**FACS as objective tools to investigate facial expressions across species**

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Abstract:

Facial expressions are subtle signals, central for communication and emotion expression in mammals. In research, facial expressions are usually classified as a whole object (e.g. happy, bared-teeth). This is partly due to the automatic face processing in the human brain, i.e., humans categorise emotion globally, but have difficulty in detecting subtle cues, such as a brow raise. Moreover, the same facial configuration (e.g. lip corners pulled backwards exposing teeth) can convey widely different information depending on the species (e.g. in human: happiness; in chimps: fear). Since the 70s, the gold standard FACS (Facial Action Coding System) for investigating human facial behaviour, has avoided the issues of a priori assumptions of meaning, by objectively measuring movement linked to underlying muscles coded as independent movements or Action Units (AUs). In the last 15 years, FACS has been adapted for eleven different species of primates and domestic animals ([AnimalFACS.com](http://www.animalFACS.com)), allowing not only objective and standardised studies of animal communication, but also opening up the possibility of truly cross-species comparative studies. I will first introduce how the human FACS has been developed for a range of species, and how can these tools be used in research. I will then present some of my studies that have applied FACS, both on its own and in combination with other novel tools (e.g. eye-tracking), to answer novel questions in a range of topics, ranging from intentionality of play faces in orangutans to production and perception of communicative and emotional cues in humans, non-human primates and domestic animals.