

Negative Appearance Evaluation is Associated with Skin Cancer Risk Behaviors
among American Men and Women

Abstract

Objective: The current study aimed to examine links between appearance evaluation and skin cancer risk behaviors in men and women. **Method:** Data, (N = 1,535; men $n = 873$; women $n = 662$), were extracted from Wave 4 of the National Longitudinal Study of Adolescent Health, a nationally-representative, longitudinal dataset of U.S. adolescents and young adults. **Results:** Skin cancer risk (i.e., number of hours spent outside for those with a history of severe sunburn and who were unlikely to use sunscreen) was significantly associated with participant gender, appearance evaluation, and their interaction. Both men and women who negatively evaluated their appearance were at significantly increased skin cancer risk, and this was particularly true for men. **Conclusions:** Negative appearance evaluation appears to be a correlate of engaging in behaviors that place individuals at risk of developing skin cancer. Future research may benefit from skin cancer prevention interventions that directly address appearance-based evaluations.

Keywords: Skin cancer; Appearance evaluation; UV exposure

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The World Health Organization (WHO) reports that UV radiation, including exposure to the sun, sunbeds, poor use of sunscreen, and a history of sunburn, are primary causes of skin cancers (i.e., melanoma, basal cell and squamous cell carcinomas; WHO, 2012). Further, skin cancers are the most prevalent forms of cancer in the United States, with 3.5 million cases diagnosed annually (Rogers et al., 2010). In 2012, the number of new cases and deaths from melanoma were estimated at 76,250 and 9,180, respectively (American Cancer Society, 2012). Clearly, UV exposure is a serious health risk, and one factor that may encourage UV exposure is the belief that it will enable an individual to attain a more attractive, leaner, and/or more clear-skinned, tanned ideal (Thompson, Ata, Roehrig, & Chait, 2012).

Previous research has found that appearance-related motives to tan are associated with greater intentions to sunbathe and fewer intentions to engage in sun protection behaviors (e.g., Asvat, Cafri, Thompson, & Jacobsen, 2010). Indeed, Thompson et al. (2012) conclude that one of the strongest correlates of intentional UV exposure is a positive attitude to a sun-tanned appearance. As a tanned appearance may lead some individuals to perceive themselves as leaner and more attractive (Hedges & Scriven, 2010; Thompson et al., 2012), it may be expected that tanned individuals would evaluate their appearance positively and those who view their skin as pale may be motivated to engage in tanning to move closer to the tanned ideal.

Various authors have addressed the issue of how appearance evaluation and sun-tanning are associated, but previous research has produced conflicting findings (e.g., Cafri et al., 2006; Cafri, Thompson, Jacobsen, & Hillhouse, 2009; Coogan, Geller, Adams, Benjes, & Koh, 2001). Gillen and Markey (2012) found that positive appearance evaluation was not significantly linked to indoor tanning, whereas it was with outdoor sunbathing. Other work

has shown that tanning may be linked to negative appearance evaluation, suggesting that this behavior may be used to redress perceived inadequacies in appearance. Thompson et al. (2012) report that adults and adolescents endorsing appearance-fixing motives for tanning (to increase attractiveness, disguise skin imperfections, make the body look more slender and toned) were more likely to have intentions to expose their skin to UV, and were less likely to have intentions to use sun protection.

Most studies on UV exposure and sun protection have focused on women, with relatively few investigating tanning in men. A systematic review of literature focusing on appearance-related interventions and tanning (Williams, Grogan, Clark-Carter, & Buckley, 2013) found that in the twenty-two studies published, the number of women was more than double that of men. There has also been limited work examining the effect of appearance evaluation on UV exposure as a function of participant gender. Thus, the aim of the present study was to examine whether appearance evaluation is associated with skin cancer risk behaviors, in both men and women. We proposed to examine a nuanced variable of skin cancer risk behaviors, examining number of hours exposed in the sun for those who are unlikely to use sunscreen and have a history of severe sunburn. This approach is novel in the field, and combining these individual skin cancer risk behaviors may aid in identifying the most at-risk individuals. It is hypothesized that participants with negative appearance evaluation will report greater skin cancer risk than those with more positive appearance evaluation. Given inconsistencies in past literature, research questions, in lieu of directional hypotheses, were generated regarding the main effect of participant gender, and the interaction between appearance evaluation and participant gender.

Method

Participants

Participants were 1,535 Americans (men $n = 873$; women $n = 662$), who were selected from a total sample of $N = 5,114$ based on skin cancer risk as assessed by history of sunburn and use of sunscreen (see below). The mean age of the sample was 29 years ($SD = 1.6$). Participants marked all race/ethnicity categories that applied to themselves, resulting in groups that summed to greater than 100%: White (66%), Black (25%), Hispanic (11%), Other (6.6%), Asian/Pacific Islander (4%), and Native American (3.6%).

Procedure

Data were extracted from Wave 4 of the National Longitudinal Study of Adolescent Health (Add Health, 2013; Harris et al., 2009), a nationally-representative, longitudinal dataset of U.S. adolescents/young adults, including data from 1996 to 2009. Wave 4 data were collected between 2008 and 2009. Initially, at Wave 1, a sample of 80 high schools and 52 middle schools from the U.S. was selected with unequal probability of selection. Incorporating systematic sampling methods and implicit stratification into the Add Health study design ensured this sample was representative of U.S. schools with respect to region of country, urbanicity, school size, school type, and ethnicity.

Measures

Skin cancer risk behaviors. Criteria based on responses to two items were combined to indicate likely risk of developing skin cancer. To do this, we assessed history of sunburns with the item, “How many times in your life have you had a sunburn that blistered?” Response options ranged from (1) “0 times” to (5) “more than 5 times.” We also assessed likelihood of sunscreen use with “When you go outside on a sunny day for more than one hour, how likely are you to use sunscreen or sunblock?” Response options were (1) “very likely,” (2) “somewhat likely,” and (3) “unlikely.” Based on these two items, we isolated participants who reported one or more lifetime sunburns and who also reported they were

unlikely to use sunscreen. Finally, as the outcome variable for this study, we examined number of hours exposed to sun during the summer for these at-risk participants, with the following item: “During a typical summer week, how many hours do you spend outdoors in the sun during the day?” Participants answered this item via free response.

Appearance evaluation. Appearance evaluation was assessed via a single item, “How attractive are you?” with response options of (1) “very attractive,” (2) “moderately attractive,” (3) “slightly attractive,” and (4) “not at all attractive.” These responses were bifurcated into “not at all attractive” vs. all other responses.

Statistical analyses

Due to the outcome variable being count in nature, a Poisson regression was employed via generalized linear modeling in SPSS (version 21). The main effects of appearance evaluation, participant gender, and their interaction term were entered into the model. Lastly, as an estimate of effect size, Cohen’s d was calculated for each effect. Cohen’s d is interpreted as .2 to .3 (small), \approx .5 (medium), and .8 or greater (large; Cohen, 1988). Statistical assumptions of Poisson regression were assessed via plots of residuals against fitted values, and appeared appropriate for analysis.

Results

The proposed overall model was significant, likelihood-ratio $\chi^2(3) = 1134, p < .0001$. The main effect of appearance evaluation was significant, $B = -.44, SE = .04, 95\% \text{ CI: } -.52, -.36, \chi^2(1) = 105.2, p < .0001$, Cohen’s $d = 1.5$, with participants endorsing negative appearance evaluation reporting greater number of hours in the sun ($M = 23, SD = 4.8$), compared to those with positive appearance evaluation ($M = 16.4, SD = 3.9$). The main effect of participant gender was also significant, $B = .21, SE = .06, 95\% \text{ CI: } .10, .33, \chi^2(1) = 12.5, p$

< .0001, Cohen's $d = .52$, with men reporting greater number of hours in the sun ($M = 22.7$, $SD = 13.8$), compared to women ($M = 16.6$, $SD = 9$). However, these main effects were qualified by a significant appearance evaluation by participant gender interaction, $B = .21$, $SE = .06$, 95% CI: .10, .33, $\chi^2(1) = 12.5$, $p < .0001$. To follow-up this significant interaction, we analyzed simple main effects via pairwise comparisons between participant gender, within each level of appearance evaluation. For participants with negative appearance evaluation, men reported greater number of hours in the sun ($M = 25.5$, $SD = 5$), compared to women ($M = 20.7$, $SD = 4.5$), $M_{Difference} = 4.8$, $SE = 1.4$, 95% CI: 2.1, 7.4, $p < .0001$, Cohen's $d = 1.0$. Similarly, for participants with positive appearance evaluation, men also reported greater number of hours in the sun ($M = 20.3$, $SD = 4.3$), compared to women ($M = 13.3$, $SD = 3.5$), $M_{Difference} = 7$, $SE = .21$, 95% CI: 6.5, 7.4, $p < .0001$, Cohen's $d = 1.8$; however, the magnitude was larger than the difference noted within negative appearance evaluation participants (see Figure 1).

Discussion

The current study is the first known examination of the relationship between appearance evaluation and skin cancer risk behaviors, as a function of participant gender, extracted from a nationally-representative sample of U.S. young adults. Results revealed that both men and women with negative appearance evaluation were at increased skin cancer risk; however, this was particularly true for men. In the U.S., men, compared to women, have a 40% increased risk of being diagnosed with, and roughly a 100% increased risk of dying of, skin cancer (American Cancer Society, 2013). The results from the current study may shed some light on this disparity, as negative appearance evaluation among men appears to be a correlate of engaging in behaviors that place individuals at risk for developing skin cancer. The strong magnitude of many of the effect sizes found in this study shows that the findings are not simply an artifact of the relatively large sample size yielding significant results

through statistical power to detect small effects.

An important question left unanswered from the current study is *why* is appearance evaluation associated with skin cancer risk behaviors? Previous research has highlighted the role appearance motives play in influencing indoor and outdoor tanning behaviors (e.g., Asvat, Cafri, Thompson, & Jacobsen, 2010; Cafri et al., 2006, 2009). However, it is also possible that individuals with negative appearance evaluation are engaging in skin cancer risk behaviors not in an attempt to improve their appearance, but rather, due to poor regard for their health/bodies. Indeed, negative appearance evaluation has been linked to smoking, low physical activity, and sexual risk behaviors (e.g., Lowery et al., 2005; Neumark-Sztainer, Paxton, Hannan, Haines, & Story, 2006; Schooler, 2013). Thus, it may also be possible that men and women who possess negative appearance evaluation also have low regard for keeping their bodies safe and healthy, and may engage in skin cancer risk behaviors as a result. This effect may be particularly salient for men, and is consistent with extant data that highlight the consistent finding that men engage in significantly less health-promoting behaviors, as compared to women (e.g., Courtenay, 2000; Gough, 2013).

The results of the current study should be interpreted within the context of several limitations. It was not possible to access information on intentionality in relation to sun exposure, and although participants were asked how much time they spent in the sun, they were not asked whether they did this with the intention of obtaining a suntan. This would have been useful, as it would have enabled us to be confident that participants were choosing to engage in more risky behavior rather than, for instance, engaging in an occupation that meant that they were exposed to more UV through no choice of their own. Future research would benefit from a more thorough assessment of body image. For instance, appearance evaluation was operationalized based on a single item. Although single-item scales have strong predictive validity for assessing related constructs, such as self-esteem (Robins,

Hendin, & Trzesniewski, 2001), they may fail to capture the full range of a construct (Cash, 2011). Also, the current study did not include assessment of appearance investment, a marker of cognitive-behavioral appearance-based orientation (Walker & Murray, 2012). Individuals whose self-concept is largely influenced by their appearance, may cognitively minimize the long-term risks of sun exposure to justify short-term appearance-related benefits. The design of the study also warrants comment. We utilized cross-sectional data from Wave 4 of the Add Health study, and thus, temporal inferences cannot be inferred. Future studies would benefit from employing a longitudinal design, ideally with three or more waves of data.

The results from the current study may have clinical implications. Results indicated that both men and women with negative appearance evaluation were at increased skin cancer risk, and that this was particularly true for men. Further research may benefit from focus on which aspects of body image are linked to tanning for men and women and why this may be gender-linked. Interventions to promote safer UV exposure can then be designed to focus on these key aspects. There are currently a number of existing appearance-based tanning interventions, including using facial-morphing software which simulates how the face may age with exposure to UV radiation (e.g., Williams, Grogan, Buckley, & Clark-Carter, 2013) and providing participants with information about photoaging and UV photography (e.g., Mahler, Kulik, Gerrard, & Gibbons, 2013). It would certainly be possible to incorporate aspects of appearance evaluation into interventions such as these; for example, information could be presented alongside photoaging information, or after participants had viewed their photographs.

Conclusions

The current study revealed that individuals with negative appearance evaluation engage in increased skin cancer risk behaviors, with this danger being particularly

pronounced for men. Health promotion interventions to reduce UV exposure need to be designed with appearance evaluation in mind. Although the current data did not allow conclusions to be drawn regarding the intentionality of UV exposure, findings are nonetheless important and worthy of further study.

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