

# Curriculum Vitae

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### ➤ ACADEMIC QUALIFICATIONS

- Specialised on evolutionary ecology (life-history theory and sex allocation).
- Adjunct Professor (docent) in evolutionary ecology, 2008. University of Turku, Finland.
- Ph.D. in Ecology, 2004. University of Turku, Finland.
- M.Sc. in Ecology and Animal Systematics, 2001. University of Turku, Finland.

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### ➤ ACADEMIC AFFILIATIONS

- 1.1.2015- Senior researcher funded by the Kone foundation.
- 1.1.2012-31.12.2014 Collegium researcher at The Turku Collegium for Science and Medicine (TCSM).
- 1.1.2009-31.12.2011 Senior researcher in the project funded by the Academy of Finland studying the effect of habitat fragmentation on the life-history of treecreepers at the University of Turku, Finland, led by Dr. Harri Hakkarainen.
- 1.1.2006-31.12.2008 Independent postdoctoral researcher funded by the Academy of Finland in the Human life-History Project at the University of Turku, Finland, led by Dr. Virpi Lummaa.
- 1.10.2004-31.12.2005 Postdoctoral researcher in the Human life-History Project at the University of Turku, Finland, led by Dr. Virpi Lummaa.
- 1.5.-31.9.2004 Research assistant in Human life-History Project led by Dr. Virpi Lummaa. University of Turku, Finland.
- 1999-2000 Research assistant in research project studying the population biology of the nomadic Sami led by Dr. Pekka Käär.
- 1.5.-31.8.1999 Research assistant of the Section of Ecology at the University of Turku.
- A member of Editorial Board in *PLoS ONE* since 2006.
- Article entitled “Temperature-related birth sex ratio bias in historical Sami: warm years bring more sons” selected in Faculty of 1000 Biology.
- 2005 Väinö Kannisto reward for the best thesis in demography in Finland 2005.
- Reviewed grants for Austrian Science Fund.
- Reviewed papers for *Science* (1), *Proceedings of the National Academy of Sciences USA* (1), *Current Biology* (1), *Human Biology* (1), *Human Reproduction* (1), *British Journal of Cancer* (1), *Biology Letters* (4), *Journal of Theoretical Biology* (4), *Journal of Evolutionary Biology* (1), *PLoS ONE* (2), *Oecologia* (1), *Evolutionary Ecology* (1), *Evolution & Human Behavior* (5), *Reproduction* (1), *European Journal of Personality* (1), *International Journal of Environmental Research and Public Health* (1), *Stress* (1), *Behavioral Ecology &*

*Sociobiology* (3), *Human Nature* (1), *Ethology* (2), *Heredity* (1), *Annals of Human Biology* (1), *Journal of Comparative Human Biology* (1), *Proceedings of the Royal Society London: Biological Sciences* (4), *Royal Society Open Science* (2), *Ornis Fennica* (1), *Journal of Gerontology: Biological Sciences* (1), *Annual Review & Research in Biology* (1), *Current Zoology* (1), *Population and Environment* (1), *Demographic Research* (2), *Medical Principles and Practice* (1), *Journal of Biosocial Sciences* (1), *Demography* (1), *International Journal of Tropical Disease & Health* (1), *Personality and Individual Differences* (1), *American Journal of Human Biology* (7), *Social Science & Medicine* (1), *Journal of Comparative Physiology – B* (1), *American Journal of Physical Anthropology* (1), *Journal of Animal Ecology* (1), *Journal of Avian Biology* (1), *Evolution* (1), *Scientific Reports* (1), *Animal Biology* (1) and *American Naturalist* (1).

- Supervised Masters thesis for Mirkka Lahdenperä (2003), Thomas Lilley (2007), Suvi Väliharju (2008), Petra Sainisto (2008), Riina Aarrekorpi (2012) and Elina Ode (2015), and Ph.D. thesis for Jenni Pettay (2008) and Eric Le Tortorec (2013).

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## ➤ PUBLIC AFFAIRS

- TV interviews for Finnish YLE TV1 (Prisma) and twice YLE TV2 (Akuutti) and radio interviews for several national and local radio stations.
- Research findings reported in several international news papers (e.g. Washington Post, The Times, The New York Times, The Japan Times, The Financial Times, Daily Telegraph, Pravda, The Indian Times, Gazeta Wyborcza, Daily Mail, New Scientist, Scientific American etc.) and Finnish news papers (Helsingin Sanomat, Turun Sanomat, Kaleva, Ilta-lehti, Tiede-lehti, Huvudstadsbladet etc.).

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## ➤ RESEARCH GRANTS

- 2014-2016 Kone foundation, senior researcher (app. 258,000€).
- 2012-2014 The Turku Collegium for Science and Medicine, senior researcher (Annual salary for the PI and 15,000€ for research).
- 2005-2008 Academy of Finland, postdoctoral grant (156,000€).
- 2005 Finnish Cultural Foundation (18,000€).
- 2002-2007 Academy of Finland (research group, led by Dr. Virpi Lummaa)
- 2001-2003 Emil Aaltonen Foundation, grants for PhD-thesis.
- 1999-2000 Jenny and Antti Wihuri Foundation (research group, led by Dr. Pekka Käär)

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## ➤ SCIENTIFIC PUBLICATIONS

### REFEREED JOURNAL ARTICLES

- Helle, S., Käär, P. & Jokela, J. 2002 Human longevity and early reproduction in pre-industrial Sami populations. *Journal of Evolutionary Biology* 15, 803-807.
- Helle, S., Lummaa, V. & Jokela, J. 2002 Sons reduced maternal longevity in pre-industrial humans. *Science* 296, 1085.
- Helle, S., Lummaa, V. & Jokela, J. 2002 Effect of producing sons on maternal longevity in premodern humans - Response. *Science* 298, 317a.
- Helle, S., Lummaa, V. & Jokela, J. 2004 Selection for increased brood size in historical human populations. *Evolution* 52, 430-436.
- Lahdenperä, M., Lummaa, V., Helle, S., Tremblay, M. & Russell, A. F. 2004 Fitness benefits of prolonged post-reproductive life span in women. *Nature* 428, 178-181.
- Helle, S., Lummaa, V. & Jokela, J. 2004 Accelerated immunosenescence in preindustrial twin mothers. *Proceedings of the National Academy of Science USA* 101, 12391-12396.

- Helle, S., Lummaa, V. & Jokela, J. 2005 Are reproductive and somatic senescence coupled in humans? Late, but not early, reproduction correlated with longevity in historical Sami women. *Proceedings of the Royal Society of London: Biological Sciences* 272, 29-37.
- Helle, S. 2005 Lisääntymisen vaikutukset ihmisen elinikään. *Suomen Lääkärilehti* 49-50, 5111-5115.
- Pettay, J. E., Helle, S., Jokela, J. & Lummaa, V. 2007 Natural Selection on female life-history traits in relation to socio-economic class in preindustrial Finland. *PLoS ONE* 2(7) e606.
- Helle, S. & Helama, S. 2007 Climatic variability and the population dynamics of historical hunter-gatherers: The case of Sami of Northern Finland. *American Journal of Human Biology* 49, 844-853.
- Helle, S., Helama, S. & Jokela, J. 2008 Temperature-related birth sex ratio bias in historical Sami: warm years bring more sons. *Biology Letters* 4, 60-62.
- Helle, S., Lummaa, V. & Jokela, J. 2008 Marrying women 15 years younger maximized men's evolutionary fitness in historical Sami. *Biology Letters* 4, 75-77.
- Helle, S., Laaksonen, T., Adamsson, A., Paranko, J. & Huitu, O. 2008 Female field voles with high testosterone and glucose levels produce male-biased litters. *Animal Behaviour* 75, 1031-1039.
- Helle, S. 2008 A trade-off between reproduction and growth in contemporary Finnish women. *Evolution and Human Behavior* 29, 186-195.
- Helle, S. 2008 Height, weight, and body mass index and offspring sex at birth in contemporary Finnish women. *Journal of Theoretical Biology* 252, 773-775.
- Helle, S., Käär, P., Helama, S. & Jokela, J. 2008 Do humans adjust offspring sex according to local operational sex ratio? *Evolutionary Ecology Research* 10, 775-785.
- Helle, S. 2008 Why twin pregnancies are more successful at advanced than young maternal age? A potential role of 'terminal reproductive investment'. *Human Reproduction* 23, 2387-2389.
- Helle, S. & Lilley, T. 2008 Maternal 2nd to 4th digit ratio does not predict lifetime offspring sex ratio at birth. *American Journal of Human Biology* 20, 700-703.
- Helle, S. & Laaksonen, T. 2009 Latitudinal gradient in 2D:4D. *Archives of Sexual Behavior* 38, 1-3.
- Helle, S. 2009 Women with long menstrual cycles have more daughters. *Epidemiology* 20, 312-313.
- Lilley, T., Laaksonen, T., Huitu, O. & Helle, S. 2009 Digit length ratio (2D/4D): comparing measurements from x-rays and photographs in field voles (*Microtus agrestis*). *Behavioral Ecology and Sociobiology* 63, 1539-1547.
- Helle, S., Helama, S. & Lertola, K. 2009 Evolutionary ecology of human birth sex ratio under the compound influence of climate change, famine, economic crises and wars. *Journal of Animal Ecology* 78, 1226-1233.
- Helle, S. 2009 Solar activity during gestation does not affect human lifespan: evidence from national data. *Biogerontology* 10, 651-675.
- Lilley, T., Laaksonen, T., Huitu, O. & Helle, S. 2010 Maternal corticosterone but not testosterone level is associated with the ratio of second-to-fourth digit length (2D:4D) in field vole offspring (*Microtus agrestis*). *Physiology & Behaviour* 99, 433-437.
- Helle, S. 2010 Does second-to-fourth digit length ratio (2D:4D) predict age at menarche in women? *American Journal of Human Biology* 22, 418-420.
- Eeva, T., Helle, S., Salminen, J-P. & Hakkarainen, H. 2010 Carotenoid composition of invertebrates consumed by two insectivorous bird species. *Journal of Chemical Ecology* 36, 608-613.
- Helle, S., Suorsa, P., Huhta, E. & Hakkarainen, H. 2010 Fluctuating feather asymmetry in relation to corticosterone levels is sex-dependent in tree creeper (*Certhia familiaris*) nestlings. *Biology Letters* 6, 521-524.

- Helle, S. 2010 Digit length ratio (2D:4D) and variation in key life-history traits and fitness in Finnish women. *Behavioral Ecology* 21, 1061-1066.
- Helle, S., Lummaa, V. & Jokela, J. 2010 On the number of sons born and shorter lifespan in historical Sami mothers. *Proceedings of the Royal Society of London: Biological Sciences* 277, 2909-2911.
- Rickard, I. J., Holopainen, J., Helama, S., Helle, S., Russell, A. F. & Lummaa, V. 2010 Food availability at birth limited reproductive success in historical humans. *Ecology* 91, 3515-3525.
- Helle, S., Huhta, E., Suorsa, P. & Hakkarainen, H. 2011 Fluctuating asymmetry as a biomarker of habitat fragmentation in an area-sensitive passerine, the Eurasian treecreeper (*Certhia familiaris*). *Ecological Indicators* 11, 861-867.
- Ruuskanen, S., Helle, S., Ahola, M., Adamczyk, F., Möstl, E. & Laaksonen, T. 2011 Digit ratios have poor indicator value in a wild bird population. *Behavioral Ecology and Sociobiology* 65, 983-994.
- Salo, M., Helle, S. & Toivonen, T. 2011 Allocating logging rights in Peruvian Amazon – Does it matter to be local? *PLoS ONE* 6, e19704.
- Helle, S. 2011 Women's age at menarche and offspring sex ratio. *Human Reproduction* 26, 2588-2589.
- Le Tortorec, E., Helle, S., Suorsa, P., Sirkiä, P., Huhta, E., Nivala, V. & Hakkarainen, H. 2012 Feather growth bars as a biomarker of habitat fragmentation in the Eurasian treecreeper. *Ecological Indicators* 15, 72-75.
- Van Dongen, S., Sprengers, E. & Helle, S. 2012 Hand asymmetry does not relate to key life history traits in post-menopausal contemporary Finnish women. *PLoS ONE* 7, e34661.
- Le Tortorec, E., Helle, S., Suorsa, P. & Hakkarainen, H. 2012 Parental and genetic factors not nesting forest patch size affect physiological traits of offspring in an area-sensitive passerine – an experimental study. *Ibis* 142, 345-353.
- Helle, S., Laaksonen, T & Huitu, O. 2013 Sex-specific offspring growth according to maternal testosterone, corticosterone and glucose levels. *Behavioral Ecology* 24, 206-212.
- Silventoinen, K., Helle, S., Nisen, J., Martikainen, P. & Kaprio, J. 2013 Height, age at first reproduction and lifetime reproductive success: a prospective cohort study of Finnish male and female twins. *Twin Research and Human Genetics* 16, 581-589.
- Helle, S. & Lummaa, V. 2013 A trade-off between having many sons and shorter maternal post-reproductive survival in preindustrial Finland. *Biology Letters* 9, 20130034.
- Lyons, M. & Helle, S. 2013 Digit ratio and risk taking in post-menopausal Finnish women. *Personality and Individual Differences* 55, 591-594.
- Le Tortorec, E., Helle, S., Käyhkö, N., Suorsa, P., Huhta, E. & Hakkarainen, H. 2013 Habitat fragmentation and reproductive success: a structural equation modeling approach. *Journal of Animal Ecology* 82, 1087-1097.
- Jelenkovic, A., Silventoinen, K., Tynelius, P., Helle, S. & Rasmussen, F. 2014 Sex of preceding sibling and anthropometrics of subsequent offspring at birth and in young adulthood: a population-based study in Sweden. *American Journal of Physical Anthropology* 154, 471-478.
- Helle, S., Brommer, J. E., Pettay, J. E., Lummaa, V., Enbuske, M. & Jokela, J. 2014 Evolutionary demography of agricultural revolution in preindustrial northern Finland. *Proceedings of the Royal Society of London: Biological Sciences* 281, no. 1794.
- Lyons, M. T., Marcinkowska, U. M., Helle, S. & McGrath, L. 2015 Mirror, mirror, on the wall, who is the most masculine of them all? The Dark Triad, masculinity, and women's mate choice. *Personality and Individual Differences* 74, 153-158.
- Bruckner, T., Helle, S., Bolund, E. & Lummaa, V. 2015 Culled males, infant mortality and reproductive success in a pre-industrial Finnish population. *Proceedings of the Royal Society of London: Biological Sciences* 282, 20140835.

- Velmala, W., Helle, S., Ahola, M., Klaassen, M., Lehikoinen, E., Rainio, K., Sirkiä, P. & Laaksonen, T. 2015 Natural selection for earlier male arrival to breeding grounds through direct and indirect effects on a migratory song bird. *Ecology and Evolution* 5, 1205-1213.
- Marcinkowska, U. M., Helle, S. & Lyons, M. T. 2015 Dark traits: sometimes hot, and sometimes not? Female preferences for Dark Triad faces depend on sociosexuality and contraceptive use. *Personality and Individual Differences* 86, 369-373.
- den Herder, M., Helle, S., Niemelä, P., Henttonen, H. & Helle, T. 2016 Large herbivore grazing limits small mammals densities in Finnish Lapland. *Annales Zoologici Fennici* 53, 154-164.
- Marcinkowska, U. M., Lyons, M. T. & Helle, S. 2016 Women's reproductive success and the preference for Dark Triad in men's faces. *Evolution and Human Behavior* 37, 287-292.
- Le Tortorec, E., Käyhkö, N., Hakkarainen, H., Suorsa, P., Huhta, E. & Helle, S. 2017 Using change trajectories to study the impacts of multi-annual habitat loss on fledgling production in an old forest specialist bird. *Scientific Reports* 7, 1874.
- Jasienska, G., Bribiescas, R. G., Furberg, A.-S., Helle, S. & Núñez-de la Mora, A. 2017 Human reproduction and health: An evolutionary approach. *The Lancet* 390, 510-520.
- Helle, S. Selection bias in studies of human reproduction-longevity trade-offs. *Proceedings of the Royal Society of London: Biological Sciences* (in press).
- Helle, S. Accounting for measurement error in human life history trade-offs using structural equation modeling. *American Journal of Human Biology* (in press).

#### MONOGRAPHS

- Reproduction and Post-Reproductive Survival in Historical Humans. Ph.D. thesis. Annales Universitatis Turkuensis AII. 179. 102 p.
- Evolution of Human Longevity: Phenotypic Associations between Post-Reproductive Survival and Fecundity in Three Pre-Industrial Human Populations. Masters thesis. University of Turku, Section of Ecology, 2000.

#### PRESENTATIONS IN INTERNATIONAL MEETINGS

- Helle, S., Käär, P. & Jokela, J. 2001 Evolution of human longevity: reproduce early, die young? Proceedings of 13<sup>th</sup> annual meeting of Human Evolution and Behaviour Society. London, UK.
- Helle, S., Lummaa, V. & Jokela, J. 2002 Sons reduced maternal longevity in pre-industrial humans. 9<sup>th</sup> Biennial Congress of the International Society for Behavioral Ecology. Montreal, Canada.
- Helle, S. 2002 Longevity and the costs of reproduction in pre-industrial humans. Seminars in Department of Zoology, University of Cambridge, UK (invited presentation).
- Helle, S., Lummaa, V. & Jokela, J. 2003 Selection for increased brood size in pre-modern human populations. 9<sup>th</sup> Congress of the European Society for Evolutionary Biology. Leeds, UK.
- Helle, S., Lummaa, V. & Jokela, J. 2003 Selection for increased brood size in pre-modern human populations. 9<sup>th</sup> Meeting of PhD Students in Evolutionary Biology. Fiesch, Switzerland.
- Helle, S. 2003 Survival costs of reproduction in pre-industrial humans. The annual meeting of the Finnish Mammalogy Society. University of Turku, Finland (invited presentation).
- Helle, S. 2003 Reproductive history and longevity in pre-industrial Scandinavian populations. Human Biology: an Evolutionary Perspective. Montpellier, France.
- Helle, S., Lummaa, V. & Jokela, J. 2004 Accelerated immunosenescence in pre-industrial twin mothers. 10<sup>th</sup> Biennial Congress of the International Society for Behavioral Ecology. Jyväskylä, Finland.

- Helle, S., Jokela, J., Russell, A. F. & Lummaa, V. 2006 Producing sons is related to increased mortality from infectious diseases in resource limited preindustrial Finnish mothers. 11<sup>th</sup> Biennial Congress of the International Society for Behavioral Ecology. Tours, France.
- Helle, S., Pettay, J. E., Lummaa, V., Enbuske, M. & Jokela, J. 2012 Evolutionary demography of the agricultural revolution: Insights from preindustrial Finland. The Nordic Evolutionary Psychology Meeting 2012. Turku, Finland (invited presentation).
- Helle, S. 2014 Potential phenotypic plasticity of birth sex ratio in relation to maternal age at childbirth and its evolutionary significance in preindustrial humans. The Nordic Evolutionary Psychology Meeting 2014. Lammi, Finland (invited presentation).
- Helle, S. 2016 Reproduction in pre-industrial Finns and Sami. The Fennoscandian and Finno-Ugric past in the light of genes, languages and cultures. Turku, Finland (invited presentation).

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➤ **REFERENCES**

- Professor JUKKA JOKELA, Department of Limnology, EAWAG, Überlandstrasse 133, CH-8600 Dübendorf, Switzerland. Tel: +358 8 553 1219 (office), +358 50 300 0247 (home), fax: +358 8 553 1016, jukka.jokela@eawag.ch.
- Professor VIRPI LUMMAA, Section of Ecology, Department of Biology, University of Turku, Turku, Finland. Tel: + 358 2 333 8863 (office), +358 50 438 2044 (home), virpi.lummaa@utu.fi.

Turku 19.10.2017

Samuli Helle