Predicting Audience Preferences for Television Advertisements Using Functional Brain Imaging

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Consistent with the Neuroergonomics approach, brain activities measured in response to viewing of natural stimuli in everyday settings could be used to assess audience preferences.[1,2] Neuroimaging tools, such as functional magnetic resonance imaging (fMRI) and Electroencephalogram (EEG), have been utilized in proof-of-concept marketing studies; however, various challenges such as high operating cost, restrictions on the user during data acquisition, and the efficiency of sensor setup, limit further use of these in large-scale deployment as well as in actual field conditions. Functional near-infrared spectroscopy (fNIRS) is the youngest and still an emerging neuroimaging technique that utilizes near-infrared light to measure oxygenation changes in the outer cortex. Latest generation of optical brain imaging utilizes wearable and wireless sensor pads to enable measurement of brain activity in nontethered and ambulatory settings.[3]

In this study, we record brain activity from a group of naive individuals while viewing popular, previously broadcast television content, Super Bowl advertisements. The Super Bowl is the largest sporting event in the United States with more than 100 million viewers each year with well-documented preferences from large audience. We have utilized fNIRS to monitor anterior prefrontal cortex of 11 volunteers. Participants viewed 30 Super Bowl advertisements (30 s videos) of which 15 were ranked highest (high-rated) and the other 15 ranked lowest (low-rated) based on USA Today's Ad Meter scores compiled from thousands of online viewers' self-reported measures. In our protocol, each advertisement followed by a set of self-reported measures to further capture the likeability, participant's familiarity with the advertisement, intend to purchase and recommend for the products/services of the advertised brand and the level of excitement of the advertisement.

Preliminary results indicate that brain activation predicts the self-reported rating by a broad audience. Consistently high cortical oxygenated-hemoglobin concentration changes occurred during the viewing episode of low-rated advertisement videos. Data acquisition for the study is still ongoing and further analysis will compare if ratings of the larger audience are more related to the accuracy or brain activity than those of the individuals from whom the brain data were obtained (Fig. 67.1).
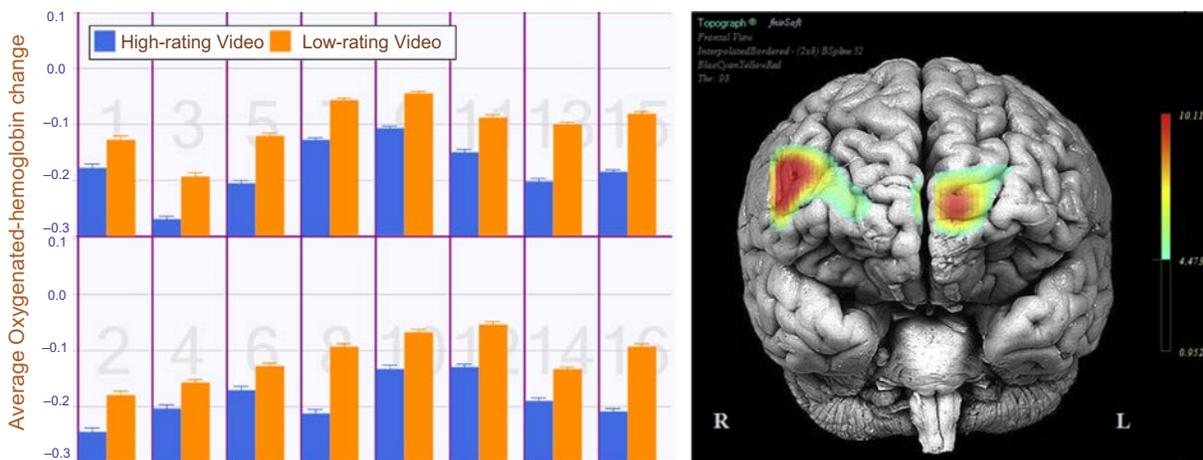

FIGURE 67.1 Average oxygenated-hemoglobin changes in prefrontal cortex while watching the advertisements indicate consistent pattern across high- and low-rated videos (left). F-statistics map of significant difference (right).

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