

# 9th Toulouse Economics and Biology Workshop

## Production and Sharing

*Toulouse, 2-3 June 2022*



### ABSTRACT BOOKLET

**Athena Aktipis, Arizona State University**

**Title:** Sharing resources and sharing risk: Lessons from small -scale societies about how to manage catastrophic risk and survive the apocalypse

**Abstract:** Humans have had to grapple with challenges including infectious diseases, famines, environmental changes, wars, and other sources of catastrophic risk throughout our evolutionary history as a species. Managing these risks effectively requires strategies including risk retention, risk avoidance, risk reduction and risk transfer. Risk transfer (also called risk sharing) is the only risk management strategy which is obligately social, requiring formal or informal relationships among actors to take on a portion of each other's risk, essentially insuring one another. In this talk, I will discuss risk sharing and resource sharing across the societies that we study in The Human Generosity Project, drawing from fieldwork, computational modeling and laboratory experiments to understand the structure and function of risk sharing arrangements in small-scale societies. Scaling up social risk sharing for dealing with the massive, wicked, and multidimensional problems of today will require creative solutions, broad interdisciplinary cooperation, and an appreciation of the fundamental interdependence that underlies our collective futures.

**Nava Ashraf, London School of Economics**

**Title:** The dynamics of organizational culture: evidence from seeding altruism in banking

**Co-authors:** Oriana Bandiera (LSE) & Alexia Delfino (Bocconi)

**Abstract:** Every year, firms spend large sums to fund initiatives with the intended aim to shape culture. Banks and financial institutions have recently been at the forefront of this since the backlash and ruinous effect on their public image post financial crisis. It is however unclear whether this is a costly whitewashing rather than any real change in values or norms. We provide evidence from a randomised evaluation in one of the world's largest global banks, aimed at encouraging greater pro-sociality. In 2018 the bank launched a new volunteering program; we randomized the density of employees within teams and offices receiving the program through an encouragement design. We follow the nearly 40,000 employees for two years and study the joint evolution of volunteering behaviour, values and beliefs, and work performance. We study whether a new volunteering norm emerges in offices initially assigned to a greater treatment density, and through which channels.

**Pat Barclay, *University of Guelph***

**Title:** Connecting the causes of cooperation: reciprocity, fitness interdependence, and signaling

**Abstract:** After decades of research, behavioural scientists have uncovered many evolutionary reasons for why humans cooperate with each other, such as kinship, reciprocity, and signaling. However, these causes of cooperation are mostly examined in isolation. Here I use fitness interdependence – i.e., organisms having a stake in each other's welfare – to start examining how these causes of cooperation can interact with each other. First, I will present mathematical models and experimental studies showing that when people engage in reciprocity, they develop a stake in each other's welfare, such that they will be willing to help even beyond the existing reciprocal relationship (e.g., anonymously). The more replaceable that partners are, the less willing that people are to help. Second, I will present mathematical models and experimental studies showing that acts of helping can signal one's stake in a partner, such that people will trust others who are seen to value them (and are therefore likely to reciprocate any trust). This helping can include the provision of public goods, such as preserving the environment, and can escalate to people competing to preserve the environment. Fitness interdependence thus provides a connection between different causes of cooperation, such as reciprocity and signaling, and can help unite our understanding of why people cooperate.

**Michael Gurven, *University of California Santa Barbara***

**Title:** Optimizing the timing of pedagogy across the human life course

**Abstract:** The evolutionary biologist W. D. Hamilton famously showed that the force of natural selection declines with age, and reaches zero by the age of reproductive cessation. However, in social species, the transfer of fitness-enhancing resources by post-reproductive adults increases the value of survival to late ages. While most research has focused on intergenerational food transfers in social animals, here I consider the potential fitness benefits of transferring information ("pedagogy") and investigate the ecological contexts where pedagogy is likely to occur. Although the evolution of teaching is an important topic in behavioral biology and in studies of human cultural evolution, few formal models of teaching exist. Here, I present a modelling framework for predicting the timing of both teaching and learning across the life course. Under a broad range of conditions, optimal patterns of information transfer in a skills-intensive ecology often involve post-reproductive aged teachers. I then present preliminary empirical tests of the model among human subsistence populations. Multi-stage pedagogy in the context of extended juvenility and multigenerational cooperation may have played an important role in shaping our evolved human life history.

**Adrian Jaeggi, *University of Zurich***

**Title:** A comparative perspective on human production and sharing

**Abstract:** Drawing mainly on comparative phylogenetic analysis, as well as a few case studies, I explore the factors explaining variation in food sharing (and to some extent divisions of labor) among nonhuman primates and across non-industrial human societies. Food sharing among nonhuman primates most commonly ensues when food packages are not monopolizable, and to the extent that sharing can be selective, it is often exchanged for other services like grooming or support. In some cases, food production is consistently biased towards certain age-sex groups, such that others can only obtain certain foods through exchange. In small-scale human societies, sharing may function to buffer the risk of shortfalls and emerges naturally from divisions of labor by age, sex, and skill. Indeed, societies with alternative means of buffering risk, such as storage or trade, share less frequently. The need for sharing and cooperation more broadly also contributes to maintaining egalitarian hierarchies across foragers.

**Karen Kramer, University of Utah**

**Title:** Intergenerational cooperation & resource flows. Indirect & direct benefits of children's production.

**Co-author:** J Hackman, University of Utah

**Abstract:** Human life history is unusual in that production and sharing occur across generations, both from parents to offspring, and from children to adults. Intergenerational transfer studies, however, largely focus on downward flows, giving a skewed picture of juvenile dependence and why cooperative sociality evolves in our species. We first briefly discuss what is unusual about production and sharing in humans, and address some of the analytic limitations that have led to a predominant focus on downward flows. Using longitudinal Maya reproductive history, time allocation and economic data, we then ask what are the immediate benefits of childhood production and sharing. We find that while Maya parents are important to children's survival, children go a long way toward supporting themselves and their siblings, which allows mothers to continue childbearing and have higher fertility than they might otherwise be able. Taking advantage of the longitudinal data, secondly we ask, does production and sharing during childhood have a delayed fitness benefit? Our sample is constructed from children for whom we have production data from the 1990s and whose reproductive histories have been followed for the past 30 years (n=50). We use age at marriage as our outcome variable since for the Maya marriage signifies leaving home and a shift in directing production and sharing from one's siblings to one's own children. Results show that i) boys who contribute more to their family, marry at younger ages, ii) while girls' production is not a significant predictor of female age at marriage. Girls grow up, marry and have children irrespective of prior contributions to the family, suggesting a sex difference in how young adults navigate leaving home and their anticipated success on the marriage market. Demonstrating both immediate and delayed payoffs to children's production provides strength to the adaptive significance of cooperative breeding.

**Shakti Lamba, University of Exeter**

**Title:** The error of our ways: measuring cooperative behaviour in the field

**Abstract:** I will describe a field study investigating the effects of demography on cooperative behaviour. The study has been conducted with the matrilineal Khasi and the patrilineal Pahari Korwa peoples in India over the past decade. I will focus on the challenges of collecting and coding behavioural and demographic data from field observations and experiments and identify potential sources of errors in such real-world data. I will share the insights I have gained from this extensive data gathering and coding exercise and the implications of my insights for studying human behaviour.

**Laurent Lehmann, University of Lausanne**

**Title:** Four levers of reciprocity across human societies: concepts, analysis and predictions

**Abstract:** This talk surveys five human societal types -- mobile foragers, horticulturalists, pre-state agriculturalists, state-based agriculturalists, and liberal democracies -- from the perspective of three core social problems faced by interacting individuals: coordination problems, social dilemmas, and contest problems. We characterize the occurrence of these problems in the different societal types and enquire into the main force keeping societies together given the prevalence of these. To address this, we consider the social problems in light of the theory of repeated games, and delineate the role of intertemporal incentives in sustaining cooperative behaviour through the reciprocity principle. We analyze the population, economic and political structural features of the five societal types, and show that intertemporal incentives have been adapted to the changes in scope and scale of the core social problems as societies grew in size. In all societies, reciprocity mechanisms appear to solve the social problems by enabling lifetime direct benefits to individuals for cooperation. Our analysis leads us to predict that as societies increase in complexity, they need more of the following four features to enable the scalability and adaptability of the reciprocity principle: nested grouping, decentralized enforcement and local information, centralized enforcement and coercive power, and formal rules.

**Ruth Mace, *University College London***

**Title:** Same-sex competition and sexual conflict expressed through witchcraft accusations

**Abstract:** There is significant cross-cultural variation in the sex of individuals most likely to be accused of practising witchcraft. Allegations of witchcraft might be a mechanism for nullifying competitors so resources they would have used become available to others. In this case, who is targeted may result from patterns of competition and conflict (same-sex or male-female) within specific relationships, which are determined by broader socio-ecological factors. Here we examine patterns of sex-specific accusations in historic cases from sub-Saharan Africa (N = 423 accusations). Male 'witches' formed the greater part of our sample, and were mostly accused by male blood-relatives and nonrelatives, often in connection to disputes over wealth and status. Accusations of women were mainly from kin by marriage, and particularly from husbands and co-wives. The most common outcomes were that the accused was forced to move, or suffered reputational damage. Our results suggest that competition underlies accusations and relationship patterns may determine who is liable to be accused.

**Polly Wiessner, *Arizona State University and University of Utah***

**Title:** Cash, choice, and institutional change: a forty-year perspective on Ju/'hoansi Bushman sharing and gifting

**Co-author:** Cindy Huang, *Arizona State University*

**Abstract:** Sharing and gifting in small scale societies are often considered be the oldest and most universal economic activities. Numerous motivations for such transfers in subsistence-based economies have been proposed where the social, emotional and economic are entwined: helping close biological kin, coping with unpredictable resources, minimizing/pooling risk, building reputation, distributing resources that cannot be stored or defended, extending social ties, and defining and reproducing communities? In small scale societies of the past, the transfer of resources was governed by social institutions with their accompanying norms and values that lowered the transactions costs of exchange. Widespread sharing 'worked' because the cost of sharing to the giver is usually low in relation to the benefit to the receiver, for example, in the distribution of meat from a large animal.

When money is introduced into a subsistence economy, it greatly complicates sharing decisions and escalates individual interests. New considerations are added: money can be saved to cover risks for the immediate family, lower workloads, acquire desired goods, ameliorate lifestyle, and enhance comfort. For marginalized groups, money can facilitate further integration into the global economy of today. The cost to the donor of giving cash is equal to the benefit to the receiver, not lower. What then is the impact of the introduction of cash into a subsistence economy on institutions governing kinship obligations, support networks, risk pooling, and social cohesion?

First I will address this question among the Ju/'hoansi Bushmen (!Kung) by comparing data from a complete possession inventory for 59 individuals in a foraging economy collected in 1974 with similar data for 100 individuals from different positions in the mixed economy from 2018-2018. The data sets include information for each possession: how it was obtained (gift, purchase, made), and from whom it was obtained, kinship relation, demographic attributes and location of the two parties. First, we will give a measure of the recent changes in economy and social ties with the switch to from foraging to greater sedentism and a mixed, partially cash, economy. Next, we will analyze data from the cash expenditures of 180 Ju/'hoansi today to better understand, how cash is differently regarded and spent according to how it was obtained (from salaries, sale of products to tourists and pharma, old age pensions, governmental aid, etc.) Finally, we will consider how the spending choices of agents in different positions in the mixed economy alter institutions of sharing and gifting.

**Michael Wilson, *University of Minnesota***

**Title:** The evolution of early hominin food production and sharing

**Abstract:** How did humans evolve from individualistic foraging to collective foraging with sex differences in food production and widespread sharing of plant and animal foods? While current models of food sharing focus on meat or cooking, considerations of the economics of foraging for extracted plant foods (e.g., roots, tubers), inferred to be important for earlier hominins (~6--2.5 mya), suggest that hominins shared such foods. Here we present a conceptual and mathematical model of early hominin food production and sharing, prior to the emergence of frequent scavenging, hunting and cooking. We hypothesize that extracted plant foods were vulnerable to theft, and that male mate-guarding protected females from food theft. We identify conditions favoring plant food production and sharing across mating systems (i.e., monogamy, polygyny, promiscuity), and we assess which mating system maximizes female fitness with changes in the energetic profitability of extractive foraging. Females extract foods and share them with males only when: i) extracting rather than collecting plant foods pays off energetically; and ii) males guard females. Males extract foods whenever these are sufficiently high in value, but share with females only under promiscuous mating and/or no mate guarding. These results suggest that if early hominins had mating systems with pair-bonds (monogamous or polygynous), sharing of extracted plant foods by females occurred long before scavenging, hunting and cooking. Such cooperation may have enabled early hominins to expand into more open, seasonal habitats, and provided a foundation for the subsequent evolution of unique human life histories.