

Utilizing Physiological Measures for Understanding Sustainable Consumers' Emotional Responses

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In marketing studies, there is an increased amount of attention being given to the idea that consumers' purchasing intentions and emotional responses can be measured by utilizing physiological data to reduce self-report response bias. Research has shown the validity of using physiological dimensions to assess consumers' responses to marketing stimuli. Measuring consumers' emotional responses (i.e., positive and negative) with physiological data has been especially well established (Ohme, Reykowska, Wiener & Choromanska, 2009). Though consensus exists within marketing studies that physiological data is a useful tool, little research in the textile and apparel field has utilized this approach.

Effective advertisements (i.e. posters and labels) can encourage consumers to increase their awareness of ethical consumption and change their shopping behavior (de Boer, 2003). In order to develop effective advertisements, noticeable designs should be complemented by the implementation of colors, messages, and images (Thogersen, 2000). Ha-Brookshire and Bhaduri (2014) found that the message of distrustful apparel business practices caught consumers' attention more than trustful. Based on a review of the current literature, this study aims (1) to understand the impact of advertisement images on consumer responses and (2) to evaluate the effectiveness of utilizing physiological responses in consumer studies. Four hypotheses were developed, they are as follows:

H1: *There is a significant difference in heart rate (HR) between exposure to a positive image and a negative image.*

H2: *There is a significant difference in heart rate variability (HRV) between exposure to a positive image and a negative image.*

H3: *There is a significant difference in alpha wave in electroencephalography (EEG) between exposure to a positive image and a negative image.*

H4: *There is a significant difference in skin conductance (SC) between exposure to a positive image and a negative image.*

Faculty, staff, and students at a Midwestern university were recruited to participate in a lab testing setting. Participants were assigned into two groups; a positive image group and a negative image group. Sixty usable data were collected; 30 data from the positive image group who were exposed to a positive advertising image and 30 data from the negative image group who were exposed to a negative advertising image. Participants were all females and right handed. Participants' physiological data were measured with NeXus – 32 Biofeedback sensors. Sensors were placed on the scalp (EEG) and fingers (heart rate, heart rate variability, and skin conductance). The image of wind power plants on grasslands was used as a positive image and

the image of *Citarum River* (known as the most polluted river in the world) was employed as a negative image. Participants' physiological responses in exposure to the image; heart rate, heart rate variability, alpha wave in electroencephalography (EEG), and skin conductance, were collected as well as base rate of each in resting condition before showing the image. Differences between base rate and measured rate after showing the images were calculated to find to what extent the rate of each physiological response changed.

Descriptive analysis was conducted to examine a mean value of rate changes between the base rate and measured rate with showing the images and analysis of variance (ANOVA) was performed to test H1-H4. Participants showed similar changes of heart rate variability and alpha wave in electroencephalography (EEG) between exposures to two images. However, their heart rate changes (on mean, -1.17 in positive image and -4.51 in negative image) and skin conductance changes (on mean, 25.12 in positive image and 53.68 in negative image) were significantly different between exposure to the two images. The results from ANOVA highlighted significant difference in heart rate and skin conductance between exposure to the positive image ($F(1, 58) = 9.223, p < .004$) and negative image ($F(1, 58) = 8.665, p < .005$). Therefore, H1 and H4 were significantly supported while H2 and H3 were rejected.

It seemed that including images, especially irritable and cruel images rather than clean and optimistic images, would stimulate consumers' physiological responses, such as heart rate and skin conductance, and lead attention to encourage ethical product consumption. These findings are somewhat consistent with Ha-Brookshire and Bhaduri's (2014) findings that consumers' heart rates were different according to the different types of messages. However, this study could not confirm whether or not utilizing heart rate variability and EEG could be a valid tool to measure consumers' emotional responses. Within this limitation, repeating this study with a larger and more diverse population is suggested.

This study attempted a new methodical approach to examine consumers' responses to images in advertisements and to suggest effective advertisement development in ethical apparel products. Marketers should put their efforts into creating valuable advertisements and campaigns to increase consumers' interest in ethical apparel products.

Reference

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