Clean and Green Beauty Movements: Does it Reflect the Growing Concern of Endocrine Disruptors in Cosmetics?

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Abstract

This study examines whether the "clean beauty" or "green beauty" movement is correlated to the growing concern about endocrine disruptors in cosmetics using a Google Trends (U.S.) analysis of months (n = 189) from 2004 to 2019. The searches for endocrine disruptors does not seem to be the primary source for the popularity of the clean and green beauty movements.

Introduction

Due to health and environmental consciousness among consumers, low-chemical and organic beauty products have gained popularity in society. The beauty industry has been responding to consumer awareness through the *clean beauty* and *green beauty* movements. Clean beauty products contain less harmful chemicals. Green beauty products are biodegradable, eco-friendly, and use less harmful chemicals. Endocrine disruptors are chemicals that interfere with the human body's hormones, glands, reproductive system, and metabolism. A few examples of endocrine disruptors are parabens, bisphenol A (BPA), pesticides, and phthalates. As a result of endocrine disruptors in the use of products, researchers have discovered a multitude of health concerns (i.e., infertility, diabetes, obesity, metabolic syndrome, thyroid problems, hormone imbalances, and cancers).
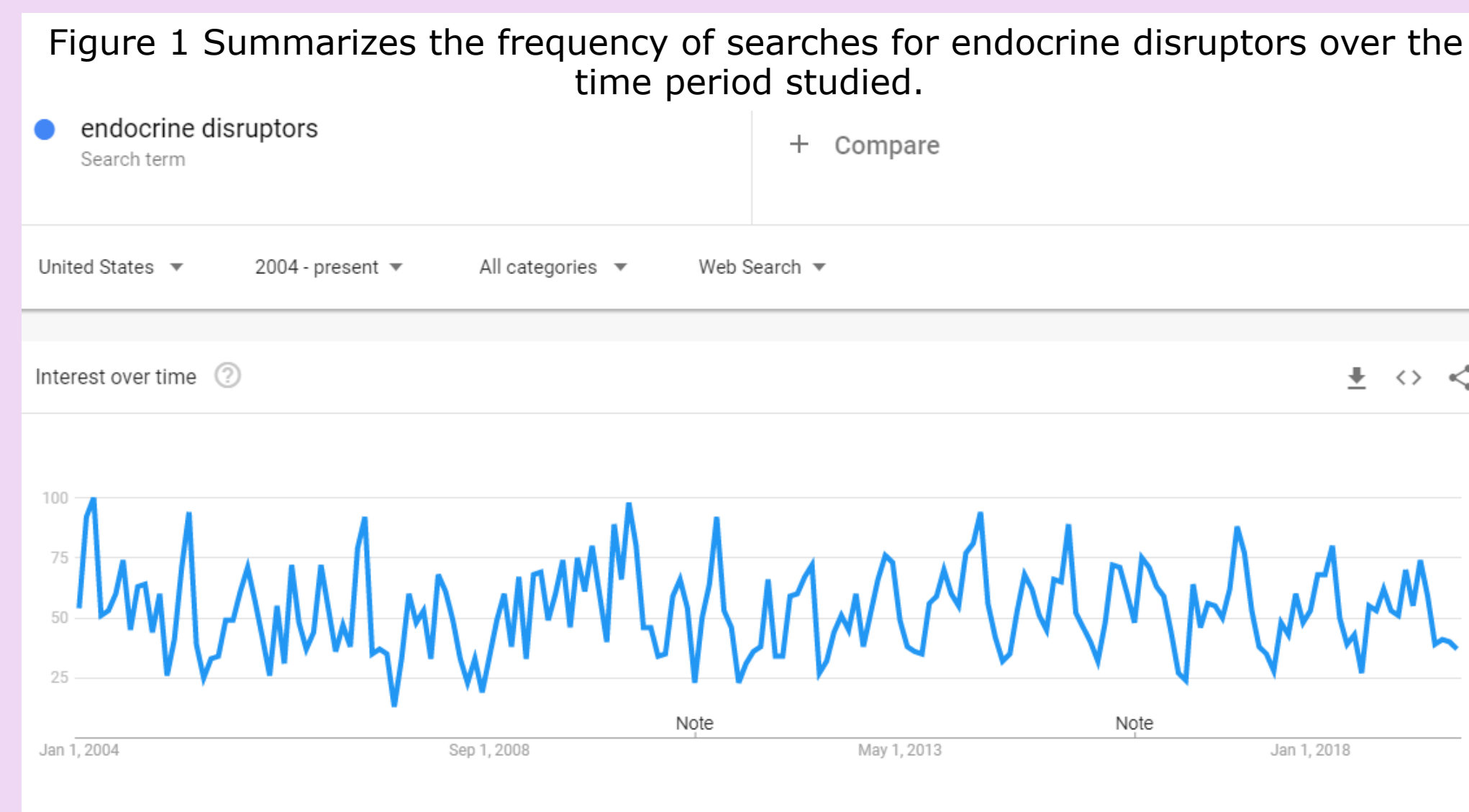
Hypotheses

H # 1: Searches for green beauty will positively correlate with searches for endocrine disruption.
H # 2: Searches for clean or green beauty will show spikes surrounding events in popular media (i.e., social media, celebrities, etc.).
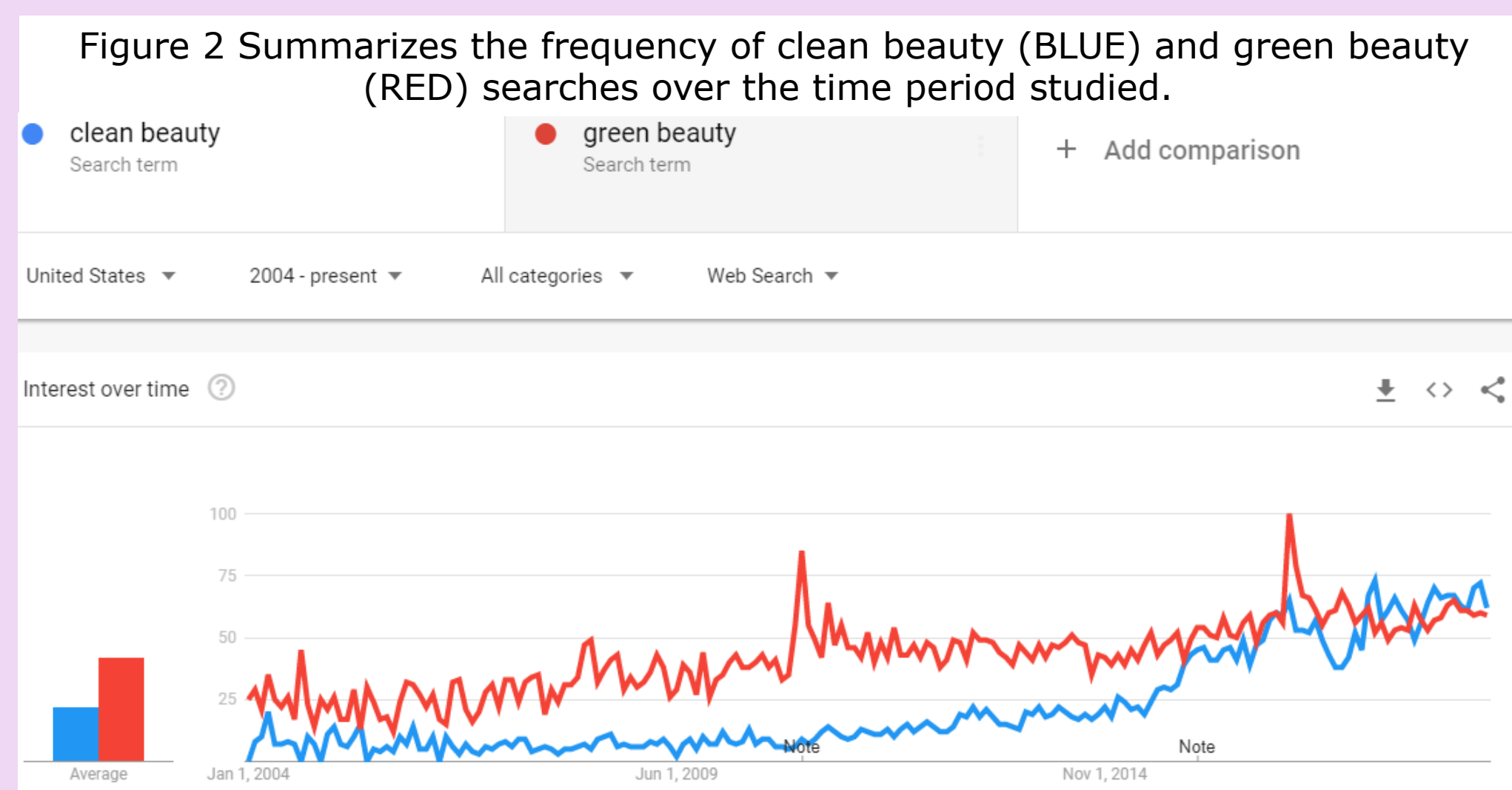
Method

A Google Trends (U.S.) analysis of months (n = 189) from 2004 to 2019 was used to determine whether "clean beauty" or "green beauty" movement is correlated to the growing concern about endocrine disruptors. The data from Google Trends was imported into JASP (a statistics program) to find the descriptive statistics of the central tendency and dispersion (e.g., mean, median, minimum, standard deviation, skew coefficient) for each variable. The Bayesian sequential analysis to determine if a given correlation persisted over the time period studied.

Results

Figure 1 Summarizes the frequency of searches for endocrine disruptors over the time period studied.

The search term "endocrine disruptors" was found to be inconsistent and less frequently searched than the other two terms, yet there were various spikes in the month of March or April.

Figure 2 Summarizes the frequency of clean beauty (BLUE) and green beauty (RED) searches over the time period studied.

- The clean beauty line graph (BLUE) has the highest peaks in March 2017 and April 2018 (read left to right).
- The green beauty line graph (RED) has the highest peaks in January 2011 and March 2017 (read left to right).
- The search terms "clean beauty" and "green beauty" have increased slowly.
- Both search terms had periodic spikes within the last two years most likely due to events in popular media.
- Since January 2017, "green beauty" has been the most searched term.
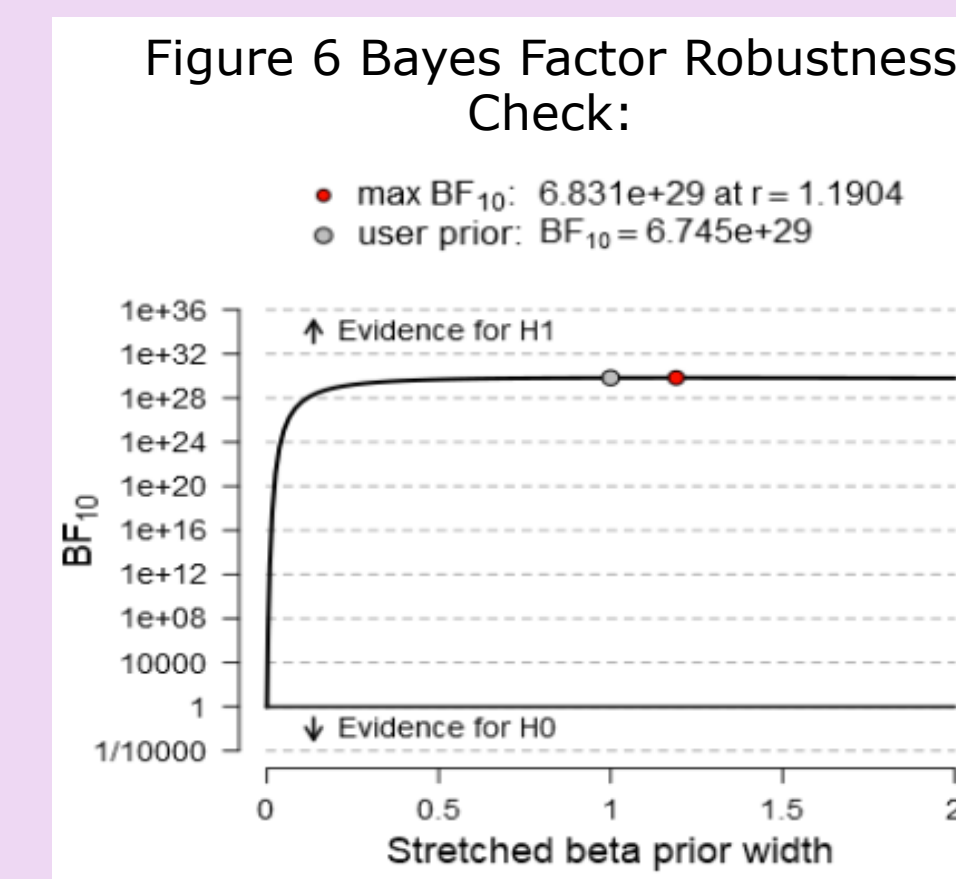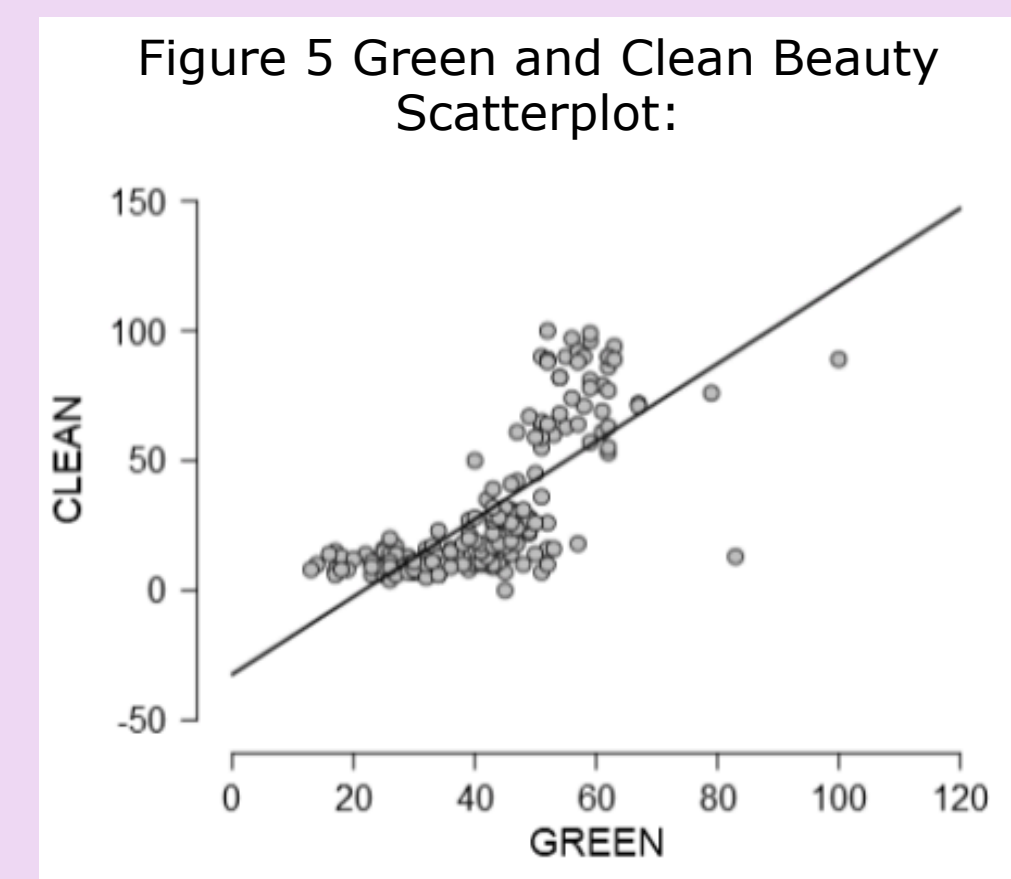
Figure 3 Descriptive Statistics

Term	Mean	Median	Minimum	Skew	SD
Clean	30.72	17.00	0	1.154	27.93
Green	42.15	43.00	13.00	0.4216	13.68
Endo	53.49	53.00	10.00	0.3050	18.39

Figure 4 Correlation Matrix

Spearman Correlations

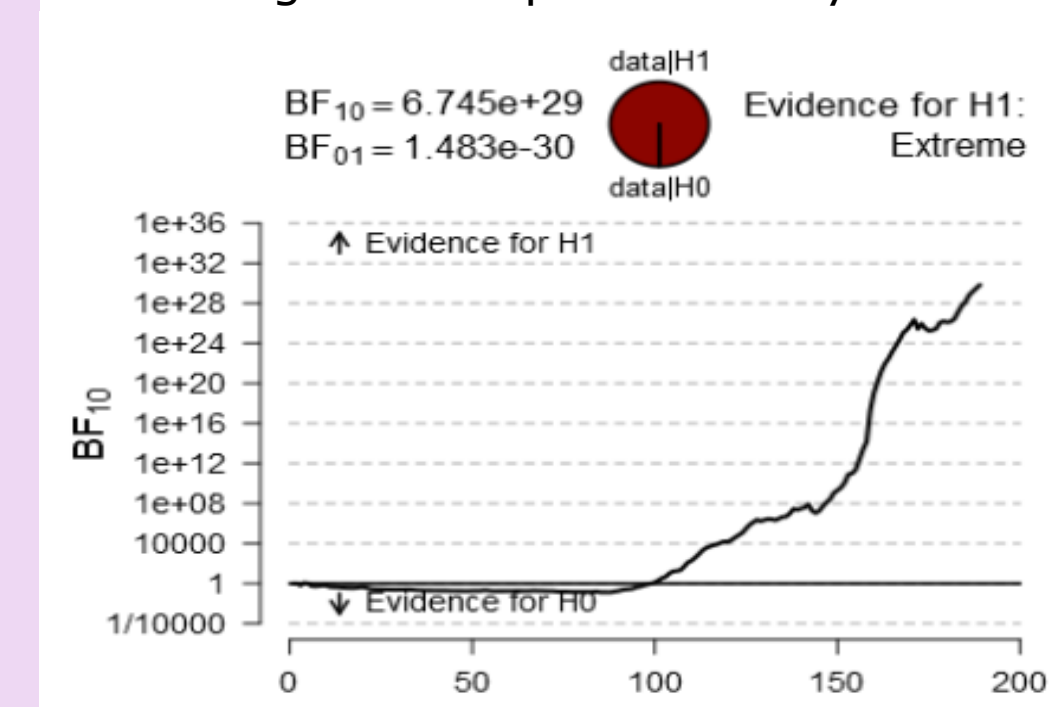|	CLEAN	GREEN
CLEAN	—	
GREEN	0.784 ***	—
ENDO	0.075	-0.023

* p < .05, ** p < .01, *** p < .001

- There is no relationship between searches for endocrine disruptors and clean beauty (rho = +0.075), as well as searches for endocrine disruptors and green beauty (rho = -0.023).
- As a result, public concern for endocrine disruptors does not seem to be the principal source for the popularity of the clean or green beauty movement.
- Thus, the first hypothesis is not supported.

Figure 5 Green and Clean Beauty Scatterplot:

Figure 6 Bayes Factor Robustness Check:

When people search for clean and green beauty, the correlation is positive, and the significance (as measured by a Bayes Factor) of the relationship gets better over time (as seen in this sequential analysis).
- Before 2011, there was not a correlation between the searches for clean and green beauty.
- Until 2011, the correlation has increased. Thus, the relationship between the two has been getting stronger.
- People searching for one term, are continuing to search for the other term.

Figure 7 Sequential Analysis:

The Bayesian sequential analysis indicates that this relationship has strengthened over time.

Discussion

Consumers purchase clean or green beauty products for the purpose of avoiding harmful chemicals in order to manage their health, the environment, or both. This study found:
- The clean and green beauty movement is not primarily due to public concern for endocrine disruptors.
- The searches for clean and green beauty are positively correlated.
- The Bayesian Sequential Analysis shows the correlation between "clean beauty" and "green beauty" has become stronger overtime.
- People searching "endocrine disruptors" were not searching for "clean beauty" or "green beauty" (rho = +0.08, rho = -0.02 respectively).

Future research should consider using correlations between clean and green beauty with alternative terms (i.e., chemicals, hormone disruptors, etc.) because The term "endocrine disruptors" may be too specialistic.

Figure 8 Kourtney Kardashian at Capitol Hill to advocate for safety regulations in cosmetics.

Figure 9 Gwyneth Paltrow on the Cover of Women's Health Magazine

Celebrities have a history of influencing consumers to purchase beauty products. To this day, celebrities continue to influence beauty standards.
- The April 2018 spike on the clean beauty line graph may be related to Kourtney Kardashian speaking at Capitol Hill about the safety of cosmetics.
- The March 2017 spike on the clean beauty, green beauty, and endocrine disruptors line graphs may be related to Gwyneth Paltrow because she was in Women's Health magazine and became the CEO of Goop.

Thus, the second hypothesis is supported.

References

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