The Impact of Tanning Culture on Adolescents

AP Research

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Introduction

Across recent decades, the motivation for achieving a tan has remained appearance-driven.[1] Despite a lack of historical clarity as to why this trend has persisted, the consequences of UV exposure have been transparently publicized in all forms of media. The American Cancer Society estimated in 2023 that about 186,000 new cases of melanoma were diagnosed in the United States; 97,000 of which were invasive. This implies an increase of 27 percent in cases, more than 5.4 million diagnoses of basal and squamous cell carcinoma. 90 percent of which are correlated to UV exposure.[2] The alarming nature of these statistics should imply that there is not just a minor issue with Americans not taking necessary precautions, but there is an epidemic insinuating a crisis. Indulgence in these behaviors has nonetheless remained economically sufficient.[3] Consumers support businesses that provide artificial UV radiation via tanning beds, as well as outdoor tanning oils and creams. This obsession has inspired companies to invent safer tanning alternatives, such as spray tanning and self-tanning, two dihydroxyacetone-based formulas that chemically react to create a topical fake tan.[4] While the long-term effects of these "safer" innovations remain unclear, access to these products puts participants at risk of developing psychological tanning dependence. All of this made me even more interested in the "Why?". Why has tanning proceeded to be a trend despite the obvious

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[1] Cafri, G., Thompson, J. K., Roehrig, M., Van Den Berg, P., Jacobsen, P. B., & Stark, S. (2006). An Investigation of Appearance Motives for Tanning: The Development and Evaluation of the Physical Appearance Reasons for Tanning Scale (PARTS) and Its Relation to Sunbathing and Indoor Tanning Intentions. *Body Image*, *3*(3), 199–209. https://doi.org/10.1016/j.bodyim.2006.05.002

[2] DeMaio, K. B. (2023, June 20). *Why do we (Still) tan?* The Skin Cancer Foundation. https://www.skincancer.org/blog/why-do-we-still-tan/

[3] *Indoor tanning*. (n.d.). https://www.aad.org/media/stats-indoor-tanning

[4] Garone, Michael, John Howard, and Jordan Fabrikant. "A Review of Common Tanning Methods." The Journal of clinical and aesthetic dermatology, February 2015. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4345932/.

health risks?

Tanning salons are transparent online with their statistics surrounding the participation of adults. Though mandated to advertise the detrimental impacts of their services, most salons still offer minors' participation upon completion of a parental consent waiver. Legislation has been proposed to prevent indoor tanning altogether, however, implementation has been nationally unsuccessful.[5] A popular argument negating this bill compares tanning, indoors or outdoors, to smoking cigarettes or drinking alcohol; indulging in a short-term fulfilling behavior regardless of long-term outcome. As a parental waiver would not enable a minor to purchase cigarettes or alcohol, the same way it would allow them to use a tanning bed, this creates a double standard. Additionally, there is no accessible data about participants under the age of 18.[6] Even excluding the indoor tanning market, outdoor tanning has been culturally modified to be seen as an activity to participate in. In my experience, teenage youth are targeted through platforms such as TikTok. Social media offers advice on achieving the perfect outdoor tan, suggesting teenagers monitor the daily UV to find the perfect time to lie outside. While most are aware of the irreversible consequences, many of my peers and thousands in my age demographic continue to participate in indoor or outdoor tanning regularly, as shown through the overwhelming societal presence. Johan Moan, senior scientist at the Oslo University hospital, shares that advocates for UV exposure argue that the vitamin D dosage is responsible for the addictive properties of UV tanning. This suggests a counterargument, implying that there are benefits to participation in

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[5] Venosa, Ali. "Indoor Tanning Legislation: Here's Where We Stand." The Skin Cancer Foundation, March 27, 2024. https://www.skincancer.org/blog/indoor-tanning-legislation-heres-stand/#:~:text=To%20date%2C%2044%20states%20and,tanning%20restrictions%20across%20the%20country.

[6] Tang, L. (2024). Tanning salons in the US - market research report (2014-2029). https://www.ibisworld.com/united-states/market-research-reports/tanning-salons-industry/

risky tanning behavior.[7] The presence of self-tanning or spray tanning directly debunks this, and proposes that it is an image that drives people to tan. The teenage demographic has been excluded in every study, likely due to inconsistency with policy or just a lack of awareness surrounding their presence in the market.[8] The main concern driving my research is that this behavior has not aligned with any previous generation, and the long-term implications of tanning might bring melanoma to pandemic-level status. But there is much more to this than just pursuing a desired complexion. In a 2017 study examining college students at an unspecified university, many felt thinner, younger, physically fit, and generally more attractive when a tan was achieved.[9] The inverse being that without a bronzed complexion, these women felt bad about themselves and less confident. Does the possession of a tan serve as a dysmorphic mirror in teenage youth? If so, action must be taken to ensure that this doesn't overwhelm the future of these impressionable participants. Bridging this gap of uncertainty would also clarify the motivation behind tanning, a result of media exposure or other internal pressures, and how these industries might be capitalizing on these adolescent insecurities. The guiding question for my research began to form: how has the rise of sun and sunless tanning impacted adolescents' (13-18) attitude towards their appearance and contributed to their beauty standard of others?

The United States Department of Health and Human Services and the World Health Organization's International Agency for Research on Cancer have determined UV radiation,

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[7] Moan, Johan, Alina Carmen Porojnicu, Arne Dahlback, and Richard B. Setlow. "Addressing the Health Benefits and Risks, Involving Vitamin D or Skin Cancer, of Increased Sun Exposure." *Proceedings of the National Academy of Sciences of the United States of America* 105, no. 2 (2008): 668–73. http://www.jstor.org/stable/25451148 .

[8] Tang, L. (2024). Tanning salons in the US - market research report (2014-2029). https://www.ibisworld.com/united-states/market-research-reports/tanning-salons-industry/

[9] Basch, Corey H., Valerie Cadorett, Sarah A. MacLean, Grace C. Hillyer, and William D. Kernan. "Attitudes and Behaviors Related to Sun-Safety in College Students." *Journal of Community Health* 42, no. 4 (2017): 757–62. https://www.jstor.org/stable/48716502.

whether artificial or from the sun, is a widely accepted and known carcinogen.[10] The concerning factors don't end there, both organizations also determine that adolescents struggle with mental health, as more prone to irresponsible tanning practices. Dr. Deborah Sarnoff, MD, and president of The Skin Cancer Foundation, made an interesting observation in Krista Bennett Demaio's "Why Do We (Still) Tan?".[11] Sarnoff brought the cultural differences of complexions associated with beauty based on not only location but time. She acknowledges the practices of Cleopatra, taking milk baths to achieve a lighter complexion in ancient Egypt. Pale skin was believed to be a symbol of status, indicating that your days were not spent performing outdoor labor. The Industrial Revolution is believed to be the main contributor to the transition. The industrial revolution of workers meant that tans were no longer a class indicator. In the same era, Sarnoff saw light therapy first introduced for its supposed medicinal benefits. The new technology had yet to be debunked, and people began to lie in the sun to improve their health. Others negate those causes and attribute the rise of the tan to Coco Chanel's accidental sunburn that served as her return from the French Riviera, becoming an influential trend.

The societal acceptance of risking health for the reward of a bronzed look led researchers to avidly search for a direct cause. A 2009 study done by the American Journal of Public Health took samples of advertisements from the years 1920 to 1929.[12] At the time, UV radiation had gained popularity for two intended results. Sunlight was rumored to have medicinal properties that improved the health of individuals, regardless of age. More specifically, those with

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[10] World Health Organization. (2022). *Ultraviolet (UV) radiation*. https://www.who.int/news-room/fact-sheets/detail/ultraviolet-radiation

[11] DeMaio, K. B. (2023, June 20). *Why do we (Still) tan?* The Skin Cancer Foundation. https://www.skincancer.org/blog/why-do-we-still-tan/

[12] Martin, J. M., Ghaferi, J. M., Cummins, D. L., Mamelak, A. J., Schmults, C. D., Parikh, M., Speyer, L., Chuang, A., Richardson, H. V., Stein, D., & Liégeois, N. J. (2009). CHANGES in SKIN TANNING ATTITUDES fashion articles and advertisements in the early 20th century. *American Journal of Public Health*, *99*(12), 2140–2146. https://doi.org/10.2105/ajph.2008.144352

tuberculosis were sent to "preventoriums" where they would be administered exposure to sunlight. The study analyzed these magazine advertisements, noting there was a drastic increase in pro-tanning attitudes in the 1928 edition of Vogue. This includes ads that may have advised precaution against burning, but still endorsed a tanning agenda. The other figure developed in the research demonstrated the occurrence of skin bleaching advertisements in the same magazines. There was an inverse relationship between the lack of promoted skin bleaching and the rise of tanning endorsement, specifically in 1928. An example of these treatments included various substances that could be topically applied to conceal a tan. Elizabeth Arden, in the July 1920 edition of Vogue, advertised Bleachine Cream, a product to reduce a darker complexion. The decrease in maintenance to pale complexion led to the melanoma rise of the 20th century, the study claims.[13] As soon as the obsession with obtaining a tan appearance was publicized in the media, consumers immediately became more susceptible to tanning practices. Sun Protection Factor (SPF) was a fairly new development with a lack of societal normalization, making the incidence of melanoma even higher. Overall, the significance of this study serves to not only provide insight as to why the 1928 shift remains notorious in understanding tanning practices, but also how melanoma began its climb to epidemic status. Understanding the historical roots of tanning practices is essential to begin examining this generation's behavior.

The scholarly conversation actively neglects the impressionable, younger demographic. Adolescents are known to be optimal targets for advertisements on social media, therefore fueling the tanning industry as a whole. In my own experience, societal pressures weigh down on the youth's appearance. In a study done by the *Canadian Journal of Public Health,* Angela M.

[13] Martin, J. M., Ghaferi, J. M., Cummins, D. L., Mamelak, A. J., Schmults, C. D., Parikh, M., Speyer, L., Chuang, A., Richardson, H. V., Stein, D., & Liégeois, N. J. (2009). CHANGES in SKIN TANNING ATTITUDES fashion articles and advertisements in the early 20th century. *American Journal of Public Health*, *99*(12), 2140–2146. https://doi.org/10.2105/ajph.2008.144352

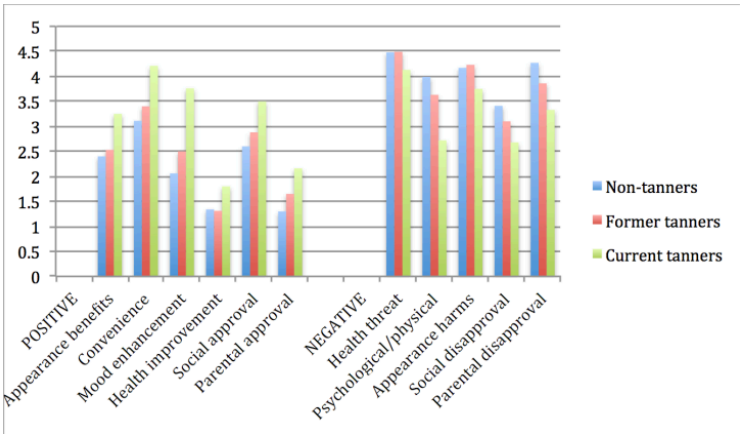
Thompson, full-time surveyor for health-related instances, found that 34% of prepubescent girls and 76% of post-pubescent females were unsatisfied with their bodies.[14] With tanning publicized in various new ways, including new sunless and self-tanning measures, there is a larger market than ever targeting youth. While appearance-based motives are typically associated with females, males are also participants and deserve a voice in the tanning conversation. Whether or not someone would find their partner more or less attractive with a tan may serve as a motivator to indulge in risky tanning practices. Including a young male's perspective is essential to understanding the impact of the tanning industry on adolescents. There is also a lack of conversation surrounding the practices teens are willing to participate in to achieve a darker complexion. Self-tan, a derivative of a DHA (dihydroxyacetone) concentrate that is applied to the skin to develop over a few hours, is typically applied by oneself for efficiency (hence the name). This newer technology differentiates from other self-tanning practices in the 19th and 20th centuries. No pricey membership is required, and there is no risk of UV-related skin damage. Participating in self-tanning can have adverse consequences on the psyche of impressionable minds. Even those who tan in the sun, intentionally or unintentionally, are necessary to be invited to the discussion, as the lack of social influence could be protecting them from the plague of participating. There is no research done on how the new developments of the tanning industry, in addition to suntanning, have impacted the attitudes of adolescents.

Methodology

The Comprehensive Indoor Tanning Expectations Scale (CITE SCALE) was developed in 2014 by Seth M Noar, PhD, et al., when examining connections between indoor

[14] Thompson, A. M., & Chad, K. E. (2000). The Relationship of Pubertal Status to Body Image, Social Physique Anxiety, Preoccupation with Weight and Nutritional Status in Young Females. *Canadian Journal of Public Health / Revue Canadienne de Sante'e Publique*, *91*(3), 207–211. http://www.jstor.org/stable/41993147

tanning (UV beds) and skin cancer.[15] The survey was conducted online and distributed to 11 sororities at a large, undisclosed southeastern university. The format of the questionnaire included a 5-point response scale to various questions that assessed motivation behind tanning. At the end of the discussion, Noar stated that the CITE Scale was designed to be adaptable for younger populations to expand the knowledge surrounding adverse tanning practices. My research would be best conducted through a structured survey that would be a modified version of the CITE Scale. Various questions would be administered to my population, aged 13-18, that would gather information on how their perceptions of self and others are altered by the presence of tanning. An additional factor my survey would include involves the method of tanning, or lack thereof, of the participant. Data would then be synthesized in a table similar to the one demonstrated by the *American Medical Association.* Surveys have been a common approach throughout the entirety of the research I've examined. With the practicality of administration, especially when developed entirely online, a survey is the most applicable method to collect socio-cultural information from participants. Sensitive subjects would also be discussed throughout my questionnaire; themes including body image can be triggering. A survey allows participants to either not answer the question or walk away from the survey entirely.



I additionally examined two other potential ways to survey a sensitive population. The

[15] Noar, S. M., Myrick, J. G., Morales-Pico, B., & Thomas, N. E. (2014). Development and validation of the Comprehensive Indoor Tanning Expectations Scale. *JAMA Dermatology*, *150*(5), 512. https://doi.org/10.1001/jamadermatol.2013.9086

Body Self-Image Questionnaire (BRSQ) was developed by David Rowe, professor at the University of Strathclyde, to be used when surveying a population about their feelings towards appearance.[16] With a response format of 5 options, 1 being least true, 5 being most true, the respondents have a straightforward approach to answering these heavy topics. However, I decided to neglect this approach to my research. Not only did the survey lack sensitivity in content, but most of the themes surrounding body size are not necessary to collect from my population. The CITE scale was also created with an intent of adaptation, whereas the BRSQ may cause several unnecessary difficulties when trying to mold it to include tanning. The second survey I potentially considered for adaptation was Duke Education's 1989 Social Physique Anxiety Scale (SPAS).[17] Differentiating in response, SPAS utilized a numerical answer format that would make analysis simpler, but less thorough. There are fewer questions that are optimal for a safer survey, however, they lack depth, and adaptation would truly be reformation to include tanning. Additionally, both the SPAS and BRSQ were not intended for adolescent participants, and different precautions to ensure safety would be necessary if chosen to conduct. The CITE Scale also displays exactly how they analyzed the data collected. This would make my work more precise and accurate. This being my first time conducting research, following a step-by-step model is beneficial in making the most of my participants' information.

In order to prioritize the safety of my participants, I completed the Institutional Review Board (IRB) approval process. This consisted of a video training course as well as a proposal to the board. The IRB process required me to do additional preparation and required a level of readiness early in the year. My proposed research method aligns with ethical practices in the

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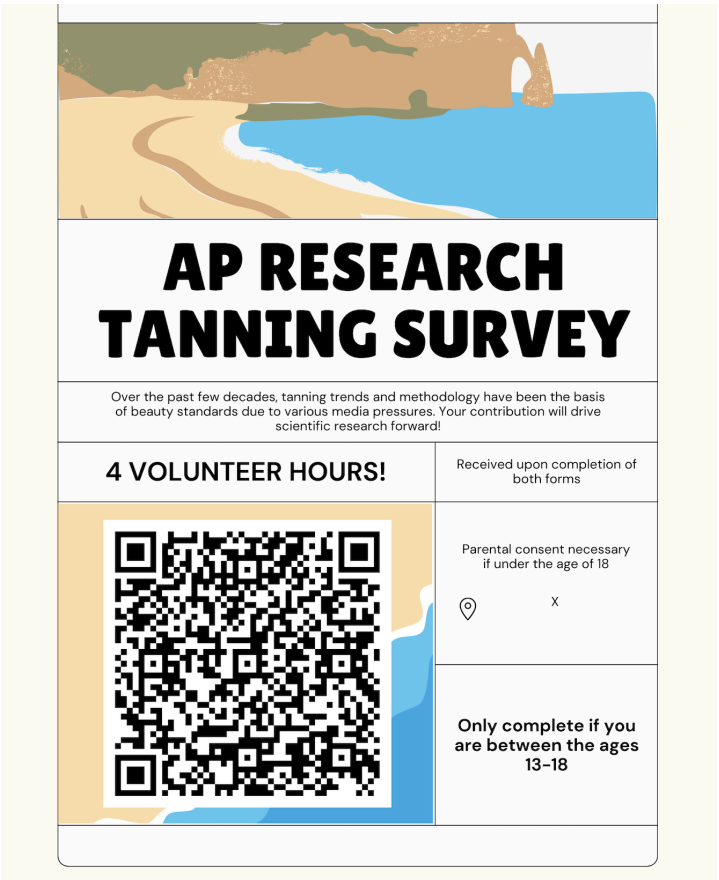
[16] Pona, C., & Berenson, K. R. (2015). *BSIQ-SF: Short-form version of the Body Self-Image Questionnaire* [PDF]. ResearchGate. https://www.researchgate.net/publication/280568978_BSIQ-SF_short-form_version_of_the_Body_Self-Image_Questionnaire

[17] Leary, M. R. (1990). *Social Physique Anxiety Scale (SPAS)* [PDF]. Duke University. https://sites.duke.edu/leary/files/2019/05/SPAS.pdf

sense that it is easy to secure and mandate safety when administering online. Protocol disciplines and procedures were explained to participants in a brief synopsis of what the study is trying to accomplish. Transparency will be implemented throughout data collection. Parental forms were collected, but not attached to participants to ensure results remain completely anonymous. Anticipated challenges include maintaining confidentiality while still regulating parental consent forms. If administered online, there will need to be a way to verify consent form has been received while still keeping the response entirely anonymous. The parental and participant consent form will be the first page of the survey, therefore, applicants cannot move forward to the survey if a signature is not received. Minimal revisions were advised by the IRB, including specificity of age and gender inclusivity. After implementing these modifications, my questionnaire was ready to go. I designed a poster, advertising my survey and the incentive to participate, a generous four volunteer hours. This has been the best way to motivate students to complete the 50-question form, using their iPhones to simply scan a QR code to begin the questionnaire. However, there were several problems with the simplicity of this process. iPhones, with dozens of notifications competing for the user's attention, have made it difficult to acquire participant retention. A noticeable trend is the blank submission, surveys that have been left blank by participants, and



overall auditing of the statistics of my data. A measure I implemented that was overwhelmingly productive was the inability to request volunteer hours without the submission of the survey. This has counteracted many from walking away, or simply clicking off the form. Another method of advertising is just through friends and family. Electronic administration is a roadblock I was not anticipating, and luckily, my thorough attention to detail in the development of my survey was able to make up for deficits I wouldn't have been able to predict. The younger demographic I was hoping to obtain has been collected locally through 3rd party recreational activities and word of mouth; they have successfully contributed to my data as well. When asking for their feedback surrounding the experience of completing my survey, I have received positive anecdotes, specifically regarding admiration for my structure and professionalism. This was an aspect important to me personally; I wanted to ensure the process was as easy as possible while still collecting complex data. The presence of resources for mental health in my survey was placed to mitigate any unsafe emotions that may be triggered by the sensitive topics discussed. However, after speaking to several participants, it does not appear that these themes were as sensitive as anticipated, another positive accomplishment.

Data Analysis

As participants completed the survey, all information was organized into a spreadsheet automatically. I utilized a strategy from the CITE Scale called “promax rotation” to sort the large quantities of data into smaller subsets. From my experience, promax rotation can be described as rotating a

Table 4. Analyses of Variances Comparing Tanner Types on CITE Subscales[a]

Outcome Expectation	Mean (SD) Nontanners (n = 386)	Former Tanners (n = 106)	Current Tanners (n = 214)	*P* Value	Partial η^2
Positive					
Appearance benefits	2.40 (0.94)$_a$	2.53 (0.95)$_{a,b}$	3.25 (0.85)$_c$	<.001	.15
Convenience	3.07 (1.05)$_a$	3.40 (0.97)$_b$	4.21 (0.53)$_c$	<.001	.25
Mood enhancement	2.06 (0.97)$_a$	2.49 (1.13)$_b$	3.76 (0.92)$_c$	<.001	.37
Health improvement	1.34 (0.53)$_a$	1.31 (0.55)$_{a,b}$	1.80 (0.80)$_c$	<.001	.10
Social approval	2.61 (1.06)$_a$	2.88 (1.00)$_b$	3.50 (0.89)$_c$	<.001	.14
Parental approval	1.30 (0.64)$_a$	1.65 (0.96)$_b$	2.16 (1.13)$_c$	<.001	.16
Negative					
Health threat	4.48 (0.72)$_a$	4.49 (0.68)$_{a,b}$	4.13 (0.77)$_c$	<.001	.05
Psychological/physical discomfort	3.99 (0.80)$_a$	3.63 (0.93)$_b$	2.72 (0.83)$_c$	<.001	.33
Appearance harms	4.17 (0.68)$_a$	4.24 (0.72)$_{a,b}$	3.75 (0.80)$_c$	<.001	.07
Social disapproval	3.41 (1.09)$_a$	3.10 (1.06)$_b$	2.68 (1.00)$_c$	<.001	.09
Parental disapproval	4.27 (1.07)$_a$	3.86 (1.27)$_b$	3.33 (1.25)$_c$	<.001	.12

[a] Comprehensive Indoor Tanning Expectations (CITE) subscales were scored by summing all items in each subscale and then dividing by the number of items. Higher values indicate greater beliefi n each positive or negative dimension. The means that do not share a common subscript are significantly different at $P < .05$ or better based on Tukey tests for honestly significant difference.

puzzle piece to fit the puzzle. Each question fell under the umbrella term of ***positive*** or ***negative*** expectations, as seen in the table above. From there, they were categorized into 9 different subcategories. These included the following: *appearance benefits, convenience, mood enhancement, health improvement, social approval, health threat, psychological/physical discomfort, appearance harm, and social disapproval.* For example, one of the prompts, "It would hide my skin imperfections," fell into the category of ***positive*** expectations, under *appearance benefits.* To prioritize the safety of my participants, I made an audit of Noar's original scale, which involved the removal of *parental approval* and *parental disapproval* categories. Each question was answered on a 5-point scale, 1 meaning strongly disagree and 5 meaning strongly agree. I calculated the means of each question, then the mean of each subcategory. Participants were also distinguished between ***non-tanners*** and ***current tanners***. People who were ***nontanners*** have never participated in any type of tanning (indoor, outdoor, etc.), while those placed into the ***current tanner*** category participate in one or more methods of tanning.

Results

Below is a chart representing the mean calculations and results of my findings, modeled after the CITE Scale table previously shown. Each outcome expectation's calculation required me to find a **p-value** and **partial eta squared** (*η2)* value. The p-value indicated the likelihood of my results happening by chance, meaning a participant's responses, question by question, align with one another or not. Though my level of mathematics is not substantially adequate, my p-value indicated that there was a significant chance that a large number of my respondents randomly selected answers, as their responses did not correlate with one another. This determines that the results are partially due to luck, an unfortunate but undeniable fact of my research. The

partial eta squared value showed how strong the effect of the p-value was. They were substantially larger in the ***positive*** expectations category than in the ***negative*** expectations category. Overall, this just indicates that while my research is still viable, there is an element of chance regarding the results of my study. For the scholarly purpose of my research, I decided to proceed as though all findings were accurate.

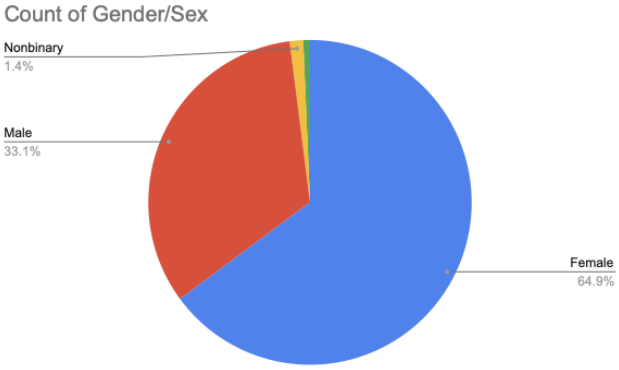
Outcome Expectations	Nontanners (n=61)	Current Tanners (n=82)	*P* Value	Partial *η2*
Positive				
Appearance benefits	2.3519	3.602	1.16×10−111.16×10−11	0.279
Convenience	1.9836	3.676	3.78×10−18	0.415
Mood enhancement	2.01	3.4289	4.53×10−14	0.333
Health Improvement	1.6525	2.329	1.01×10−4	0.102
Social Approval	2.227	3.415	8.32×10−11	0.259
Negative				
Health Threat	3.606	3.30625	0.078	0.022
Psychological/Physical discomfort	3.6647	3.1739	0.0043	0.056
Appearance harms	3.3827	3.28	0.545	0.003
Social Disapproval	2.333	2.0679	0.119	0.017

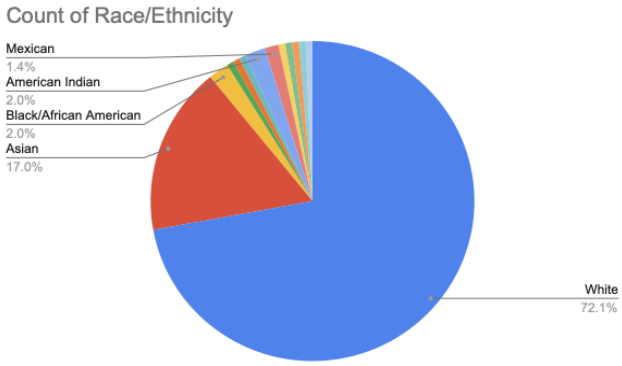
Significant Differences (P<0.05P<0.05): Appearance Benefits, Convenience, Mood Enhancement, Health Improvement, Social Approval, and Psychological/Physical Discomfort.

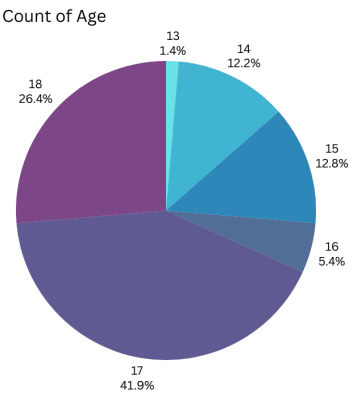
Strongest Effect Size (η2>0.3η2>0.3): Convenience (0.4150.415) and Mood Enhancement (0.3330.333).

Non-Significant Differences (P>0.05P>0.05): Health Threat, Appearance Harms, and Social Disapproval

The following graphics show the demographics of my population. **(Fig. 1)** demonstrates the count of gender/sex of my participants, totalling at 96 identifying as female, 49 identifying as male, and 2 identifying as nonbinary. This was a positive finding as I was not expecting to reach all desired demographics, however, it truly was able to provide the male lens I wanted to include. **(Fig.2)** demonstrates race/ethnicity. Though I anticipated a predominantly white population, the incorporation of other ethnicities was important when discussing tanning. Complexion greatly differs amongst these populations, and that lens was important to incorporate into my data. **(Fig.3)** demonstrates the age of my participants. Due to my survey being administered mainly within a high school setting, the incentive being volunteer hours being mandatory for graduation, it was not as easy to access a younger demographic. However, each age group was present in the completion of my research, and the void of adolescents within the

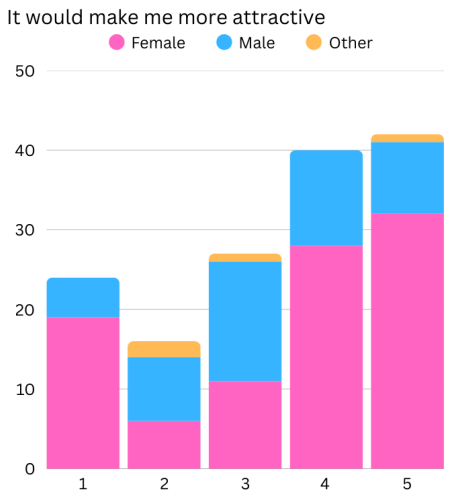


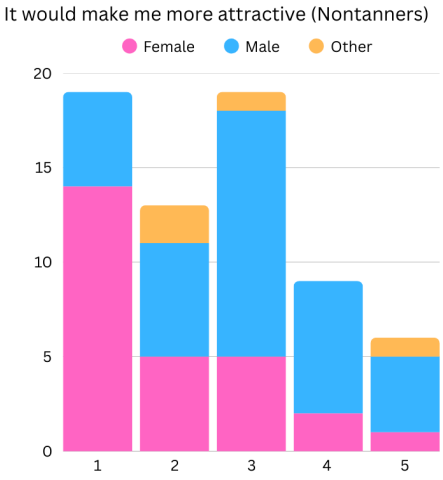




tanning conversation was able to be bridged through the reach of my questionnaire.

Revisiting my original hypothesis, I predicted that there would be a direct correlation between security in appearance and lack of tanning dependence. This is due to the positive feelings associated with having a tan inciting a deficit upon lack of dark complexion. I sorted the results into two groups, current tanners and nontanners, to see whether or not the presence of a tan (regardless of method) would make them feel more attractive.

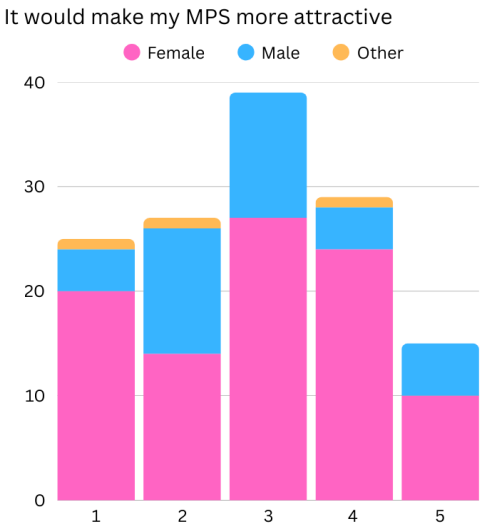




(Fig.1) Participants who agreed that a tan would make them feel more attractive. The graph demonstrates that trends were similar, regardless of gender. Both the mean calculations and the graph support that those who participate in a tanning practice feel that it positively affects their appearance. **(Fig. 2)** exclusively shows participants who have *never* indulged in any tanning method. The results were slightly more scattered. However, the overarching demonstration is that the graph is left-leaning. This suggests that those who have never even attempted to tan feel no insecurity surrounding their lack of. My hypothesis was proven correct, as there is a direct

correlation between security in appearance (nontanners, who feel no need to tan) and lack of tanning dependence (no inadvertent need to).

The second component of my research question and discoveries was the examination of whether or not teens found their member of preferred sex (MPS) more attractive when a tan was possessed. This would not only serve as a personal motive to tan, as it would make oneself more appealing to their MPS, or if it is insignificant and just not sought after in others, the way it is personally. As it was previously found that those who have participated in tanning *feel* more attractive, it was interesting to see how scattered these findings are. The graph is much more evenly dispersed, showing that even though tanning is sought after for personal motives, it is not vastly sought out in partners. This proves the second portion of my hypothesis incorrect. Though it is not completely inaccurate, the findings are not as transparent, indicating that participants found tanned skin tones more attractive. This would have just affirmed that the media has shifted perceptions surrounding pale skin, however, this is a new window in the scholarly conversation that has the opportunity to build upon.



Limitations and Implications

This entire process offered a lot of insight into the reality of conducting research in a younger demographic. A major limitation that could not have been anticipated was participant retention. Many participants exited the survey, which was easily done by just swiping out of the app. Others just skipped through questions, selecting answers in hopes of receiving volunteer

hours for their completion. I believe that this was mitigated to the best of my ability, as to requested the hours they had to affirm that they had fully participated. I was limited in my outreach, simply due to the extent of resources in a high school setting. The topics I was investigating contained sensitive information surrounding the body image of oneself and others. I chose to prioritize the safety of my participants and limit the intensity of the content instead of looking into what they were able to visit in the CITE Scale. Although there were limitations to be expected, my findings were viable and answered the curiosities I had originally posed, even if slightly audited.

Scientific and social implications fall under the same hot topic of legislation surrounding indoor tanning. Petitions and activism have increased in states that have yet to ban minors from tanning indoors, however, no research has yet proven their presence in the industry until now. My findings justify that this demographic is participating, and their vulnerability needs to be protected by the state legislature. Rhode Island Senate Majority Whip Maryellen Goodwin, in a publication by the Skin Cancer Foundation, stated, "The evidence of the dangers of tanning to young people is just overwhelming."[18] There is now not only evidence that it is detrimental physically, but there is proof that it is becoming more and more widespread through my data. Scientists can also continue to ask the more sensitive questions. With the proper resources to mitigate strong emotions of adolescents, discoveries can be made and conducted beyond the capabilities of a student.

Conclusion

To answer my research question, the rise of sun and sunless tanning influenced adolescents' (13-18) attitude towards their appearance, shaping their own self-perception more

[18] Skin Cancer Foundation. (2023, May 10). *Indoor tanning legislation: Here's where we stand*. https://www.skincancer.org/blog/indoor-tanning-legislation-heres-stand/

significantly than their beauty standards for others. Investigating this subject answered a plethora of my independent curiosities, while allowing me to synthesize my findings with scientists in the field. Being in a high school setting, I have access to younger demographics that researchers might have had a more difficult time acquiring. It is fulfilling to observe discoveries being made, but as a student, seeing your age demographic neglected in an industry you actively participate in makes the scientific field somewhat irresponsible. Understanding that those who have participated in any tanning procedure are more susceptible to appearance-based insecurities may instill preventative awareness in those tempted to participate. Those who have never attempted any tanning procedure don't feel that same lack, despite facing the same societal pressure. Limits and regulations on the attempts of tanning industries to target youth can also be prohibited in the future, as there is now a gap bridged acknowledging their presence in consumerism. Tanning, regardless of method, is a historically prominent standard of beauty that will continue to shapeshift throughout time. Through its modification, we must continue taking accountability for how it impacts vulnerable populations, our youth.

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Appendix A: IRB Information and Materials

Survey A, Human Consent form

https://docs.google.com/forms/d/1fvhAerSSIDT5sSqXPLwbi0AiXmr_6_MXf-cGsiIIZvo/edit?usp=forms_home&ths=true

Survey B, Questionnaire

https://docs.google.com/forms/d/1wLurSphvlfmX8Ckozq79-fZiBFKRH5iAJWgJTQQPPMo/edit?usp=forms_home&ths=true

IRB approval form

https://docs.google.com/document/d/1v5pns1sHHIKst3qNBCq0nx8NSn6DEWSzn7gABW4ISEs/edit?usp=sharing

IRB Video Questions

https://docs.google.com/document/d/1QN16pakLNofNDniSTuPczoSZSsN7e0DBX6tYQI-mzM4/edit?usp=sharing