The objective of the present study was to understand the use of physiological measures as an alternative to traditional market research tools, such as self-reporting measures and focus groups. For centuries, corporations and researchers have relied almost exclusively on traditional measures to gain insights into consumer behavior. Oftentimes, traditional methods have failed to accurately predict consumer demand, and this has prompted corporations to explore alternative methods that will accurately forecast future sales. One of the most promising alternative methods currently being investigated is the use of physiological measures as an indication of consumer preference. This field, also referred to as neuromarketing, has blended the principles of psychology, neuroscience, and market research to explore consumer behavior from a physiological perspective. The goal of neuromarketing is to capture consumer behavior through the use of physiological sensors.

This study investigated the extent to which physiological measures were correlated to consumer preferences by utilizing five physiological sensors which included two neurological sensors (EEG and ECG) two hemodynamic sensors (TCD and fNIR) and one optic sensor (eye-tracking). All five physiological sensors were used simultaneously to capture and record physiological changes during four distinct marketing tasks. The results showed that only one physiological sensor, EEG, was indicative of concept type and intent to purchase. The remaining four physiological sensors did not show any significant differences for concept type or intent to purchase.

Furthermore, Machine Learning Algorithms (MLAs) were used to determine the extent to which MLAs (Naïve Bayes, Multilayer Perceptron, K-Nearest Neighbor, and Logistic Regression) could classify physiological responses to self-reporting measures obtained during a marketing task. The results demonstrated that Multilayer Perceptron, on average, performed better than the other MLAs for intent to purchase and concept type. It was also evident that the models faired best with the most popular concept when categorizing the data based on intent to purchase or final selection. Overall, the four models performed well at categorizing the most popular concept and gave some indication to the extent to which physiological measures are capable of capturing intent to purchase.

The research study was intended to help better understand the possibilities and limitations of physiological measures in the field of market research. Based on the results obtained, this study demonstrated that certain physiological sensors are capable of capturing emotional changes, but only when the emotional response between two concepts is significantly different. Overall, physiological measures hold great promise in the study of consumer behavior, providing great insight on the relationship between emotions and intentions in market research.

Major: Industrial Engineering

Educational Career:
Bachelor's of Mechanical Engineer, BS, 2003, University of Florida
Master's of Master of Business Administration, MBA, 2008, University of Florida
Master's of Industrial Engineering, MS, 2015, University of Central Florida

Committee in Charge:
Dr. Waldemar Karwowski, Chair, Industrial Engineering
Dr. Petros Xanthopoulos, Industrial Engineering Department
Dr. Ahmad Elshennawy, Industrial Engineering Department
Dr. Lauren Reinerman-Jones, Institute for Simulation and Training

Approved for distribution by Dr. Waldemar Karwowski, Committee Chair, on October 22, 2015.
The public is welcome to attend.