

THE PENNSYLVANIA STATE UNIVERSITY
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DETERMINANTS OF TANNING ON A COLLEGE CAMPUS

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ABSTRACT

Skin cancer has become an epidemic, with indoor UV tanning as a major risk factor. The behavior of indoor tanning is common among college-aged females. The purpose of this paper is to look at the factors that motivate young adult females to indoor tan. The model of Unified Behavior was used as a framework for this paper. Two hundred college-aged females on a college campus were surveyed about their tanning behaviors as well as the things that motivate their tanning. Appearance beliefs, injunctive norms, negative emotions and confidence proved to be significant in predicting indoor tanning intention. Intention to indoor tan was significant in predicting indoor tanning behavior in the last 12 months. Future research should focus on the aspects on appearance, injunctive norms, negative emotions, and confidence as predictors for indoor tanning.

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Introduction

Skin Cancer is an epidemic and the most common cancer affecting the United States, with more than two million people diagnosed a year (The Skin Cancer Foundation, 2008). It is now the leading cause of cancer in adults, with 75% of skin cancer deaths from malignant melanoma, a fatal form of skin cancer (CDC, 2010). Skin cancer is increasingly affecting young adults and it is the most common type of cancer for those 25 – 29 years of age (CDC, 2010). These numbers are continuing to be on the rise despite the increased knowledge of risk factors and policy change. One of the major factors in this growing trend is the use of Ultra Violet (UV) indoor tanning beds. A 2010 CDC article stated that 65 – 90 % of melanomas are due to UV light exposure, like indoor tanning booths or beds. These beds allow sunbathers to tan year round and generally increase the risk for skin cancer.

Those most at risk for engaging in these behaviors are females between the ages of 18-24, or college aged women (American Academy of Dermatology, 2010). With this group we are seeing an increase in the diagnosis of melanoma and other more common types of skin cancer (CDC, 2010). Therefore it is important to keep up-to-date with what motivates this group to indoor tan. The purpose of this paper is to look at the past research in hopes of utilizing what worked to decrease indoor tanning and improve what did not. This paper also hopes to illustrate the need for more research in the field of indoor tanning and to look closer at the social aspect of indoor tanning. This paper will focus on sororities and their tanning behaviors in order to help us understand how social norms and socialization play into tanning behaviors.

Utilization of theories and models is also important to prevention research and this paper proposes the use of the Theory of Unified Behavior in understanding the motivations for indoor tanning among college females. This paper will also explore the large social aspect that

contributes to indoor tanning.

Many studies have explored the field of indoor tanning and looked specifically at the types of people who indoor tan, the ages of these people and the different types of tanning behaviors. For example, a study by Heckman, Coups & Manne (2008), helped highlight the risky behaviors that young adults, or college-aged adults, engage in, like regular indoor tanning. This study reported that indoor tanning was highest among 18-24 year olds, with non-Hispanic whites making up the majority of this age group. A study done by Hillhouse, Turrisi, and Shields (2007) explored the categories into which tanners fit. The authors of this paper looked at four different types of tanners. These types include event tanners, regular year round tanners, spontaneous/mood tanners, and finally mixed tanners. Event tanners were people who went tanning before events, dates, formals, spring break or summer and do not go indoor tanning on a regular basis. Spontaneous or mood tanners were those tanners who indoor tanned irregularly but reported some change in mood upon going indoor tanning. Mixed tanners were those tanners who showed a mix of these behaviors, they indoor tanned regularly for a period of time and then continued to tan spontaneously. Each of these groups shows different patterns of tanning behavior. Most problematic are the regular year round tanners because they start tanning early and scored highest on the measures of attitude, social norms and tanning dependence. These indoor tanners believe that indoor tanning is the best way to improve their appearance or attractiveness and that most of their friends or other college females are indoor tanning. They also exhibit behaviors like tanning obsessions, physical or psychological tolerance, loss of control and thoughts or feelings of disliking the color of their skin (Hillhouse et al., 2007). This group may benefit from interventions that encourage alternatives to indoor tanning that improve appearance as well as have a social aspect.

Studies done to help us understand what might deter people from indoor tanning showed that policy change and knowledge of health risk may not be effective in predicting or preventing tanning behaviors. Among these was a 1997 study by Beasley and Kittel, which addressed the issue of indoor tanning policy. The authors found that less than half of indoor tanners believed that regulations on the indoor tanning industry would limit or make them more cautious about their indoor tanning behaviors. This illustrates the idea that tanning regulations are not strong motivators for deterring tanning behavior. The tanning policies meant to raise the price by increasing taxes may not be a successful deterrent.

Of these theories and models, many researchers have used Jaccard's (1981) Theory of Alternative Behavior, which states that people are faced with different behavior choices or alternatives and will pick the behavior toward which people have the most positive attitudes. Turrisi, Hillhouse and Gebert looked at this theory in 1998 and they found that positive attitudes toward behavioral alternatives lead tanners to be less likely to tan. These authors also found that as attitudes toward appearance, social norms and perceived consensus toward tanning became more positive, the attitudes toward indoor tanning became more positive. Hillhouse, Turrisi, Howiski and McVeigh (1999) used this theory to look at the attitudes people have to the alternatives to indoor tanning. These alternative behaviors were exercising, dieting, wearing clothing, grooming, personality, intelligence, and monetary status improvement as ways to improve appearance. This article illustrated that when people have positive attitudes toward the alternative behavior choices to indoor tanning, they are less likely to indoor tan. This paper also looked at attitudes in terms of intention to tan and the authors found that those with more positive attitudes toward tanning were more likely to intend, or plan, to indoor tan.

Finally, Danoff-Burg and Mosher (2006) utilized Jaccard's Theory of Alternative

Behavior as a predictor to indoor tanning behavior. This paper looked closer at the construct of appearance as a motivator to tanning behavior. The authors found that attitudes toward behavioral alternatives, such as diet and exercise, clothing, and self tanners as appearance enhancing, were not significant predictors of tanning salon use but that the best predictor was the attitudes toward indoor tanning itself. Most significantly, the authors found that indoor tanning was associated with positive attitudes toward socializing at the tanning salon and negatively associated with going to the gym to socialize. This helps us understand the importance of social norms and tanning salon use as a way to socialize, which will be addressed later in the paper.

The Theory of Planned Behavior is also used as a model for predicting indoor tanning behaviors. Hillhouse, Turrisi, and Kastner utilized this theory in 2000. They looked at social norms, perceived behavioral control, and attitudes in terms of indoor tanning behaviors. The authors found a strong relationship between social norms of indoor tanning and likelihood to indoor tan or engage in indoor tanning behaviors. They also found that as perceived behavioral control increased so did the relationship between tanning attitudes and the intention to indoor tan. The behavioral control, in this case, is the ability to utilize indoor tanning effectively to improve appearance.

Other studies looked specifically at the idea of social norms and socializing in terms of indoor tanning. Robinson, Kim, Rosenbaum and Oritz in 2008, looked at tanning behaviors longitudinally and found that there has been an increase between 1994 and 2007 in the belief that tanning makes people more attractive. They also found that the use of tanning beds increased rapidly between 1988 (1%) and 1994 (26%), but stayed stable in 2007 (27%). Most importantly, this study found that in 1994 and 2007 the single greatest source of information on the safety of indoor tanning reported was friends and social group. This illustrates the social norm aspect of

indoor tanning.

Along these same lines, Stapleton, Turrisi, and Hillhouse (2008) looked at the relationship between peer crowd identification and indoor tanning behaviors. When asked to identify with a peer crowd, 26.9% of tanners reported association with the “partier crowd.” In addition, females who perceived high rates of tanning among their friends reported more indoor tanning in the past year as well as a higher intention to indoor tan. Stapleton et al. also found that identification with the popular peer crowd was associated with increases in beliefs about friends’ indoor tanning behaviors, indoor tanning attitudes, and intention to use indoor tanning.

The purpose of this paper is to explore the use of a Unified Theory of Behavior for indoor UV tanning to help explain why indoor tanners engage in this behavior. This paper is modeled after a paper written by Guilamo-Ramos, Jaccard, Dittus, and Collins in 2008, in which the authors looked at the Unified Theory of Behavior. This model utilizes many of the constructs mentioned in the previous studies but attempts to combine them to make one all-encompassing theory. This theory is this combination of The Theory of Reasoned Action (Fishbein & Ajzen, 1980), Social Learning Theory (Bandura, 1986), Health Belief Model (Rosenstock, Strecher & Becker, 1988), self-regulation theories (Kanfer, 1975), and the Theory of Subjective Culture (Triandis, 1972). From these theories the variables Expectancies, Social Norms, Self Concept/Self Image/Self Esteem, Affect and Emotion, and Self Efficacy were taken and combined into one more comprehensive framework.

In the case of this paper, these variables may lead a person to intend to indoor tan and in turn engage in indoor tanning behavior. Many of the studies previously mentioned looked at aspects of this theory but, they have not yet been looked at within one paper using the Theory of Unified behavior. As mentioned before, that is one of the goals of this paper, to look at these

constructs within the realm of indoor tanning. The paper by Guilamo-Ramos et al. (2008) helped define and explain the constructs to be used in this paper.

As illustrated above, there is a need for research that looks into indoor tanning behaviors with two million people being diagnosed with some form of skin cancer each year. Most importantly these numbers can be prevented if we can prevent young adults from engaging in the risky behaviors, like indoor UV tanning, that lead to skin cancer of all types. In trying to prevent these behaviors we have to understand what drives, or motivates, young adults to engage in these behaviors.

Methods

Sample and Recruitment

There were 200 participants surveyed from a table set up in a public place within the HUB-Robeson center on Penn State's campus. Those included were females 18 years of age and older. This group was chosen to be representative of the college campus. Those excluded were males and those under 18 years of age. Participants were asked to complete a ten to fifteen minute survey. Participants were given ten dollar gift certificates to the Creamery on Penn State's Campus as compensation.

Measures

This paper looked at the predictors of intention to indoor tan which lead to indoor tanning behaviors. In order to test this, a Structural Equation Path Model was used. The measures utilized in that model were Expectancies, Social Norms, Self Concept/Self Image/Self Esteem, Affect and Emotion, and Self Efficacy. Please See Figure 1. All the variables were measured at baseline. The Expectancies were split into two similar variables of appearance beliefs and damage beliefs. The appearance and damage belief variables were both taken from four items on the survey. The survey questions for this section were statements about appearance and health with five response options (*strongly disagree, disagree, neither agree nor disagree, agree or strongly agree*). These were statements like; "I think that using indoor tanning beds would make me look more attractive and if I indoor tan regularly it is likely I will develop skin cancer."

The Social Norms variable was split into two composite variables of descriptive norms and injunctive norms. The descriptive norms were evaluated by three items which asked the participants what percentage they believed their close friends, the typical college female, and Sorority members used indoor UV tanning beds. The injunctive norms were evaluated with three

items. The survey items included statements like; “My close friends think that I should use indoor tanning” and “The typical Penn State college student thinks that I should use indoor tanning.” Respondents answered *strongly disagree, disagree, neither agree nor disagree, agree* or *strongly agree*.

Self Concept, Self Image and Self Esteem were evaluated through the Self Image variable. The survey questions asked participants to describe the typical indoor tanner. These descriptors included the eight items of Immature, Self-confident, Independent, Careless, Unattractive, Stylish, Well liked, and Uptight. The response options were *not at all, slightly, somewhat, very, and extremely*.

Emotions and Affect were evaluated using five items to create the composite variables of Positive Emotion and Negative Emotion. Respondents were asked to answer with *strongly disagree, disagree, neither agree nor disagree, agree or strongly agree* to the statement, “When I indoor tan, I feel.” This was asked for each of the items: Relaxed and Comfortable, Satisfied, Guilty, Attractive, and Confident. Relaxed and Comfortable, Satisfied, Attractive and Confident were combined to form the variable Positive Emotion, leaving Guilty for the Negative Emotion variable.

Self-Efficacy was reported as the variable of Confidence. Respondents were asked how confident they are in their ability to use an indoor tanning bed to get their desired results. Respondents answered *not at all, slightly, somewhat, very, and extremely*.

Intention to indoor tan was evaluated on a scale of 0 to 6, 0 being definitely do not intend to indoor tan in the future and 6 being definitely do intend to indoor tan in the future. The behavior of indoor tanning was evaluated by self-reported estimate of time the participant indoor tanned in the last 12 months.

Analysis

This paper looked at the predictors of intention to indoor tan which lead to indoor tanning behaviors using the Theory of Unified Behavior. Please see the modified version in Figure 1. In order to test this a Structural Equation Path Model was used. Each of the items was made into composite variables in order to test the model. A single composite score was made for each variable. A table (1) was created to present Cronbach's coefficient alpha values, means, minimums, maximums and standard deviations for each composite variable.

The variable of Expectation became Appearance Belief and Damage Beliefs. A factor analysis was used to combine the survey questions into the two composite variables. This was also done for Emotions (Positive and Negative), and Self Image. For Self Image, the descriptor of "uptight" was removed to improve the association of the composite variable.

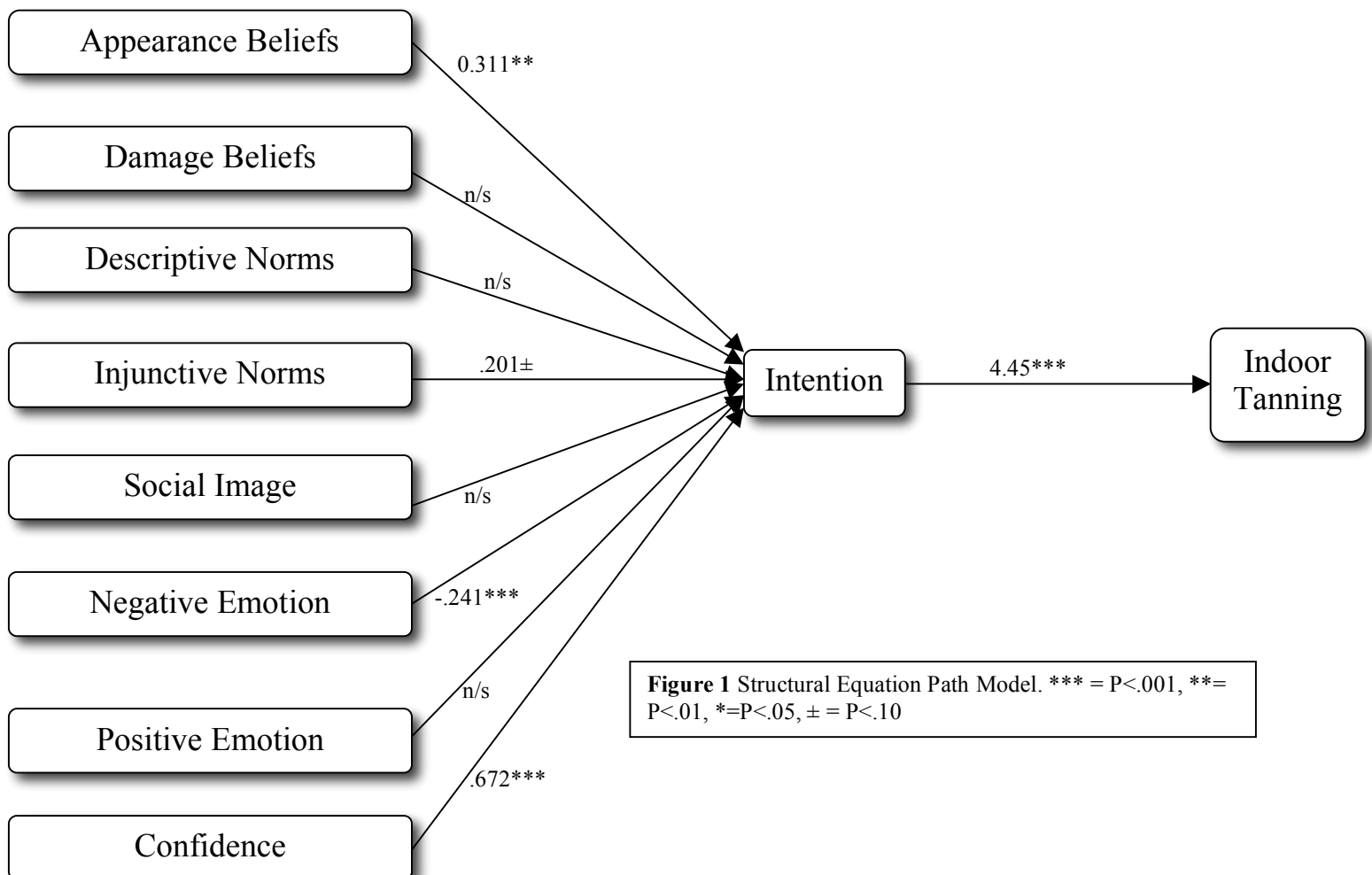
Social Norms, Descriptive and Injunctive Norms, were analyzed using Alpha calculations. Correlations were done for the variable of Self-Efficacy, Intention to Indoor Tan and the Behavior of Indoor Tanning.

	Alpha	Mean	Standard Deviation	Minimum	Maximum
Appearance Belief	.906	1.2113	1.08064	.00	4.00
Damage Belief	.870	3.4417	.73218	.00	5.00
Descriptive Norms	.725	4.6142	1.72386	.33	9.00
Injunctive Norms	.805	1.1150	.87067	.00	3.00
Social Image	.680	1.5554	.49825	.00	4.00
Positive Emotion	.903	1.8752	1.06938	.00	4.00
Negative Emotion	n/a	2.2000	1.25614	.00	4.00
Self-Efficacy	n/a	3.3038	.61793	.25	4.00

Table 1. Results for the composite variables.

Results

The analysis of the model fit indicated an excellent model fit: $\chi^2 (8) = 11.065$; $P = .198$; root mean square error of approximation, 0.045; and comparative fit index, .995. In predicting intention to indoor tan appearance belief was significant ($\beta = .311$; $P < .01$). Negative emotions ($\beta = -.241$; $P < .001$) and confidence ($\beta = .672$; $P < .001$) were also significant in predicting intention to indoor tan. The variable of injunctive norms was moderately significant ($\beta = .201$; $P < .066$). Damage Beliefs were not significant in predicting intention to indoor tan ($\beta = -.113$; $P > .10$). Descriptive norms ($\beta = .046$; $P < .10$), social image ($\beta = .146$; $P > .10$), and positive emotion ($\beta = .163$; $P > .10$) were also not significant in predicting intention to indoor tan. Intention to indoor tan significantly predicted indoor tanning behavior in the last 12 months ($\beta = 4.457$; $P < .001$). This indicates that for every increase of one unit of intention there is an increase of 4.45 in the behavior of indoor tanning.



Discussion

The purpose of this paper was to explore the predictors of indoor tanning among college females using a novel approach in the Unified Theory of Behavior. The variables of Appearance Beliefs, Damage Beliefs, Descriptive Norms, Injunctive Norms, Self Image, Positive Emotion, Negative Emotion, and Confidence were used to test this model. Appearance Beliefs, Negative Emotion, Confidence and Injunctive Norms, to a lesser degree, were significant in predicting indoor tanning intention. Damage Beliefs, Descriptive Norms, Social Image, and Positive Emotion were not significant in predicting intention to indoor tan. Intention was significant in predicting indoor tanning behavior and more specifically, indoor tanning in the last 12 months. A 12 month estimate of tanning behavior is indicative of regular year round tanners which Hillhouse et al., (2007) found to be most problematic of the indoor tanners. This was an interesting finding because it showed that as intention to tan increased by one unit, a 4.45 increase was seen in the behavior of indoor tanning.

There is strong evidence among the indoor tanning intervention research that the variable of appearance beliefs is a strong predictor of indoor tanning. Therefore that finding, within this study, was somewhat expected. The significance of the variable negative emotion was unexpected as this is a variable that has not yet been explored as extensively. Many previous studies found a strong association between social norms and indoor tanning but within this study the variable of injunctive norm, or the perceived approval of others, was only slightly significant. The social aspect of tanning was thought to be more important but this study found that the social image portrayed by indoor tanners is not predictive of indoor tanners.

The limitations of this study were the convenience sampling and the small sample size. A more random sample would have been taken from Data warehouse where names are drawn at

random and the survey is administered online. Also, the sample size can be considered a limitation, as many studies use more than 200 participants.

These findings suggest that there is an aspect of negative emotions that play a role in whether or not a person intends to indoor tan. Negative emotion in this case is a guilty feeling upon indoor tanning. There could be an association between negative emotion and whether or not your peers think that you should or should not indoor tan. Within this study this would be the injunctive norms variable. If peers encourage you to indoor tan, or you think they do, than there may be less guilt associated with indoor tanning. This means that because you have their approval, then you feel less guilty about engaging in that behavior. Likewise, if peers do not think you should indoor tan this may produce guilt upon engaging in that behavior and you may be less likely to indoor tan.

The negative emotion variable might also be explained by your value system as a whole. If you have been taught that indoor tanning is bad or frivolous, than engaging in that behavior might elicit a guilty feeling and therefore decrease your intention to indoor tan. This is more than just damage beliefs or norms as it may encompass all the aspects of a person's value system. The significance of the confidence variable was also interesting. The finding showed that when indoor tanners are confident in their ability to get their desired effects from indoor tanning they are more likely to indoor tan. The less confident you are the less likely you are to indoor tan.

The significance of the appearance belief in predicting indoor tanning is in line with most of the current intervention in this field. We know that appearance plays a large role in preventing and predicting indoor tanning. When people believe that they are more attractive with a tan or that indoor tanning makes them attractive they are more likely to indoor tan. This was also found in this study.

This study reiterates how important it is to have an appearance component to indoor tanning prevention and intervention but, it also shows that negative emotion might also play a role. This may be an interesting avenue for skin cancer prevention research to take. Future intervention and prevention strategies may want to include a negative emotion aspect but, more research needs to be done to understand the association between negative emotion, namely guilt, and indoor tanning intention. Understanding these factors may help us prevent indoor tanning and in turn reduce the skin cancer epidemic.

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EDUCATION

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COMMUNITY SERVICE

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PUBLICATIONS

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