PLENARY LECTURES

HUMANS ARE NOT COOPERATIVE BREEDERS BUT PRACTICE BIOCULTURAL REPRODUCTION

Bogin Barry[1], Bragg Jared[2], Kuzawa Christopher[2]

[1]*School of Sport, Exercise and Health Sciences, Loughborough University, Loughborough, UK*
[2]*Department of Anthropology, Northwestern University, Evanston, USA*

Alloparental care and feeding of young is often called 'cooperative breeding' and humans are increasingly described as being a cooperative breeding species. We critically evaluate whether the human offspring care system is best grouped with that of other cooperative breeders. We find that human reproduction and offspring care are distinct from other species because alloparental behaviour is defined culturally rather than by genetic kinship alone. This system allows local flexibility in provisioning strategies and ensures that care and resources often flow between unrelated individuals. This study proposes the term "biocultural reproduction" to describe this unique human reproductive system. Human biocultural reproduction lowers the lifetime reproductive effort of individual women by 14–29% compared to expectations based upon other mammals. This efficiency could help explain lifespan extension beyond menopause. There are risks and trade-offs from the evolution of biocultural reproduction, including childhood neglect, social brain malfunction, and diseases of aging.

Key words: *alloparenting, human life history, childhood, lifetime reproductive effort, longevity*

Contact information: Bogin Barry, e-mail: B.A.Bogin@lboro.ac.uk.

GLOBAL GROWTH CHARTS: NEW CONCEPTS OF GENERATING NATIONAL AND REGIONAL REFERENCES FOR HEIGHT, WEIGHT, AND BMI FROM 0–18 YEARS

Hermanussen Michael[1], Karol Stec[2], van Buuren S.[3], Meigen C.[4]

[1]*Aschauhof, Altenhof, Germany*
[2]*University of Potsdam, Institute of Biochemistry and Biology, Bioinformatics Group, Potsdam-Golm, Germany*
[3]*TNO Prevention and Health, LEIDEN, The Netherlands*
[4]*Deutsches Zentrum für Neurodegenerative Erkrankungen, Bonn, Germany*

Background: The world-wide variation in human growth has long been documented. The present work was undertaken to re-analyse the between-population variance in growth, and to provide a globally applicable technique for generating growth references. Material and methods: We meta-analyzed 196 female and 197 male growth studies published since 1831 using Preece-Baines analysis and Principal Component Analysis (PCA). Maximum Likelihood Principle (MLP) for non-linear optimization was used to generate synthetic growth references for any desired population. Results: PCA revealed five components that explain 98.4% of the between-study variance in mean height, 99.2% of this variance in mean weight, and 93% (females) and 94% (males) of this variance in mean BMI. Combining PCA and MLP improves generating synthetic growth references, with average residuals for mean height of 0.92 cm when registering at 2 age groups, and 0.45 cm when registering at 5 age groups. Conclusion: PCA provides global descriptions of height, weight and BMI for the full age range (0–18 years). Combining PCA and MLP can be used for plausibility checks in growth investigations, and for generating synthetic growth references for any population that lacks autochthonous growth references, e.g. modern African populations, migrants, or ethnic minorities.

Key words: *auxology, growth studies, meta-analysis, national and regional references, synthetic growth charts, 0-18 age range*

Contact information: Hermanussen Michael, e-mail: michael.hermanussen@gmail.com.