

1 Individual differences in great ape cognition across time and domains: stability, structure,
2 and origins

3 Manuel Bohn^{1,2}, Christoph Völter², Johanna Eckert², Daniel Hanus², Nico Eisbrenner², Jana
4 Holtmann³, & Daniel Haun²

5 ¹ Institute of Psychology in Education, Leuphana University Lüneburg

6 ² Department of Comparative Cultural Psychology, Max Planck Institute for Evolutionary
7 Anthropology, Leipzig, Germany

8 ³ Wilhelm Wundt Institute of Psychology, Leipzig University, Leipzig, Germany

Manuel Bohn was supported by a Jacobs Foundation Research Fellowship (2022-1484-00). We are grateful to thank all children and caregivers for participating in the study. We thank the Max Planck Society for the Advancement of Science.

The authors made the following contributions. Manuel Bohn: Conceptualization, Formal Analysis, Writing - Original Draft Preparation, Writing - Review & Editing; Christoph Völter: Conceptualization, Writing - Original Draft Preparation, Writing - Review & Editing; Johanna Eckert: Conceptualization, Writing - Original Draft Preparation, Writing - Review & Editing; Daniel Hanus: Conceptualization, Writing - Original Draft Preparation, Writing - Review & Editing; Nico Eisbrenner: Formal Analysis, Writing - Original Draft Preparation, Writing - Review & Editing; Jana Holtmann: Formal Analysis, Writing - Original Draft Preparation, Writing - Review & Editing; Daniel Haun: Conceptualization, Writing - Review & Editing.

Correspondence concerning this article should be addressed to Manuel Bohn, Universitätsallee 1, 21335 Lüneburg, Germany. E-mail: manuel.bohn@leuphana.de

24

Abstract

25 200 words

26

Keywords: keywords

Individual differences in great ape cognition across time and domains: stability, structure,
and origins

Introduction

Methods

Participants

A total of 48 great apes participated at least in one tasks at one time point. This included 12 Bonobos (*pan paniscus*, 4 females, age 3.60 to 40.70), 24 Chimpanzees (*pan troglodytes*, 17 females, age 3.80 to 57.80), 6 Gorillas (*gorilla gorilla*, 4 females, age 4.40 to 24.40), and 6 Orangutans (*pongo abelii*, 5 females, age 4.70 to 43.10). The sample size at the different time points ranged from 34 to 45 for the different species. All apes participated in cognitive research on a regular basis. Apes were housed at the Wolfgang Köhler Primate Research Center located in Zoo Leipzig, Germany. They lived in groups, with one group per species and two chimpanzee groups (group A and B). Research was noninvasive and strictly adhered to the legal requirements in Germany. Animal husbandry and research complied with the European Association of Zoos and Aquaria Minimum Standards for the Accommodation and Care of Animals in Zoos and Aquaria as well as the World Association of Zoos and Aquariums Ethical Guidelines for the Conduct of Research on Animals by Zoos and Aquariums. Participation was voluntary, all food was given in addition to the daily diet, and water was available ad libitum throughout the study. The study was approved by an internal ethics committee at the Max Planck Institute for Evolutionary Anthropology.

⁴⁷ **Procedure**

⁴⁸ **Data collection**

⁴⁹ **Analysis and Results**

⁵⁰ **Discussion**

⁵¹ **Conclusion**

References