Emotional Congruence and Depression

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Depression is one of the most prevalent and severe mental disorders today. Due to its prevalence, there is a lack of resources and therapists to help treat all patients. Therefore, the aim of our study was to create an alternative intake resource to be able to treat patients on a need basis. AI is a new possible alternative that can be used to solve this dilemma. Because depression is accompanied by many nonverbal cues, this study works with a *Facial Expression Recognition Software* (FaceReader 9) to determine whether it could be used as a tool in helping diagnose depression [1]. This study runs short intake videos (around 25 minutes) of clinical patients through *FaceReader*, which analyzes the six basic universal facial expressions in order to detect their valence (e.g., happy vs. sad) and arousal (intensity of emotion). The valence and arousal are then compared to the content of speech to determine the level of emotional congruence.

When a healthy individual speaks, the assumption is that the emotion conveyed in the facial expressions are congruent with the emotion conveyed by the content of speech, known as emotional congruence. When the facial expressions do not match the content of speech, there is said to be emotional incongruence, which is associated with an impairment in the individual's psychological functioning, and can potentially be indicative of worse mental health [1].

The authors hypothesized that the level of congruence between the different emotional channels (facial expression and content of speech) can contribute to the clinical assessment of depression, even more than the BDI and Hamilton Assessment do; the higher the incongruence detected by the analysis of *FaceReader* and speech content, the more severe depression an individual may experience. Additionally, the initial level of congruence before therapy begins is expected to predict therapy outcome, as well as symptom severity after the therapy ends.

This study is the first step towards determining whether *Facereader* can be a useful tool in helping diagnose depression more efficiently and promptly, considering the difficulty in gaining access to professional help in a timely manner.
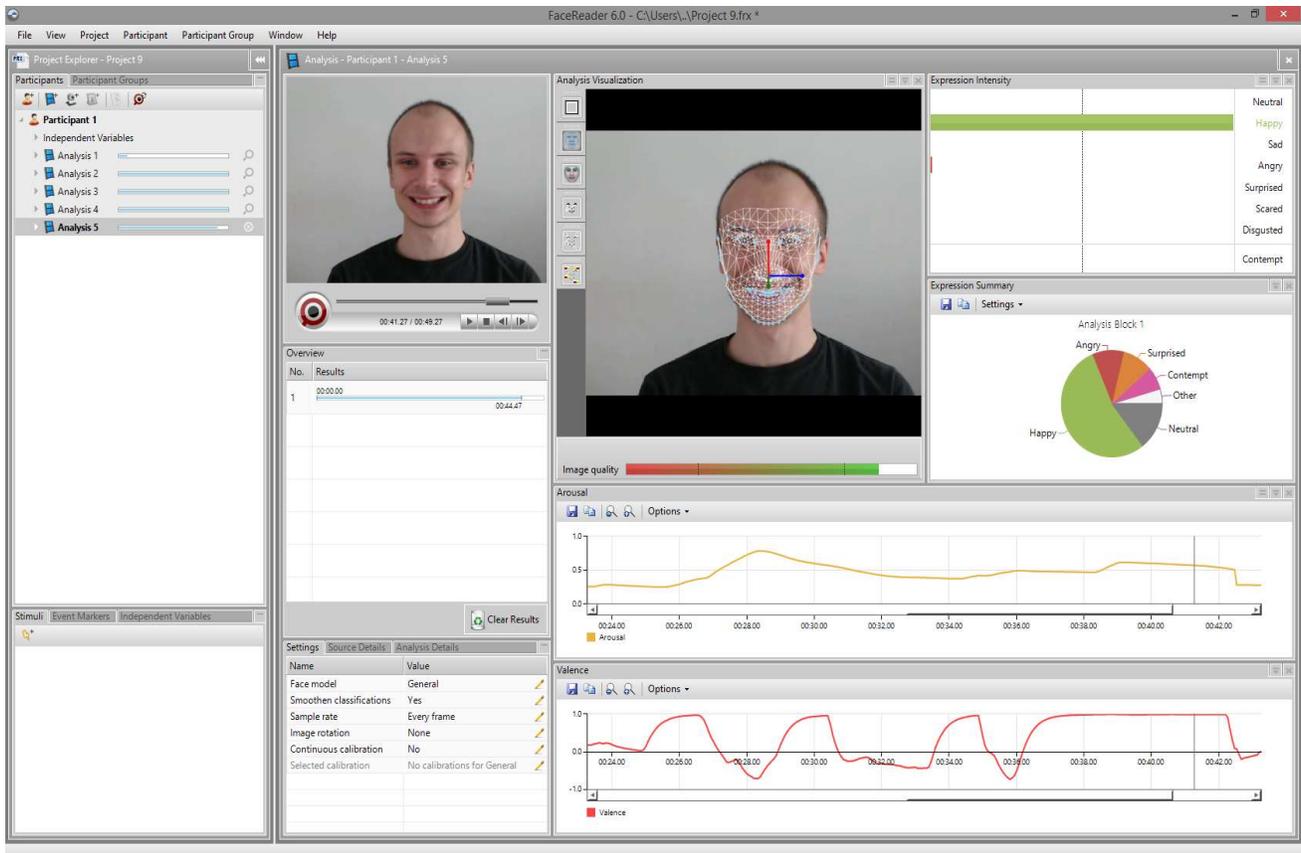
Figure 1. *FaceReader* detecting the valence and arousal.

References

[1] Pampouchidou, A., et al. (2017). Automatic assessment of depression based on visual cues: A systematic review. *IEEE Transactions on Affective Computing*, *10*(4), 445-470.