

# A proposed methodology for the assessment of consumer experience of personal care products in consumer-relevant environments

Phoebe-Claire Bramley<sup>1</sup>\* Helen Brannon<sup>2</sup> and Matt J. Carré<sup>1</sup>

<sup>1</sup>University of Sheffield, Mechanical Engineering department, Sheffield, UK

<sup>2</sup>Unilever, Port Sunlight Research Lab, Merseyside, UK

\*Corresponding author: pbramley1@sheffield.ac.uk

One of the main challenges faced in the personal care industry is finding ways of evaluating products to bridge the gap between function and consumer experience. Although accessible, *in vivo* testing on humans can lead to discrepancies due to many confounding factors. Alternatives such as using artificial skin models have been studied, but there are limited results applied to the personal care industry. This study looks at a new method for assessing the tribological properties of personal care products in a representative environment.

**Keywords (from 3 to 5 max):** tribology, skin, personal care products

## 1. Introduction

The personal care industry covers a vast array of products with a range of different functions, from creams and soaps to deodorants. Although many consumers consider these products as staples, difficulty occurs when trying to quantify consumer preferences, in other words, what makes up an enjoyable user experience.

For a number of years and even more so today, skin has become one of the most studied tissues in bio-tribology[1]. Experiments have often been carried out the forearms or fingertips of human subjects [2]–[4] but such methods can lead to experimental challenges such as involuntary movement of the subjects or a stress induced increase in skin moisture. Researchers have adopted the use of artificial skin models made of materials such as silicone elastomers or polyurethanes [5] but their hydrophobic properties do not match the moisture absorbing capacity of skin making them unsuitable for testing in moist conditions. More accurate models such as VitroSkin™ have been used for testing the tactile perception of skin cream [6] but the higher cost and complexity of these surrogates make them unlikely candidates for a standard test approach that could be adopted for the development of personal care products.

The general aim for this study is to evaluate candidate experimental set-ups and protocols in order to develop an accurate and reproducible method for assessing the tribological properties of personal care products.

## 2. Methods

Bio-tribological experiments were in the form of a force plate and probe covered with candidate skin surrogates developed as part of the project. Consideration was given to the ease of preparation of the skin surrogates and whether they can be reused over the course of several experiments. As in previous studies, factors such as ridges/grooves[7], finger pad deformation [9] and water absorption [4] were considered for their influence on friction and what role they play in the development of skin surrogates. Additional factors such as room humidity, skin temperature and contact pressure were also examined.

Based on these considerations, an experimental

methodology is proposed for the assessment of consumer experience of using personal care products.

## 3. References

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