12th TOULOUSE ECONOMICS AND BIOLOGY WORKSHOP
June 2-3, 2025

ABSTRACTS BOOKLET

CONFERENCE VENUE
Institute for Advanced Study in Toulouse (IAST)
1, Esplanade de l'Université - 31 000 Toulouse, France
Auditorium 3 – JJ Laffont (Ground Floor)

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AT A GLANCE

MONDAY JUNE 2

8:30-9:00 *Registration & Coffee*
9:00-9:05 *Welcome*
Session 1: Childhood, Development, and Learning
9:05-10.55 PRESENTATIONS
10:55-11:25 *Coffee break*
11:25-12:30 PRESENTATIONS
12:30 *Group Photo*
12:35-14:00 *Lunch*
***Session 2:* : Cooperative Care and Resource Sharing in Human Life History Evolution**
14:00-15:50 PRESENTATIONS
15:50-16:20 *Coffee & snacks*
16:20-17:25 PRESENTATIONS
17:25-19:00 *Poster session & drinks*
20:00 *Dinner (Invitation Only)*

TUESDAY JUNE 3

8:30-9:00 *Coffee*
9:00-9:05 *Welcome*
Session 3: Residence Patterns and Social Norms
9:05-10.55 PRESENTATIONS
10:55-11:25 *Coffee break*
11:25-12:30 PRESENTATIONS
12:30-14:00 *Lunch*
Session 4:* : *Ageing and Menopause
14:00-15:50 PRESENTATIONS
15:50-16:20 *Coffee & snacks*
16:20-17:25 PRESENTATIONS
17:25-18:25 PANEL DISCUSSION
18:25-18:30 *Conference wrap-up*
20:00 *Dinner (Invitation Only)*

PLEASE NOTE

An updated version of the program will be available in Auditorium 3 – JJ Laffont

ABSTRACTS

Richard Akresh **Social Safety Nets for Child Development**

(with Damien de Walque, Harounan Kazianga, Abigail Stocker)

Session 1: *Childhood, Development, and Learning*

Cash transfers are a critical part of social safety nets. Recently, integrated programs combining either information or home visits have been adopted to help households overcome barriers to improving child development. Working with the Burkina Faso government, we conduct a randomized experiment in 225 rural villages to assess the impact of an integrated social safety net over the child's life cycle. Villages were randomized to a control group or one of the following treatments: cash transfers; cash transfers plus government-run information meetings focused on children's health and psychosocial development; or cash transfers, information, and home visits reinforcing the information meetings. Fifteen months after the treatment ended, households receiving the cash, information, and home visits have fewer pregnancies, more medically assisted childbirths, enhanced health behaviors, and better educational outcomes. Home visits are critical for improving early childhood development, while cash transfers, with or without information, do not show such lasting impacts.

Siwan Anderson **Societal Moral Values and the Gender Gap in Intimate Partner Violence Acceptability**

(with Daniel Araujo)

Session 3: *Residence Patterns and Social Norms*

Women are paradoxically more likely than men to justify intimate partner violence (IPV). We investigate the role of societal moral values in explaining why possible victims are more likely to condone violence than possible perpetrators. We contrast the influence of universalist values (which emphasize justice, fairness, equality, and tolerance) to communal values (which stress family, ingroup cohesion, obedience, and adherence to norms). We show that this gender gap in IPV tolerance is wider in societies which reinforce communal values in their traditional oral narratives. It appears that women are more likely than men to rationalize IPV to validate social order and male control in societies that prioritize the group over the individual. The results highlight the relevance of broad-based cultural factors in understanding gender-based violence.

Piret Avila **"It Takes a Village and the Village Shall Be Repaid": The Evolutionary Economics of Intergenerational Transfers**

(with Laurent Lehmann)

Session 2: Cooperative Care and Resource Sharing in Human Life History Evolution

How does evolution shape energy transfers across the lifespan? We demonstrate that intergenerational resource transfers trigger a co-evolution of distinctly human life history traits. We derive a mathematical model comparing two scenarios: one where individuals must balance their energy budget individually, and another where resources can flow freely between family members. When intergenerational transfers are permitted, selection simultaneously favors extended childhoods, increased investment in embodied capital, higher adult productivity, longer lifespans, menopause, and significantly higher productivity in the lineage overall. Crucially, the energetically expensive, altricial, big-brained babies characteristic of humans necessarily co-evolve with extended adult lifespans, as transfers later in life are required to balance the energy equation. Our model identifies the age-specific marginal value of receiving energy in both scenarios and quantifies precisely when individuals should transition from energy consumers to producers. Our findings highlight multiple factors that created opportunities for selection to favor intergenerational transfers, catalyzing human evolution's unique trajectory. This work demonstrates that resource sharing alone could have triggered the cascade of adaptations enabling humans' extraordinarily expensive yet remarkably successful life history strategy.

Judith Burkart **Cooperative Breeding: A Catalyst for Early Human Evolution**

Session 2: Cooperative Care and Resource Sharing in Human Life History Evolution

Humans are unique among great apes in giving birth to large, secondarily altricial infants, exhibiting early-developing social behavior, possessing unusually large brains that require prolonged maturation, and practicing cooperative breeding (CB). These interconnected traits are part of the human adaptive complex and likely evolved together through mutual reinforcement over time. Drawing on recent findings from paleontology, developmental psychology, and pediatrics—alongside comparative analyses—we explore what may have initiated this coevolutionary process: the emergence of bipedality, direct selection for altriciality, dietary improvements, or cooperative breeding. The evidence most strongly supports the CB-first model, suggesting that early reliance on extensive allomaternal care was a key evolutionary shift. Notably, cooperative breeding played a crucial role in enabling further brain expansion. While larger brains typically slow development and reproductive rates—creating a demographic challenge—CB helped resolve this by supporting higher birth rates.

Raphaëlle Chaix **DNA and human kinship systems: since when are we living in a mostly patrilineal and patrilocal world?**

Session 3: *Residence Patterns and Social Norms*

Human societies exhibit a great diversity of kinship systems, with different rules of descent, residence and alliance. Beyond this variation, patrilineal and patrilocal systems predominate. These systems are known to have detrimental consequences for women's status and health. In this presentation, I will show that DNA can shed light on the origin of the predominance of patrilineal patrilocal systems in humans. I will present results from fieldwork in Central Asia and Southeast Asia that allowed us to characterize the genetic signatures left by different kinship systems on genetic diversity. I will show that it is likely that patrilineal descent systems increased in frequency in many parts of the world during the Neolithic and drastically reduced the Y chromosome genetic diversity of human populations, through the growth of some lineages and the loss of others.

Siobhán Cully **Strategies for managing biases in interpretations of gendered contributions to human uniqueness**

Session 3: *Residence Patterns and Social Norms*

Mothers and children form the core of human families. Variation around this core is significant, with biological fathers, grandparents, and various other carers supporting family economies. Despite recognition of this variation, there is ongoing debate about the relative importance of women versus men in nurturing families and, by extension, contributing to the unique suite of behavioral and biological outcomes that set humans apart from other animals. This talk reviews these debates and attempts to identify why they persist despite consistent evidence that male contributions to families are highly variable around a core of reliable female provisioning. It offers suggestions for remedying historical male biases in collecting and interpreting anthropological data and concludes that we should direct greater attention to women-centered activities.

Willem Frankenhuis **Human evolution and development in stressful environments**

Session 1: *Childhood, Development, and Learning*

I will begin by conceptualizing evolution and development as nested processes operating on different timescales. Next I will argue that the human species has evolved the capacity to adjust to certain forms of childhood adversity, such as exposure to violence, resource insecurity, and low and inconsistent parental care. Such developmental adaptations may include: life-history strategies, coordinated ways of allocating time and energy across traits directly affecting fitness, reasonable responses, decisions tailored to the demands of adverse environments, and hidden talents, psychological abilities enhanced by adversity. Understanding such adaptations promotes a well-rounded view of psychological functioning in adverse conditions. Such a balanced view has implications for education, policy, and intervention. Specifically, the better we understand responses to stress, including both vulnerabilities strengths, the more effectively we will be able to tailor education, jobs, and interventions to suit the needs and potentials of those affected.

Chris Kuzawa **Food for thought: The energetic costs of brain development and the evolution of the human life history**

Session 2: Cooperative Care and Resource Sharing in Human Life History Evolution

The human life history is unusual in having a childhood stage characterized by a prolonged period of exceptionally slow growth. In this talk, Prof. Kuzawa will discuss his team's work quantifying the costs of the human brain during development, which has had a formative role in the evolution of the human life history. They find that the costs of the brain do not peak at irth, when relative brain size is largest, but at 4-5 years of ge, when the brain consumes the equivalent of 66% of the body's energy use at rest. This childhood peak in brain costs reflects the proliferation of energy-intensive synapses prior to experience-driven synaptic pruning, and accounts for more energy use than kids expend on physical activity at this age. Consistent with the hypothesis of a brain-body growth trade-off, maximal brain energy demands co-occur with slowest body weight gain and body weight growth rate is tightly, inversely related to brain energy demands from infancy until puberty. These findings illustrate the brain's dominance of the body's energy budget early in life which has constrained the huma pattern of growth. They also reveal an intriguing paradox: children devote a lifetime peak of the body's energy budget to a non-negotiable expenditure at the same age that energy stores (body fat) are at their lifetime minimum. This energetically precarious state is evidence for they pothesized importance of social buffering -- cooperative childcare melded with food sharing -- to the evolution of human's uniquely energy-intensive brain. The talk will conclude with some of the public health implications of these findings including work underway to incorporate the study of brain energetics into studies of child development.

Ronald Lee **Reproduction and Production in a Social Context: Group Size, Reproductive Skew, and Increasing Returns**

(with Cyrus Chu)

Session 4: Ageing and Menopause

Evolutionary success requires both production (acquisition of food, protection and warmth) and reproduction. We suggest that both may increase disproportionately as group size grows, reflecting 'increasing returns' or 'group augmentation benefits', raising fitness in groups that cooperate in production and limit reproduction to one or a few high fertility females supported by non-reproductives, with high reproductive skew. In our optimisation theory both Allee effects (when individual fitness increases with group size or density) and reproductive skew arise when increasing returns determine optimal group size and proportion of reproductive females. Depending on which of food or maternal time is more important for reproduction, evolutionary trajectories of lineages may (1) reach a boundary constraint where only one female reproduces in a period (as with African wild dogs) or (2) reach a boundary where all females reproduce during their lifetimes but only during an early life stage (human menopause) or a late life stage (birds with non-dispersing helpers), where stage length optimizes the proportion of females that is reproductive at any time or (3) reach the intersection of these boundary constraints where a single reproductive female is fully specialized in reproduction (as with eusocial insects). We end with some testable hypotheses.

Pat Monaghan Evolution of a post reproductive life stage

(with Ed Ivimey Cook)

Session 4: *Ageing and Menopause*

In this talk, I will discuss the evolution of the female menopause. This a very unusual, and somewhat paradoxical, life history stage. It involves permanent curtailment of reproduction part-way through the lifespan of women, and is associated with a number of conditions that adversely affect health. Reasonably robust evidence for a such a post reproductive life stage is confined to only five other species, all of which are mammals. That this life stage occurs at all appears to contradict our view of natural selection operating to maximise fitness and special circumstances must exist to explain its occurrence, why it has evolved in such a restricted group of animals and why only in females. It seems likely that while this time-limited female fertility is not in itself adaptive, the duration of subsequent survival is likely to be linked to inclusive fitness benefits. So why does the duration of female fertility not match potential longevity female in some species? The relevant literature spans multiple biological disciplines and levels of enquiry, ranging through evolutionary ecology, developmental biology, physiology, neuroscience, molecular biology, and human medicine. In a recent paper, we presented a new hypothesis focussed on mitochondria, which in almost all sexually reproducing eukaryotes, are maternally inherited via the oocyte. This hypothesis posits that the duration of female fertility in certain long-lived, highly encephalised species, with no post-natal oogenesis, is limited by the need for intense screening of oocyte mitochondria prior to fertilisation. Highly functioning mitochondria are required to support endothermy and the very high energy requirement for the development and maintenance of the exceptionally large brain size required for complex social living. This limits the number and storge-time of oocytes, creating an antagonistically pleotropic effect that is beneficial to the production of high performing offspring but carries the later life cost of time-limited female fertility. But the end of the female fertile period is not necessarily the time to die. That Inclusive fitness benefits can arise from protracted parental care of offspring, overlapping generations, and kin group structures means that continued survival of post-reproductive females can sometimes be favoured by selection. I will suggest further lines of research to test these ideas.

April Nowell **The Secret Lives of European Upper Paleolithic Teens**

(with Jennifer French, Mary Lewis)

Session 1: *Childhood, Development, and Learning*

Childhood and adolescence are two stages of development that are either unique to the human life course or significantly expanded relative to other primate. While childhood in the Pleistocene has received considerable attention in recent years, adolescence during the same period remains an understudied area of research. Yet it is during adolescence that key social, physical and cognitive milestones are reached. Thus, through studying adolescents, there is enormous potential for improving our understanding of Upper Paleolithic lifeways more broadly. In this paper, we present our recent research on the timing and duration of puberty in the Upper Paleolithic. Drawing on archaeological and ethnographic data, we then present a model of the lived experiences of these teens, with a particular emphasis on sex differences. Finally, we argue that as Ice Age "influencers", Upper Paleolithic teens played a key role in human cultural evolution.

Ben Trumble **Chronic Diseases of Aging in an Evolutionary Context**

Session 4: *Ageing and Menopause*

The US Census Bureau predicts a 200% increase in US adults aged 85 years and over by 2060, accompanied by major increases in chronic diseases of aging like cardiovascular disease and Alzheimer's dementia. Most research on human health is conducted in industrialized settings- by working with populations living traditional lifestyles, we can better understand human diversity, and better appreciate what healthy aging was like prior to sedentary urban life. In this talk, I will be discussing my research with the Tsimane and Moseten people of Bolivia, examining how ecology and lifestyle impact chronic diseases of aging. I will focus on several studies related to cardiovascular disease and dementia, and explain why an evolutionary medicine framework is ideal for understanding the causes, and maybe solutions, to key health problems facing the world today and in the future.

Feeding practices and maternal trade-offs in rural southern Poland

Joanna Żyrek (Andrzej Galbarczyk, Sarah Myers, Heidi Colleran)

Exclusive breastfeeding in the first six months of life is assumed to be optimal and universally achievable. Yet infant feeding practices vary dramatically across communities and are shaped by socio-economic and cultural conditions. Maternal behaviours also often do not align with medical advice. Life History Theory (LHT) has previously been applied to highlight the role of investment trade-offs in shaping maternal infant feeding strategies in high-income context. However, few studies explore these trade-offs in the context of subsistence transition, which offers a window into changing constraints and cultural values. Our study examines shifts in the distribution of feeding practices over time and with different livelihoods, as well as the moralisation surrounding different infant-feeding choices in rural southern Poland. We analysed quantitative data from 62 rural Polish women aged 21-77 (mean = 50.50, SD = 15.65) collected through long-form demographic interviews including detailed questions about feeding practices and perceptions of breastfeeding. Initial findings reveal that infant feeding patterns varied across birth cohorts, with older women breastfeeding for shorter durations and more often substituting breastmilk with non-formula alternatives such as cow's milk. Agricultural labour was linked to perceived breast milk supply issues. It appears that intensive farming historically has necessitated trade-offs in breastfeeding duration, influenced both by maternal choice and energy constraints. With deeper market integration and increased access to formula-feed, the infant-feeding landscape has changed. Younger cohorts have shifted towards exclusive breastfeeding, but also formula-feed their infants. While there was moderate support for statements that moralise breastfeeding, older women consistently showed stronger agreement suggesting shifting cultural values. Descriptive exploration will be presented disentangling age influence on observed patterns, with further analyses on a larger sample still under collection pending.

Preferences, Goals, and Implications for Paternalism
Petr Krautwurm

This paper proposes a conceptual model of decision-making tying specific preferences to broader individual goals. In particular, the model considers two hierarchically ordered types of goals: Terminal goals, which represent fundamental objectives (e.g., health, social connection, etc.), and instrumental goals, which serve as complexity-reducing intermediate steps towards achieving terminal goals (e.g., healthy eating, meeting people, etc.) and which are used to derive eventual preferences (e.g., salad instead of cake, sports club instead of reading, etc.). Notably, originating from the simplification of a complex optimization problem, the hierarchical goal structure allows for contextual misalignments between different instrumental goals (directed towards different terminal goals). As a consequence, in some contexts, it may lead agents to make suboptimal decisions – as evaluated from an outside perspective. Thus, applied to the discussion about paternalism and nudging, the model is compatible with arguments in favor of external interventions as it assumes agents to be boundedly rational, which can be addressed, instead of having generally inconsistent preferences, which are hard to rank without further assumptions on the agency of decision makers. In that sense, the model provides methodological justification for (some aspects of) paternalistic interventions.

A rapid decline in gender bias relates to changes in subsistence practices over demographic changes in a formerly matrilineal community
Yaming Huang (Pengpeng Bai, Liqiong Zhou, Ruth Mace, Juan Du)

This research examines dynamics of kinship systems, emphasizing changes in gender-biased inheritance and social interaction within a formerly matrilineal community. Using demographic data over 70-years of lifespan from 17 Tibetan villages, we observe a significant shift within the predominantly matrilineal inheritance structure: a once-prevalent preference for females in older cohorts has now gone in recent generations. We explore two possible explanations: that this is driven by changes in subsistence system or by changes in sibling configuration. Our investigation reveals that a change from agriculture to non-traditional economy with more market integration marks a pivot from matrilineal to non-unilineal inheritance systems. Moreover, results from economic games conducted in two distinct survey periods (2015 and 2021), indicate that high donations for females in 2015 has become unbiased in 2021. These findings provide concrete evidence of shifts in gender preference both at the level of familial resource allocation and broader societal interactions.

A life history model of continuous growth and negligible senescence under resource allocation trade-offs

Arttu Soukainen (Piret Avila)

The evolution of aging remains as one of the unanswered questions in evolutionary biology. Long-lived organisms tend to be characterized by prolonged growth periods or even indeterminate growth, in which growth continues throughout their lifespan. We present a mathematical model with resource allocation schedules as evolving traits that explores the connection between indeterminate growth and negligible and negative senescence. By synthesizing and developing previous theoretical work, we show that the indeterminate growth does not lead to negative senescence as was previously thought. Instead, under different ecological and physiological conditions, optimal somatic maintenance allocation can lead to diverse age-trajectories of mortality that include slow senescence and sustained allocation to growth. Our work shows the connection between growth strategies, mortality and fertility rates, and details optimal allocation strategies that can lead to even more complex nonmonotonic mortality patterns. While we do not focus on human specific life histories (such as intergenerational transfers), this work also provides clues for the type of ecological and physiological conditions that promote longevity. These findings clarify the role of growth schedules and other ecological and physiological conditions that favour the evolution of ultimately longer lifespans.

Moral Judgement of Sexual Purity

Sajjad Sojoudi

This poster examines the moral judgment of female modesty through the case of the Hijab. The Hijab (i.e., religious veiling) is a social norm symbolising modesty in many Islamic societies. While some argue that mandatory Hijab restricts women's freedoms (El Guindi, 1999), others contend it serves as a divine mandate protecting women's moral integrity (Mir-Hosseini, 2007). The Hijab thus represents not only a cultural marker but also one facet of a broader range of sex-specific restrictions experienced in countries such as Iran.

Central to this analysis is the concept of mate guarding and the role of sexual jealousy in human reproductive strategies. Evolutionary theory suggests that, beyond mate selection and attraction, mechanisms to prevent infidelity—behaviours collectively termed mate guarding—have evolved to mitigate the risk of cuckoldry (Alcock, 1994; Trivers, 1972). In humans, sexual jealousy is a primary motivator for these behaviours, influencing a spectrum of cultural practices, from the enforcement of chastity to the regulation of female dress (Buss et al., 1992; Wilson & Daly, 1992).

Although previous research has linked mate-guarding mechanisms to cultural phenomena such as adultery laws (Daly et al., 1982), monogamous marriage norms (Grant & Montrose, 2018), female genital cutting (Onyishi et al., 2016), and religious practices including veiling (Pazhoohi, 2024; Pazhoohi et al., 2017), there has been limited empirical focus on the moral judgment of phenomena such as these. Recent evidence suggests that sexual jealousy may drive support for feminine honour norms and the moral condemnation of behaviours seen as violations of sexual purity (Kupfer & Gul, 2023).

This presentation outlines a series of ongoing studies that investigate the moral evaluation of Hijab wearing in Iran and explore broader cross-cultural patterns in the moral judgment of sexual purity. By applying an interdisciplinary lens that integrates insights from evolutionary and moral psychology, this work aims to elucidate the psychological foundations of sex-specific cultural practices in human life history evolution.

Gender differences in partner preference: reanalysis of a cross-cultural dataset

Jinwen Xie

Background: Evolutionary life history theory suggests that gender differences reflect distinct reproductive strategies shaped by environmental conditions, whereas biosocial theory attributes these differences to socially imposed roles. Some previous studies have reported smaller gender differences in preference for partner age and earning capacity in more gender-equal countries, while others found no significant association. We postulated that the inconsistent findings reflect the fact of a reliance on economic indicators of gender equality rather than the actual endorsement of gender norms, which may directly reflect life history trade-offs in human mating strategies.

Method: Using a previously published dataset on mate preferences (45 countries, N=14,399; Walter et al., 2020), we examined the relationship between World Values Survey measures of gender norms and gender differences in partner preferences. A set of multilevel models tested the relationships between univariate mate preferences (good financial prospects, physical attractiveness, health, kindness, intelligence and age difference) and each of the equality indicators, with random effects for both slopes and intercepts.

Results: Our results showed gender differences in partner preference for good financial prospects (b = -0.07, p = 0.014) and age differences (b = -0.11, p = 0.006) were larger in countries with stronger gender norms. The results of additional analysis showed the same pattern with the specific subtypes of gender norms. The results remain under the control of GDP per capita and geographical distance. Future analysis will use a culture distance measure to control the effect of cultural closeness.

Conclusion: Our findings highlight the influence of gender norms in shaping gender differences in partner preferences, showing larger gender differences in countries with stronger gender norms and little association with the majority of economic indices. The results suggest that inconsistencies in the literature may stem from the use of indicators that do not reflect the gender biases experienced by individuals within populations.

Ingroup Favoritism in Cooperation in Equal and Unequal Conditions
Tycho van Tartwijk (Leticia Micheli, and Angelo Romano)

Cooperation is crucial to achieve and sustain public goods. An obstacle to cooperation is ingroup favoritism, the tendency to cooperate more with ingroup members than outgroup members. Past research and theoretical frameworks on ingroup favoritism largely focus on settings of equality, where individuals have access to equal resources, endowments, and productivity. However, many social interactions are often characterized by inequality. Economic disparities exist even in the most equal societies and therefore should be accounted for when examining ingroup favoritism in cooperation. The present experimental laboratory study (expected N = 240) investigates whether ingroup favoritism in cooperation differs between equal and unequal contexts. Furthermore, we model whether an individual's socioeconomic status in society influences this effect. To do so, we utilize a 2 (advantaged vs disadvantaged status; between-subjects) x 2 (ingroup vs outgroup partner matching; within-subjects) x 3 (equality vs low inequality vs high inequality; within-subjects) mixed design. Participants' cooperation is measured in a two-person repeated prisoner's dilemma game involving stranger matching in groups of eight participants. Preliminary findings reveal that cooperation decreases as inequality rises, and that individuals cooperate more with ingroup members than outgroup members. However, this ingroup favoritism declines as inequality increases, which is driven by disadvantaged individuals in highly unequal settings showing reduced ingroup favoritism. We review the implications of these findings on current theoretical frameworks of ingroup favoritism in cooperation.

Trait interdependencies shape social learning strategies
Nanda Jafarian (Björn Lindström, Ingmar Visser, Annemie Ploeger, Pieter van den Berg, and Lucas Molleman)

Human development largely consists of acquiring skills and knowledge ("traits") through social learning, but it remains unclear how to do so effectively when traits build on each other. This poster presents results from a Markov chain model that shows how interdependencies alter the effectiveness of different social learning strategies. When traits have prerequisites, copying successful individuals becomes counterproductive, often performing worse than random copying. We find that learning from slightly more knowledgeable peers consistently outperforms other strategies when traits have interdependencies, while payoff-biased learning performs best only when constraints on learning are minimal. An agent-based reinforcement learning model further illustrates how individuals might adapt their social learning strategy based on the strength of interdependencies they encounter. This work offers an explanation for why payoff-biased learning is less common than traditional models predict and connects formal cultural evolution models with foundational concepts in developmental psychology.