

Long Lasting Fragrances with High Emotional Impact: a Possible Match?

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1. Introduction

In the world of fragrance development, three key criteria often drive consumer choice: hedonic liking, technical performance, and increasingly, emotional impact. While liking and performance are well-established metrics in sensory evaluation, the integration of emotion as a measurable and claimable attribute remains an emerging field. Consumer preferences are becoming more complex, often seeking products that do not only smell pleasant and last long but also resonate emotionally. The present study explores the potential of aligning these three dimensions within a single fragrance development process. This research aimed to evaluate whether fragrances designed with emotional targets can also meet standards of consumer liking and olfactory performance. The study focused on a young adult female demographic in two European markets—France and the Netherlands—and tested four fragrances formulated with aromachological principles to elicit distinct emotional responses. This paper discusses the methodology, key findings, and implications for future fragrance design.

2. Materials and Methods

2.1. Fragrances and Raw Materials

Four finished perfumes—Safe, Balanced, Desirable, and Fierce—were selected for the study. Each fragrance was developed using specific raw materials chosen based on aromachological insights aimed at targeting particular emotional benefits. The perfumes

were formulated in an ethanol base and represented a variety of olfactory families. Additionally, four raw materials present in the compositions were tested independently to evaluate their intrinsic effects on perception and emotional responses. This dual testing approach allowed for a comparison between the isolated ingredients and the complete fragrances.

2.2. Participants

A total of 144 perfume users were recruited for the liking and emotions evaluations. The sample included 72 participants from France and 72 from the Netherlands. Each country's sample was composed of 60 women and 12 men aged between 18 and 35 years. All participants were regular users of fine fragrances, ensuring familiarity with evaluating such products. The age range was chosen to reflect a young adult demographic, often targeted by emotional marketing campaigns in the fragrance industry.

The performance testing was performed with a trained panel of eight assessors.

2.3. Study Design

The experimental design included three parts: hedonic liking, olfactory performance, and emotional impact assessment. A semi-monadic approach was used for each test, meaning each participant evaluated the samples in a controlled, randomized sequence. Evaluations took place under standardized sensory testing conditions to minimize external influences. All materials were provided in identical packaging and applied to standardized blotters for consistency.

2.4. Liking Testing

Participants were asked to rate each of the eight samples (four perfumes and four raw materials) using a 7-point hedonic scale, ranging from "I dislike it very much" to "I love it." This type of unipolar scale is common in sensory science and provides a straightforward method for gauging consumer preference. Data were collected digitally using tablet interfaces, allowing for real-time data acquisition and minimizing recording errors. This part of the study aimed to identify which products generated the most favorable responses and to compare overall preference across the two countries.

2.5. Performance Testing

Performance was evaluated by a trained panel of eight assessors (four women and four men) using the standardized VDI 3882 Part 1 method. Fragrance intensity was assessed at five time intervals: immediately after application (T0), and at 4, 8, 16, and 24 hours post-application. Assessors used a 7-point intensity scale ranging from "imperceptible" to "extremely strong". Additionally, descriptive terms were collected to characterize the perceived evolution of the scent over time. All performance evaluations were conducted in France under controlled conditions. This methodology enabled a detailed understanding of the longevity and transformation of the fragrances.

2.6. Emotional Evaluation

The emotional analysis employed declarative methodologies, including visual associations (moodboards), semantic descriptors, and categorical mood questions. Participants were asked to choose images, words, and emotional states that best represented their feelings after smelling each perfume. Moodboards were specifically designed to align with the emotional positioning of each fragrance. Testing tools were translated and culturally adapted to French and Dutch audiences to reduce language bias. The emotional evaluation focused on verifying whether the fragrances could effectively evoke the emotions they were designed to target.

3. Results

3.1. Liking

Overall, all four perfumes received favorable liking scores from participants in both countries. The data revealed no significant differences in liking across the French and Dutch samples, suggesting a degree of pan-European consistency in preference for these formulations. Notably, the raw materials tested individually were consistently rated lower in liking compared to the finished perfumes. This finding underlines the importance of the perfumer's expertise in blending ingredients to achieve a pleasing final product. Among the perfumes, Desirable and Safe stood out with slightly higher average scores, indicating a broader consumer appeal.

3.2. Performance

The performance analysis revealed that all four perfumes maintained a perceptible presence after 24 hours, suggesting good substantivity. Among the fragrances, Fierce exhibited the strongest long-lasting intensity, followed closely by Desirable. Balance, on the other hand, showed a more rapid decline in intensity and less pronounced olfactory evolution. Descriptive data indicated that most perfumes followed their intended olfactory pyramids, confirming their structural integrity over time. Balance was the exception, as it showed a general flattening of sensory descriptors and a lack of emerging base notes. This may reflect either a formulation issue or a mismatch in expectations between the fragrance and the panelists' interpretations.

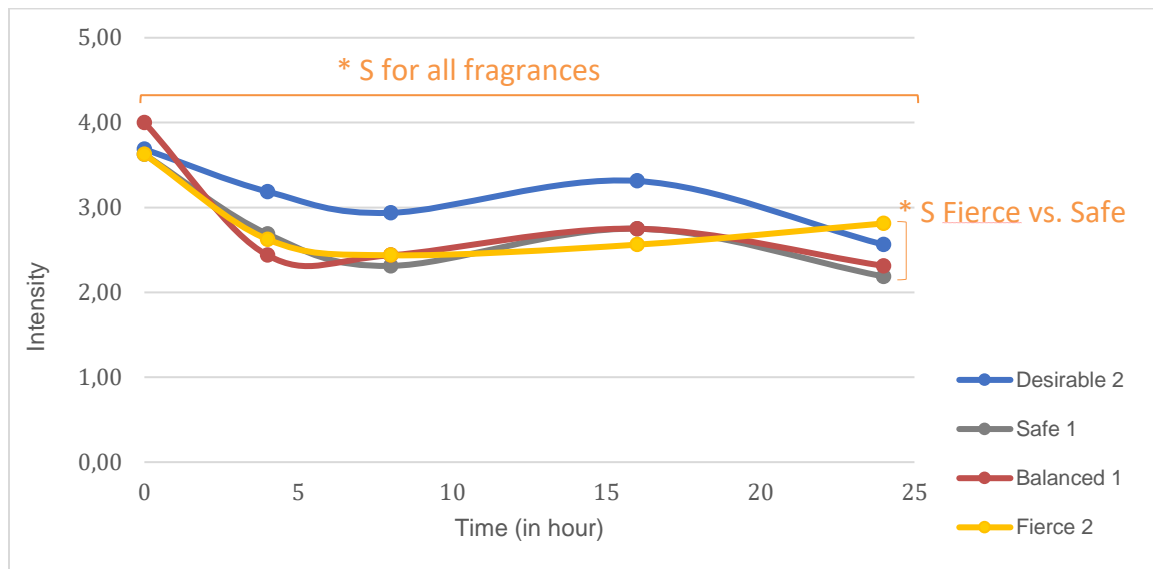


Figure 1: Comparison of 24-hour intensity performance

3.3. Emotion

The emotional evaluation yielded compelling results for two of the four perfumes. Safe and Desirable showed a strong alignment with their intended emotional concepts. Participants frequently selected images and descriptors that matched the emotional goals of these fragrances, such as safety, comfort, sensuality, and attractiveness. In contrast, Balanced and Fierce did not achieve the same level of alignment. Participants in both countries struggled to associate these perfumes with their expected emotional states, suggesting potential problems in the development brief or in the cross-cultural interpretation of emotional cues. In particular, the term "Balance" appeared to be

semantically weaker in French than in English, which may have diluted its intended meaning.

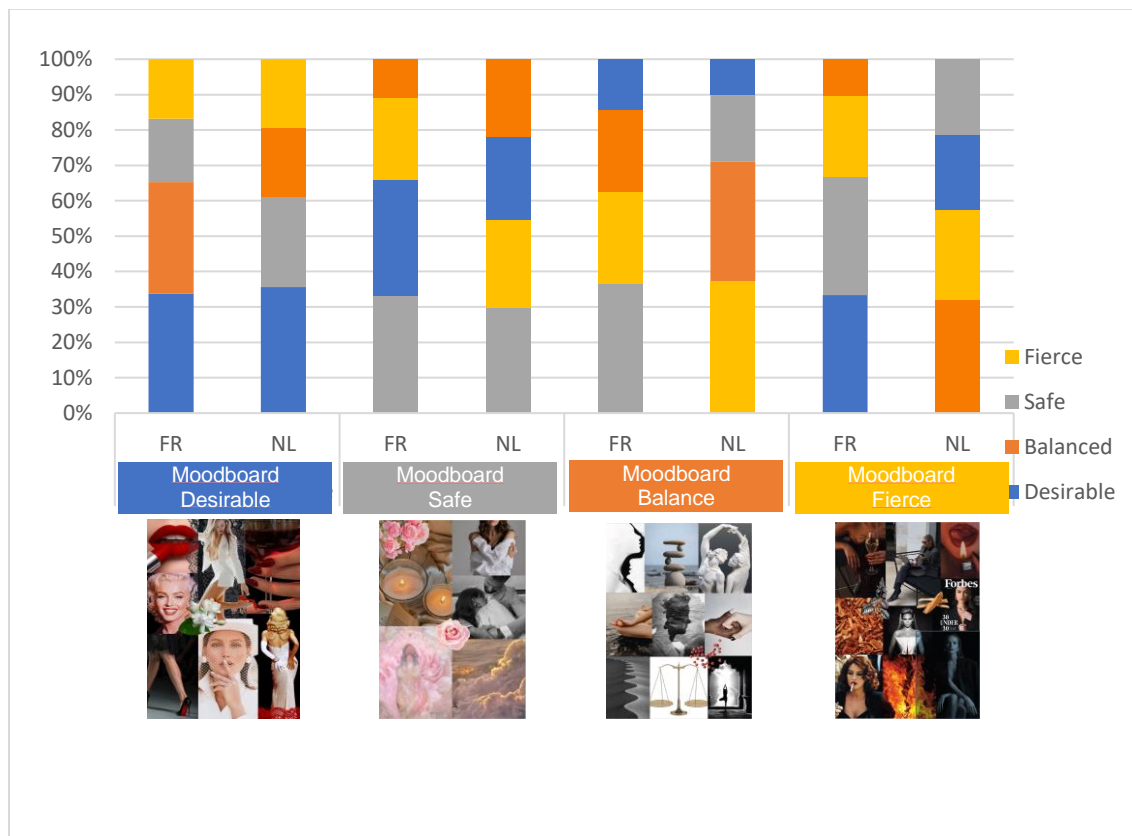


Figure 2: Correlation with moodboards

4. Discussion

The integration of liking, performance, and emotional resonance into a single fragrance evaluation framework poses significant challenges but also opens promising avenues for innovation. This study demonstrates that it is possible to develop fragrances that perform well across these dimensions, although success may vary depending on formulation choices and cultural context. The favorable results for Desirable and Safe suggest that it is feasible to achieve a harmonious blend of pleasantness, longevity, and emotional impact. However, the weaker outcomes for Balanced and Fierce underscore the importance of precise semantic framing and culturally sensitive formulation strategies.

Another key insight from this study is the value and limitation of declarative methodologies in emotion research. While self-report tools are useful for identifying

broad emotional trends, they may lack the sensitivity to capture more nuanced or subconscious responses. Future studies could benefit from integrating physiological measures such as facial coding, skin conductance, or heart rate variability to complement verbal data. Additionally, extending such evaluations to more culturally distant regions could provide a more robust understanding of how emotions are universally or uniquely triggered by scent.

5. Conclusion

This research shows that it is possible to develop fragrances that are well-liked, perform effectively over time, and evoke targeted emotional responses—at least under certain conditions. The fragrances Desirable and Safe achieved alignment across all three criteria, validating the potential for multi-dimensional fragrance development. However, the discrepancies observed with Balanced and Fierce highlight areas for improvement, particularly in the domains of semantic translation and emotional clarity. Declarative methods provide a solid starting point, but more comprehensive approaches may be required to fully capture the complexity of emotional engagement in olfactory experiences. These findings contribute to the growing body of knowledge on emotionally intelligent fragrance design and offer practical guidance for brands aiming to position their products on both rational and emotional grounds.