12.80	<.01	.06	4.57 *(.10)*	4.38, 4.76	4.35 (.06)	4.23, 4.47
Sun Risk Belief: Females	8.30	<.01	.08	4.63 *(.12)*	4.39, 4.86	4.46 (.08)	4.31, 4.61
Sun Risk Belief: Males	5.38	.02	.05	4.53 *(.16)*	4.22, 4.84	4.25 (.10)	4.06, 4.44

***Partial Eta Squared,** All participants: df = 1,211, Females: df = 1,102, Males: df = 1,109

Figure 1. Participant Flow Chart Showing Randomisation and Study Procedure for Both Groups