



Givaudan

When skin and scalp appearance can affect emotional response: skin-brain axis exploration through the use of three neuroscience tools

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Introduction

Since a couple of years in cosmetic industry, experts in skin research have increased their interest in understanding the link between the people's skin condition and their state of mind: the skin-brain axis. We can illustrate this axis with skin sensitivity which affects many people worldwide. Clinically, people with skin sensitivity suffer from unpleasant feelings every day, due to itching, skin redness and pricking sensations. It also has been shown in many psycho-dermatology studies that people suffering from sensitive skin are emotionally affected by their skin appearance. Indeed, skin appearance is considered the most important part of the body influencing the mind. For example, it has been observed that people who have unaesthetic skin disorders

on their face are more prone to depression, anxiety and lost sleep, feel unable to play a useful role, lose confidence and experience many other negative feelings. Regarding these observations, we formulated the hypothesis that people who have sensitive skin, and also people suffering from other visible skin disorders such as dry and itchy scalp would be emotionally affected, with an increase of negative moods. Moreover, we supposed that soothing active ingredients with a proven biological and clinical soothing efficacy would trigger an increase of positive emotions for people suffering from these conditions. Givaudan decided to explore this skin-brain axis by studying the feelings and the mood of people suffering from skin and scalp sensitivity.

Materials & Methods

2 double-blind and placebo controlled studies

Sensitive skin panel

- 40 volunteers
- Aged from 20 to 49 years old
- Capsaicin sensitivity
- Twice daily application of soothing ingredient versus placebo on face for 28 days

Dry and itchy scalp panel

- 30 volunteers
- Aged from 18 to 75 years old
- White flakes, itching and dry scalp
- Twice daily application of a soothing ingredient versus placebo on scalp for 28 days

Emotional evaluation using neuroscience methods

Pictures selection method: a non-verbal method

Non-verbal communication: evaluating unconscious emotions

Grid of non-verbal communication reading: analysis of all the non-simulated facial expressions, body postures, voice tone and related typical emotions.
→ over 200 non-verbal reactions.
Laugh, caressing face / hair = happiness, sensuality = **positive emotions**
Pouting on the mouth, grinning = contrariety, unpleasantness = **negative emotions**

Prosody analysis

Day 0 versus day 28.

Two main variables extracted:

- Loudness (i.e. vocal intensity): mean amplitude measured in dB.
- Pitch (i.e. tone): coefficient of variation of the fundamental frequency (cvFO) measured in Hz.

→ Assessment of the degree of emotional valence and arousal expressed vocally.

What do you feel today about your scalp?



Results & Discussion

Sensitive skin

Picture selection method



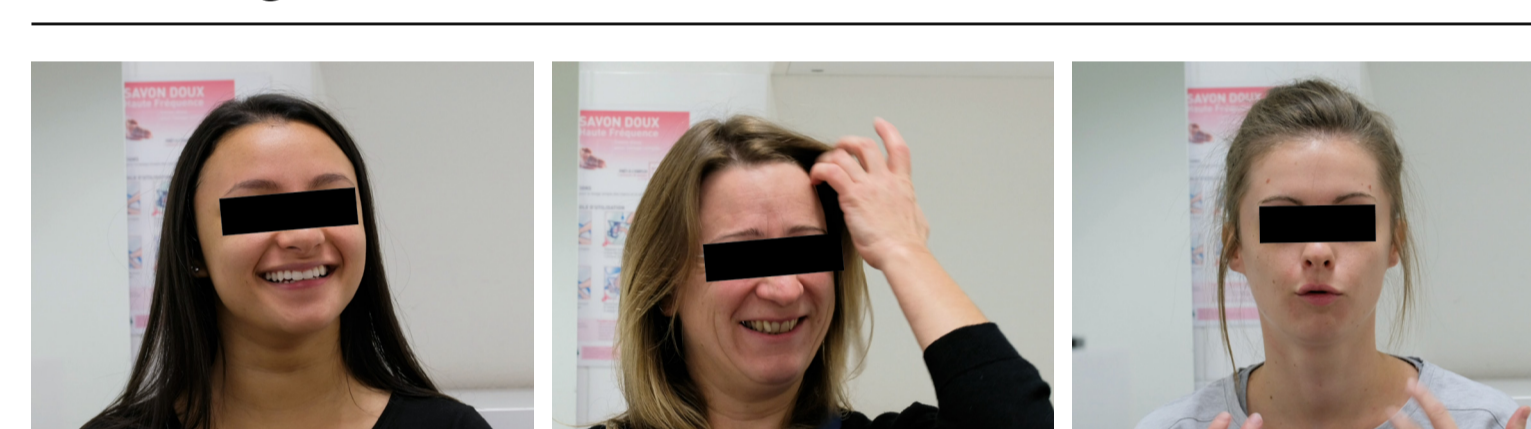
Majority of negative moods expressed by people with sensitive skin (left panel). Soothing ingredient positively influence the mood of people with sensitive skin versus placebo (right panel), with a significant increase of emotions such as confident and invigorated.



Non verbal communication

25 positive emotions and 3 negative emotions after using soothing ingredient versus an equal amount of each with placebo (10 positive and 10 negative emotions).

Soothing active



Happiness Sensuality Protection & appeasement

Placebo



Contrariety Unpleasantness Disinterest

Dry and itchy scalp

Picture selection method

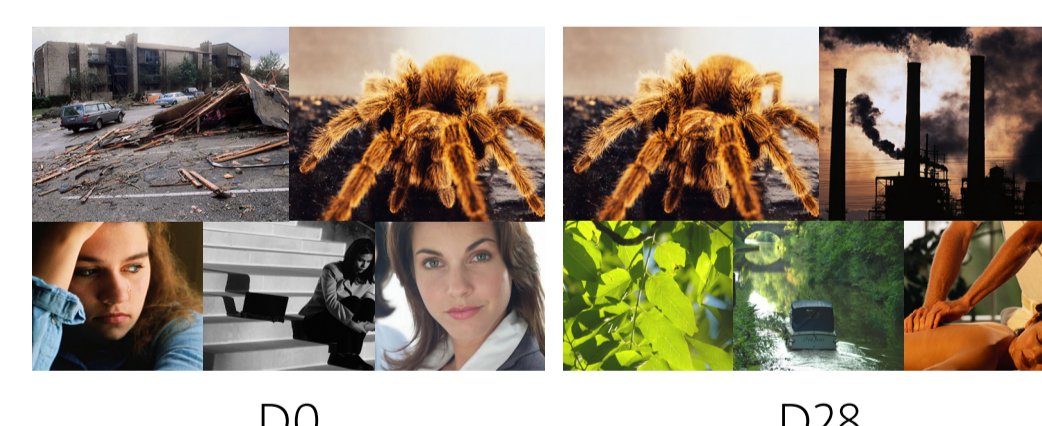
Majority of negative moods expressed by people with dry and itchy scalp (left panel). Soothing ingredient positively influence the mood of people with sensitive skin who selected images evoking refreshing and self-confidence feelings and did not selected negative images. Neutral emotions expressed by volunteers with placebo (right panel).

Soothing active



D0 D28

Placebo



D0 D28

Non verbal communication

Soothing active



Comfort, care, happiness → 19 positive emotions and 4 negative emotions

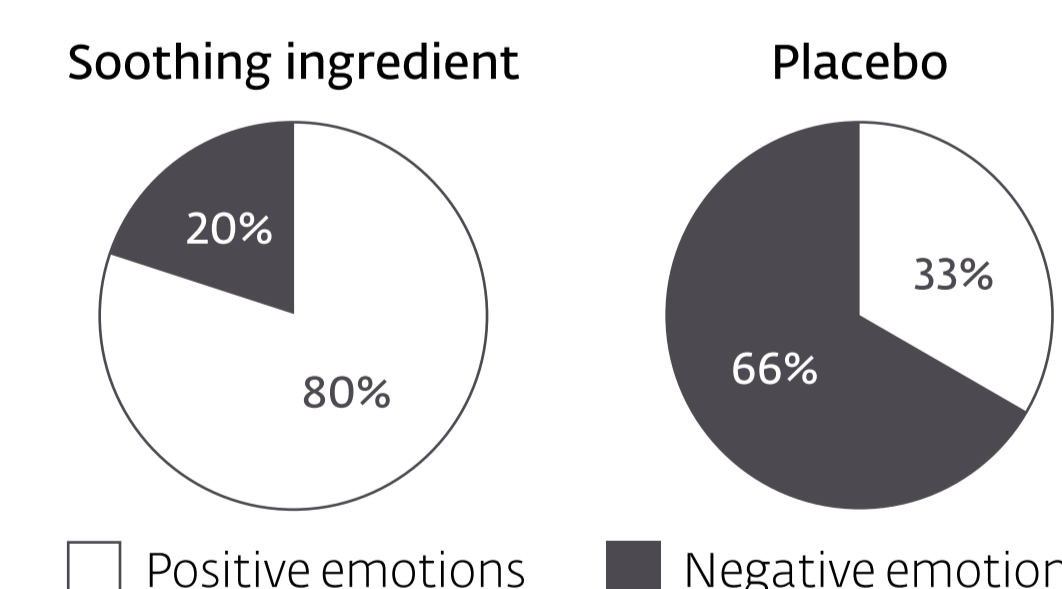
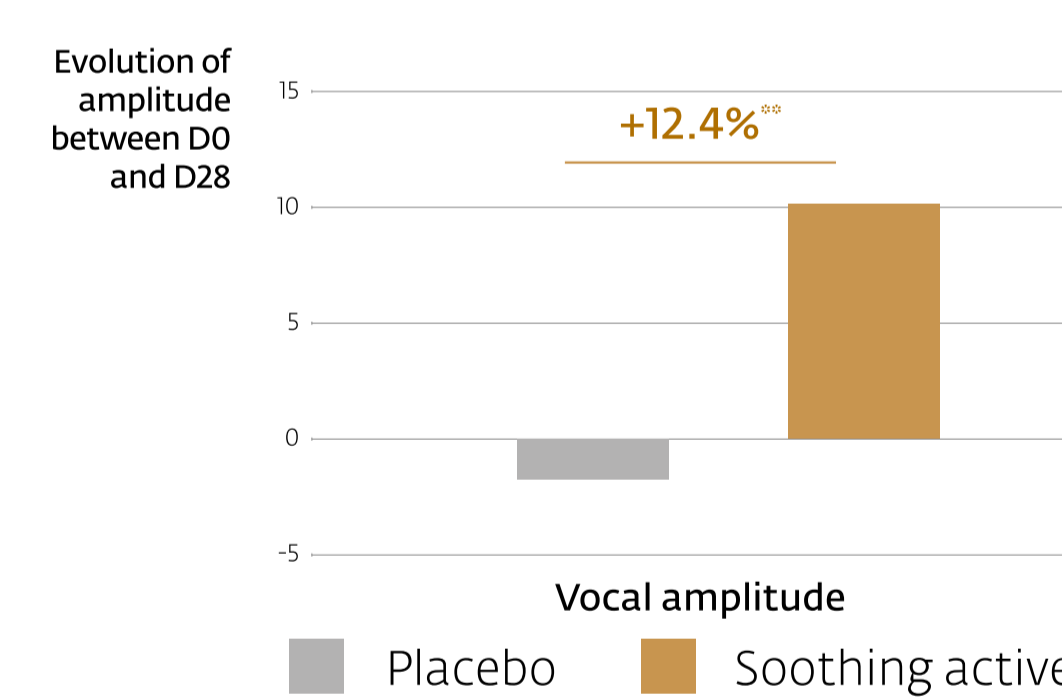
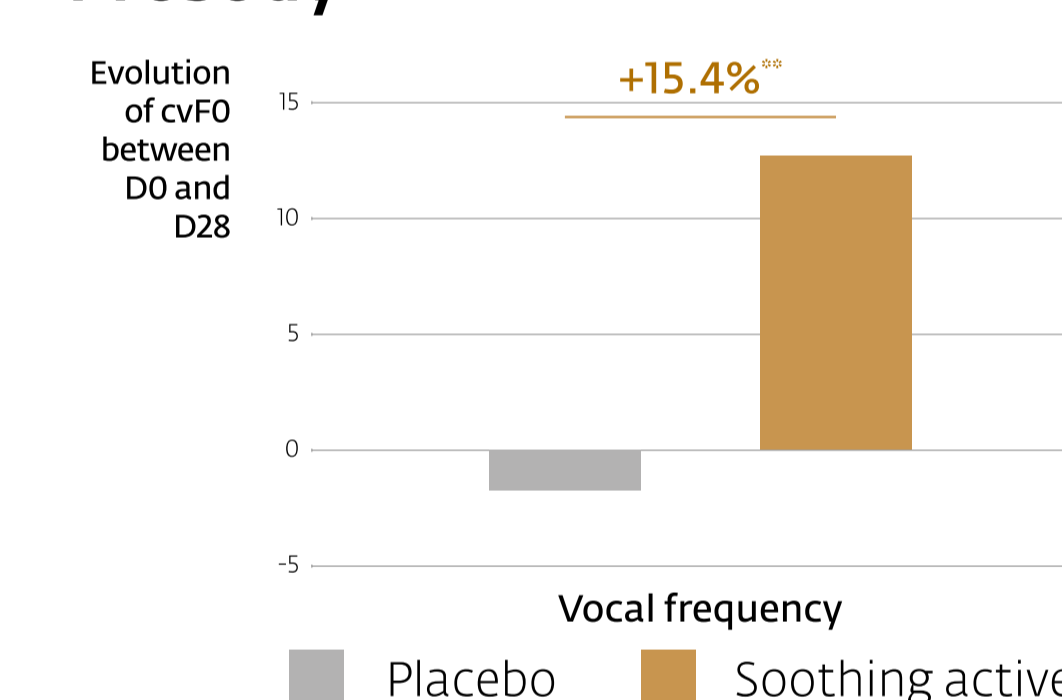
Placebo



Annoyance → 2 positive emotions and 14 negative emotions

Increase of vocal frequency and amplitude with soothing ingredient = more positive emotions felt by volunteers using the soothing ingredient

Prosody



Conclusions

Using three neuroscience tools, we highlighted that sensitive skin and dry and flaky scalp negatively impact the emotional response of volunteers. We have fully proven that the soothing efficacy of an active ingredient correlates well with an improvement in the volunteers' mood for more positive emotions, whether

by pictures selection, by facial reactions, posture, micro-expressions, or by the voice tonality. This improvement of their emotional response is a proof of the link between appearance and emotion expressed by skin-brain axis. Thanks to our research and observations, we reinforced the link between skin/scalp sensitivity and emotions, and evidenced that evaluating emotions using new and disruptive methods could be a new method for measuring the efficacy of a soothing activity.

Aknowledgments

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