

## ABSTRACTS TALKS

**Alger Ingela**, TSE-CNRS-IAST

*How many wives do men want? On the evolution of monogamy*

Why are some societies monogamous and some polygamous? The question matters for all the reasons that families themselves matter: investment in children, reproductive skew, gender differences in well-being, and more. Most theories of polygyny invoke male heterogeneity as a key driving factor. I argue that such heterogeneity itself depends on males' willingness to fight against each other to acquire more wives. I derive the preferences of ex ante identical males over polygyny rates by focusing on evolutionary fundamentals. Preferences are shown to depend on exogenously given factors such as the cost of producing food and care, and the technology of defense. I find that males never prefer intermediate numbers of wives: depending on the ecology, a male either always benefits from having more wives, or he prefers both strict monogamy and high polygyny rates to intermediate polygyny rates. Hence, depending on the ecology evolution should lead either to monogamy, or to a significant amount of polygyny.

**Brooks Robert**, University of New South Wales

*Conflict over the price of sex*

Sex can be understood as a social exchange, in which participation in sex, or a long-term sexual and reproductive arrangement is traded for status, parental care, goods, or even cash. Evolved sex differences in reproductive investment mean that human sex is usually a female-controlled resource, and we can understand the price of sex as the contributions men have to exchange for this resource. The price of sex has risen steadily for most of humanity's history, and that rising price secured much of our species' ecological and cultural success. Over slightly more than the last century, however, driven by the industrial and sexual revolutions, that trend has largely reversed in many societies, scandalising social conservatives and heartening progressives. Adult sex ratios, the legal status of polygyny and bride price, and economic inequality all influence the price of sex by altering the strength of intra-sexual competition and the incentives for hypergamy. I will consider the origins and some manifestations of sexual suppression, particularly of females, in light of the view that there exists a standing tension between various players over the price of sex. Exposing the interests of individuals, and the origins of those interests will help us to understand why sex grows so complicated, fraught and political.

**Chiappori Pierre-André**, Columbia University

*The economic role of the family: then and now*

Family has, throughout ages, served several functions, from provision and consumption of public goods to risk sharing to fertility and production of children's human capital. In this paper, we argue that over the recent decades, in most developed countries, the respective importance of these roles has shifted, and that human capital production has become the major aspect, particularly at the top of the human capital distribution. We construct a model along these lines, derive testable implications, and derive implications in terms of growth and inequality.

**Cox Donald**, Boston College

*Evolution of paternal care in humans and game-changing ecological transition*

What explains the evolution of human paternal care? Why did males turn to provisioning offspring and away from competing for mates? This transition arguably set the stage for modern social life, yet paternal care is a puzzle. It is rare in primates and nonexistent in apes. Emergent care would have faced formidable obstacles. A lone "dad" would have stood little chance against hordes of mate-seeking "cads." Recent models rely on exacting clockwork between male provisioning and female choice to bootstrap up from incipient preferences. We propose a simpler approach that stresses ecology, whereby environmental change transforms the provisioning game. Because ecology affects large swaths of the population, it could have surmounted the social dilemma of paternal care. We derive a simple transition criterion: returns to paternal care must exceed the probability of misattributed paternity. We contend that the hunting grounds emanating from East African climate change galvanized men to provision offspring. Because a man is more likely to provision if neighbors do too, ecological change can provide the push for leveraging grassroots complementarities. Our approach connects the dots between environmental change and social evolution and generate testable hypotheses about the timing of transition to paternal care.

**Dasgupta Partha**, University of Cambridge

*Socially embedded preferences, environmental externalities and reproductive rights*

Externalities are the unaccounted for consequences for others of actions taken by one or more persons. As they are symptoms of institutional failure, they cannot be eliminated without reasoned collective action. When externalities are adverse, the moral directives flowing from them can clash with the exercise of personal rights. In this paper we identify a class of environmental externalities in the contemporary world that accompany procreation. We also identify externalities that are allied to socially embedded preferences for family size. Those preferences can give rise to a heightened demand for children, which exacerbates the adverse environmental externalities present people impose on future generations. We show that current indicators of sustainable development undervalue the contribution of family planning programmes. Crude but suggestive figures for the demand humanity currently makes on the biosphere are used to show that adverse environmental externalities accompanying new births are significant. We construct very rough estimates of the size of the global population that the Earth system can support at a good standard of living. Technological changes that economise on our use of nature's services would of course raise the estimates, but such changes in the past have been known to be accompanied by unintended adverse consequences. And the direction of technological progress can be expected to remain unfavourable to conservation so long as much of the biosphere remains an open access resource.

**De la Croix David**, Université Catholique de Louvain

*French fertility and education transition: rational choice vs cultural diffusion*

We analyze how much a parsimonious rational-choice model can explain the temporal and spatial variation in fertility and school enrollment in France during the 19th century. The originality of our approach is in our reliance on the structural estimation of a system of first-order conditions to identify the deep parameters. Another new dimension is our use of gendered education data, allowing us to have a richer theory having implications for the gender wage and education gaps. Results indicate that the parsimonious rational-choice model explains 38 percent of the variation of fertility over time and across counties, as well as 71 percent and 83 percent of school enrollment of boys and girls, respectively. The analysis of the residuals (unexplained by the economic model) indicates that additional insights might be gained by considering cross-county differences in family structure and cultural barriers.

**Edlund Lena**, Columbia University

*Islam and marriage*

Sharia law gives men but not women the right to agree to or veto their own marriage. Women, however, unlike chattel slaves, are the owners of any bride price, an improvement over pre-Islamic Arabian practices. Where on the individual-parental consent continuum do these rules place the Muslim family? This paper discusses how the lack of marriage freedom for women results in marriage freedom for neither sex and like other arranged marriage regimes, binds men, punishes women, and holds back society.

**Gettler Lee**, University of Notre Dame

*The biology of fatherhood: evolutionary origins, ontogenetic influences, and proximate functions*

A growing body of research on hormones such as testosterone, prolactin, and oxytocin as well as human neural function suggests that human males have a flexible psychobiological capacity to respond to committed parenting. These findings hint at evolved neuroendocrine capacities that help facilitate refocused priorities as men make the transition into fatherhood. Evolutionarily, these capacities likely emerged alongside humans' "slow" life history. Specifically, we produce highly dependent infants who rely on care from mothers and other caregivers for well over a decade and yet we also commonly produce these costly children more frequently than would be expected. Cooperative caregiving, as a derived characteristic that diverges from the more common mother-only care systems found among most mammals, including the Great Apes, would have been necessary for this suite of human life history traits to evolve. Although by way of the fossil record we are limited in our ability to probe questions related to forms of paternal care, I have argued, along with other scholars, that examining contemporary male neuroendocrine function, including derived features that are unique to humans, can help shed light on past selection pressures related to forms of paternal investment. Across contemporary cultures, fathers commonly cooperate with mothers to raise young, though their involvement and roles are variable, as they likely were evolutionarily. Accordingly, the nature and magnitude of men's physiologic adjustments to fatherhood and the influences of diverse neuroendocrine profiles on behavior might be shaped by the cultural contexts and family systems in which men are socialized and in which those roles find contemporary expression.

Using longitudinal data from a 30+ year study in the Philippines, my collaborators and I have modeled men's testosterone responses to major life transitions, such as partnering and fatherhood, and the degree to which these changes interrelate with shifts in behavior (i.e. paternal care or sexual activity), as is predicted by life history theory and other relevant psychobiological theoretical models. Drawing on the full scope of these multi-generational data to focus on ontogenetic processes, we are currently testing how early life experiences of familial care and the quality of generation 1-generation 2 parent-child relationships shape men's later-life parenting with their own children. We also test whether these same dimensions of early life social experiences moderate the magnitude and direction of men's changes in testosterone across the transition to fatherhood. These analyses help clarify how the intergenerational, learned components of social behaviors interact with and shape psychobiological responses to fatherhood decades later. Combined with evolutionary and proximate, mechanistic perspectives, these ontogenetic insights shed light on the flexibility and plasticity of human fatherhood and its contextual expressions.

**Kokko Hanna**, University of Zurich

*The evolutionary enigma of the demographic transition*

Some aspects of human reproduction make humans thoroughly typical mammals, other aspects however form clear outliers from what is expected of an animal population. Perhaps the most puzzling characteristic of human reproductive strategies is that we do not expect wealth to correlate positively with reproductive success in modern societies. The pattern where birth rates drop (after a time lag) once death rates have become low is called the demographic transition, and it is a remarkably repeatable finding in different societies when they transition from pre-industrial to an industrialized economic system. The covariance of low birth rates and low death rates bears some resemblance to predictions of life history theory where organisms can be (to some extent at least) arranged along a continuum of fast vs. slow life histories; however, evolutionary theory has obvious trouble predicting reproductive traits that lead to below-replacement fertility levels. We will outline how previous theoretical work has tried to solve the problem, and present a new model based on phenotypic plasticity in relative (as opposed to absolute) material wealth among peers.

**Mace Ruth**, University College London

*The evolution of family systems in Sino-Tibetan cultures*

Here we examine the phylogenetics of kinship evolution among Sino-Tibetans. I will start by describing the diverse kinds of family systems in China and what we know about how this cultural diversity is maintained. Then we use linguistic data to construct a phylogenetic tree of Chinese languages, and then use a variety of ethnographic sources to identify the kinship and residence of the cultures at the tips of the tree. We compare a number of different evolutionary pathways for the origin of the current distribution of kinship, examining patterns of both residence and descent. We find that models allowing changes in either direction of which sex disperses or stays generally fit better than unidirectional models. In China it is widely believed that ancestral kinship systems were matrilineal, but we find no support for this view. The rare system of duolocality (neither sex disperses) evolves from matrilocality not patrilocality. We do not find support for the notion that ancestral kinship systems were matrilineal.

**Scelza Brooke**, University of California

*The value of concurrency: exploring the social, economic and genetic benefits of multiple mating among Himba women*

Research on human mate preferences has been conducted mainly in industrialized societies, where multiple mating and concurrent partnerships are heavily stigmatized. However, cross-culturally, extra-pair partnerships are more common, and there is significant variation in the acceptance of such relationships, particularly for women. In order to understand why concurrency remains common, despite the negative stigma surrounding it, I will explore the potential social, economic and genetic benefits for women when they maintain multiple partnerships. I will focus on my work among Himba pastoralists, where concurrent partnerships are common and accepted for both sexes. Experimental, ethnographic and genetic data that examine both women's preferences and their behavior provide support for an adaptive explanation for concurrency in this population.

**Wood Brian**, Yale University

*Chimpanzees and the evolutionary demography of human families*

This talk will describe research on the ecology, demography and social organization of chimpanzees and human hunter-gatherers. I will describe my recent research documenting significant demographic variation among chimpanzee communities, and the role of ecology in shaping this variation. These findings invite the question: how should studies of living communities of chimpanzees inform reconstructions of the evolution of the human family? I will present work guided by this question, using simulations to explore how demographic variation influences the genealogical structures of populations and the evolution of inter-generational cooperation.

## POSTER SESSIONS

**Baniel Alice**, Institute of advanced study in Toulouse (IAST)

*Male violence and sexual intimidation in a wild primate society*

Sexual violence occurring in the context of long-term heterosexual relationships, such as sexual intimidation, is widespread across human populations. However, its evolutionary origins remain speculative because few studies have investigated the existence of comparable forms of sexual coercion in animals, where repeated male aggression towards a female provides the aggressor with delayed mating benefits. Here, we test whether male aggression towards females functions as sexual coercion in wild chacma baboons (*Papio ursinus*). We found support for all three main predictions of the sexual coercion hypothesis: male aggression (1) is greatest against cycling females, (2) is costly and represents the main source of injuries for cycling females, and (3) increases male mating success with their victims in the future. Detailed analysis of chronological sequences between aggression and matings ruled out other coercive mechanisms, such as short-term harassment and punishment, by showing that aggression and matings are temporally decoupled. This decoupling may explain why some forms of sexual violence have been largely overlooked in well-studied animal populations despite their likely impact on the fitness of both sexes. Finally, we found no support for alternative hypotheses such as a female preference for aggressive males. This new, detailed study of the forms and intensity of sexual intimidation in a wild primate suggests that it may be widespread across mammalian societies, with important implications for understanding the evolution of mate choice and sexual conflict in mammals, as well as the origins of human sexual violence.

**Barragan-Jason Gladys**, Institute of advanced study in Toulouse (IAST)

*The two facets of patience in young children*

Patience, or the ability to tolerate delay, is usually studied using delay of gratification (DoG) tasks. However, the use of a reward to test patience implied different issues including the effect of the type of reward (eatable vs abstract) and the motivation toward the reward (preference toward the small or the large reward). In addition, the measure of patience does usually not include the ability to wait in the absence of a specific reward (e.g., patience as a virtue). This study aimed evaluating a new measurement of patience called pure waiting paradigm (3 minute of waiting with nothing to do but wait without gratification while an experimenter pretended to have work to do) and look at its possible relation with the classical DoG paradigm. To do so, 3 to 5 year-old children performed (i) two novel tasks called pure waiting tasks (wait in the presence of the absence of a busy experimenter) from which spontaneous patient and impatient behaviors were coded, (ii) two multiple trial (5 different imposed wait delays) DoG tasks (Candy and Video rewards) and two Motivation tasks (small vs large reward immediately available). Results from the pure waiting tasks revealed that children engaged more in patient behaviors than in impatient behaviors and showed less impatient behaviors in the presence of the experimenter. Results from the DoG tasks showed that 5 years-olds outperformed 3 years-olds in the DoG-Video condition. Delay maintenances improved as the imposed delays increased. In addition, participants selected the larger option more often in the Motivation-Video condition compared to the Motivation-Candy condition. Importantly, significant correlations were reported between performance in DoG and patient behaviors, especially in children who were highly motivated. These results and methodology show for the first time a direct link between patience “as a virtue” and DoG performance and provide new insights into the study of patience in children.

**Chabé- Ferret Bastien**, Université catholique de Louvain (UCLouvain)

*Adherence to cultural norm and economic incentives: evidence from fertility timing decisions.*

I analyze the interplay between culture and economic incentives in decision-making. To this end, I study birth timing decisions of second generation migrant women to France and the US. Only the probability to have three or more children increases with the home country fertility norm, whereas the timing of the first two births is either unaffected or negatively correlated. I propose a model that rationalizes these findings in which decisions are the result of a trade-off between an economic cost-benefit analysis and a cultural norm. The model predicts that decisions with a higher cost of deviation from the economic optimum should be less prone to cultural influence. This is consistent with substantial evidence showing that the timing of the first birth bears much larger costs for mothers in terms of labor market outcomes than that of subsequent births.

**Chaudhary Nikhil**, University College London (UCL)

*Social capital and fitness in hunter-gatherers*

Polygyny is estimated to be permitted in more than 80% of human societies, and therefore is very relevant to our understanding of the human family. Polygynous marriage is typically explained using the polygyny threshold model, whereby rich men are able to afford multiple wives in societies with large inequalities in male wealth. However, the occurrence of polygynous marriage in hunter-gatherer societies, which do not accumulate wealth, remains largely unexplored. Hunter-gatherer societies offer the greatest insight in to human evolution since they represent the majority of our species' evolutionary history. In order to elucidate the evolution of hunter-gatherer polygyny we study marriage patterns of BaYaka Pygmies. We investigate 1- rates of polygyny amongst BaYaka hunter-gatherers; 2- whether polygyny confers a fitness benefit to BaYaka men; 3- in the absence of wealth inequalities, what are the alternative explanations for polygyny amongst the BaYaka. To understand the latter, we explore differences in phenotypic quality (height and strength), and social capital (popularity in economic gift games). We find polygynous men have increased reproductive fitness; and that social capital and popularity but not phenotypic quality might have been important mechanisms by which some male hunter-gatherers sustained polygynous marriages before the onset of agriculture and wealth accumulation.

**Du Juan**, University College London (UCL)

*Child survival and kin effects in a pastoralist society*

Here we show how sex-biases in parental investment in a Tibetan pastoralists society, has changed in relation to recent changes in the control of resources ownership and inheritance pattern, that have resulted from changes in Chinese government policy. We examine four demographic measures which we believe are closely related to the sex-biases in parental investment: infant mortality, the duration of breast-feeding, the introduction of complementary feeding, the marital status of the parents and the interbirth intervals. We interpret the demographic data to illustrate how people respond to the changing social and political system with changes in the sex-biases of parental investment. Our results show that female-biased parental investment started to predominate since the earlier 90s, when both sexes could own land or livestock, but more recently, since 2000, biases are being muted in this pastoralist society as the system moves away from herding towards children's education, in this case, both female and male children will get the compulsory education opportunity.

We argue that sex-biased parental investment are based on the potential economic contribution and inheritance patterns that are changing in response to policy changes which have altered the political, social and ecological environment at various times in recent history.

**Dyble Mark**, Institute of advanced study in Toulouse (IAST)

*Inclusive fitness benefits can favour altruism towards reproductive partners and affinal kin*

Kin selection holds that individuals can receive inclusive fitness benefits from altruism toward genetic kin. In humans, however, kinship reflects not only shared genetic ancestry but also kinship through marriage: our affinal kin (“in-laws”) and reproductive partners. Here we argue that in estimating inclusive fitness benefits of altruism, relatedness should be defined not by shared genetic ancestry ( $r$ ) but as genetic interest of the altruist in the future offspring of the recipient. We propose a coefficient of shared reproductive interest ( $s$ ) that allows the extension of kin selection to reproductive partners and affinal kin and show, using a computational model, that directing altruism according to  $s$  rather than  $r$  is positively selected when reproductive partnerships are stable. We also show that  $s$  is a better predictor than  $r$  of social interactions among two hunter-gatherer populations (the Palanan Agta and Mbendjele BaYaka). We argue that the evolution of pair-bonding and energetically demanding offspring in humans provided the conditions for the recognition of affinal kin, and the emergence of extended families.

**Frigo Annalisa**, Université catholique de Louvain (UCLouvain)

*Now she is Martha, then she is Mary: the influence of beguinages on attitudes toward women*

When 12th-century young women in Belgium decided to live together and care for themselves in communities without male intervention, they triggered a change in attitudes toward women. They lead a religious life of contemplation and prayer while earning a living as labourers or teachers. Contrary to nuns, they never took formal vows nor lived cloistered. This paper follows the legacy of these “feminist” forerunners, called beguines, during the 19th century and shows the long-lasting effects they had on gender-related outcomes. Using novel data featuring the precise location of each beguine community in Belgium combined with 19th century census data, we show that wage and literacy differentials between men and women reduced in municipalities exposed to the presence of a beguinage in the past. Using changes in the political organisation through which some villages became more attractive to beguines, we establish that the variation in gender literacy and wages is indeed related to the presence of beguinages. Our results are in line with the extensive empirical evidence documenting the persistence of gender norms and institutions.

**Mercier Marion**, IRES- Université catholique de Louvain (UCLouvain)

*Economic development and Human handedness*

We study the relationship between economic development and left-handedness. A unique dataset on handedness in the US, by county and birth-cohort (Gilbert and Wysocki, 1992), combined with further data on GDP and human capital, allows us to establish a robust correlation between lefthandedness and economic development, as well as some other interesting stylized facts, such as the U-shaped trajectory of left-handedness rates over the last two centuries. In order to make sense of such empirical evidence (which lacks so far a convincing explanation), we build a unified growth model augmented with a full-fledged evolutionary mechanism governing the dynamics of the alleles that determine handedness.



We are able to show that, in a world where left-handed people are characterized by lower productivity in using tools designed for the right-handed majority or operating industrial machines, the inversion of the fertility – human capital relationship brought about by the Industrial Revolution can explain the reversal in the time-evolution of left-handedness. In addition, we (i) resort to quantitative theory in order to assess the quantitative relevance of our story, and (ii) explore, both theoretically and empirically, the feedback from handedness to growth. Our research provides an example of how economic development (namely, structural transformation) can shape evolutionary forces, thus improving our understanding of the growth – diversity link.

**Migliaccio Emanuela**, Institute of advanced study in Toulouse (IAST)- Paris School of Economics (PSE)

*Cultural transmission and traveling cooperators*

This paper studies the spatial diffusion of cooperative behavior when cooperation is determined by a cultural trait that can be endogenously transmitted across generations through some socialization mechanism à la Bisin and Verdier (2001). We explicitly embed this model into a continuum spatial structure in which individuals can locally migrate in space according to a simple diffusion process. Using mathematical techniques and results from reaction-diffusion equations theory, we provide conditions under which a culture of cooperation can fully diffuse in the whole population across space and we characterize the asymptotic traveling speed of such diffusion. Through this process, we show that even an initially localized domain of cooperators can invade the whole spatial structure.

**Moya Cristina**, Max Planck Institute for Evolutionary Anthropology

*Intergenerational conflict may help explain why parents delay the onset of their children's reproduction: a cross-cultural analysis.*

Parental presence is consistently associated with delayed first births in high income, low fertility human societies. This counters both findings from non-human primates, and the simple prediction that parental investment should enable offspring to reproduce earlier. Several hypotheses have been proposed to explain this puzzle, but this literature lacks a cross-cultural perspective. Here we present the most extensive systematic cross-cultural comparison of parental effects on first births to date. We (1) test whether parental presence is consistently associated with offspring's age at first birth using data from 20 populations, predominantly representing small-scale and higher fertility societies; and (2) test hypotheses about cross-cultural variation in these associations derived from several theoretical accounts. We find that on average parental presence is associated with later reproductive onset for daughters, but not sons. Yet these effects are cross-culturally variable and patterned. Mothers delay their children's first births least in societies with flexible post-marital residence norms (i.e. ambilocal societies compared to matri-, patri- or neolocal ones), and fathers delay their sons' first births more in highly polygynous societies. These patterns are consistent with parents winning intergenerational conflicts over limited household resources that can be used towards reproduction. However, other explanations also likely play a role. For example, parents are associated with the largest delays to daughters' reproduction in the most post-industrial society in our sample, suggesting multiple explanations of parental effects are plausible, and that caution is necessary when generalizing from research in post-demographic transition societies.

**Myers Sarah**, University of Kent/Roehampton University

*A life history perspective on maternal emotional investments during infancy*

#### Purpose

Life history approaches to parental investment have typically highlighted trade-offs humans make by measuring variations in the transfer of resources such as knowledge, wealth, or social status from parents to offspring. Such transfers often occur later in the life of offspring, yet parents make investments their offspring from conception. Here we use various measures of maternal investment to assess whether access to allocare, and perceptions of extrinsic risk, affect maternal emotional investment trade-offs in early infancy, and measures of available emotional resources to assess whether emotional investment is costly. Bonding is of interest because it may guide long-term investment motivations and because it plays a role in enhancing infant development.

#### Methods

A longitudinal survey study tracked 70 Western women across the perinatal period, recording their maternal investment in the form of strength of bonding, time taken to bond, and the confidence they had in their bond, along with their perception of extrinsic environmental risk, access to a variety of allocare figures, and a number of measures of emotional capacity, including emotional intelligence.

#### Results

The perception of extrinsic risk negatively predicted bonding, while overall support from allocarers positively predicted strength of bonding. However, support from the child's father negatively predicted strength of bonding and support from paternally related family members negatively predicted the time taken to bond. Strength of bonding positively predicted falls in emotional capacity; access to allocare moderated this relationship.

#### Conclusions

These results demonstrate that maternal emotional investments are contingent on circumstance. Bonding incurs a cost to a mother's emotional resources when access to allocare is low. High support from an infant's father and father's family allows mothers to offset their emotional investment costs in favour of their infant's gaining emotional investment from their paternal kin.

**Page Abigail**, University College London

*Why care for someone else's child? Exploring adaptive hypotheses for cooperative breeding*

Humans are defined as prolific cooperative breeders, which arguably allows for the rapid production of highly dependent and costly offspring. Previous literature has focused on key relatives such as grandmothers, as well as exploring the adaptive value of this childcare in terms of increased child survival and/or maternal fertility. However, a systematic exploration into why these alloparents (non-parental carers) provide childcare is much rarer. Inclusive fitness models of cooperation attempt to explain behaviour from the perspective of individualistic gains and studies frequently demonstrate that more related individuals provide more childcare. However, previous research rarely separates the effects of relatedness from reciprocity, costs and benefits or explores childcare from non-kin. Consequently, the answer to 'why care' still escapes the human literature. Here, we use high-resolution proximity data from 2,045 child-alloparent dyads among Agta hunter-gatherers (Philippines), to test whether the evolutionary explanations of relatedness and reciprocity explain interactions both from kin and non-kin. Relatedness was positively associated with hourly interactions with a child, while costs associated with childcare obligations in the alloparents household negatively predicted interactions. Reciprocity was only an important predictor in distant kin and nonkin, as close kin would invest irrespectively. Thus, despite shared genes, distant kin interactions were also contingent on reciprocity. Finally, non-kin interacted more at high costs compared to distant kin, perhaps due to juvenile playgroups providing childcare en masse. These findings demonstrate how alternative hypothesis testing reveals the complexity of cooperative breeding, suggesting how mothers manage to produce multiple dependent offspring in unpredictable environments.

**Raiber Eva**, Toulouse School of Economics (TSE)

*Marriage markets with parental search: theory and data from China*

This project addresses the question of when to actively search for a marriage partner. Potential marriage partners can be met during daily life activities but one can also make the decision to actively search for a partner by engaging in an additional activity that comes with a cost. We aim to model the decision of active search in a non-stationary matching model with search frictions where individuals meet another individual of the opposite sex randomly drawn from the population in each period. Unmatched individuals can decide to actively search to have another meeting with an individual drawn only from those that actively search. This option become more advantageous the higher the share of matched in the population and the more the distribution of active searchers fits to one's expectations of a marriage partner. We then use a novel data set of mostly parents that come to a public part in Kunming, China in order to help their adult child find a spouse, to provide an illustration for the model. This active search platform attracts mostly locals and comparing our data set with representative household data from the same city, we find that individuals that are represented by their parents at the public park are older and more educated than the average unmatched population within the city. We use stated preferences on the lowest level of education and income a parent would accept as well as the upper and lower limits on age to investigate matching preferences and variables affecting selectiveness.

**Revathi Venkateswaran Vandana**, Max Planck Institute for Evolutionary Biology, Plön

*Evolutionary dynamics of multiple games in the multiverse*

Game theory is widely applied in scenarios ranging from economics to biology. For instance, hunting techniques, studies on the evolution of cooperation, modeling sexual strategies etc. In evolutionary game theory, for a particular application, usually a single game is analyzed, which can have  $n$  strategies. However, there are unfocused games where players play several games during the same instant. Here, a combination of the various individual games must be considered. We combined single multiplayer multi-strategy single games as a multi-game to see if the Multi Game Dynamics (MGD) is comparable to the Single Game Dynamics (SGD). Previous studies on combinations of two player two-strategy (or  $2 \times 2$ ) games showed that it is not always possible to decompose the MGD into its constituent games if at least one game has  $n > 2$  and thus impossible to always predict dynamics of a combination of games even if the underlying games are well understood. We propose an idea of combining multiplayer multi-strategy games where the conditions of  $n > 2$  is no longer necessary.

**Salali Gul Deniz**, University College London (UCL)

*Marital ties, cooperative childcare and cultural evolution*

Human evolution is marked by long-term pair bonds between men and women, exogamy (marriage outside one's own group), and our unique ability to recognize both maternal and paternal kin. The importance of marital ties (i.e. affinal kin) in allowing peaceful interactions between groups has long been acknowledged in anthropological literature. However, their role in cultural transmission has been neglected. Given that marital ties are the key links connecting distant families in hunter-gatherers, their importance in transmission and accumulation of knowledge should be substantial and requires further investigation. Marital ties also play a crucial role in childrearing, because individuals connected through marriage often have shared reproductive interests. Interactions through childcare provide not only fitness benefits, but also a medium for knowledge and skill exchange that is necessary for survival. Here, I investigate the role of marital ties and cooperative childcare in the transmission of plant knowledge in Mbendjele BaYaka Pygmies of Congo-Brazzaville.

**Sarkisian Roberto**, Toulouse School of Economics (TSE)

*Team incentives under moral and altruistic preferences: which team to choose?*

This paper studies incentives provision when agents are characterized either by homo moralis preferences (Alger and Weibull, 2013, 2016), i.e. their utility is represented by a convex combination of selfish preferences and Kantian morality, or altruism. In a moral hazard in teams setting with two agents whose efforts affect output stochastically, I demonstrate that the power of extrinsic incentives decreases with the degrees of morality and altruism displayed by the agents, thus leading to increased profits for the principal. I also compare the power of the optimal contracts and the principal's expected payoff under both preferences, and show that a team of altruistic agents will be preferred if the production technology exhibits increasing returns to efforts, while a team of moral agents might be preferred under decreasing returns to efforts and additional conditions on the parameters of the model.

**Zheng Jiakun**, Toulouse School of Economics (TSE)

*Household risk versus individual risk: an experimental study*

Many decisions taken by households involve risk and are taken jointly by multiple members of the family. There is increasing evidence that joint decisions can not be estimated as a convex combination of individual preferences. Moreover it seems that different members of the household have different weights on the overall outcome. We experimentally study a joint decision task taken by 100 established couples from Toulouse, France. In a first part couples had to choose between two options, that varied overall household risk while keeping expected payouts constant. In a second part one of the two spouses (either the man or the woman) was 'insured' against risk in one of the two options. We investigate behavior in these two parts and relate it to socioeconomic variables and individual risk preferences. We find that overall couples show a preference for the option that presents lower risk on the couple level even if this implies accepting larger individual risk. Secondly we investigate the case where one partner is insured: couples where men are insured stay with similar preferences, which can be interpreted as women not being negatively affected by holding all risk. However couples where women are insured show a switch in preferences to an option that increases risk for the household. Thus men and/or couples seem to be averse to the idea of the man holding all risk in the household.

**Vincent Zvenigorosky**, (Molecular Anthropology) Laboratoire AMIS

*Matrimonial culture in two Eastern Siberian communities*

We endeavoured to study the conservation of traditional patrilocality rules in two localities of the Sakha Republic (Eastern Siberia). We chose a rural village from Central Yakutia and an airport town near the Arctic Circle, two settlements with different means of subsistence and cultural backgrounds. Clear distinctions appeared between them regarding the prevalence of mixed marriage and the gender-dependent geographical origin of adults. In the traditionally rural Yakut community, patrilocality was still evidenced by the fact that most men (67%) had been born in the village and most women (55%) had been born outside. Marriage of mixed origins was prevalent and the union of a local man with a non-local woman was favoured (40%). In the airport town, there appeared to be no difference in the geographical origins of men and women, although the proportion of natives was overall smaller than in the rural village. Mixed marriage was again favoured but we did not identify any union between a local man and a non-local woman. We conclude that traditional matrimonial rules have evolved differently or at different rates in settlements that occupy distinct positions in their respective networks and are therefore not subjected to foreign influence in the same way.