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Cognitive Rationalizations for Tanning-Bed Use: A Preliminary Exploration

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Abstract

Objectives—To examine construct and predictive utility of an adapted cognitive rationalization scale for tanning-bed use.

Methods—Current/former tanning-bed-using undergraduate students (N = 216; 87.6% females; 78.4% white) at a large northeastern university participated in a survey. A cognitive rationalization for tanning-bed use scale was adapted. Standardized self-report measures of past tanning-bed use, advantages of tanning, perceived vulnerability to photoaging, tanning-bed use dependence, and tanning- bed use intention were also administered.

Results—The cognitive rationalization scale exhibited strong construct and predictive validity. Current tanners and tanning-bed-use-dependent participants endorsed rationalizations more strongly than did former tanners and not-tanning-bed-use-dependent participants respectively.

Conclusions—Findings indicate that cognitive rationalizations help explain discrepancy between inconsistent cognitions.

Keywords

cognitive dissonance; college students; indoor tanning; rationalizations

Increased ultraviolet (UV) exposure from suntanning and tanning-bed use is associated with increasing skin cancer rates in the United States.[1] Skin cancer that forms in melanocytes (skin cells that make pigment) is called melanoma and is the most severe form of skin cancer.[2] An estimated 114,900 new cases of melanoma were diagnosed in the United States

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Human Subjects Statement

Institutional review boards from Memorial Sloan-Kettering Cancer Center and Rutgers University approved the study.

Conflict of Interest Statement

The authors report no conflict of interest.

in 2010, with nearly 7.5% (8700) resulting in death.[3] Indoor ultraviolet (UV) tanners are 74% more likely to develop melanoma than are those who have never tanned indoors.[1]

Despite evidence of increased melanoma risk, indoor tanning remains a popular recreational activity for American youth. Nearly 30 million people tan indoors in the United States every year,[4] of whom 2.3 million are teens.[5] In a population-based study (the 2005 National Health Interview Survey) examining skin cancer risk behaviors, Coups et al found that rates of tanning-bed use were highest among young adults aged 18–29 years, with one in five 18-to-29-year-olds reporting tanning-bed use in the past year.[6] Successful interventions that prevent and limit tanning-bed use, particularly among adolescents, warrant increased attention.[7,8]

Current interventions on tanning-bed use have predominantly been appearance focused[9–12] and have documented promising results for decreasing tanning-bed use intentions and/or behavior. However, appearance-focused interventions do not reach all tanners.[13] In the Stapleton et al study,[13] the appearance-focused intervention was not successful with tanners who scored highest on appearance- based motivations and were knowledgeable about appearance and health-related damage by tanning-bed use. This group of resistant tanners has also been identified by others[14,15] and is characterized by engagement in tanning-bed use for appearance enhancement despite being knowledgeable about harmful effects of their behavior. It is presumed that their motives for indoor tanning are supported by cognitive rationalizations for continued tanning-bed use despite awareness of risks.[16]

Cognitive dissonance theory can help explain the role of cognitive rationalizations. Cognitive dissonance is usually experienced when an individual has 2 or more cognitions (ie, beliefs, opinions, behaviors) that are conflicting in relation to one another, resulting in motivational tension.[17] In the context of tanning-bed use, therefore, those who use tanning beds may be experiencing forms of cognitive dissonance and using cognitive rationalizations (termed disengagement beliefs or self-exempting beliefs in literature) to justify their behavior despite awareness of health risks associated with tanning-bed use. Research suggests that direct engagement of these disengagement beliefs may provide an efficacious strategy to motivate tanning-bed users to reduce and/or give up tanning- bed use.[18] For instance, one of the cognitive rationalizations offered by participants who justify their tanning-bed use despite awareness of risks may be “I only use tanning beds once in a while, so I am not at risk.” Developing an intervention that not only provides information about individualized risk and population-level estimates of skin cancer from tanning-bed use but also makes individuals challenge their own rationalizations may motivate tanning-bed users to understand their personal vulnerability and reduce their intentions of using tanning beds. Cafri et al endorse this approach as they conclude that “…reduction of the positive valuation of a tan appearance could be achieved through a cognitive dissonance approach in which people who tan are asked to challenge their idealization of a tan appearance” (pp. 542–543).[18] Undermining these cognitive rationalizations may make risks of tanning-bed use more personally relevant, thereby motivating efforts to change the tanning-bed use behavior.

To examine these cognitive rationalizations, we adapted an available measure of cognitive rationalization[19] to tanning-bed use (the original measure explored cognitive rationalizations

related to continued smoking despite awareness of smoking risks) and conducted a survey with a sample of college students. Results of the item-response distribution are presented elsewhere.[20] In this paper, we present quantitative assessment of the adapted cognitive rationalization scale for tanning- bed use. Our aims are (1) to evaluate the construct validity of the cognitive rationalization scale by comparing it with 2 well-known theoretical attitudinal constructs in tanning-bed-use research, namely advantages of tanning[21] and perceived vulnerability to photoaging[9] (We expected the cognitive rationalization scale to correlate positively with the advantages of tanning scale but correlate negatively with perceived vulnerability to photoaging); (2) to identify moderators by examining the differences in endorsement of cognitive rationalizations between former versus current tanning-bed users and tanning-bed-dependent versus not-tanning-bed-dependent users. Prior research has revealed differences in attitudinal and/or behavioral outcomes between current and former tanning-bed users[14] and, more recently, between tanning-bed-dependent versus non-tanning-bed-dependent users[22]; and (3) to examine the predictive utility of the cognitive rationalization scale in explaining variance in tanning-bed use intention in the next 3 months (data were collected in November of 2010, so tanning- bed use intention was relevant in the next 3-month period and 12-month period).

METHODS

Participants and Procedure

After receiving human subjects' approval from the institutional review boards, 587 undergraduate students in introductory communication courses at a large northeastern university in the United States were surveyed. The participants individually and anonymously completed the surveys in their classrooms. Two versions of the surveys were administered. The first version of the survey included questions about behavior and intention in the beginning followed by attitudinal questions. The second version of the survey included attitudinal questions in the beginning followed by questions about behavior and intention. No significant differences emerged because of survey version, and so we combined the 2 data sets. Of the original 587 participants, students older than 25 years were removed (N = 36) to retain sample homogeneity.

Of the 551 participants surveyed, 218 participants (39.6%) had ever used tanning beds. Our objective of examining cognitive rationalizations for tanning-bed use necessitated that we use the data from former and current tanners only, and therefore, our sample for this study consisted of 218 participants. Among this group of ever tanners, 87.6% (N = 191) were females. The mean age of participants was 19.98 years (SD = 1.13, Range = 18 – 24 years), and about 78.4% participants identified themselves as white; 9.6%, Asian; and 7.8%, Hispanic/Latino (other groups < 2% each). We also measured participants' past-year tanning-bed use behavior using Hillhouse et al's 12-month categorization.[23] Among this group of ever tanners, 181 (83%) were current tanners who had used a tanning bed in the last 12 months. As well, Fitzpatrick's measure of skin type was assessed.[24] Table 1 presents demographic characteristics of the participants.

Measurement Instruments

Cognitive rationalization scale—We adapted the cognitive rationalization scale developed by Oakes and colleagues to tanning-bed use.[19] The scale consisted of a common stem for all items, "Tanning-bed use can make me ill, but…..," and was measured with 16 Likert-type items with responses ranging from 1 (strongly disagree) to 5 (strongly agree). We first assessed endorsement of each of the items and removed the items that were endorsed by less than 10% of the participants. [20] We used 10 of the 16 items supporting the 3 a priori factors (we altered the factor names for relevance to tanning-bed use; Figure 1): factor 1 (skeptical rationalizations, ie, beliefs indicating tanning-bed users do not believe medical evidence about tanning-bed use and disease; example item, "More skin cancer is caused by frequent sunburns and family history than tanning-bed use"), factor 2 (worth-it rationalizations, ie, beliefs indicating tanning-bed users consider tanning-bed use as a worthwhile activity despite potential hazards; example item, "You have to die of something, so why not enjoy yourself and use tanning beds?"), and factor 3 (danger ubiquity rationalizations, ie, beliefs normalizing the dangers of tanning-bed use because of the ubiquity of risks; example item, "It is even dangerous to walk across the street"). The original measure exhibited moderate reliability for the 3 factors: skeptical rationalizations (alpha = .81), worth-it rationalizations (alpha = .68), and danger ubiquity rationalizations (alpha = .55).[19]

Advantages of tanning—We adapted the advantages- of-sunbathing scale developed by Jackson and Aiken (2000) to tanning-bed use (eg, "I feel more attractive with a tan").[21] The scale consisted of 7 Likert-type items with responses ranging from 1 (strongly disagree) to 5 (strongly agree). Responses were summed and averaged with a higher score indicating greater advantages of tanning-bed use (M = 3.90; SD = .72; α = .89).

Perceived vulnerability to photoaging—We used the perceived vulnerability to photoaging item developed by Gibbons et al to assess the likelihood of wrinkling prematurely due to tanning-bed use.[9] This is a single-item construct--"If you were to get tanned on a regular basis from using indoor tanning beds, what are the chances that your skin would wrinkle prematurely?"--followed by a 7-point scale, ranging from 1 (no chance) to 7 (definitely would happen). A higher score indicated greater perceived vulnerability to photoaging (M = 5.96, SD = 1.11).

Tanning-bed use dependence—We used Mosher and Danoff-Burg's (2010) modified 4-item CAGE (Cut down, Annoyed, Guilty, Eye-opener) questionnaire[22] (with yes/no response options) originally developed by Mayfield et al and used for alcohol screening purposes.[25] As per Warthan et al's scoring recommendations,[26] 2 or more affirmative responses to items on the modified CAGE (mCAGE) were classified as indicating a probable substance-related disorder that involved tanning-bed use or tanning-bed-use-dependence (33% of study participants had scores of 2 and higher).

Tanning-bed use intention—Tanning-bed use intention was measured at the 3-month and 12-month periods using the measure by Hillhouse et al.[27] Participants were asked to estimate the number of times they plan to use a tanning-bed in the next 3 months with 7-

point Likert scale with 0 (0 times), 1 (1–5 times), 2 (6–10 times) … and 6 (more than 25 times) as response options (M = 1.21, SD = 1.57). For tanning-bed use intention in the next 12-month period, participants were asked to estimate the number of times they plan to use a tanning-bed in the next 12 months with 11-point Likert scale with 0 (0 times), 1 (1–10 times), 2 (11–20 times) … and 11 (more than 100 times) as response options (M = 1.83, SD = 2.31). As expected, the 2 measures of intention had a strong correlation (r = .90, p < .001).

Data Analysis

Scale analysis—For scale analysis, given that the factor structure was derived from the smoking literature,[19] we conducted a confirmatory factor analysis (CFA) to examine the factor structure of the adapted items. Version 7 of the Analysis of Moment Structures (Amos) software was used to fit the CFA models using maximum likelihood estimation. The models specified that each item loaded on a single factor and that error terms were independent. Factors were allowed to be correlated.

Three goodness-of-fit indices estimated the fit of the CFA models. The χ^2/df adjusts the χ^2 statistic for sample size.[28] The comparative fit index (CFI) calculates the ratio of the noncentrality parameter estimate of the hypothesized model to the noncentrality parameter estimate of a baseline model.[29] The root mean squared error of approximation (RMSEA) accounts for errors of approximation in the population.[30] We determined that the model reasonably fit the data if χ^2/df was less than 3, CFI was greater than .90, and RMSEA was less than .08.[28,30]

Next, we examined the construct validity of the cognitive rationalization scale through Pearson product-moment correlations between the cognitive rationalization scale and other related established scales.

Identifying moderators—In order to examine the differences in endorsement of cognitive rationalizations between former versus current tanning-bed users, and tanning-bed-dependent versus not-tanning- bed-dependent users, we conducted independent sample t test with p < .05.

Predictive utility—Finally, to examine the predictive utility of the cognitive rationalization scale in explaining variance in tanning-bed use intention in the next 3-month and next 12-month periods, we conducted 2 hierarchical regression analyses. In all regressions, age, gender (female), prior tanning-bed use (current users), and tanning dependence (tanning-dependent users), were entered as the control variables, followed by advantages of tanning and perceived vulnerability to photoaging in Block 2. Cognitive rationalizations were entered last.

RESULTS

Scale Analysis

CFA—Results of the CFA revealed that the predicted model (see Figure 1) fit the data; $\chi^2(32) = 46.28$, p = .05, χ^2/df = 1.45, CFI = 0.97, RMSEA = 0.05. The data indicated that all CFA item loadings were statistically significant at the p < .001 criteria. For skeptical

rationalizations (factor 1), standardized item loadings ranged from 0.46 to 0.77 with an average loading of 0.61. Standardized item loadings on worth-it rationalizations (factor 2) ranged from 0.75 to 0.81 with an average loading of 0.78. Standardized item loadings on danger ubiquity rationalizations (factor 3) ranged from 0.33 to 0.72 with an average loading of 0.51. All items in respective factor structures were averaged with a higher score indicating greater rationalizations (skeptical rationalizations M = 2.55, SD = .74; worth-it rationalizations M = 1.98, SD = .94; danger ubiquity rationalizations M = 3.24, SD = .71).

Correlations—Table 2 presents correlations for all items from the cognitive rationalization scale, and Table 3 presents correlations between study variables. Interitem correlations and correlations among the 3 fitted factors were generally moderate supporting the uniqueness of the 3 factors. Skeptical rationalizations were negatively related to perceived vulnerability to photoaging, yet unrelated to advantages of tanning. Worth-it rationalizations were positively related to greater advantages of tanning, yet unrelated to perceived vulnerability to photoaging. Danger ubiquity rationalizations were negatively related to perceived vulnerability to photoaging, yet unrelated to advantages of tanning. Overall, results of CFA and correlations suggest strong construct validity of the modified cognitive rationalization scale for tanning-bed use.

Identifying Moderators

Independent sample t test results indicated that current tanners (M = 2.55, SD = .74) reported greater endorsement of skeptical rationalizations, $t(216) = -4.08$, $p < .001$ compared to former tanners (M = 2.02, SD = .61). Similarly, current tanners (M = 1.98, SD = .94) reported greater endorsement of worth-it rationalizations, $t(216) = -3.59$, $p < .001$ compared to former tanners (M = 1.41, SD = .63). Finally, current tanners (M = 3.24, SD = .71) reported greater endorsement of danger ubiquity rationalizations, $t(216) = -2,82$, $p < .01$ compared to former tanners (M = 2.88, SD = .67). Therefore, there was a consistent pattern of results showing that current tanners endorse cognitive rationalizations more strongly than former tanners do (Table 4).

Independent t test results also indicated that tanning-dependent participants (M = 2.66, SD = .56) reported greater endorsement of skeptical rationalizations, $t(216) = -2.87$, $p < .01$ compared to not-tanning-dependent participants (M = 2.36, SD = .80). Similarly, tanning-dependent participants (M = 2.19, SD = .89) reported greater endorsement of worth-it rationalizations, $t(216) = -3.50$, $p < .001$ compared to not-tanning-dependent participants (M = 1.74, SD = .89). There was no statistically significant difference between tanning-dependent participants (M = 3.27, SD = .63) and not-tanning-dependent participants (M = 3.13, SD = .76) on danger ubiquity rationalizations, $t(216) = -1.35$, $p = .18$. Therefore, results indicated that “former versus current tanning-bed users” was a significant moderator for the 3 rationalizations. “Tanning-dependent versus not-tanning-dependent users” was also a significant moderator, but only for skeptical and worth-it rationalizations (Table 4).

Predictive Utility

The first hierarchical regression assessed the independent contribution of cognitive rationalizations to intention to use tanning-beds in the next 3 months (see Table 5). Controls

were entered in step 1, and the model was significant, $F(5, 209) = 16.69$, $p < .001$, Adjusted R-square = .27. Current tanning-bed use ($\beta = .19$, $p < .01$) and tanning-bed use dependence ($\beta = .42$, $p < .001$) were positively associated with intention to use tanning beds in the next 3 months. Attitudinal variables, advantages of tanning, and perceived vulnerability to photoaging entered the model in step 2 and the model was significant, $F(7, 207) = 13.18$, $p < .001$, Adjusted R-square = .29, R-square change = .02. Advantages of tanning had an independent contribution to intention to use tanning beds in the next 3 months, $\beta = .13$, $p < .05$. Cognitive rationalizations entered the model on step 3, and the final model was significant, $F(10, 204) = 10.95$, $p < .001$, Adjusted R-square = .32, R-square change = .04. Particularly, worth-it rationalizations, $\beta = .16$, $p < .05$ had independent effect on intention to use tanning beds in the next 3 months. Similar results were observed in the second hierarchical regression with worth-it rationalizations emerging as having an independent contribution on intention to use tanning beds in the next 12-month period.

Summary of Findings

Overall, the results of our study can be summarized as follows: (1) the scale exhibits strong construct validity; (2) endorsement of cognitive rationalizations is generally higher among current tanners and tanning-bed-use-dependent participants as compared with former tanners and not-tanning-bed- use-dependent participants respectively; and (3) worth-it rationalizations independently contribute to tanning-bed use intention in the next 3-month and 12-month periods respectively.

DISCUSSION

The present study aimed to evaluate the construct and predictive utility of an adapted cognitive rationalization scale for tanning-bed use among a sample of college tanning-bed users. In addition, we examined moderators by examining the differences in endorsement of cognitive rationalizations between former versus current tanning-bed users, and tanning-bed-dependent versus not-tanning-bed- dependent users. The results indicated that the scale exhibits strong construct and predictive validity. As well, current tanners and tanning-bed-use- dependent participants endorse cognitive rationalizations more strongly than do former tanners and not-tanning-bed-use-dependent participants respectively. These results are further discussed.

Endorsement of Cognitive Rationalizations

The 10-item cognitive rationalization scale for tanning-bed use fit cleanly into the a priori 3-factor structure and exhibited moderate interitem correlation. Among the 3 factors, only worth-it rationalizations predicted tanning-bed use intention in the next 3-month and 12-month periods. It is important to note that whereas endorsement of worth-it beliefs was not very high, and was in fact lower than endorsements for skeptical and danger ubiquity rationalizations (skeptical rationalizations $M = 2.55$, $SD = .74$; worth-it rationalizations $M = 1.98$, $SD = .94$; danger ubiquity rationalizations $M = 3.24$, $SD = .71$), they were stronger predictors of tanning-bed use intention in the next 3- and 12-month periods (Table 5).

These findings reaffirm consistent findings that appearance-based motivations are strong predictors of tanning-bed use behavior and intentions. [31–37] Stapleton et al conducted a latent profile analysis to identify subgroups of tanning-bed users based on patterns of tanning-bed use motives. [38] The largest subgroup in their sample reported strongly positive appearance-enhancement beliefs despite knowledge of the appearance- and health-damaging effects of tanning-bed use. These findings, combined with prior work,[14,15,39] suggest that for this group of tanners, the immediate benefits of tanning-bed use, particularly in terms of physical attractiveness, outweigh the costs of tanning- bed use that may occur in near future. They may also rationalize their continued tanning-bed use behavior as "worth it" for immediate gains.

In order to dissuade these tanning-bed users from using tanning beds in the future, 2 strategies may be useful for intervention purposes: (1) the appearance-based interventions that make the appearance-damage effects of tanning-bed use more salient[9,40]; and (2) tailoring of interventions to make them more personally relevant by countering one's own cognitive rationalizations. This is a ripe area for future research.

Need for Qualitative Work to Capture Other Cognitive Rationalizations

Motivations for tanning-bed use not only include appearance reasons to tan, but also include peer norms, parental norms, and other sociocultural influences to use tanning beds.[18,35] However, these other motivations were not reflected in the adapted cognitive rationalization scale. As well, Sjoberg et al reported an unrealistic optimism amongst Swedish adolescents aged 13 to 17 years who rationalized their tanning-bed use behavior by suggesting that their own level of risk was small when compared to the risk to others.[36] More in-depth qualitative work with tanning-bed users may help uncover other rationalizations that they offer to justify tanning-bed use behavior despite awareness of risks associated with usage. Supplementing quantitative scale development with qualitative work is generally considered to be an optimal model for scale development,[41] as was undertaken by Cafri et al to create the "appearance-based motives to tan and not tan" scale.[42] Therefore, in order to develop a comprehensive list of cognitive rationalizations for tanning-bed use justification, we recommend the need for more in-depth qualitative work.

Implications of the Study

This study suggests that cognitive dissonance theory may be used as a foundational theory for behaviors that may be inconsistent or incongruent with attitudes and perceptions. Studying cognitive rationalizations that people use to lower their dissonance may provide public health practitioners with tools of dissuading young adults from using tanning beds. Given that worth-it rationalizations appeared to have maximum association with tanning-bed use intention in the next 3-month and 12-month periods, this study suggests that making tanning-bed use risk more salient and more immediate may be a better way of countering the worth-it rationalizations. Finally, taking this study further to examine the role of cognitive dissonance in other sun risk behaviors (such as, spending excessive time in the sun, "laying out," not wearing protective clothing when out in the sun) will be the logical next step.

Limitations of the Study

There are a number of potential limitations in the present study that should be noted. First, there were a number of demographic limitations. These data were collected from one northeastern university in the United States (and therefore limited by age, racial distributions, etc), and it is not known if these results would generalize to other areas of the country. Second, we were limited by the number of variables we measured in the survey. Another related limitation with measurement issues included the use of a single-item measure to assess an attitudinal construct (perceived vulnerability to photoaging). Including more multiple-item measures such as appearance-based motives to tan and not tan,[42] health-damage knowledge,[38] and tanning image beliefs[31] may help strengthen the construct validity of the cognitive rationalization scale. Third, we adapted a preexisting cognitive rationalization scale (on smoking behavior) to tanning-bed use. Given that these 2 behaviors are very different in context, a more complete measure may need to include other rationalizations, possibly identified through rich focus-group data with the target populations for whom the intervention is designed.

Future Research

Future research should definitely address the issue of cognitive dissonance in tanning-bed use in a more in-depth fashion by qualitative methods. As well, the role of individual difference factors (such as, personality differences, tanning-bed use frequency, dependence, addiction, etc) in endorsing different kinds of rationalizations may be examined. Most of the research to discourage tanning-bed use has focused on educating the users about appearance-related motivations for not tanning, but at the same time it is also necessary to acknowledge that competing appearance-related motivations for tanning exist.[18] How people rationalize these dissonant cognitions may be social (“My friends do it, so I want to do it”) or motivated by media ideals (“My favorite stars on Jersey Shore reality television look beautiful and tanned”). A more thorough exploration of cognitive rationalizations may help us uniquely craft antitanning messages that will not just discourage tanning-bed users, but motivate them to consider other alternatives to tanning, while aiming to respect their desire for appearance-enhancement.

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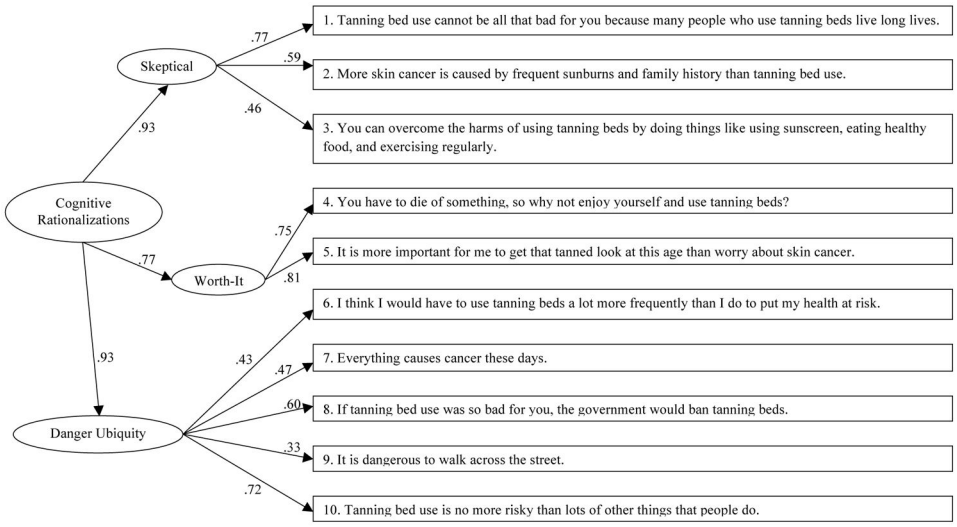

Figure 1.

Final Factor Structure for the Cognitive Rationalization of Tanning-Bed Use (10 questions Scale)

Note.

All standardized weights reported in the model are significant at the $p < .001$ level.

Table 1

Demographic Characteristics of Study Participants

Characteristic	No. (%) of participants (N = 218)
Sex	
Female	191 (87.6%)
Male	27 (12.4%)
Age (in years)	
18–19	74 (33.9%)
20–21	125 (57.3%)
22–24	19 (8.7%)
Skin Type	
Burns, never tans	1 (.5%)
Burns easily, then develops light tan	22 (10.1%)
Burns moderately, then develops light tan	35 (16.1%)
Burns minimally, then develops moderate tan	100 (45.9%)
Does not burn, develops dark tan	58 (26.6%)
Does not burn, shows no noticeable change in appearance	2 (.9%)
Number of Times Tanned in the Last 12-Months	
0[a]	37 (17.0%)
1–10	78 (35.8%)
11–20	35 (16.1%)
21–30	20 (9.2%)
31–40	14 (6.4%)
41–50	7 (3.2%)
51–60	3 (1.4%)
61–70	6 (2.8%)
71–80	3 (1.4%)
81–90	2 (.9%)
91–100	5 (2.3%)
> 100	8 (3.7%)

Note.

[a]These participants reported using tanning beds, but not in the past 12 months and were categorized as “former tanning-bed users.” All others who reported using tanning beds in the past 12 months were categorized as “current tanning-bed users.”

Table 2

Correlations Among the 10 Items of the Cognitive Rationalization of Tanning-Bed Use Scale

	Item #1	Item #2	Item #3	Item #4	Item #5	Item #6	Item #7	Item #8	Item #9	Item #10
Item #1 (M = 2.11, SD = .87)	1.00									
Item #2 (M = 2.73, SD = 1.01)	0.46*	1.00								
Item #3 (M = 2.53, SD = 1.09)	0.36*	0.24*	1.00							
Item #4 (M = 1.82, SD = 1.05)	0.39*	0.30*	0.23*	1.00						
Item #5 (M = 1.95, SD = .99)	0.48*	0.35*	0.24*	0.61*	1.00					
Item #6 (M = 3.14, SD = 1.24)	0.26*	0.28*	0.31*	0.17	0.22*	1.00				
Item #7 (M = 3.49, SD = 1.15)	0.32*	0.20*	0.15	0.28*	0.29*	0.23*	1.00			
Item #8 (M = 2.66, SD = 1.17)	0.46*	0.32*	0.30*	0.29*	0.37*	0.17	0.29*	1.00		
Item #9 (M = 3.31, SD = 1.12)	0.13	0.22*	0.07	0.23*	0.15	0.11	0.21*	0.13	1.00	
Item #10 (M = 3.29, SD = .99)	0.45*	0.36*	0.28*	0.45*	0.40*	0.36*	0.31*	0.42*	0.33*	1.00

* $p < .01$

Note.

Item #1: Tanning-bed use cannot be all that bad for you because many people who use tanning beds live long lives.

Item #2: More skin cancer is caused by frequent sunburns and family history than tanning bed use.

Item #3: You can overcome the harms of using tanning beds by doing things like using sunscreen, eating healthy food and exercising regularly.

Item #4: You have to die of something, so why not enjoy yourself and use tanning beds?

Item #5: It is more important for me to get that tanned look at this age than worry about skin cancer.

Item #6: I think I would have to use tanning beds a lot more frequently than I do to put my health at risk.

Item #7: Everything causes cancer these days.

Item #8: If tanning-bed use was so bad for you, the government would ban tanning beds.

Item #9: It is dangerous to walk across the street.

Item #10: Tanning-bed use is no more risky than lots of other things that people do.

Table 3

Zero-Order Correlation Matrix for All Variables

	1	2	3	4	5
1. Skeptical Rationalizations	1.00				
2. Worth-it Rationalizations	.43**	1.00			
3. Danger Ubiquity Rationalizations	.54**	.46**	1.00		
4. Advantages of Tanning	.16	.30**	.06	1.00	
5. Perceived Vulnerability	−.17*	−.07	−.19*	.12	1.00

* p ≤ .01,

** p ≤ .001

Table 4

Differences in Cognitive Rationalizations by Former Versus Current Tanning- Bed Users and Tanning-Dependent Versus Not-dependent Users (N = 218)

Variables	Former (N = 37) vs Current (N = 181) Users			Dependent (N = 72) vs Not-dependent (N = 146) Users		
	Former Tanners M (SD)	Current Tanners M (SD)	t (216)	Not-dependent M (SD)	Dependent M (SD)	t (216)
Skeptical Rationalizations	2.02 (.61)	2.55 (.74)	−4.08**	2.36 (.80)	2.66 (.56)	−2.87*
Worth-it Rationalizations	1.41 (.63)	1.98 (.94)	−3.59**	1.74 (.89)	2.19 (.90)	−3.50**
Danger Ubiquity Rationalizations	2.88 (.67)	3.24 (.71)	−2.82*	3.13 (.76)	3.27 (.62)	−1.35

* p ≤ .01,

** p ≤ .001

Table 5

Hierarchical Regression Analyses (standardized regression weights) Predicting Tanning-Bed Use Intention in Next 3-month (N = 215) and 12-month (N = 215) Periods

	Tanning-Bed Use Intention (3-months)			Tanning-Bed Use Intention (12-months)		
Variables	**Step 1 β**	**Step 2 β**	**Step 3 β**	**Step 1 β**	**Step 2 β**	**Step 3 β**
Demographics						
Age	.09	.10	.11	.08	.08	.08
Female	.05	.08	.09	.03	.06	.09
White	.10	.09	.10	.08	.06	.06
Current user	.19**	.18**	.14*	.21***	.20***	.16**
Tanning-bed dependent	.42***	.39***	.37***	.40***	.35***	.32***
Advantages of Tanning		.13*	.09		.18**	.13*
Perceived Vulnerability		−.10	−.07		−.10	−.08
Cognitive Rationalizations						
Skeptical			−.00			−.08
Worth-it			.16*			.24***
Danger ubiquity			.10			.09
Adjusted R^2	.27***	.29***	.32***	.25***	.31***	.36***
R^2 Change		.02*	.04**		.04**	.06***

* p ≤ .05,

** p ≤ .01,

*** p ≤ .001