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Sociocultural Experiences, Body Image, and Indoor Tanning Among Young Adult Women

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Abstract

The purpose of this survey study was to evaluate a model of body image influences on indoor tanning behavior. Participants were 823 young adult women recruited from a probability-based web panel in the United States. Consistent with our hypothesized model, tanning-related sociocultural experiences were indirectly associated with lifetime indoor tanning use and intentions to tan as mediated through tan surveillance and tan dissatisfaction. In secondary analyses, tan dissatisfaction was positively associated with recent indoor tanning. Findings suggest the need for targeting body image constructs as mechanisms of behavior change in indoor tanning behavioral interventions.

Keywords

indoor tanning; sunbed; body image; melanoma; skin cancer

The use of artificial ultraviolet radiation-emitting indoor tanning beds is associated with an increased risk of skin cancer, including the fatal melanoma (Boniol et al., 2012). An estimated 30 million people use indoor tanning beds each year in the United States (American Academy of Dermatology Web site, 2015). Indoor tanning use is most popular among young adult Caucasian females as nearly 1 in 3 report use in the past year (Guy et al., 2013). Indoor tanning prevention is of international importance as usage rates in Northern

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and Western Europe and Canada are similar to the United States. Young women are a particularly important group to study as rates of indoor tanning are consistently at least twice as large as males in corresponding age groups (Wehner et al., 2014) and they are actively targeted by the indoor tanning industry as potential consumers (Prior and Rafuse, in press). Further, use of indoor tanning before the age of 35 doubles the risk of melanoma (Boniol et al., 2012). The rising popularity of indoor tanning in the United States has been accompanied by a growing melanoma incidence among young women over the past three decades (Chen et al., 2013). The United States, Canada, and several European counties with large populations of indoor tanning users report rising incidence of melanoma of the trunks of women in recent years (Boniol et al., 2012).

Indoor tanning users believe that tanning enhances physical attractiveness, increases confidence, and leads to greater social acceptance (Noar et al., 2014). Sociocultural factors associated with indoor tanning include normative perceptions that tanning is common, positively valued, and accepted among peers, family members, celebrities, and other media figures (Banerjee et al., 2008; Cafri et al., 2008; Cafri et al., 2009; Cho et al., 2010; Hay et al., 2014; Myrick et al., 2015). As a whole, these studies suggest that sociocultural and interpersonal experiences that positively reinforce tanning serve to create expectancies related to the personal and social benefits of tanning that promote indoor tanning behavior. Accordingly, indoor tanning interventions often target appearance expectancies, by focusing on the appearance-damaging effects of tanning, as well as attempting to change normative perceptions related to tanning (Gibbons et al., 2005; Greene and Brinn, 2003; Heckman et al., 2013; Hillhouse et al., 2008; Lazovich et al., 2013).

Body image theories posit that sociocultural experiences can promote appearance-related behaviors by influencing not only behavioral expectancies but also the way that individuals think and feel about their bodies (Cash and Pruzinsky, 1990; Stice et al., 1996; Thompson et al, 1999). Although such theories have important variations, their general application to tanning motivations suggest that indoor tanning is motivated by a user's belief that being tan is a central aspect of being a beautiful or attractive person, called *internalization* of a tan beauty ideal. The tan beauty ideal is theoretically formed in part from perceptions of media portrayals of women and reinforced through experiences with peers. The internalization of cultural beauty ideals leads to *appearance surveillance*, which entails monitoring aspects of one's current appearance in comparison to the corresponding aspects in the cultural beauty ideal and subsequent feelings of *appearance dissatisfaction* caused by incongruence between one's appearance and an ideal standard (Fitzsimmons-Craft et al., 2014; McKinley and Hyde, 1996; Tylka and Sabik, 2010). In the context of tanning, a young woman who internalizes being tan as an important aspect of the beauty ideal will compare her current tan with her ideal tan, referred to as *tan surveillance*, and experience negative feelings, or *tan dissatisfaction*, if her tan does not match the ideal. The desire to eliminate negative feelings associated with tan dissatisfaction would represent a strong proximal motive for indoor tanning. Viewed from a body image theory lens, indoor tanning may be motivated by not only positive goals (e.g., to enhance one's appearance) but also a desire to alleviate negative affect associated with appearance surveillance and body dissatisfaction. An important implication of this view is that indoor tanning interventions should address body image concerns among tanners.

The extant literature provides preliminary support that constructs central to sociocultural theories of body image may provide useful insight to understanding indoor tanning attitudes and behavior (Thompson, Ata, & Roehrig, 2012). The desire to possess the same tan as favored celebrities, an indicator that one has internalized being tan as part of a beauty ideal, has been linked to indoor tanning (Cafri, et al., 2008; Yoo & Kim, 2012). The general tendency to monitor one's appearance, or appearance surveillance, is also associated with indoor tanning (Prior et al., 2014; Stapleton et al., 2009). However, general dissatisfaction with one's appearance, a central construct across sociocultural theories, is not associated with reasons for tanning among adolescent girls (Prior et al., 2014) or indoor tanning behavior among undergraduate students (Gillen & Markey, 2012). Notably lacking from this research are empirical models of indoor tanning that capture numerous potentially relevant and tanning-specific body image theory constructs. The aim of this study is to address this gap in the literature by testing a tanning-specific sociocultural body image model of indoor tanning intentions and behavior using structural equation modeling.

The hypothesized model (Figure 1) holds that tan ideal internalization (i.e., believing that being tan is part of a cultural beauty ideal) and tanning-related comments from peers are positively associated with tan surveillance (i.e., monitoring one's tan in comparison to an ideal). This relationship is hypothesized based on several body image studies of disordered eating behaviors that demonstrate that appearance surveillance is largely a product of both internalization of broader cultural beauty ideals and interpersonal experiences in the form of appearance-related comments from friends (Fitzsimmons-Craft et al., 2014; Vandenbosch and Eggermont, 2014). Although tan ideal internalization has been assessed in prior studies (Cafri et al., 2008; Cafri et al., 2009; Yoo and Kim, 2012), it has not been examined in relation to body image constructs. The hypothesized association between tan surveillance and indoor tanning is mediated through dissatisfaction with one's tan. The influence of body surveillance on symptoms of disordered eating as mediated through body dissatisfaction has also been supported in multiple studies (Claudat and Warren, 2014; Fitzsimmons-Craft et al., 2014; Miles-McLean et al., 2014). Tanning studies have failed to show an association between general appearance dissatisfaction and tanning (Gillen and Markey, 2012; Prior et al., 2014; Yoo and Kim, 2012). However, these studies have not measured dissatisfaction specific to one's tan as in this study.

Methods

Participants and procedure

Study participants were young women between the ages of 18-25 years drawn from a nationally representative web-based participant panel administered by the survey research firm GfK Knowledge Networks (www.gfk.com/us). Although some participants lived in states with legislation banning minors from using indoor tanning, all participants were at least 18 years of age and were able to legally tan during the time of the study. Participants are recruited to join GfK's panel using a combination sampling approach of address-based sampling and random-digit dialing. This sampling approach covers an estimated 97% of United States households, including those without landline telephones. Participants without household Internet access are provided with a laptop and free Internet service.

A simple random sample was drawn of 2,217 eligible panel participants. Eligible participants were sent a study email notification that described the study and provided a link to the survey. Non-responders were sent email reminders on the third day of data collection. Data collection continued until the contracted number of participants completed the survey and spanned from June 5, 2014 to June 11, 2014. All participants provided online informed consent prior to completing the survey and all procedures were approved by the University's Institutional Review Board. Participants were paid the standard GfK rate of $5 to complete the survey. The median time for survey completion was 17 minutes. Data were excluded from nine participants due to very short survey completion times (completed the survey in 5 or fewer minutes) or repetitive response patterns to survey items.

Measures

Tanning researchers have examined body image constructs using survey items that were developed in the context of disordered eating literature (Gillen and Markey, 2012; Prior et al., 2014; Stapleton et al., 2009; Yoo and Kim, 2012). We instead adapted many of these items for this study to specifically refer to tanning or having a tan appearance rather than weight or body shape as in the original scales. All body image survey items (with the exception of items related to peer comments) were measured on a 5-point Likert-type scale anchored with '1' *strongly disagree* and '5' *strongly agree*.

Tan ideal internalization—Six items were adapted from the internalization-general subscale of the Sociocultural Attitudes Toward Appearance Scale-3 (Thompson et al., 2004). These items are designed to capture an individuals' endorsement of relevant aspects of cultural appearance norms to the extent of expressing desire to and engaging in behaviors to align personal appearance with these norms. Example items include: "I compare my skin color to the skin color of TV and movie stars" and "I would like my tan to look like the models that appear in magazines". The items exhibited high internal consistency in this study ($\alpha = 0.90$).

Peer tanning comments—Three items were adapted from the Appearance Conversations with Friends scale (Jones et al., 2004). Example items include: "Someone said that my tan looked good" and "Someone said that I should go tanning" ($\alpha = 0.74$). Items response options were measured on a 5-point response scale anchored with '1' *never* and '5' *very often*.

Tan surveillance—Three items were adapted from the body surveillance subscale of the Objectified Body Consciousness Survey (McKinley and Hyde, 1996) ($\alpha = 0.89$). Higher item scores indicate increased appearance surveillance or monitoring of one's tan. Example items include: "I often think about how tan I am" and "I worry about how tan I look to other people".

Tan dissatisfaction—Three items were developed based on the appearance evaluation subscale of the Multidimensional Body Self-Relations Questionnaire, a widely used assessment of body appearance satisfaction (Cash, 2000) ($\alpha = 0.66$). In this study, we adapted the wording of selected items by substituting tanning or tan skin for references to

other body parts or body weight and shape related concerns. Higher values on these items reflect greater levels of tan dissatisfaction. Example items include: “I like my skin color when I haven't been tanning or out in the sun for a while” (responses were reverse coded for analyses) and “I dislike the color of my non-sun-exposed skin (for example, the inside of your upper arm)”.

Intention to use indoor tanning—Participants indicated how likely they were to use indoor tanning in the next 12 months on a 6-point response scale (anchored with 0 = *extremely unlikely* and 6 = *extremely likely*) (Hillhouse et al., 2008).

Indoor tanning behavior—Participants first indicated whether they had ever used a tanning bed or booth with tanning lamps. Participants who had tanned then estimated with open-ended responses how many times they had used indoor tanning in their entire life (i.e., lifetime indoor tanning sessions) (Hillhouse et al., 2008; Lazovich et al., 2008). Participants' who reported never tanning were coded as “0”.

Statistical analysis

Aim 1: Evaluating the hypothesized model—We first examined the latent factor structure and fit of the measurement model (i.e., the model without the outcome variable) using confirmatory factor analysis (Byrne, 2010). Factor loadings of the indicator items were estimated using indirect latent factor scaling (i.e., fixing one item loading within each factor). We created three parcels of indicator variables for the tan ideal internalization and body dissatisfaction latent variables in order to limit the number of indicator variables (Russell et al., 1998). Factor variances and covariances were freely estimated. After establishing the measurement model, we modeled the hypothesized regression paths shown in Figure 1 in the full structural model. Indoor tanning sessions and intentions were modeled in two separate models as a single item manifest variable.

We used multiple model fit indices to evaluate model fit including the comparative fit index (CFI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA) (Byrne, 2010; Claudat and Warren, 2014; Fitzsimmons-Craft et al., 2014; Miles-McLean et al., 2014). Good model fit values were considered to be a CFI value of 0.95 or higher, a SRMR of .08 or lower, and a RMSEA of .06 or lower. An RMSEA value between .06 and .08 represents adequate model fit. Models were analyzed with Mplus Version 7.3 (Muthén, 2010) using maximum likelihood estimation.

Results

Participants

The mean age of the 823 study participants was 22.72 years (*SD* = 2.06) and self-identified race was: Caucasian (79.0%), Black/African American (10.6%), Asian (2.6%), American Indian (1.1%), Native Hawaiian (0.6%), or two or more races (6.6%). Hispanic ethnicity was reported by 16% of participants. Participants' indicated the color of their non-sun-exposed skin to assess their skin type (Glanz et al., 2003): very fair (15.3%), fair (40.7%), olive (17.7%), light brown (13.9%), medium brown (8.2%), or dark brown or black (2.5%).

Approximately half of the participants were current students (51.4%) and the majority reported either some college education (47.1%) or at least a bachelor's degree (28.2%). Region of U.S. residence was: northeast, 14.4%; midwest, 29.6%; south, 32.7%; and west, 23.6%. Lifetime use of indoor tanning was reported by 36.2% of participants and past 12 month use by 14.8%.

Data screening

Data screening revealed acceptable levels of skewness and kurtosis for all variables except indoor tanning behavior. Consistent with prior studies, (Cafri et al., 2009; Noar et al., 2014) extreme outliers on the indoor tanning behavioral measures were trimmed (rescored to a value of 3.29 standard deviations above the mean) and a square-root transformation was performed on the lifetime sessions outcome in the structural equation model.

Aim 1: Hypothesized model

The five-factor measurement model revealed significant factor loadings for all items and parcels. The overall model fit was marginal (CFI=0.94, SRMR = 0.07, RMSEA = 0.08 (90% CI=0.07-0.09). We examined model modification indices to identify sources of misspecification related to factor cross-loadings or item error covariances (Byrne, 2010). A misspecification was associated with the fixed item error covariances associated between two items within the tan dissatisfaction latent factor. These items had a high inter- item correlation ($r = 0.67$), which is a common source of misspecification when forcing error terms of manifest items to be uncorrelated in a latent factor (Byrne, 2010). A subsequent model that freely estimated this error covariance resulted in an improvement in overall model fit. However, modification indices identified an additional error covariance misspecification related to two items within the peer comments factor. A final measurement model that freely estimated both of these error covariances had good overall model fit (CFI=0.97, SRMR = 0.04, RMSEA = 0.06 (90% CI=0.05-0.07).

Results from the structural equation models with the indoor tanning session and indoor tanning intentions outcome are presented in Table 1. Fit indices suggests good to acceptable model fit for the model with indoor tanning intentions as the outcome as well as indoor tanning sessions. All beta values for the hypothesized structural paths were significant in both models (all p's < .001). The effect size for the indoor tanning outcomes as mediated through tan dissatisfaction was $R^2 = 23\%$ for number of indoor tanning sessions and $R^2 = 32\%$ for intentions.

Discussion

We evaluated a model of body image influences on indoor tanning. Indoor tanning intentions and behavior were hypothesized to be directly associated with tan dissatisfaction. Tan dissatisfaction was hypothesized to be indirectly associated with tan ideal internalization and peer comments through tan surveillance. The results suggested the hypothesized model was an accurate representation of the data. This study both supports and expands existing indoor tanning research by demonstrating the importance of considering sociocultural influences and body image related to tanning. Internalization of media tanning norms (Cafri et al.,

2008) and experiences with peers (Noar et al., 2014) are associated with indoor tanning. Indoor tanning users monitor and evaluate their tans as well as their general body appearance (Cafri et al., 2008; Gillen and Markey, 2012; Prior et al., 2014; Stapleton et al., 2009). This study is novel in providing empirical evidence that the influence of tan ideal internalization and peer comments on indoor tanning appears to be mediated through tan surveillance and tan dissatisfaction. The inclusion of these theoretically-based constructs in a single model provides some of the strongest evidence to date to support the influence of body image on indoor tanning behaviors.

Several sociocultural body image theories share the tenant that dissatisfaction with one's appearance is a proximal motive for engaging in appearance-altering behaviors (Cash and Pruzinsky, 1990; Stice et al., 1996; Thompson et al., 1999). Although prior research has documented a relationship between negative appearance evaluation and skin cancer risk behaviors (Blashill et al., 2015) other studies have not found an association between body dissatisfaction and reasons for tanning among adolescent girls (Prior et al., 2014) or indoor tanning behavior among undergraduate students (Gillen and Markey, 2012). The observed association between indoor tanning and dissatisfaction represents an important and unique study contribution. The use of survey items that asked specifically about tanning dissatisfaction, rather than general body dissatisfaction, may explain why we found an association between dissatisfaction and tanning.

The value of these study findings should be considered in the context of the study limitations. The sampling method of recruiting participants from a national panel of female young adults represents a strength over convenience sampling and provides increased confidence regarding the generalizability of the findings. However, the use of a national panel required limiting the length of the survey assessment and our body image measures consistent of adapting selected items from scales rather than adapting entire scales. The survey design was cross-sectional and it is important to note that the study design does not assess truly causal associations. Although this study provides preliminary evidence of the proposed relationships, future research is needed to evaluate models of indoor tanning behavior using a prospective design. The study was designed to examine the fit of a sociocultural model rather than test a broader model of indoor tanning motives. It is important for future research to address this limitation by examining how the observed constructs are related to other known correlates of indoor tanning or risk perceptions. Finally, this study focused on young women as this group reports the highest use of indoor tanning. It is important to consider the possible role of body image in promoting indoor tanning among male users (Blashill et al., 2015).

There are a number of important study implications. Although indoor tanning is clearly motivated by positive goals (e.g., to enhance one's appearance) it may function as a self-regulatory process users attempting to alleviate negative affect related to body image (Leventhal and Mora, 2005). Future work should consider the manner in which indoor tanning is used to manage thoughts and feelings related to body image. In addition, sociocultural and body image constructs should be included in future indoor tanning survey research. For example, it may be valuable to assess whether tan-related body image is implicated in the development of persistent, frequent tanning behavior.

These findings also have implications for the design of indoor tanning prevention and intervention efforts. Existing interventions do address sociocultural influences on tanning by addressing peer norms related to tanning, highlighting examples of attractive women who do not tan, and promoting healthy alternatives to tanning (Hillhouse et al., 2008; Lazovich et al., 2013). There may also be value in targeting body image constructs as mechanisms of change as this approach has been successful in some disordered eating prevention programs (Thompson et al., 2012) as well as recent tanning interventions (Chait et al., 2015; Stapleton et al., 2015). The intent of such an approach would be to encourage tanners to consider that their tanning may be in part due to comparisons with unrealistic image ideals or goals as well as a desire to alleviate negative feelings about their appearance that accompany such comparisons. Possible intervention techniques would include providing psychoeducational content designed to engage participants in reflecting on the influential role of societal experiences and the media's representation of women on their internalization of tanning norms. It may also be beneficial to encourage participants to actively speak out against or critique the tan ideal as well as providing strategies for resisting ideal thinking and perceived social pressures to tan, promoting positive body image, and embracing one's natural skin tone. Future intervention studies should examine whether body image-focused content to existing efficacious interventions can improve their efficacy.

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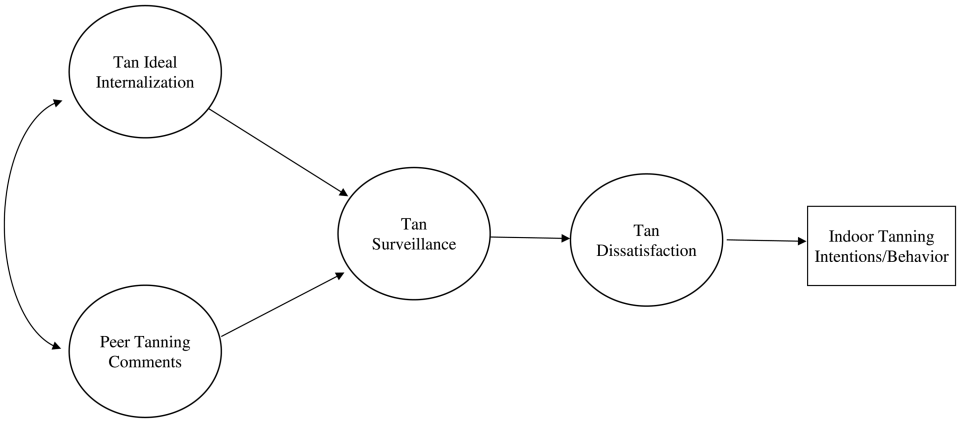

Figure 1.

Hypothesized full structural model of sociocultural and body image influences on indoor tanning intentions and behavior. Circles represent latent constructs with manifest variables. Manifest variables and estimated error terms are omitted from the figure. Two separate models were tested with either indoor tanning intentions or indoor tanning behavior as the outcome.

Table 1

Fit Indices and Beta Path Parameters from Hypothesized Structural Equation Models

Model Outcome	Fit Indices			Beta Path Parameters				Effect Size
	CFI	SRMR	RMSEA (90% CI)	Internalization to Surveillance	Peer to Surveillance	Surveillance to Dissatisfaction	Dissatisfaction to Outcome	R^2 of Outcome
Lifetime indoor tanning sessions[a]	0.96	0.05	0.069 (0.061- 0.077)	0.42***	0.66***	0.44***	2.94***	22%
Indoor tanning intentions	0.95	0.05	0.074 (0.066- 0.082)	0.41***	0.69***	0.43***	1.81***	32%

Note. CFI = comparative fit index; SRMS = standardized root mean square residual; RMSEA = root mean square error of approximation; CI = confidence intervals

*** = $p < .001$

[a]Square-root transformation performed on the past 12 month indoor tanning outcome.

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