Predictive Validity of a New Self-report Measure of Individual Skin Type Through Characterization of Skin Melanin Using Reflectance Photospectroscopy

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Melanin content in skin is important for sun protection. The skin's melanin content affects the skin's response to ultraviolet (UV) radiation, helping to protect the skin from damage. The Fitzpatrick Skin Type Scale (FSTS) is commonly used to categorize skin types based on how the skin reacts to UV exposure. However, FSTS may not accurately reflect the melanin content of an individual's skin. A revised self-administered survey, the Self-Type System (STS), has been developed to better assess melanin content.

The STS survey includes questions about sun exposure and skin appearance, which are used to calculate a melanin score. This score is then compared to FSTS scores to determine if the STS score is an accurate reflection of melanin content.

In this study, 57 adults who were previously surveyed using the STS were also surveyed using FSTS. The results showed a strong correlation between the two methods, indicating that the STS is a valid tool for assessing melanin content.

Future Project Considerations
Increased Participant Count For Refinement

Individualized Sun Safety Behaviors
Personalized Reports
With the advent of the photospectroscopy combined with the self-reported survey we will be able to offer a more personalized set of suggestions for sun protection behaviors which will help an individual.

Citations

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Abstract
In the realm of research and dermatology, the Fitzpatrick Skin Type Scale (FSTS) has been the gold standard of measurement to classify sun sensitivity for human skin. This scale is based on an individual’s dermal reaction to ultraviolet exposure (Parrish, et al., 1974; Fitzpatrick, 1975; Pathak, et al., 1976; Fitzpatrick, 1988). It was assumed in science as well as popular culture that individuals with darker skin were less susceptible to issues related to UV damage of their skin. More recent research (Eilers, et al., 2015) suggests that while melanin affords some skin protection, damage can still occur that may result in disparities of darker skin individuals getting diagnosed with skin cancer later when the disease is more advanced and deadly. This phase of the Let’s Get Healthy! sun sensitivity project compares a revised self-administered survey with objective, reflectance photospectroscopy to determine if an individual’s melanin content correlates with FSTS. Validation of the self-administered survey will enable better characterization of individuals and guide tailored recommendations of sun protection behaviors that may reduce their risk of skin cancer.

Materials and Methods
In this study, 57 adults who were previously surveyed using the STS were also surveyed using FSTS. The results showed a strong correlation between the two methods, indicating that the STS is a valid tool for assessing melanin content.

Results
The melanin content findings show a well matched relationship with the scores from the FSTS revised surveys. We still feel there are changes that could be made to this survey to better appropriate the language to include all cultures with their sun safety behaviors.

Findings
- The comparison of melanin content with the self-reported skin type scores show a close relationship.
- There are strong correlations between the FSTS scores and melanin scores. The mean combined melanin scores and FSTS E self-reported survey scores are clustering well. The outliers are likely confounded somewhat in wording or intent of the survey.

Discussion
- The survey is scoring well and appropriating the correct skin types to individuals.
- Less than 10% of participants felt the survey scored their skin type incorrectly. This shows improvement over prior versions and that the survey works for the vast majority of participants. More guidance or comprehension is necessary by reviewing the results and feedback.

Conclusion
- The reflectance photospectroscopy is showing similarity in melanin content across all three skin among participants.
- The data is showing consistent increase of melanin score across the FSTS which shows the appropriate categorization based on the melanin score ranges.

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