

# Linda Scheider<sup>1</sup>, Katja Liebal<sup>1</sup>, Leonardo Oña<sup>2</sup>, Anne M Burrows<sup>3,4</sup>, Bridget M Waller<sup>5</sup>

1 Dept. of Psychology, Freie Universität Berlin, GER

2 Dept. of Natural Science and Mathematics, University of Groningen, NET

3 Dept. of Physical Therapy, Duquesne University, Pittsburgh, US-PA

4 Dept. of Anthropology, University of Pittsburgh, Pittsburgh, US-PA

5 Dept. of Psychology, University of Portsmouth, Portsmouth, UK

Correspondence: [scheider@zedat.fu-berlin.de](mailto:scheider@zedat.fu-berlin.de)

## How do gibbons use facial expressions in social interactions?

Whether non-human primates use communicative signals intentionally and goal-directed in social interactions is one of the main focuses of research in primate communication. Primate gestures are commonly considered intentionally produced and flexibly used signals, while facial expressions are often referred to as inflexible expressions of internal states. By using facial action coding system for hylobatid species (GibbonFACS), we approached the question whether gibbons use their facial expressions in a directed, voluntary way in social interactions. We found that the duration of facial expressions was significantly longer when facing another individual compared to non-facing situations in social contexts, but not in non-social contexts. Facial expression events when facing occurred significantly more often in social compared to non-social contexts. Furthermore, facial expressions used when facing differed significantly from non-facing events in their distribution across time by being more consecutive, supposing a reaction of the recipient, supporting the notion that individuals use facial expressions in a voluntary way. One interpretation of our results is that gibbons have voluntary control over the production of at least some of their facial expressions and thus are able to use them in an intentional, directed way in communicative interactions with other conspecifics. Although alternative lower level mechanisms cannot be fully ruled out, we find unexpected flexibility and dynamics in the communicative system of hylobatids' facial expressions. A multimodal approach in future research can help to narrow down the mechanisms underlying communicative expressive signals in non-human primates' social interactions.