

FaceReader's Assessment of Happy and Angry Facial Expressions Predicts *Zygomaticus* and *Corrugator* Muscle Activity

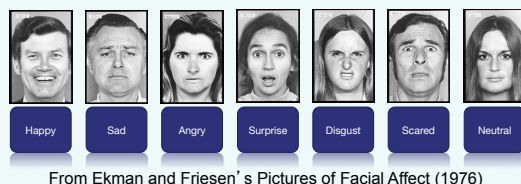
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Background:

FaceReader is a software program that analyzes facial expressions. Specifically, it claims to identify seven discrete emotional expressions illustrated below:



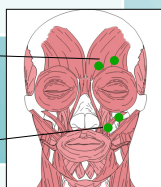
From Ekman and Friesen's Pictures of Facial Affect (1976)

Our goal was to test FaceReader's validity by comparing it with facial electromyography (EMG), which measures the activity of specific muscles.

We measured the activity of the muscles illustrated below:

Corrugator supercilli
(brow muscle). Plays a critical role in frowning

Zygomaticus major
(cheek muscle). Plays a critical role in smiling



Hypotheses:

- Hypothesis 1: FaceReader's assessments of happiness will be positively correlated with *zygomaticus* activity
- Hypothesis 2: FaceReader's assessments of anger will be positively correlated with *corrugator* activity

Method:

N = 30. Participants mimicked happy and angry facial expressions presented in a random order while FaceReader analyzed their facial expressions and facial EMG measured muscle activity

Results:

Hypothesis 1: Supported. We used regression analyses of repeated measures (Lorch & Myers, 1990) and found that FaceReader's assessment of happiness was significantly correlated with *zygomaticus* activity, $t(29) = 6.54$, $p < .001$; median $r = .723$.

Hypothesis 2: Supported. Using the same analysis, we found that FaceReader's assessment of anger was significantly correlated with *corrugator* activity, $t(29) = 2.222$, $p < .05$; median $r = .552$.

Discussion:

Our data suggest that when FaceReader is assessing "happiness," it is a valid proxy measure of increased *zygomaticus* activity and decreased *corrugator* activity (see Figure 2, below).

When FaceReader is assessing "anger," our data suggest that it is a valid proxy measure of increased *corrugator* activity and decreased *zygomaticus* activity (see Figure 2, below).

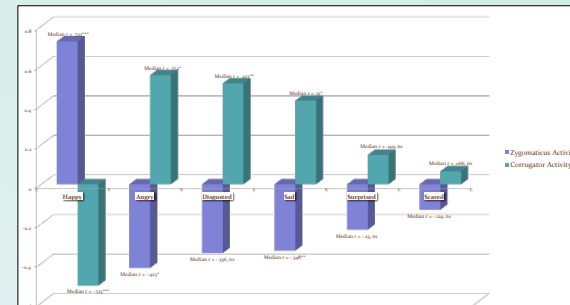


Figure 2: Median Correlations Between FaceReader and Facial Electromyography

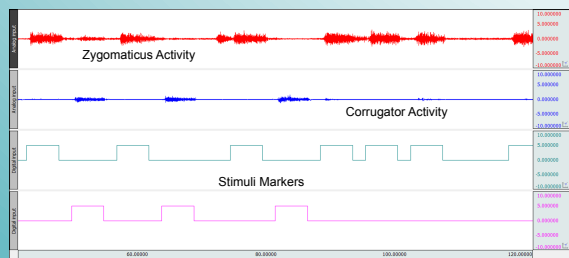


Figure 1: Example Facial Electromyography Data

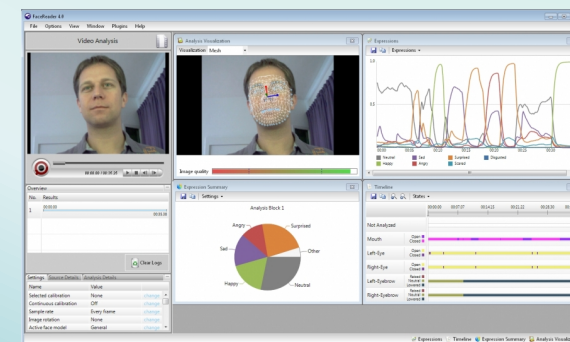


Figure 3: Example of FaceReader Analysis Interface