



# Response to the commentary ‘Becoming uniquely human? Comparing chimpanzee to human infancy’

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We thank the authors of the invited commentary ‘Becoming uniquely human? Comparing chimpanzee to human infancy’ for providing thought-provoking interpretations of our recently published study (Bründl et al., 2021). The authors point out that our study fills an important gap in describing early developmental milestones in wild chimpanzees, aiding comparison with human development. They then focus on species-comparisons of two superficially comparable social traits, laughing and comforting, that we show to emerge at a later average age in our chimpanzee population than seen in humans. The authors argue that the relatively early emergence of these social traits in humans indicates more ‘prosocial tendencies that foster cooperation’. They state that ‘already by about 2 years of age, human children outperform their great ape cousins, the chimpanzees, in terms of their social cognitive skills’. While we agree with the validity of the author’s initial question, we urge caution in such interpretation that we feel goes beyond the current knowledge of early-life great ape social development and the scope of the descriptive dataset we have presented.

As we mention in our paper, social and communication milestones are not always easily comparable in humans and chimpanzees. We urge caution in advocating an explanation of species differences based on only two comparable social traits. Further, we make no claim that ‘comforting’ behaviour in chimpanzees is empathic. Whether this is prosocial behaviour in human infants would need to be proven—as it would

in chimpanzees. Also, the authors discuss both laughing and smiling, which may differ functionally. While we included laughter, the chimpanzee ‘play face’ facial expression used when initiating play and playing, and which potentially has a similar emotional origin to a smile (Hooff & Preuschoft, 2013), was not included in our study. We expect play face emergence earlier in wild chimpanzees than laughing (as in humans; Bard et al., 2011).

Socioecology in both human and chimpanzee populations seems likely to impact the development and plasticity of behavioural and cognitive traits (Boesch, 2020, 2021; Nielsen & Haun, 2016). This, together with our study that demonstrates overlap in the age of trait emergence in chimpanzees and humans, strongly indicates that valid comparative assessments must carefully match subjects from each species to control for potentially influencing variables, such as comparative age, sex and social history, as is standard practice in human psychological studies (Chiang et al., 2015; Martin et al., 1993). Wild chimpanzees live in complex socioecological environments and like in humans, rely on cooperative, long-term relationships (Samuni et al., 2018; Suchak et al., 2016). As in humans, social drivers are expected to shape ontogenetic capacities to establish and maintain positive social relationships with group members in chimpanzees.

Overall, we strongly agree with the authors to encourage future studies investigating theoretical claims of human’s advanced social cooperation, using comparable data from a combination of

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observational and experimental studies. We advocate following comparative research protocols using matched subjects, where diversity of the socioecological spectrum across chimpanzee and human populations is appropriately considered.

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