Analysis of Sephora Skin Care Products

By Ricarda Dallmann

SKINCARE FINDER

Let's find just what your skin needs to look and feel its best.

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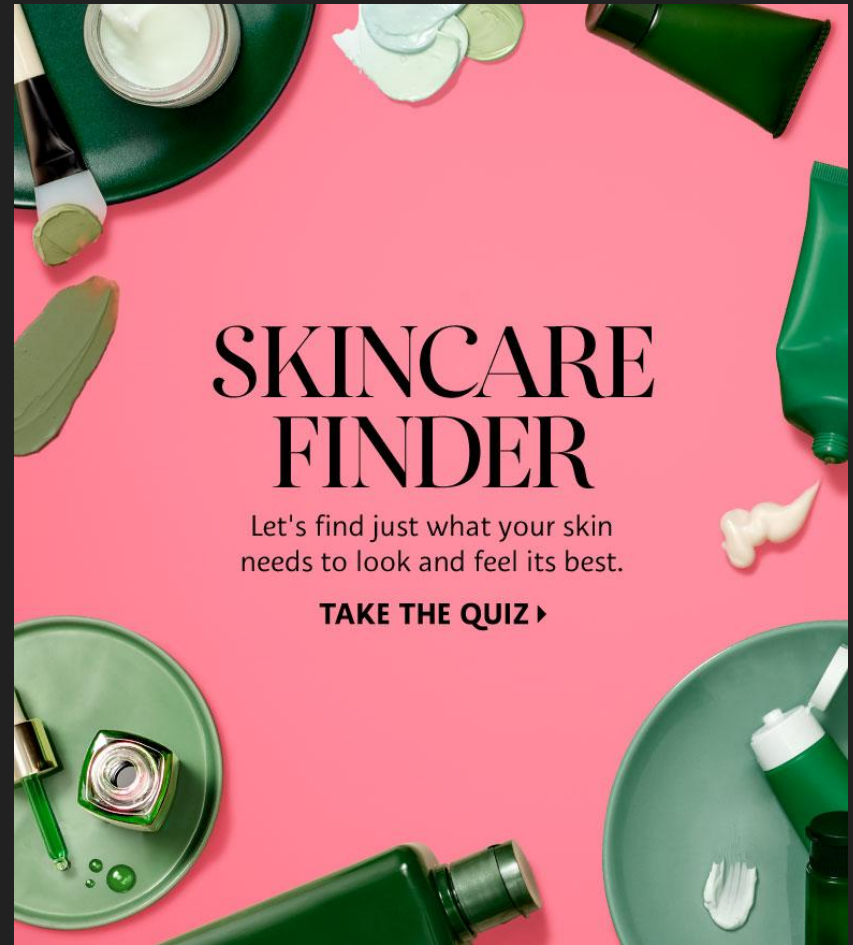
About Sephora

- Sephora is a French multinational retailer of personal care and beauty products.
- Sephora offers beauty products including cosmetics, skincare, body, fragrance, nail color, beauty tools, body lotions and hair care.
- Sephora carries over 3,000 brands and operates over 2,700 stores in 35 countries worldwide

About the Sephora Website Dataset

- The dataset of the Sephora website I used for this investigation was obtained from Kaggle ()
- The dataset contains 2054 skincare products
- From the dataset, I kept the following columns:

Name	Rating	Love	Price	Details	Ingredients

- I also made a separate dataframe using the ingredients column

Paula's Choice

- Paula's Choice is a skincare brand and published information on skincare
- Paula's Choice publishes an ingredient dictionary that is extremely well researched and cited among skincare experts
- From Paula's Choice website: "We endlessly read medical and scientific journals for research related to every aspect of skin care ...from over 35 years of work"
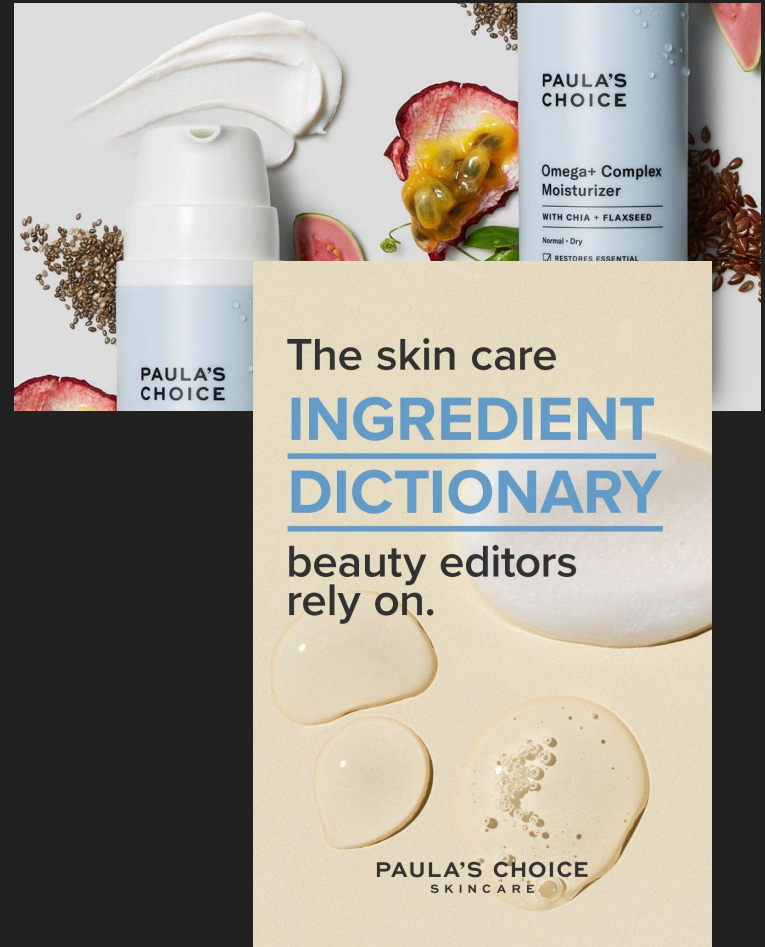
Paula's Choice Dataset

- I built a web scraper to obtain create a dictionary containing the Paula's Choice Ingredient Dictionary
- The dictionary had 27 keys corresponding to different ingredient categories (i.e. anti-aging, hydration, etc) and the values were lists filled with ingredient names
- I also converted this dictionary to a dataframe

Starting Questions

1. How many products on the Sephora website contain sensitising ingredients?

2. What is the most references skin type on the Sephora website?

3. Which skin type received the most likes on the Sephora website?
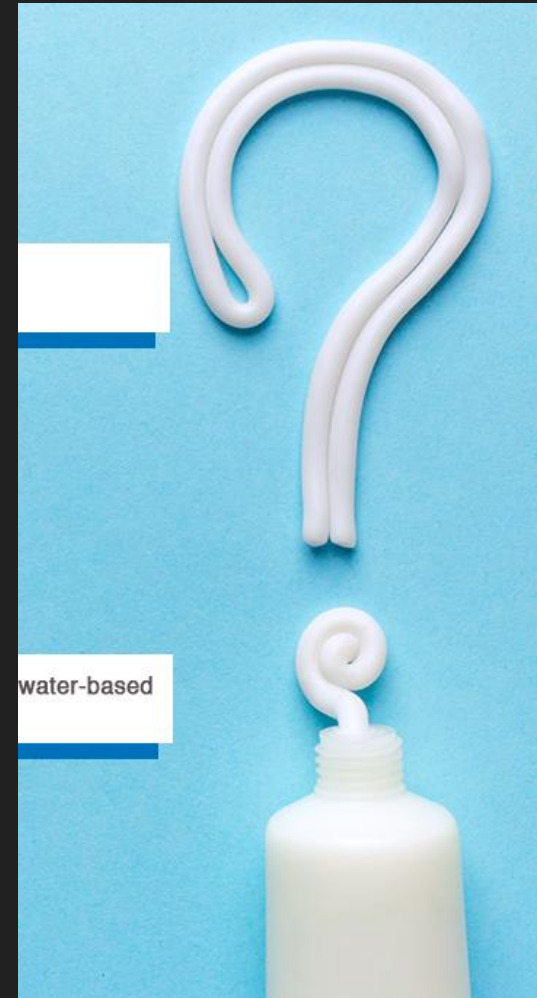
# Number of Products Containing Sensitising Ingredients

- According to my analysis, **zero** skincare products on the Sephora website contain sensitising ingredients
- However, this may also be because I used the Paula's Choice Ingredient Dictionary dataframe to define ingredients as sensitizing and perhaps the Sephora skincare products contain lesser known sensitizing ingredients not listed on the Paula's Choice website.

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What is the most referenced skin type on the Sephora website?

Figure A Caption: The "dry" skin type is the most referenced skin type in Sephora products with over 1600 mentions, this type is followed by "normal", "combination" and "oily" with "sensitive" being the least references out of all types by far as it barely has more than 600 mentions.

Figure A

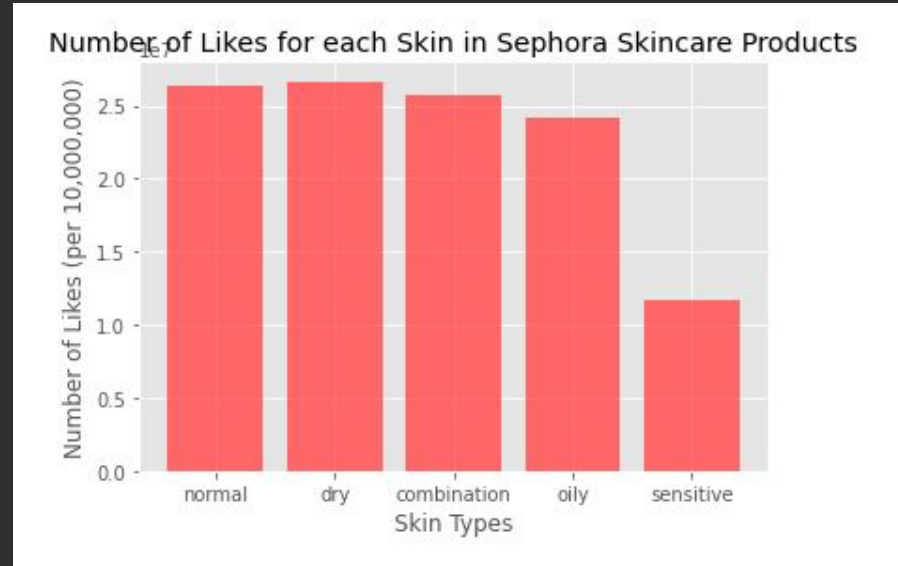Skin Type References in Sephora Skincare Products
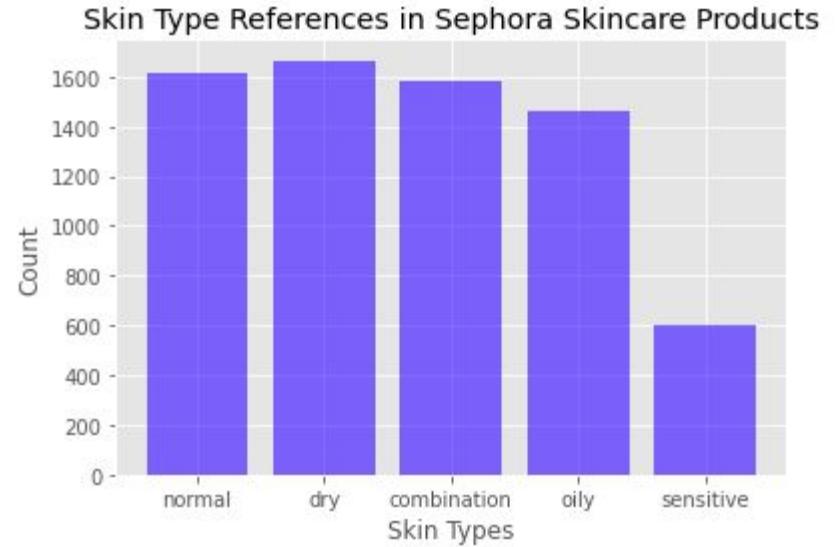
What is the most liked/loved skin type on the Sephora website?

Figure B Caption: The "dry" skin type is the most loved skin type on the Sephora website with over 1600 mentions, this type is followed by "normal", "combination" and "oily" with "sensitive" being the least references out of all types by far as it barely has more than 600 mentions.

However, this bar graph made me question whether "dry" just had the most number of "loves" because it was the most targeted out of all skin types. As a result, I decided a better measure of finding the "most loved" skin type was the find the skin type with the largest average number of "loves".

Figure B

Number of Likes for each Skin in Sephora Skincare Products

What is the most liked/loved (using average number of "loves") skin type on the Sephora website?

Figure C caption: Using average number of "loves", the "dry" skin type is not longer the "most loved". Rather, it is the "sensitive" skin type. In fact, the "dry" skin type has the lowest average number of likes. And the "normal", "combination", and "oily" skin types have roughly the same with the "oily" type having a bit more than the other two.

This result was very surprising to me as, from a previous bar graph, it is clear that the "sensitive" skin type is the least targeted out of all Sephora products. I wanted to visualize this discrepancy and see if there was a similar gap for the other skin types...

Figure C

Average Number of Likes for Each Skin Type in Sephora Skincare Products
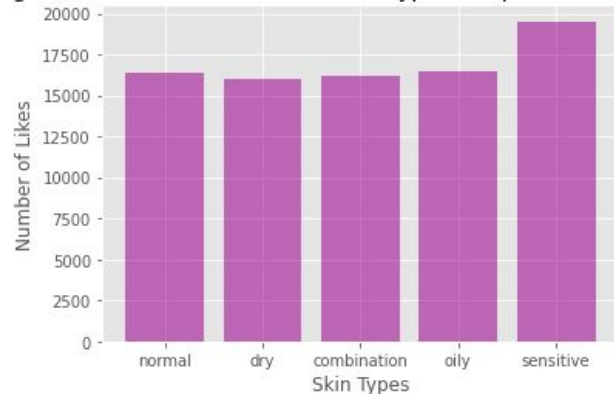
Let's dive deeper into the differences between the products targeting different skin types on the Sephora website...
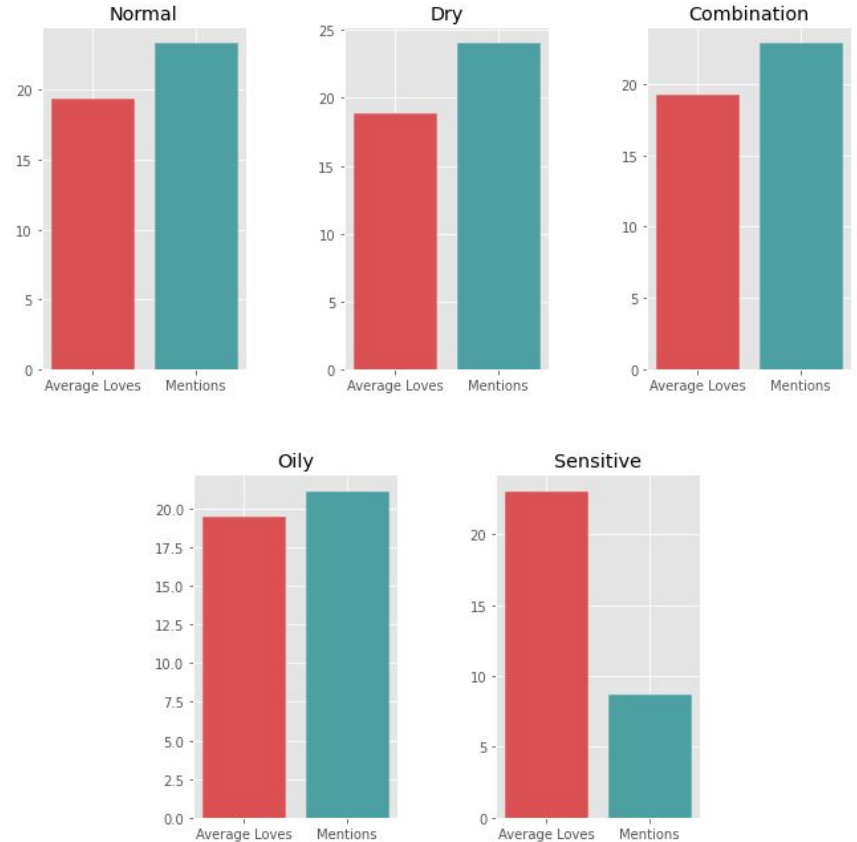
Figure D

Figure D Caption: Clearly, the sensitive skin type is the only type where the average loves far outweighs its mentions. In fact, for all other skin types, the number of products targeting it outweighs the average number of likes.

However, this makes me wonder whether the type of ingredients used in the products targeting different skin types is truly that different. This led me investigate the percentage breakdown of the different ingredient types for each skin type.
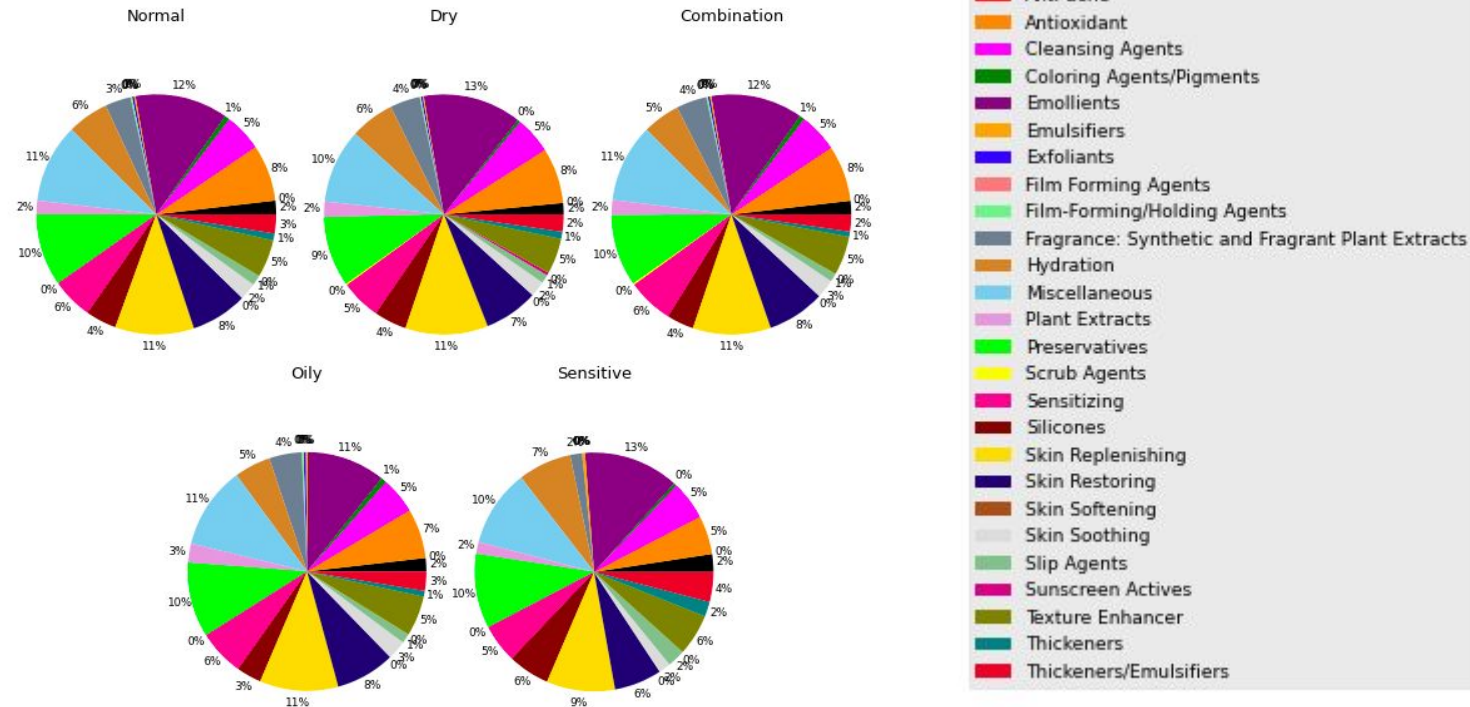

Percentage of Total Average Loves and Mentions for Each Skin Type

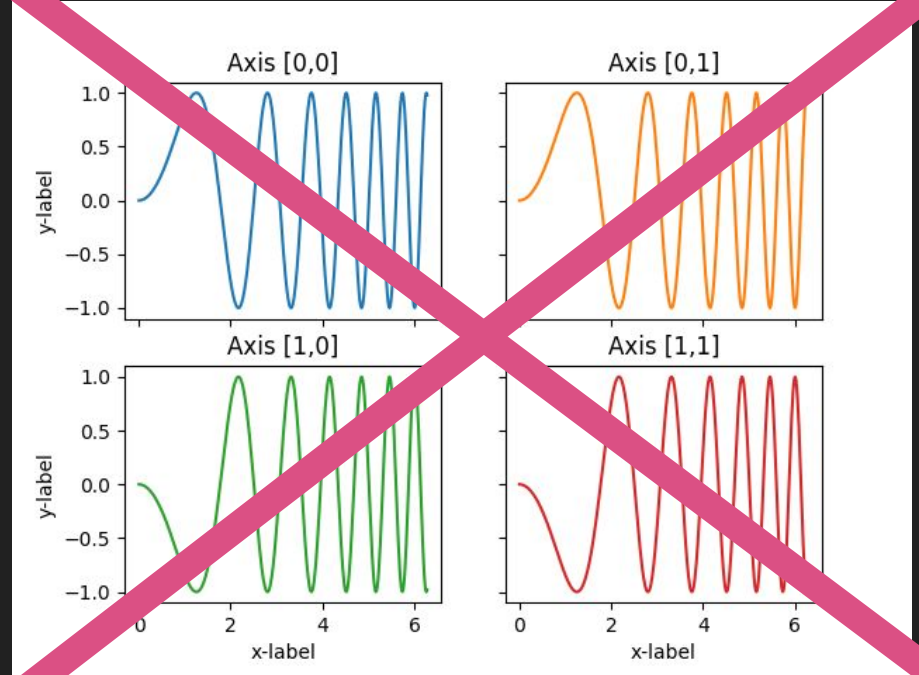# Ingredient Category Breakdown for Each Skin Type

Ingredient Category Percentage Breakdown for Each Skin Type

This figure shows that, although the percentages vary a bit from skin type to skin type, we can see a remarkable similarity between the largest ingredient categories for each skin type. In all skin type, the largest ingredient categories include: "Miscellaneous", "Skin Replenishing", "Emollients", "Skin Restoring", "Preservatives", and "Antioxidants".

Additionally, although, using subplots is very good for comparing the different skin types, the pie charts become rather small to fit the shared space. As a result, I will presenting individual pie charts for each skin type so the breakdown of ingredient categories is more easily recognizable.
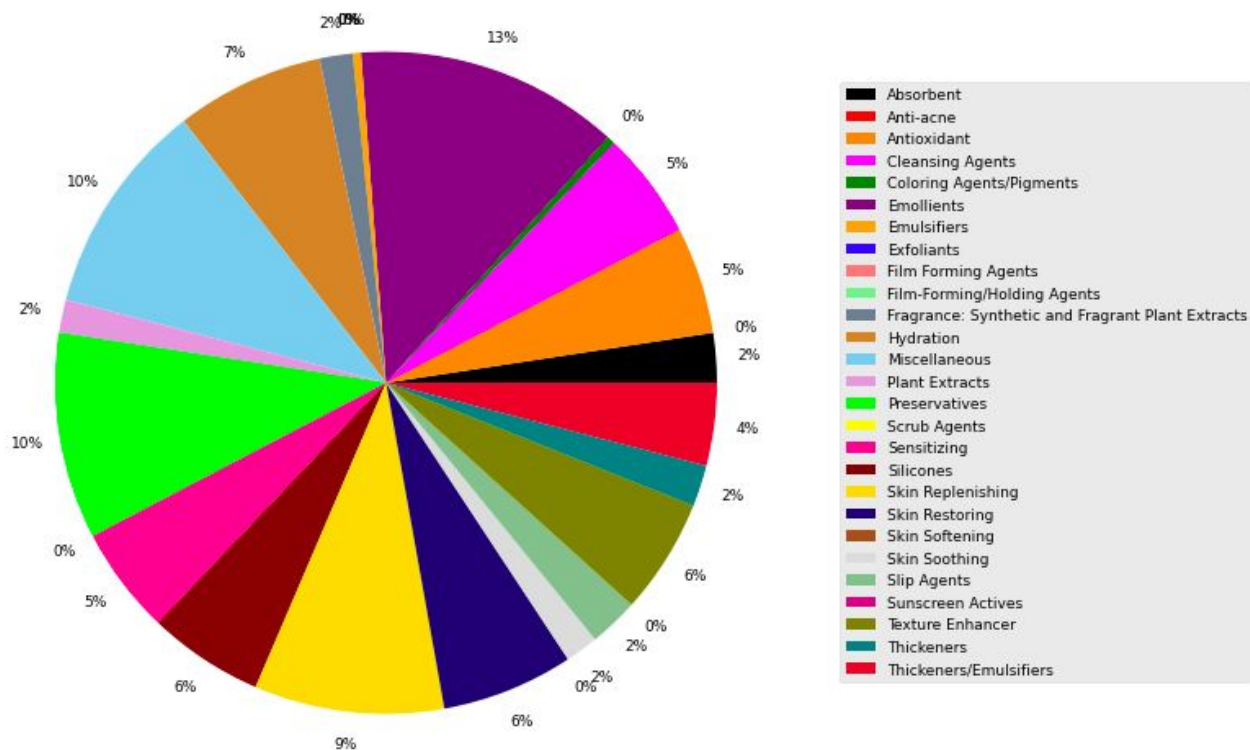
Ingredient Percentage Breakdown for Dry Skin Type
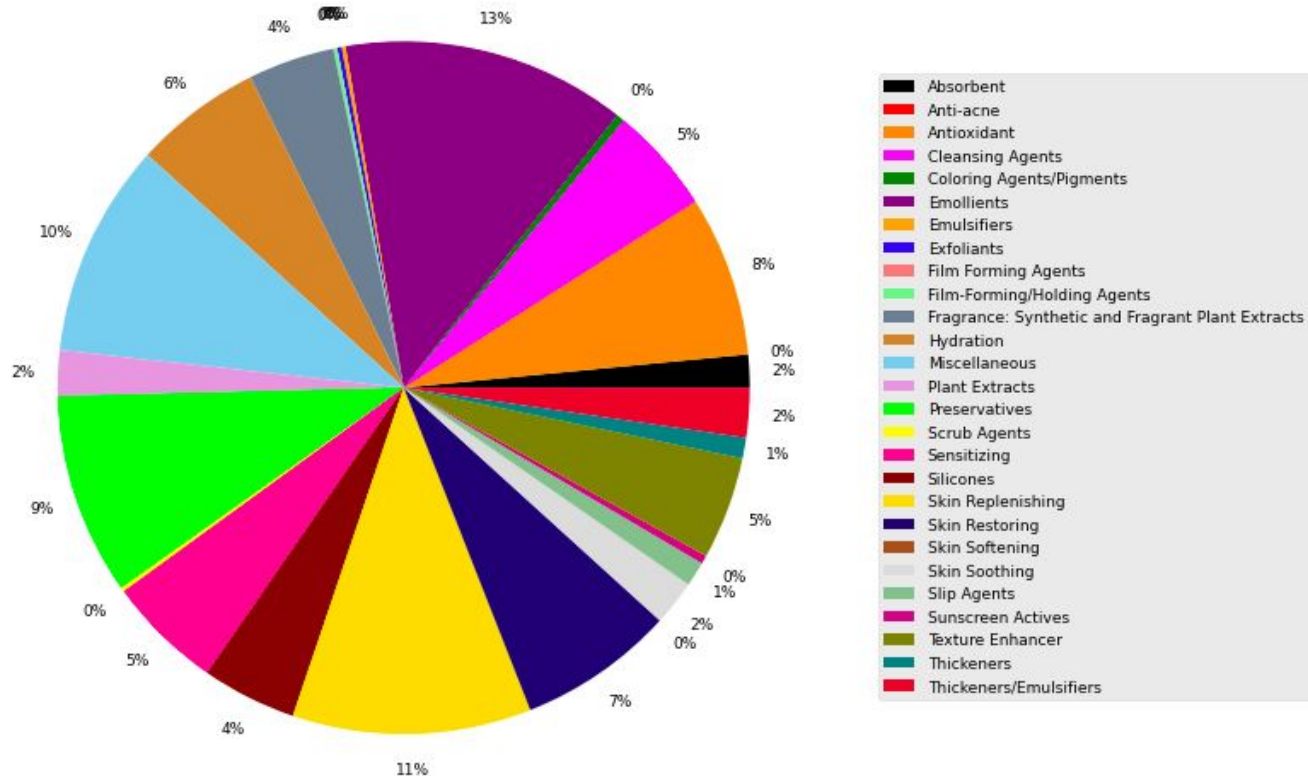
This figure shows that the ingredient categories most used in skincare products targeting the "dry" skin type on the Sephora website are "Emollients" with 13%, Miscellaneous" with 10%, "Skin Replenishing" with 11%, "Preservatives" with 9%, "Antioxidants" with 8% and "Skin Restoring" with 7%.
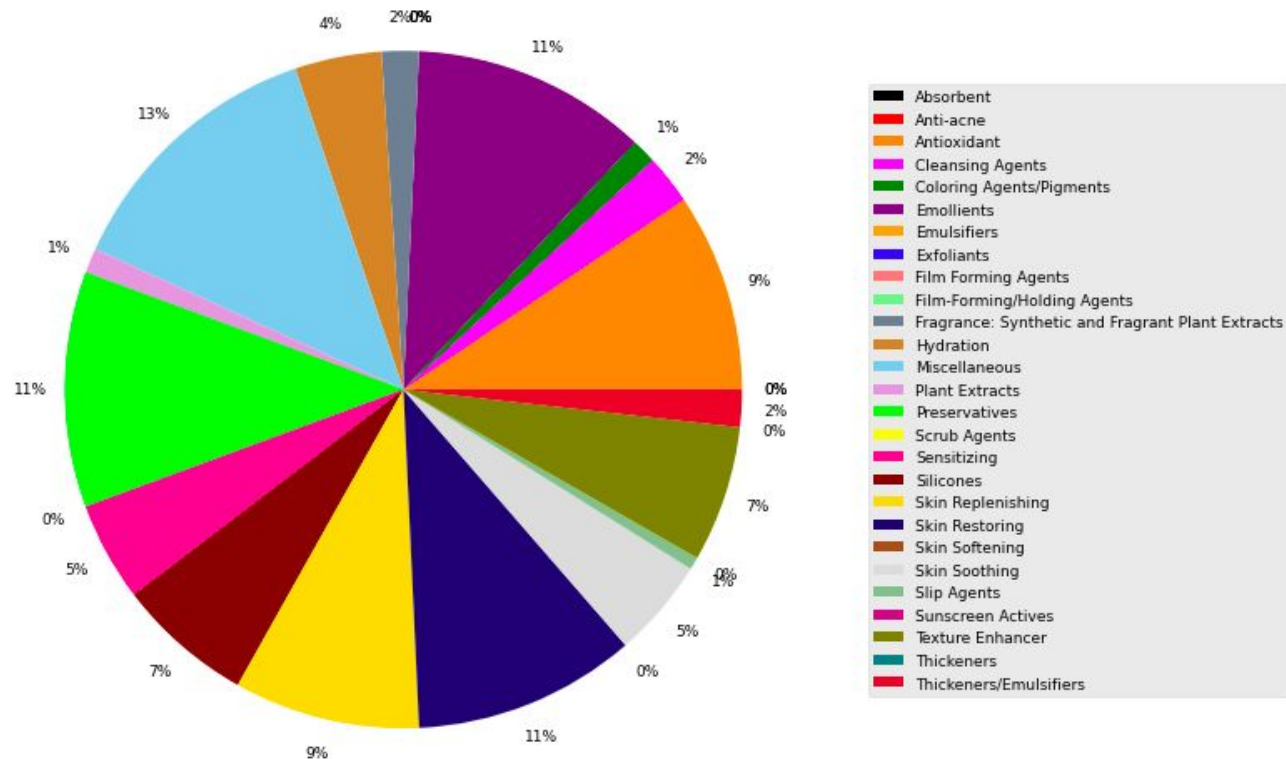
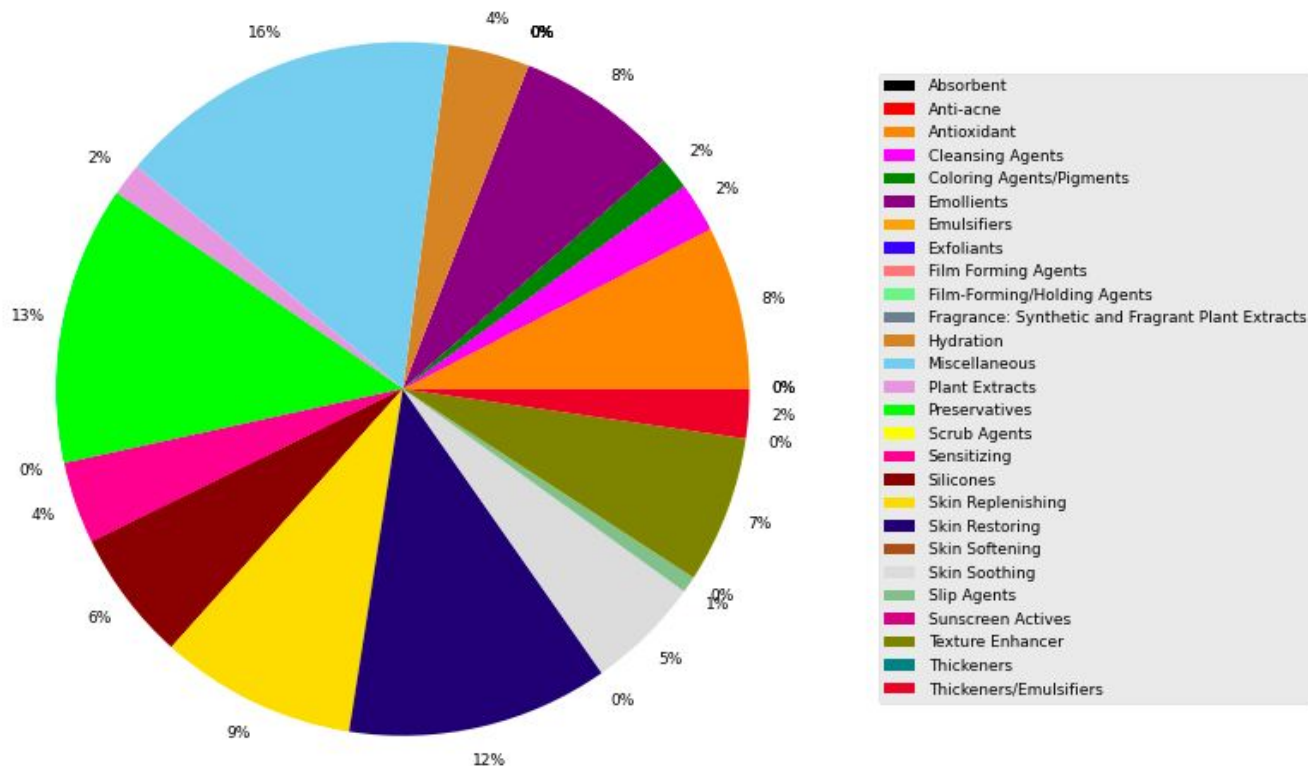Ingredient Category Breakdown for Sensitive Skin Type

This figure shows that the ingredient categories most used in skincare products targeting the "sensitive" skin type on the Sephora website are "Emollients" with 13%, Miscellaneous" with 10%, "Skin Replenishing" with 9%, "Preservatives" with 10%, and "Skin Restoring" with 6%.

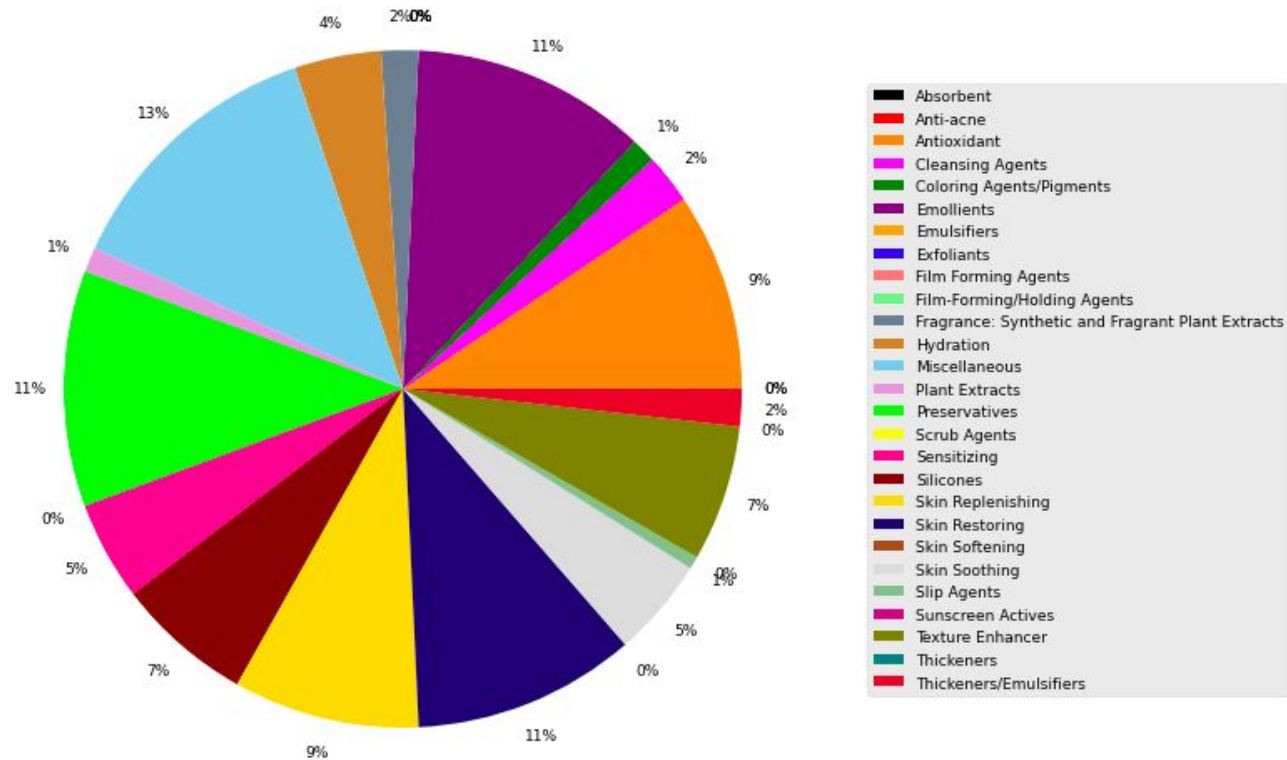Ingredient Category Percentage Breakdown for Normal Skin Type

This figure shows that the ingredient categories most used in skincare products targeting the "normal" skin type on the Sephora website are "Emollients" with 11%, Miscellaneous" with 13%, "Skin Replenishing" with 9%, "Preservatives" with 11%, "Antioxidants" with 9% and "Skin Restoring" with 11%.

Ingredient Category Breakdown for Oily Skin Type

This figure shows that the ingredient categories most used in skincare products targeting the "oily" skin type on the Sephora website are "Emollients" with 8%, Miscellaneous" with 16%, "Skin Replenishing" with 9%, "Preservatives" with 13%, "Antioxidants" with 8% and "Skin Restoring" with 12%.

This figure shows that the ingredient categories most used in skincare products targeting the "combination" skin type on the Sephora website are "Emollients" with 11%, Miscellaneous" with 13%, "Skin Replenishing" with 9%, "Preservatives" with 11%, "Antioxidants" with 9% and "Skin Restoring" with 11%.

THE RESULTS ARE IN

In Conclusion

Based on this analysis, I believe Sephora should expand the amount of products targeting sensitive skin as my analysis shows there is a gap in the amount of products targeting this skin type and the demand for them. Additionally, this should not prove too difficult as, as seen by my analysis of the ingredient category breakdown of each skin type, Sephora's skincare products use remarkable similar ingredient categories for each skin type.

Weakness of Analysis

- I believe my greatest disadvantage in this investigation was the size of the Paula's Choice dataset
- Although the ingredient dictionary is quite large and well researched, it is probably not large enough to completely accurately analyze all the ingredients present in Sephora skincare products
- In the future, I would hope to combine ingredient dictionaries from multiple sources to create a greater scope of ingredient analysis

Future Steps

In the future, I would also hope to process the language used in the descriptions of the products and deduce which words/phrases received the most "loves" and which had the highest rating. I would also like to investigate which ingredients where most used in products that contained these words/phrases.

Thank you!

Feel free to ask any questions!