

True emotions: Kinematic characterization of genuine and simulated facial expressions

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We often make facial expressions to convey an emotional message, but it does not mean that we sincerely feel this emotion. Sometimes, we pretend to express happiness, disgust or sadness as actors usually do. Available literature on genuine and simulated emotional facial expressions is, however, based only on qualitative indexes. The aim of this study was to address this topic from a quantitative point of view, in order to provide a full spatial and temporal characterization of six basic emotional expressions: anger, fear, surprise, sadness, disgust and happiness and to implement a mathematical tool for distinguishing Genuine Emotions (GE) from Simulated Emotions (SE) via facial cues. Ten naïve participants were requested to watch videos which triggered spontaneous GEs. Then, they were asked to deliberately reproduce the same expressions without video support (SE). For both GE and SE, kinematic profiles of facial movements were recorded by means of six infra-red cameras using a 3-D motion analysis system. We found a range of cues characterising and distinguishing GEs from SEs facial cues. For instance, a simulated smile entails larger distances between the angles of the mouth compared to a genuine smile. Crucially, this effect is also evident on the velocity profiles: the maximum speed, reached by the anatomical landmarks of interest upon the mouth, is higher for simulated than for authentic smiles. Overall, these findings indicate that SE are characterized by greater amplitude and velocity peaks within the same amount of time spent for authentic expressions. In practical terms, these results will provide a decisive step forward for the detection of facial deceptive cues and the creation of a well-established database of GEs and SEs for multi-disciplinary future studies.