Abstracts

Zegni Triki

(Department of Biology, University of Neuchatel)

The Fish Challenge to Vertebrate Cognitive Evolution. Several evolutionary hypotheses have been proposed to explain the tremendous variation in vertebrate brain size. Among these, the social brain and ecological brain hypotheses propose that social and dietary challenges have driven brain expansion, enhancing cognitive skills to cope with these challenges. While initially focused on primates, the social brain hypothesis has been somewhat adapted for other vertebrate groups, including ectotherms like fish. Due to their brain plasticity, evidence shows that social complexity can affect cognitive development in various fish species. Although this hypothesis applies to both endotherms and ectotherms, it does not adequately address the deeper divide between these two groups, as ectotherms typically possess brains that are ten times smaller than those of endotherms. Current theories do not adequately explain this difference, particularly since some endothermic species with simpler social systems and diets than ectotherms still have larger brains. Additionally, a growing body of evidence indicates that fish have a cognitive "toolkit" comparable to many endotherms. This challenges existing concepts of vertebrate cognitive evolution as we know it. Here, we suggest two hypotheses to explain this challenge. First, the fish brain achieves modularity more cost-effectively, though it is less adept at problem-solving compared to an endothermic brain with a more domain-general organisation. Second, variations in brain size may be more accurately attributed to perception and motor skills than to cognitive processes. In that case, understanding brain size evolution would necessitate employing a broad definition of animal cognition, specifically regarding how animals perceive and process sensory input before deciding how to act on it with motor competencies.

Jean-Christophe Billeter

(Department of Biology, University of Groningen)

Tiny Brains, Big Insights: How Fruit Flies reveal the fundamental Impact of the Social Environment on individuals. Fundamental aspects of an individual's physiology and behaviour are modulated by the social environment. Being in the presence of others reduces pain perception in humans, slows down cancer progression in rats, and increases growth rate in farm pigs. Conversely, being alone leads ants to let themselves die of starvation, and fruit flies to die younger. The profound impact of being with others on an individual's performance raises the question of what mechanisms mediate this influence. The fruit fly -Drosophila melanogaster- is a superior research tool for discovery and investigation of novel biological pathways. Available tools mean that Drosophila behavior can be dissected from the single cell to the whole organism. But does the social environment affect Drosophila and can this species help us build a mechanistic understanding of how the presence of others shape an individual's behavior and physiology? In this talk, I will explore how key aspects of Drosophila biology are influenced by its social environment -a feature that had been until recently overlooked- and demonstrate how core biological processes in this species are modulated by the presence of others.

Isabel Thielmann

(Max Planck Institute for the Study of Crime, Security and Law)

The role of personality for cooperative behavior. Evidence consistently shows that individuals differ in their prosociality. Whereas some people are inclined to cooperate with others, even at personal cost, others largely refrain from cooperation. Why is this the case? In my talk, I will focus on a set of psychological variables that can account for these systematic individual differences: personality traits. Situations conducive to cooperation provide opportunities – so-called affordances – for certain personality traits to manifest themselves. In turn, different personality traits have been shown to predict cooperative behavior in various contexts. I will present evidence on such person-situation interactions based on economic games to measure cooperation and discuss implications of these research findings for promoting cooperation through targeted interventions.

Daniel Balliet

(Psychology, Vrije Universiteit Amsterdam)

Inferences about interdependence shape cooperation. During social interactions in daily life, people possess imperfect knowledge of their interdependence (i.e., how behaviors affect each person's outcomes), and what people infer about their interdependence can shape their behaviors. I will review theory and research that suggests people can infer their interdependence with others along several dimensions, including mutual dependence, power, and corresponding-versus-conflicting interests. I will discuss how perceptions of interdependence affect how people cooperate and punish others' defection in everyday life. I propose that people understand their interdependence with others through knowledge of the action space, cues during social interactions (e.g., partner behaviors), and priors based on experience. Finally, I will describe how learning interdependence could occur through domain-specific and domain-general mechanisms.

Jorg J.M. Massen

(Animal Behaviour and Cognition, Utrecht University)

Interdependency as diver for the evolution of cooperation. The evolutionary mechanisms of cooperation, like kin-selection and reciprocal altruism, are well-studied, yet what motivates individuals to start cooperative interactions or relationships remains unclear. Whereas there are several theoretical accounts trying to deal with this caveat, empirical studies are scarce, and the few that do exist use a wide array of set-up and procedures making comparisons across species difficult, and are primarily primate focussed, which puts further limits on evolutionary interpretations of these results. Some of the earlier work that tried to remedy at least the first point, compared multiple species of primates using a single procedure and found that the extent of allomaternal care was directly linked to prosocial motivations that are in turn tightly linked to cooperative success, resulting in the cooperative breeding hypothesis regarding the evolution of cooperation. Capitalizing on this procedure, I have extended the taxonomic breath, and made comparisons across multiple birds species, that partly show similar results, but extend the explanatory variables to more general tolerance, a concept that has in the past been dubbed the self-domestication hypothesis. Yet other studies from my lab also show prosocial motivations in species that show no allomaternal care, nor are they considered very tolerant. In fact, we showed comparatively high levels of prosociality in a very

despotic macaque species. A large-scale comparison across 6 different macaque species that vary in their degree of despotism furthermore, showed, that this despotism even enhances cooperation in comparison to egalitarian species. We, therefore, propose an overarching interdependency hypothesis, which identifies interdependence at the group level for cooperative- and/or colonially breeding species, and interdependence at the dyadic level in despotic species, where individuals rely on coalitions to gain resource potential. Both routes may lead to increased tolerance and subsequently enhanced cooperation, but whereas for the former this should be indiscriminative of the individual (with whom to cooperate), in the latter it should be very specific to only a couple individuals.

Marco Colnaghi

(Vrije Universiteit Amsterdam)

Interdependence, Ecology, and the Origins of Collectivism. Subsistence styles that enhance interdependence have been linked with the emergence and diffusion of collectivism. For example, farming rice and other labour-intensive crops demands a collective effort, making people more mutually dependent on each other. This process is thought to promote collectivistic values, which enhance cooperation within a group. Greater interdependence, on the other hand, can also lead to conflict of interest, as the temptation to exploit the common good becomes stronger. Using a game-theoretical model, I investigate the evolution of collectivism in ecologies where people need to cooperate to maintain a common resource, and thus experience varying degrees of conflict and mutual dependence. The model reveals that conflict of interest and relational mobility play a major role in the evolution collectivism, providing new insight on the relation between ecology, interdependence, and cooperation.

Sacha C. Engelhardt

(Deutsches Primaten Zentrum; University of Göttingen)

Pro-sociality in mammals and birds—a meta-analysis. Prosocial behavior is defined as any behavior that is intended to benefit another individual. This behavior does not need to be costly. Results of individual studies are heterogenous, obscuring major effects. We conducted a phylogenetically controlled meta-analysis in order to investigate how much variation in non-human mammalian and avian prosocial behavior can be explained by different experimental approaches and prosocial-choice paradigms. We examined if variation in prosocial behavior can be predicted by social organization and care systems, and their associated social tolerance. We calculated Hedge's g as the effect size to compare the outcome of conditions for the actor and the recipient: 1) selfless (0/1) vs spiteful (0/0), 2) mutualistic (1/1) vs selfless (0/1), 3) mutualistic (1/1) vs selfish (1/0), 4) selfish (1/0) vs selfless (0/1), and 5) mutualistic (1/1) vs spiteful (0/0). We compared the test condition, i.e. partner present, to different controls conditions, i.e. partner absent or random chance. We classified the experimental design according to the techniques used in the experiment (prosocial choice task: bar-pulling, symbol/token; giving assistance task: helping, token exchange, or release paradigm). We conducted meta-regressions to assess the influence of allomaternal care, the care system (cooperative breeding, communal breeding, group-living) on the effect sizes. The meta-analysis included over 40 studies, 160 test effect sizes and 210 control effect sizes to investigate which factors may explain the evolution of prosocial behavior. Preliminary results indicate that the care system did not significant affect the effect sizes for the 1/1 vs 1/0 and the 1/1 vs 0/0 comparisons, and these results did not support the

cooperative breeding hypothesis for prosociality. However, categories of care system are rather broad categorization of allomaternal care. Hence, additional analyses, including the amount of allomaternal care, are now indicated.

Catherine Molho

(Toulouse School of Economics, and Institute for Advanced Study)

How does punishment enforce social norms? From peer enforcement to punishment institutions. Enforcing norms that support cooperation is a crucial challenge for human societies. An interdisciplinary literature has identified punishment as an important mechanism to address this challenge. Across societies, people are sometimes willing to punish norm breakers via direct confrontation or via indirect means such as gossip and social exclusion. At the same time, several theoretical perspectives propose that the punishment rules devised by human groups depend on ecological and cultural conditions. In this talk, I will present two lines of research aiming to understand when and how punishment enforces cooperative norms. In the first, I investigate the proximate mechanisms underlying direct and indirect punishment of norm violations in daily life settings. In the second, I examine how exogenous threats faced by groups causally influence the punishment rules that they develop in a controlled experiment. Together, these studies address longstanding questions regarding the prevalence of punishment in the field, the psychological mechanisms underlying punishment of norm breakers, and the influence of ecological conditions on the development of punishment institutions.

Luuk Snijder

(Department of Sociology, University of Groningen)

How partner choice and cooperation increase resource inequality. Cooperation is more likely when individuals can choose their interaction partner. However, partner choice may be detrimental in unequal societies, in which individuals differ in available resources and productivity, and thus in their attractiveness as interaction partners. We experimentally examined this conjecture in a repeated public goods game. Individuals (n = 336), participating in groups of eight participants, were assigned a high or low endowment and a high or low productivity factor (the value that their cooperation generated), creating four unique participant types. On each round, individuals were either assigned a partner (assigned partner condition) or paired based on their self-indicated preference for a partner type (partner choice condition). Results show that under partner choice, individuals who were assigned a high endowment and high productivity almost exclusively interacted with each other, forcing other individuals into less valuable pairs. Consequently, pre-existing resource differences between individuals increased. These findings show how partner choice in social dilemmas can amplify resource inequality.

Daniel Redhead

(MPI Leipzig and Department of Sociology, University of Groningen)

A cross-cultural analysis of the associations between social networks and inequality. People's social relationships are crucial to their success and wellbeing. Given this, there are expectations of a broadly

positive association between the social position that a people occupy within their community's network and their material wealth. There is, however, limited understanding of how different types of social support and material wealth are associated, and we have little empirical evidence of how these associations may vary across different settings. In this presentation, I will introduce the ENDOW project (Economic Network Dynamics Of Wealth Inequality), a collaborative and interdisciplinary research project primarily aimed at exploring the effect of social network structure on the degree of inequality in wealth. To do this, we are gathering social network data from over fifty communities in thirty-plus countries around the world. The communities are relatively small and somewhat contained (ranging in size from roughly thirty to over two hundred households), but are remarkably and purposefully diverse in their economies, market integration, institutional forms, and cultural practices. Among other communities, our sample includes wage labourers in India, foragers in the Congo, horticulturalists in Suriname, pastoralists in Namibia, and fishers in Fiji. Anthropologists working with each community have gathered detailed demographic, economic, and social support network data that form the foundations of our analyses. I will present current cross-sectional findings focused on the associations between social support networks and material wealth, both within and between sites.

Jonas Stein

(Sociology Department, University of Groningen)

Limited evidence for structural balance in the family. Previous studies have shown that relationship sentiments in families follow a pattern wherein either all maintain positive relationships or there are two antagonistic factions. This result is consistent with the network theory of structural balance that individuals befriend their friends' friend and become enemies with their friends' enemies. Fault lines in families would then endogenously emerge through the same kinds of interactional processes that organize nations into axis and allies. We argue that observed patterns may instead exogenously come about as the result of personal characteristics or homophilous partitions of family members. Disentangling these alternate theoretical possibilities requires longitudinal data. The present study tracks the sentiment dynamics of 1,710 families in a longitudinal panel study. Results show the same static patterns suggestive of balancing processes identified in earlier research, yet dynamic analysis reveals that conflict in families is not generated or resolved in accordance with balance theory.

Laura C. Hoenig

(Department of Psychology, Vrije Universiteit Amsterdam)

How Intragroup Cooperation Generates Intergroup Conflict. Research on cooperation suggests that intergroup conflict motivates cooperation within groups, but less is known about how such conflicts arise. This paper demonstrates an additional, reverse pathway of intragroup cooperation leading to intergroup conflict. In two experiments (N = 342), participants in groups invested in club goods that either benefitted only the in-group or benefitted the in-group at a cost to the out-group. Results show individuals cooperated more on goods that were efficient or equally benefitted in-group members, even when these actions harmed the out-group. Those benefitting from inequality readily imposed costs on the out-group, triggering cycles of retaliation and reducing overall welfare. This research identifies an heretofore overlooked root of intergroup conflict: Cooperation aimed at enhancing in-group welfare can inadvertently spark conflict with other groups. The findings have implications for

understanding the origins of conflict and the evolution of cooperation, revealing how managing common resources can lead to unintended, harmful consequences.

Angelo Romano

(Institute for Psychology, Leiden University)

The co-existence of ingroup favoritism and the nasty neighbor effect. Like other group-living species, humans often display ingroup favoritism, that is they cooperate with ingroup members more than with outgroup members. Theoretically, ingroup favoritism should imply that people also compete less with ingroup members than with outgroup members. Across five empirical studies, we show that in situations where people could invest to take other's resources, and invest to protect against such exploitation, they are surprisingly more competitive with ingroup than outgroup members. This 'nasty neighbour' behaviour emerged independent of ingroup favoritism and trust towards others that have the same (versus different) nationality. A theoretical and agent-based model including both cooperation and competition reveal that neighbor nastiness and ingroup favoritism can co-evolve, especially when ingroup cooperation provides larger benefits than outgroup cooperation. That humans can exhibit both parochialism and nastiness within groups is difficult to reconcile with existing theories on the evolution of cooperation in structured populations.