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Plenary abstract

Taming the confusion in the human life history literature

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Interest in incorporating life history theory from evolutionary biology into the human sciences has grown rapidly in recent years. Two core features of this research have the potential to prove valuable in strengthening theoretical frameworks in the health and social sciences: the idea that there is a fundamental trade-off between reproduction and health; and that environmental influences are important in determining life history outcomes. There is a barrier to furthering this interdisciplinary agenda, however: the term ‘life history theory’ is applied to quite different research programmes in the evolutionary human sciences, creating considerable confusion in the literature. Here, I review the different approaches to studying life history, and related behavioural, outcomes from evolutionary anthropologists, developmental psychologists and evolutionary psychologists. I then make recommendations for improving the usefulness of this literature, since a rigorous, theoretically sound research programme on human life history has the potential to better our understanding of human health and behaviour.

Plenary abstract

The adaptive use of social learning

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Social learning (learning from others) underlies the wide-spread occurrence of traditions or culture in all animals, including humans. Although social learning is a cheap and efficient form of learning, it is not adaptive to use social information indiscriminately due to its potential unreliability. Accordingly, transmission biases (or social learning strategies) enable individuals to avoid the costs associated with asocial learning and determine when they should use social information and from whom they should acquire it. Investigation of these biases has increased rapidly in the last 15 years. I shall review several of my empirical studies, with young children and non-humans, highlighting the potential role of transmission biases, in the establishment of cultural traditions and in humanity's striking capacity for cumulative culture. I will also touch upon future directions, including the potential for applying knowledge of transmission biases to societal issues.

Plenary abstract

Natural selection – now!

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The Industrial Revolution and the accompanying nutritional, epidemiological and demographic changes have profoundly changed human ecology and biology, leading to major shifts for example in our disease patterns, lifespan, family size or age at puberty. These recent social and cultural adaptations have cast doubt on the continued relevance of Darwinian selection in humans – we now have modern medical care and effective contraceptive methods so what does that mean for evolution by natural selection? I will discuss how the mismatches between past adaptations and the current environment mean that gene variants linked to higher fitness in the past may now predispose us to non-communicable diseases, such as Alzheimer disease, cancer and coronary artery disease. Moreover, in both traditional and industrialized societies, differences among individuals still lead to selection favouring certain heritable traits. This is because although survival to old age can be high, not everyone has the same family size and many forego reproduction altogether. In line with this, increasing evidence suggests that the transition to modernity has also altered the direction and intensity of natural selection acting on many traits, with important implications for public and global health.

Plenary abstract

Local languages in a globalizing and pandemized world: challenges, opportunities and new understandings

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A number of studies within the last two decades have called the attention of the scientific community and the public at large to the accelerating loss of linguistic-cultural diversity and the disappearance of local languages. While advocacy for counteracting this loss has been growing, it is not always considered a negative scenario. Some view it as an adaptive transition to those global languages that offer socio-economic advancement. But is this loss neutral in terms of social advantages and consequences? A broad span of research implies it is not. On the one hand, language loss among indigenous people is correlated with deterioration in health, symptoms of post-traumatic stress, and elevated suicide rates. On the other hand, it has been shown that bilinguals have an expanded capacity for task-solving and achieving goals; active bilingualism among the elderly hinders cognitive decline and possibly delays dementia. And heritage languages appear to play a protective role in addressing health crises and lowering behavioral risk factors. In this talk I will discuss the results of quantitative and qualitative multidisciplinary research carried out in a number of minority/indigenous communities in Europe and America, representing different stages of language endangerment and loss. My presentation will examine several interconnected types of results, including the relationship between minority language use, experiences of discrimination, historical trauma and different aspects of individual and collective well-being. I will also discuss the outcomes of the most recent research dealing with the impact of the pandemic on speakers of minority/indigenous languages, which highlight and help to contextualize both the vulnerability and the resilience of local communities in the globalizing world.

Finally, I will relate these emerging understandings of the benefits of retaining and supporting community languages as well as of the impact of the Covid-19 pandemic on current language policies that are rarely efficient in supporting local languages because of their perceived lack of global ‘market value’. It can be argued that local languages and multilingualism in general should be considered a public good; however, if they are left to the mercy of market forces and nationalistic political agendas, without efficient and knowledge-based support policies, their existence will be at risk. And, as it is becoming increasingly clear, the multi-faceted implications of the reduction of linguistic-cultural diversity affect not only local communities, but also societies at large.

Plenary abstract

Orangutan socio-sexual behavior and sexual conflict: Insights for human evolution

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In this talk I reveal how recent research on great ape behavior and physiology provides new insights into the similarities we share with our closest relatives. In particular, I focus on my long-term research studying wild orangutans in Gunung Palung National Park, Indonesia for over 25 years. Orangutans are known for one of the highest rates of sexual coercion, through forced copulation, of any animal. This is coupled with another intriguing phenomenon of having two male morphs, a rare type of male bi-maturism. Females share crucial features of reproductive physiology in common with humans, such as concealed ovulation and menstrual cycle length. In this talk I explore the complexity of male and female reproductive decisions in wild orangutans and the ways that these reveal insights into the evolution of human mating systems. This includes new research from my team on the development of socio-sexual behavior in adolescent females and how the threat of forced copulation, as well as possible infanticide risk, impacts female behavior and ranging patterns. I also demonstrate the success of strategies employed by females to avoid undesired sires. These results reveal that, despite high rates of forced copulation, female choice is an important feature of orangutan mating patterns. I also discuss why sexual coercion is so prevalent in orangutans and how this type of sexual selection may be much more common across animals than often recognized. I point to the need for considering comparative data on sexual conflict as we consider the evolution of human mating patterns.

Plenary abstract

Peacocks or predators? Socially aversive personality traits, attractiveness, and coercion in human mating.

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Successful reproduction is contingent on several cognitions and behaviours that relate to mate choice, competition, and coercion. In the past few decades, there has been a mushrooming of studies investigating socially aversive personality traits as potential adaptations for promiscuous mating. In this talk, I will discuss research on the Dark Triad (i.e., Machiavellianism, narcissism, and psychopathy), focusing on two themes: attractiveness and coercion. Individuals at the high end of the Dark Triad continuum have an enhanced interest in promiscuous mating, and seem to be successful in short-term mate acquisition. The interesting question is how this success is achieved- is it facilitated by attractiveness to the opposite sex, or by the use of coercive tactics? Our studies suggest that women perceive high Dark Triad facial morphs as undesirable mating partners, irrespective of numerous contextual factors. This has led us to investigate whether short-term mating success of high Dark Triad individuals is based on coercive strategies rather than attractiveness. I will discuss several studies where we demonstrate that the Dark Triad relates to sexual harassment proclivity, misperceptions of consent, and victim blame. Socially aversive personalities seem to achieve their mating goals by harassment and coercion rather than through attractiveness.

The 2020 New Investigator Award winner

Principles of music perception

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Human musicality is underlain by two distinct systems of representation: one for tonal perception, which contextualizes pitch input in reference to a hierarchy of tones; and one for metrical perception, which contextualizes temporal input in reference to a hierarchy of rhythmic groupings. The two systems appear to be universal, early-developing, encapsulated, and supported by distinct genetic and neural correlates. But unlike the systems underlying number and spatial cognition, and like those underlying language, tonal and metrical perception appear to be uniquely human. Tonal and metrical representation form a basic structure for music perception that, when combined with each other and with higher-level musical structures (such as harmony, timbre, etc), and used in conjunction with other domains of human cognition including auditory (but non-musical) perception, social cognition, and language, yield a human psychology of music.

The 2021 New Investigator Award winner

Origins of the social mind: Cognition in humans and other apes

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Few traits characterise humans more profoundly than the complexity of our social lives, and the depth of our insights into the social and mental lives of others. To predict behaviour and make decisions in a dynamic and uncertain social world, we track others' social relationships, evaluate others based on their behaviour or identity, and even attempt to infer their thoughts and emotions. That our potential social partners possess these skills, too, is precisely what makes the social world so complex. In turn, we must manage our reputation and relationships, adhere to the norms of our group, and strategically navigate manifold cooperative and competitive interactions. Cognition is at the heart of what makes social life so demanding and thus, to characterize the origins of human social complexity, we must understand the origins of our social cognition. I will present a series of comparative experiments with humans and our closest phylogenetic relatives, chimpanzees (*Pan troglodytes*) and bonobos (*Pan paniscus*), aimed at identifying shared traits that were likely present 6-9 million years ago in our last common ancestor, as well as spotlighting unique features of the human mind. This work demonstrates that great apes, like humans, possess impressive knowledge of their social world: they remember social partners for decades, encode their dispositions and relationships, and even track their perspectives in surprisingly rich ways. Together, this body of research suggests that the roots of our social minds are discernible in the minds of our closest relatives, and extend deep into our evolutionary history.

From storytelling to Facebook. Content biases are stronger when retelling a story than when sharing it.

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Objective

Cultural evolution researchers use transmission chain experiments to investigate which content is more likely to survive when transmitted from one individual to another. Results from these experiments have been extended to real-life cultural domains, such as online misinformation or urban legends. However, a crucial difference between online transmission and these experiments is that participants in transmission chains need to understand, memorise, and reproduce the content, while an online “share” simply involves the willingness to do it. Do this difference influence which content is successful?

Methods

Two fully preregistered online experiments (<https://osf.io/wf7pd>). The first experiment (N=540) tests whether negative content, threat-related information, and information eliciting disgust are better transmitted than their neutral counterpart in a traditional transmission chain setup. In the second experiment (N=600), the same material is used, but participants are asked whether they would share or not the content in two conditions: in a large anonymous social network, or with their friends, in their favourite social network.

Results

Experiment 1 confirmed that attractive content is better transmitted than its neutral counterpart, for all three types of content. Experiment 2 instead showed that, out of six possibilities (2 conditions X 3 contents), in only one the attractive content was shared more than the non-attractive one, i.e. negative content in anonymous sharing.

Conclusions

Content biases are stronger when retelling a story than when sharing it.

Grab 'em by the...: Hostile and benevolent sexism as signals of mating strategies

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Objective

Men's hostile sexism is associated with many negative interpersonal consequences (e.g., lower relationship quality). Men's benevolent sexism does not seem to similarly promote negative behaviours and interpersonal interactions but is still associated with harmful attitudes and stereotypes (e.g., endorsement of rape myths). Recent work finds that disclosures of benevolent sexism are associated with perceived attractiveness and provisioning qualities, even though they are perceived as patronising. Our work is designed to apply evolutionary and feminist perspectives to investigate this further – is sexism used to infer mating-relevant qualities, mate attractiveness, and mating strategy?

Methods

Using a nationally representative sample (N = 317; Female = 50%), participants were randomly assigned to evaluate descriptions of men varying along two criteria, sexism (hostile vs. benevolent) and social prestige (with vs. without prestige criteria).

Results

2x2 Between-subjects ANOVAs highlighted several main effects: benevolent sexists were rated higher on long-term mate qualities, hostile sexists were rated higher on short-term mate qualities, and hostile sexists were rated as “more sexist” overall. Interaction effects indicated that having prestige decreased how “sexist” hostile sexists were perceived, the same was not true for benevolent sexists.

Conclusions

As predicted, disclosures of benevolent sexism were used to infer long-term mating qualities, while disclosures of hostile sexism were used to infer short-term mating qualities. We found that women were much more likely to report long-term mate attraction to the benevolent, compared to the hostile, sexist. The hostile sexist generated greater distrust and dislike in both men and women, compared to the benevolent sexist.

Facial masculinity increases perceptions of men's age, but not perceptions of their health: Data from an Arab Sample

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Masculine characteristics in men's faces are often assumed to function as health cues. However, evidence for this assumption from empirical tests is mixed. For example, research on Western women's face perceptions found that masculinized versions of men's faces were perceived to be older, but not healthier, than feminized versions. Since research on this topic has focused on Western women's face perceptions, we investigated the effects of masculinizing face images on Arab women's perceptions of men's health (study 1, N = 211) and age (study 2, N = 209). Arab women perceived masculinized versions of male face images to be older, but not healthier, than feminized versions. These results add to a growing body of evidence challenging the assumption that male facial masculinity functions primarily as a health cue.

It happened to a friend of a friend: inaccurate source reporting in rumour diffusion

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People often attribute rumours to an individual in a knowledgeable position two steps removed from them (a credible friend of a friend) such as 'my friend's father who's a cop told me about a serial killer in town'. Little is known about the influence of such attributions on rumour propagation or how they are maintained when the rumour is transmitted. In four studies (N = 1824) participants exposed to a rumour and asked to transmit it overwhelmingly attributed it either to a credible friend of a friend or to a generic friend (e.g. 'a friend told me about a serial killer in town'). In both cases participants engaged in source shortening: e.g. when told by a friend that 'a friend told me ...' they shared the rumour as coming from 'a friend' instead of 'a friend of friend'. Source shortening and reliance on credible sources boosted rumour propagation by increasing the rumours' perceived plausibility and participants' willingness to share them. Models show that in linear transmission chains the generic friend attribution dominates but that allowing each individual to be exposed to the rumour from several sources enables the maintenance of the credible friend of a friend attribution.

Forensic implications of human inbreeding mechanisms

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Over the years, evolutionary psychologists have developed and tested theory on the proximate mechanisms regulating human inbreeding aversion. The proximate mechanisms build on kin-recognition, which informs humans about relatedness and modulates kin-directed behaviour. Although the current theory has received support based on various methods, these findings have yet to reach scholars in forensic sexology and shape investigation of alleged intra-familial sexual abuse. In the presentation, we discuss the current model of human inbreeding aversion, the available support for it, and ways in which it could inform forensic sexology in ways that benefit society. Currently, intra-familial sexual abuse is often perceived and investigated as just another form of sexual abuse. We argue that this view overlooks a number of important differences.

Accelerated growth in infants of mothers with early childhood trauma

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Early life stress has long-term programming effect on growth, development and further health. Recent experimental studies in animals demonstrated that the effect of early maternal psychological stress may extend on the offspring. The aim of the presented study is to investigate the effect of early maternal trauma on infant growth parameters. To test this effect, we studied a sample of 99 exclusively breastfeeding mothers and their healthy, born on-time, 5 months old infants. Mothers were asked to complete Early Life Stress Questionnaire (ELSQ) to assess maternal trauma during childhood. Anthropometrical measurements of infant body length, weight and head circumference were taken. Multivariate analysis of variance (MANCOVA) was used to test for the effect of maternal trauma and infant sex on infant's growth parameters. Maternal childhood trauma and infant sex significantly predicted infant growth parameters. However, no effect of interaction between maternal trauma and infant sex was detected. The maternal childhood trauma was positively associated with infant growth parameters ($\lambda = .90$, $F(3,93) = 3.42$, $p = .02$, $\eta^2 = .10$). The separate univariate models indicated trauma and infant sex effect on body weight and head circumference and infant sex effect on body length. Our results demonstrate that maternal childhood trauma can affect infant growth parameters. They also suggest that early maternal stress might set child's development for faster life trajectory.

Intent-based morality in Colombian and Spanish children

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Objective

The majority of the developmental literature about the role of outcomes and intentions in moral evaluations has been conducted on English-speaking children and focused on harm and property transgressions. We aimed at investigating this phenomenon in 5- to 11-year-olds from collectivistic Colombia and individualistic Spain (N=123) employing moral scenarios involving disloyalty and unfairness.

Methods

We developed a computer game showing internet players violate moral norms; children took the role of referees and had the opportunity to judge and punish the players for their behaviour.

Results

Regarding judgements of transgression severity, Colombian children judged failed intentional transgressions more severely than accidental transgressions in case of disloyalty, but not yet in case of unfairness. Regarding punishment severity, Spanish children began to punish failed intentional transgressions of both moral domains more severely than accidents around 8 years of age. While punishment severity decreased with increasing age for both unfairness and disloyalty in Spanish children, in Colombian children the downward pattern was observed only for unfairness. Additionally, children anticipated punishment to feel worse than how it actually felt during and after punishment allocation.

Conclusions

According to cultural group selection, it makes evolutionary sense that children's sensitivity to intentionality develops earlier within the moral domains (loyalty) privileged by their own (collectivistic) cultures. Moreover, selective concerns for one moral domain (loyalty) over another (fairness) may become more pronounced with development because of culture-directed learning processes. The lack of hedonic punishment expectations suggests that retribution is unlikely to be the primary driver of children's third-party punishment.

Caring for parents: An evolutionary perspective on kin-care directed up the generations

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Objective

Globally, an increasing number of middle-aged women are dealing with the demands of multi-generational caring. Care by older women of younger kin, such as grandchildren, is well understood from an inclusive fitness perspective. Why adult women would care for their elderly parents, however, has been less researched. Here, we empirically study care directed towards elderly parents in a group of women with both grandchildren and elderly parents, and examine time spent caring relative to menopause status.

Methods

Data were drawn on women aged 55 from the National Child Development Study, some of whom had gone through the menopause, and some who had not. Using Poisson regression, we firstly test the assumptions of the Grandmother hypothesis and look at whether post-reproductive women spend more time caring for their grandchildren than women who are fertile ($n = 1877$), and secondly look at the caring behaviours of women who have two generations of family to care for (their elderly parents and grandchildren) ($n = 383$).

Results

After controlling for age, parental age, health, and other relevant factors, we find that menopause status affects how care is directed. In this sample of women, post-menopausal women spent up to an extra 18.33 hours per month caring for their grandchildren compared to pre-menopausal women, while pre-menopausal women spent an extra 9.74 hours a week caring for their parents than post-menopausal women.

Conclusions

The findings demonstrate that time dedicated to helping kin might be facultatively adjusted relative to the woman's own fertility status.

The contributions of eco-spirituality to pro-environmentalism

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Religious systems can be potent motivators of cooperation. However, it remains an open question as to what role religions can play in sustaining the types of coordination needed to respond to present-day cooperative problems such as the increasingly immanent threat of global environmental degradation. More broadly, there is surprisingly little psychological data about how religion can structure individual orientations to the natural world. We begin to document the existing variability by testing the relationships between religiosity, spirituality, and pro-environmentalism in a sample of Americans (N = 792) and students at a Canadian university (N = 816). We assessed the relative contributions of moral concern for the environment and eco-spiritual beliefs to the extent to which environmental protection is held to be a non-fungible sacred obligation, and behavioral commitments to protecting the environment. Results indicate that while moral concern for the environment has a small positive relationship with pro-environmental behaviours, it is those who consider environmental protection to be sacred obligation that are more strongly willing to make sacrifices to protect the environment. Moreover, while ‘religiosity’ is found to be negatively correlated with moral concern and behavioral commitments to the environment – spirituality, and specifically eco-spiritual beliefs are sizeable positive contributors to pro-environmentalism across cultural divides (both religious and political). This work provides evidence that fostering moral concern for the environment is only a weak means by which to increase pro-environmental behavioral and that eco-spirituality plays a special role in the (and could be harnessed to further the) transmission of pro-environmentalism.

Naïve, unenculturated chimpanzees fail to make and use flaked stone tools

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Objective

Despite extensive research on early hominin lithic technology, the mechanisms underlying flake manufacture and use are still debated. To draw phylogenetic inferences on the potential cognitive processes underlying these abilities in early hominins, we examined whether our closest living relatives, chimpanzees (*Pan troglodytes*), could learn to make and use flakes.

Methods

We provided naïve unenculturated chimpanzees from two independent populations (n=11) with baited puzzle boxes that could only be accessed with cutting tools, stone cores, and hammerstones to test for their ability to spontaneously make and use flakes.

Results

Despite the fact that the chimpanzees demonstrated an understanding of the requirements of the task and were sufficiently motivated, none of the chimpanzees made or used flakes in any of the experimental conditions.

Conclusions

These results differ from previous ape flaking experiments, which found flake manufacture and use in bonobos and one orangutan. However, these earlier studies tested only enculturated apes and provided them with demonstrations. The contrast between these earlier positive findings and our negative findings (despite using a much larger sample size) suggests that enculturation and/or human demonstrations may be necessary for chimpanzees to acquire these abilities. The data obtained here is consistent with the hypothesis that flake manufacture and use might have evolved in the hominin lineage after the split between *Homo* and *Pan* 7 million years ago, a scenario further supported by the apparent absence of flaked stone tools in the archaeological record after this split.

Weight location moderates weight-based self-devaluation and perceived social devaluation in women

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People with overweight and obesity devalue themselves, partially because they are socially devalued (e.g., stigmatized and discriminated against). However, for women, social valuation depends not only on how much weight they carry but on where on their bodies they carry it (i.e., their body shape). Here, we investigated whether weight-based self-valuation similarly depends on body shape. Study 1, using a nationally-representative U.S. sample from National Health and Nutrition Examination Survey (N = 1,052 reproductively-aged women) and proxy measures, found that self-devaluation and perceived social devaluation depended on weight location, above and beyond fat amount. Study 2 used an undergraduate sample of young adult women (N = 215) and more focused measures. Study 2 found that with increased fat amount, women with an abdominal weight distribution reported more self-devaluation (e.g., lower self-esteem) and perceived social devaluation (e.g., higher perceived weight discrimination); women with a gluteofemoral weight distribution, however, were shielded—partially or fully—from these adverse effects.

Is the Gini coefficient the right way to measure inequality?

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Objective

The concept of inequality is theoretically central to human behavioral ecology, but its measurement by Gini coefficient has been criticized as idiosyncratic and arbitrary. Can the Gini be given a direct theoretical motivation, or are alternative measures such as Shannon entropy to be more justifiable in studies of inequality?

Methods

Using systematic simulation of different species-abundance distributions, I calculate the compare various measures of inequality and diversity, then use the resulting patterns to develop mathematical connections between the Gini coefficient and standard ecological measures of diversity.

Results

Using the principle of Maximum Entropy, I demonstrate a simple 1:1 equivalency between Shannon entropy and the Gini coefficient, connecting the Gini to the foundations of information theory.

Conclusions

This novel connection between two fields demonstrates aspects of inequality that are not captured by the Gini, with practical consequences in the empirical study of distributions of wealth (or anything, really).

Social-learning strategies are flexible and depend upon the value of social information

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Objective

Conformity is a social-learning strategy where individuals disproportionately copy the majority. This study investigated whether people conform flexibly, when they recognise the value of the majority, or whether conformity is indiscriminately used like a heuristic.

Methods

We created a game where conformity was optimal in some cases but sub-optimal in others. Flexible social-learners should conform when this maximises pay-offs, whereas people who conform indiscriminately will conform even on sub-optimal trials. 120 social-learners completed a game where they used social information to choose between two options to maximise pay-offs. This social information included: (1) the frequency of in-game choices made by other participants (2) the social-learners' similarity to these participants and (3) the reliability of this similarity signal. This signal may be reliably incorrect, uninformative or correct. This creates trials where conforming maximises pay-offs (for reliably similar and unreliably different others) and trials where conforming was sub-optimal (for unreliably similar and reliably different others).

Results

Social-learners adjusted their learning strategies flexibly to most of the social information, though they could not maximise their pay-offs on all trials. Social-learners earned more when responding to trials that presumably match past selection environments (e.g. learning from reliably similar others), and earned less on trials representing unusual scenarios in regards to our evolutionary past (e.g. learning from unreliably similar others).

Conclusions

Social-learners are flexible, conforming when this maximises pay-offs rather than conforming indiscriminately. The social-learners' flexibility was limited by a slight bias to follow the majority.

A four-stage model for language evolution under self-domestication

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Objective

Instead of viewing language(s) evolution as a sequential process, with our language-readiness emerging first from biological changes mostly and with languages being modified later via language change, we argue that it is more accurate to see it as the outcome of both biological and cultural changes operating simultaneously and reinforcing mutually, with both aspects interacting directly and tangibly with human self-domestication (Hare, 2017).

Methods

Our evidence relies on recent paleogenetic, paleoanthropological, archaeological, clinical, and linguistic findings, and advances testable hypotheses.

Results

We posit a four-stage model for language evolution under self-domestication. Stage One, roughly 250-200 kya, was characterized by high reactive aggression and a pre-grammar stage of language. Stage Two, roughly between 200 and 100-50 kya, features an intense feedback loop between increased self-domestication and the emergence of simple (two-slot) grammars, particularly suitable to replace physical aggression with verbal aggression. In Stage Three, roughly between 100-50 kya and 10 kya, self-domestication reached its peak, and reactive aggression its bottom, resulting in stronger in-group networks, and ultimately the emergence of more complex languages optimized for communication based on in-group shared knowledge. These languages feature complex phonologies, opaque morphologies, and reduced semantic transparency (Wray and Grace, 2007).

Conclusions

The present stage, Stage Four, witnesses increased inter-group contacts, including large-scale (proactive) aggression, which we argue correlate with the emergence of languages aimed to communicate with strangers, featuring simpler phonologies and morphologies, but larger vocabularies and more complex syntax.

Number of male offspring as a predictor of age-related cognitive decline in post-reproductive women. Preliminary results.

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Objective

Producing multiple offspring is biologically demanding and requires high energetic investment through repeated pregnancies, lactation and childcare. In the framework of Life History Theory and the trade-offs hypothesis, such prolonged cumulative investment in multiple offspring will result in need for their effective allocation. This might happen at the expense of other metabolic functions leading to disrupted metabolism, faster ageing and increased susceptibility to diseases. Recent research indicates that this effect might be related more to the number of sons, rather than daughters.

Methods

This study tested the effect of the number of sons and daughters on cognitive decline in post-reproductive women. Cognitive functioning was measured twice with 7 year interval using Mini-Mental State Examination (MMSE). The sample consisted of N=88 women from a population in Mogielica Human Ecology Study Site in Poland, aged 52-90 (median age = 55) at the time of second measurement. Number of children varied between 0 and 10 (median = 5).

Results

Linear regression model was used to predict change in MMSE score in relation to the number of children, daughters and sons respectively while controlling for initial MMSE score. The change of cognitive functioning (MMSE) was predicted by the number of sons ($p=0.03$), but not the number of daughters ($p=0.47$) or the overall number of children ($p=0.26$). On average, each son decreased MMSE score by -0.30 points over past 7 years.

Conclusions

We have shown that this result is coherent with the assumption that male offspring is more resource-demanding than female offspring.

Risk-seeking or impatient? Disentangling variance and time in hazardous behaviors

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Individual observations of risky behaviors present a paradox: individuals who take the most risks in terms of hazards (smoking, speeding, risky sexual behaviors) are also less likely to take risks when it comes to innovation, financial risks or entrepreneurship. Existing theories of risk-preferences do not explain these patterns. From a simple model, we argue that many decisions involving risk have a temporal dimension, and that this dimension is often the main determinant of individual choices. In many real life instances, risk taking amounts to damaging the individual's capital (whether embodied capital, financial capital, social reputation, etc.), which would affect her over a long period of time after the risky decision. In evolutionary terms, the marginal cost of this type of risky behavior depends on the relative importance of the future in the individual's fitness (e.g. her time horizon). Because the cost of a degradation of their capital will be paid for an effective shorter period of time, individuals with short time horizons will give less importance to this degradation. This approach explains patterns of behaviors observed across socio-economic groups and puts forward new approaches to prevent hazardous behaviors such as smoking.

This paper has been revised and resubmitted to *Evolution and Human Behavior*.

The pre-print can be found at the following link: <https://psyarxiv.com/phtm8/>

The potential to infer the historical pattern of cultural macroevolution

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Phylogenetic analyses increasingly take centre-stage in our understanding of the processes shaping patterns of cultural diversity and cultural evolution over time. Just as biologists explain the origins and maintenance of trait differences among organisms using phylogenetic methods, so anthropologists studying cultural macroevolutionary processes use phylogenetic methods to uncover the history of human populations and the dynamics of culturally transmitted traits. In this poster we show the results of a simulation study that reveals how properties of the sample (size, missing data), properties of the tree (shape), and properties of the traits (rate of change, number of variants, transmission mode) influence the inferences that can be drawn about trait distributions across a given phylogeny and the power to discern alternative histories. We show very high rates of Type I and Type II errors contingent on properties of the trait, of the tree shape, and less so of the sample. Our results do not appear to be specific to the data sets we use, suggesting they may be quite general. In an upcoming publication (Lukas, Towner and Borgerhoff Mulder, *Phil. Trans. Roy. Soc.*) we offer this simulation tool to help assess the potential impact of these risks for future cultural macroevolutionary work.

Development of teaching in ni-Vanuatu children

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Objective

Teaching -where knowledgeable individuals modify their behaviour in a way that helps others learn- is an important mechanism of social learning. Some have argued that teaching is a 'natural cognition' that emerges reliably during ontogeny. In support of this, previous studies have identified a consistent developmental trajectory. While 3-year-olds tend to teach through demonstrations and short commands, 5-year-olds use more verbal communication, abstract explanations, and combinations of verbal and gestural teaching, which has been linked to Theory of Mind. However, these findings are from Western societies and it remains unclear whether they generalize to other cultures.

Methods

To address this, we implemented a peer teaching game with N = 55 children (aged 4.7 to 11.4 years) in Vanuatu, an island nation in the South Pacific where Theory of Mind has been found to develop at later ages.

Results

Most participants used one of two distinct teaching styles: a participatory approach that emphasized 'learning-by-doing' (49.1%) through demonstrations and short commands, and an abstract one where they walked their partner through the game using abstract explanations (43.6%). The latter group not only used significantly more abstract communication, but also more verbal communication and combined teaching in general. Most 4-6-year-olds (66.7%) and 7-8-year-olds (64.7%) used the participatory approach, and abstract verbal teaching only became common in 9-11-year-olds (63.6%).

Conclusions

Contrary to Western findings, ni-Vanuatu children only began to emphasize abstract verbal teaching in late childhood. This suggests that while teaching itself is developmentally reliable, specific teaching strategies may be culturally learnt.

COVID-19: the relationship between perceptions of risk and behaviours during lockdown

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Objective

Understanding COVID-19 risk perceptions and their impact on behaviour can improve the effectiveness of public health strategies. Prior evidence from behavioural ecology suggests that, when people perceive uncontrollable risks to their health, they are less likely to engage in healthful behaviour. The aim of this article is to understand the extent to which COVID-19 is perceived as an uncontrollable risk, and to assess whether this perceived risk is associated with health behaviour.

Methods

We surveyed a nationally representative sample of 496 participants during the first UK lockdown. We assessed perceptions of COVID-19-related risk, self-reported adherence to infection control measures recommended by the UK Government, and general health behaviours. We predicted that increased perceived extrinsic mortality risk (the portion of mortality risk perceived to be uncontrollable) would disincentivise healthy behaviour.

Results

Perceived threat to life was the most consistent predictor of reported adherence to infection control measures. Perceived extrinsic mortality risk was found to have increased due to the pandemic, and was also associated with lower reported adherence to Government advice on diet, physical activity and smoking.

Conclusions

Our findings suggest that promoting a message that highlights threat to life may be effective in raising levels of adherence to infection control, but may also lead to a reduction in health-promoting behaviours. We suggest that messages that highlight threat to life should be accompanied by statements of efficacy, and that messages evoking feelings of concern for others may also be effective in promoting compliance with anti-infection measures.

Cross-cultural competence: measurement in the field and implications for cultural dynamics

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Interaction between members of culturally-distinct (ethnic) groups is an important driver of the evolutionary dynamics of human culture, yet relevant mechanisms remain under-explored. For example, cultural loss resulting from integration with culturally-distinct immigrants or colonial majority populations remains a topic whose political salience exceeds our understanding of mechanisms that may drive or impede it. For such dynamics, one mediating factor is the ability to interact successfully across cultural boundaries (cross-cultural competence). However, measurement difficulties often hinder its investigation. Here, simple field methods in a uniquely-suited Amazonian population and Bayesian item-response theory models are used to derive the first experience-level measure of cross-cultural competence, as well as evidence for two developmental paths: Cross-cultural competence may emerge as a side effect of adopting out-group cultural norms, or it may be acquired while maintaining in-group norms. Ethnographic evidence suggests that the path taken is a likely consequence of power differences in inter- versus intra-group interaction. The former path, paralleling language extinction, can lead to cultural loss; the latter to cultural sustainability. Recognition of such path-dependent effects is vital both to theory of cultural dynamics in humans and perhaps other species, and to effective policy promoting cultural diversity and constructive inter-ethnic interaction.

Altruism and parochialism in Russian children and adolescents: sex and age differences

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The goal of research is to reveal the altruistic behavior among Russian children and adolescents based on their decision-making in sets of sharing games.

Data were collected in Moscow region. Total sample consisted of 211 Russian schoolchildren (109 males, 102 females), from 10 to 17 years old. Children's prosocial orientations had been evaluated through experimental method developed by Fehr et al. (2008). We examine readiness of schoolchildren to take prosocial, sharing and fairness decisions in direction of friends and anonymous peers, and to test the sex and age differences in the decision-making.

The results show significant sex differences in the two games in situations with unfamiliar peers: prosocial behavior and altruism. Schoolchildren make a prosocial decision with friends regardless of sex, but results changed in case of making decisions in relation to strangers - girls demonstrate more prosocial behavior with anonymous peers. In the "Envy" dilemma we didn't find sex differences, however, we observed the parochial effect (the difference in decision-making in relation to friends and anonymous peers).

The sample was divided into 4 age cohort categories to see the trends in prosocial behavior with age. We found significant age differences only in Envy game with friends and unfamiliar peers. Also, we noticed strong parochial effect in all three games - the choice in favor of friends was observed much more than in direction of anonymous peers.

Our results provide confirmation of the parochial altruism hypothesis.

The study was supported by Russian Science Foundation (project №18-18-00075).

Other-regarding perspective and parochialism in children and adolescents: Hadza and Meru compared

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Other-regarding preferences as a basement of fundamental human ability to cooperate in groups may co-evolve with parochialism (Choi and Bowles, 2007). Recent studies demonstrate that egalitarianism and efficiency concerns are gradually increasing with age. To what extent these tendencies are universal in non-industrial societies is unknown. To answer this question, the Hadza foragers (n=130) and the Meru farmers (n=271), children and adolescents (median age 14 y), were compared. The results of decision-making in simple allocation tasks associated with limited recourse distribution between self and imaginable partners (a friend or an unknown same-age person): prosocial, envy and sharing, revealed similarities as well as differences. Hadza and Meru did not differ in resource allocation towards friend and unknown person in envy game. But Hadza compared to Meru were more prosocial to friends, than to unknown individual ($F=9,407$, $p=0,002$), and more altruistic in sharing game ($F=84,673$, $p=2,129E-18$). These findings are discussed in the light with socio-economic and demographic patterns of these two societies. Supported by RSF, grant 18-18-00075.

Ethnicity is more important determinant of reproductive strategy than father absence

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Objective

To examine if father absence during one's childhood, income, and ethnic background determined a fast versus slow reproductive strategy. The study was conducted among the five major ethnic groups in Surinam, i.e., the Creoles, Hindustani, Javanese, Maroons, the Mixed.

Methods

A random sample of 500 respondents, aged 25 to 50 years was drawn equally divided over the ethnic groups, and over men and women. The majority (82%) had a steady partner, and the majority (77%) had children. Respondents answered at their homes questions about father absence during childhood and about their reproductive strategy i.e., age at first intercourse, the age of the birth of one's first child, the number of children, and the number of lifetime sexual partners.

Results

A distinction was made between father absent (n = 181) and father present (n = 315) respondents. Overall, the Maroons had more sex partners, had their first intercourse as well as their first child at an earlier age, and had more children, especially compared to the Hindustani and Javanese. Father absence only affected the age at first intercourse, which was lower among those who grew up without a father. Income did not affect reproductive strategy. Compared to men, women had fewer sex partners, had their first sexual experience later, but had their first child earlier, and had more children.

Conclusions

In Surinam, ethnicity and gender are clearly much more important determinants of reproductive strategy than father absence and socio-economic level.

What is the impact of poor oral health -a bad breath and ugly teeth- on dating and mating among Indonesian transgender?

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Objective

For Indonesian warias are male-to-female transgender individuals –many of whom are sex-workers - dating and mating are important issues. Knowing that warias act and feel as women, they have sex with men, and the main question is: Are a low social status (LSS), sense of defeat (SOD) and self-perceived oral health among warias associated with more fear of social rejection because one's poor oral health and with a stronger tendency to reject potential or actual partner based on their poor oral health?

Methods

A cross-sectional digital semi-structured questionnaire containing all variables mentioned above was administered to 92 waria with a mean age of 36 years in five districts in Jakarta.

Results

Waria expressed a tendency to reject potential partners based on their poor oral health and a fear of social rejection because one's poor oral health. Low social status was associated with the tendency to reject potential partners based on their poor oral health, as well as with a fear of social rejection because one's own poor oral health. Although the tendency to reject potential partners based on their poor oral health was associated with fear of social rejection because one's poor oral health, sense of defeat was not correlated with either of these variables.

Conclusions

Especially waria who perceive their own social status as low are more afraid to be rejected by potential partners, but are also, as those who feel defeated in their life, more inclined to reject others on the basis of their poor oral health.

The relationship between marital satisfaction with adult attachment and the dark triad in young couples

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From an evolutionary point of view, relationship satisfaction is the psychological state that accompanies the benefits and costs associated with a romantic union. Satisfaction, thus, can be influenced by the individual characteristics of both partners, which may imply costs for the relationship maintenance. Accordingly, this study aimed to investigate the relationship between marital satisfaction, adult attachment styles and the dark triad. We expected that one's dark triad traits and insecure attachment styles would be negatively correlated to his/her partner satisfaction, once they may imply such costs. The sample consisted of young adults individuals, mostly university students, who comprised 94 couples, 72 heterosexual couples, 15 female homosexuals and 7 male homosexuals. Participants answered on an online platform the Scale of Love (used as a measure of relationship satisfaction), Experience in Close Relationships Inventory (anxiety and avoidance) and the Dark Triad Dirty Dozen (narcissism, machiavellianism and psychopathy). However, negative correlations were observed only between DT and attachment to self-reported satisfaction. The exclusion of homosexual couples from the analyses did not affect the results found. Although contrary to the initial hypothesis, the results indicate that individuals with higher scores in dark triad and anxiety and avoidance may be less likely to maintain long-term bonding. Despite the analyses with the entire sample or only with heterosexual couples have led to similar results, it is considered the importance of including more homosexual couples in future studies to confirm the results found, and additionally identify possible specific challenges to relationship maintenance in different sexual orientations.

Dark triad, adult attachment and relationship satisfaction in young couples

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The love satisfaction experienced can be affected by characteristics of the individual himself, such as his style of adult attachment, as well as by the personality of his partners. Studies reveal that aversive personality traits (dark triad) are associated with behavior that imply costs for others, but little has been investigated about its effects in the context of love relationships. This study aimed to investigate the connection between relationship satisfaction, dark triad features and adult attachment styles in couples. We hypothesized that insecure attachment styles and dark triad (DT) would imply costs in maintaining the relationship and decreasing satisfaction. 72 heterosexual couples participated, between boyfriends and married, who answered in an online platform the Dark Triad Dirty Dozen, Experience in Close Relationships - Revised and a Love Scale (Marriage and Relationship Questionnaire), used as a measure of marital satisfaction. We found that DT presented a positive correlation with anxious attachment style and that self-reported DT and anxious attachment were negatively correlated with self-reported satisfaction. No relationship was found between the subfactors of DT and partner satisfaction. The relationship between DT and anxious attachment style may indicate a possible adaptation of individuals who fear the abandonment of the relationship to be more prone to antisocial profiles, even if the dark triad traits do not impact partner satisfaction. Although, contrary to our hypothesis, the association found between satisfaction, self-reported DT and anxious attachment style can indicate difficulties in maintaining a long-term relationship, confirming previous associations between DT with short-term relationships.

Olfactory sensitivity and food neophobia

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Objective

Food neophobia, i.e., rejection or avoidance of novel foods could have been an adaptation that previously reduced chances for food poisoning in childhood. However, currently it is a problem that affects quality of diet and healthy food preferences. Researchers identified some determinants and correlates of this issue that include also sensory sensitivity, but the studies in the area are scarce and limited to certain age groups. Here, we tested whether odor perception is associated with older children's food neophobia.

Methods

We examined the relationship between food neophobia, odor identification and odor pleasantness assessments. The study comprised 257 girls and 253 boys aged 15-17 ($M=15.98$, $SD=0.82$) tested during group sessions at different schools in Poland. The teenagers completed a questionnaire and a psychophysical test of odor identification abilities. Within the questionnaire part, the teenagers completed a translated Food Neophobia Scale (Pliner & Hobden, 1992) that consists of 10 questions, each measured on a 7-point agree–disagree scale. The psychophysical testing involved a self-administered smell test for children (Schriever et al., 2018) in participants' native language. In addition to identifying each smell in a cued identification task, the subjects were asked to rate pleasantness of each smell using a percentage scale (0-100%).

Results

Odor identification score was slightly, but significantly related to food neophobia ($r=-.12$, $p=.01$) and averaged odor pleasantness assessments ($r=-.22$, $p<.001$).

Conclusions

The results among older children mirrored the previous findings in adults – it seems that the reduced variance in consumed food may decrease olfactory expertise regardless of age.

More is less: Grandmother effects over the demographic transition

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Objective

Demographic transitions are defining events for societies, marking a clear shift from natural mortality and fertility rates to the low rates seen in industrialised populations. These transitions can affect evolutionary selection on traits through changing selection pressures and through strength of selection changing with variance in fertility and mortality. Indirect fitness benefits from grandmothing may have been involved in the evolution of post-reproductive life. There have been many studies in pre- and post-transition societies on benefits associated with grandmother presence, yet we do not know whether these associations changed during the transition or much later on. We aimed to quantify how the demographic transition affected i) grandchild survival and ii) offspring fertility effects associated with grandmother presence.

Methods

We used an extensive genealogy from 18th-20th century Finnish registers – a population with known grandmother effects and multi-generational life history information - to investigate these objectives. Analyses were implemented as discrete time-event models for grandchild survival, offspring age at first birth, and offspring inter-birth intervals.

Results

As expected, the effect of grandmothers on child survival declined as mortality rates declined. Across the pre-industrial period, maternal grandmother presence was associated with grandchild survival. Following the demographic transition, grandmothers were no longer associated with survival outcomes. Age at first birth before, during, and after the transition was not associated with mother/mother-in-law presence. The association of mother/mother-in-law with inter-birth interval changed but did not entirely disappear.

Conclusions

Whilst the demographic transition increased the potential for interactions between generations, it was also associated with a decline in the (hypothesised) evolutionary importance of these interactions.

The evolution of ritual bonding: The role of the opioid system

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The ubiquity of rituals has long puzzled social scientists - why are activities that appear to confer no direct benefit present so widely, and so often? Some suggest that rituals provide a way for humans to form and maintain social bonds in an effective and efficient way. It has also been hypothesised that mu-opioids are the neurochemical mechanism behind bonding during rituals. However, this has not previously been investigated directly. We tested the role of mu-opioids in rituals through a series of studies, involving cross-cultural field work, a longitudinal lab study, and two double-blind studies with a mu-opioid antagonist. Across all studies we assessed social bonding before and after taking part in the ritual. In the large-scale field study, we found that taking part in religious rituals increased pain threshold (a proxy for mu-opioid activation), and that this increase predicted the increase in social bonding with others in the group. In the lab study, we examined social bonding across 5 weeks. We found a progressive increase in social bonding predicted by pain threshold. In the final part of the project, we used the mu-opioid blocker Naltrexone in two double-blind, placebo-controlled studies, and found that participants in the Naltrexone condition had a negative change in social bonding, compared to the positive change in those in the placebo condition. Overall, the results from these studies provide the first direct support that rituals may be a unique way for humans to bond, through the increase of mu-opioids they bring about.

Variation of food neophobia across meat and plants

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Food neophobia (i.e., the willingness to try new foods) varies across individuals. Generally, the Food Neophobia Scale (FNS; Pliner & Hobden, 1992) is used to measure this variation and is interpreted as a unidimensional construct. In this paper we explore the validity of a picture-based meat and plant neophobia measure and show that food neophobia varies across meats and plants. Further, we test if meat and plant neophobia predict eating a novel food product (i.e., an insect-based snack bar). Mixed-effects model across four studies (N's = 210, 306, 160, 161) indicated that meat and plant neophobia differentially relate to a number of variables, including disgust sensitivity, animal empathy, and masculinity. Women scored higher on meat neophobia than men, but not on plant neophobia. Only meat neophobia uniquely predicted eating a novel insect-based snack bar. Overall, these results extend knowledge regarding orientations toward novel foods.

Is there a difference in the level of anxiety during COVID-19 pandemic between women who has or has not any previous children?

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Objective

The COVID-19 pandemic is a particular time that can affect anxiety levels, especially in pregnant women. The purpose of this study is to investigate the difference in the anxiety level in the context of COVID-19 pandemic between pregnant women who has or has not any previous children.

Methods

The sample included 1155 adult Polish women, pregnant at the time of COVID-19 pandemic. The study took the form of an online survey, conducted before the child's birth. The levels of trait and state anxiety were measured with the State-Trait Anxiety Inventory (STAI). We compared the level of anxiety in women who already had children with those who were pregnant for the first time during the COVID-19 pandemic by the means of ANCOVA and with control for the pregnancy trimester, woman's age, social status and the occurrence of pregnancy complications.

Results

We observed significantly increased the level of trait ($F_{1,1147}=12.48$; $p<0.001$) and state anxiety ($F_{1,1145}=10.93$; $p<0.001$) in woman who already had child or children compared to women who were pregnant with for the first time during the COVID-19 pandemic.

Conclusions

Increased levels of trait and state anxiety in women who already have offspring during the COVID-19 pandemic may be due to the pregnant woman's fear of the future, based on the experience of previous pregnancies and deliveries. The results presented should be regarded as preliminary. They, however, provide a promising basis for further analyses.

Grandparents raising grandchildren: An NGO-partnership producing policy impact in Australia

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Across human societies grandparents contribute to the health of their families and communities. There is little understanding, however, of the health implications for the grandparents who are raising their grandchildren. An Australian Federal Government Senate Inquiry (2014) examined the experiences of grandparents raising their grandchildren that highlighted the challenges these grandparents face when taking on full-time parenting responsibilities. The inquiry called for research to quantify these challenges and review the support available for these largely hidden families. An interdisciplinary research team consisting of an anthropologist, occupational therapist, public health researcher, sociologist and community service provider was established to examine the implications of the caring role for grandparents, the views of grandchildren raised by their grandparents, and the service and policy context to this issue. Despite the competing demands of researchers and universities and not-for-profit human service organisations, through community engagement, this project has contributed to policy impact since 2019. The launch of interim results from the first 300 grandcarers to complete the survey received extensive media coverage and brought widespread attention to the plight of grandcarers. In the run up to the Australian federal election (2019) this was harnessed in an advocacy campaign 'A Fairer Future for Grandchildren.' Subsequently, the Australian Greens released a policy plan to support grandcarers and the research has been the basis of policy change in the Australian Federal Parliament. This presentation will describe the journey through which this applied research project has culminated in advocacy and influenced policy in Australia.

Social intelligence modulates the effect of androstenedione on aggression in preschool children

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Objective

This study examined the potential modulatory effect of social intelligence on the relationship between androgen levels (testosterone, DHEA, androstenedione) and observed behavioral aggression in 5 year-old-children.

Methods

Participants: the subjects in the study were 129 children aged 5 (60 boys and 69 girls). Behavioral aggression: Children videotaped social behavior in open-air playgrounds was analysed using Observer 4.1 behavior analysis software. Hormones: androgens levels (testosterone, DHEA, androstenedione) were determined using an enzyme immunoassay technique (ELISA) in saliva samples. Social intelligence: To score social intelligence teachers in each classroom were asked to complete an adapted version of the Peer-Estimated Social Intelligence (PESI) instrument (Kaukiainen et. a., 1995).

Results

Regression analyses were conducted to study the influence of hormones, social intelligence, and their interactions on aggressive behavior. The results show that children with low social intelligence scores and high androstenedione levels display more aggressive behavior (provocation, interaction that may preclude aggressive behavior).

Conclusions

It is suggested that high levels of androstenedione and low scores of social intelligence may have a positive influence on children's aggressive behavior. This serves to confirm the idea that we have to take into account the moderating effects of cognitive factors as social intelligence in androgen-aggressive behavior relationships.

Aversive medical treatments as honest signals of need

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Objective

Humans are often incapacitated by illness and injury, and are unusually dependent on care from others during convalescence. Medical and social science findings indicate that this caregiving is sometimes undermined by illness deception whereby people feign/exaggerate illness in order to gain access to care. We argue that sick individuals can use medical treatments to validate the legitimacy of requests for care since only ill individuals are willing to undergo the risks and suffering that many medical interventions entail. Here, we test if would-be-caregivers are more willing to provide care to individuals who undergo aversive treatment.

Methods

Two online experiments involving 341 UK-based participants. Participants read vignettes describing a co-worker with an illness and completed a caregiving index capturing willingness to provide support and take over the co-worker's responsibilities. The manipulation was the presence/absence of medical treatment.

Results

Preregistered study 1 demonstrated that participant's caregiving index scores were .31 SDs higher ($p < .0001$) when a medical treatment was present, and .64 SDs higher ($p < .0001$) when an aversive/painful medical treatment present, compared to when no treatment was present. Study 2 demonstrated that aversive self-treatment (as apposed to doctor-prescribed treatment) can similarly validate care requests.

Conclusions

Individuals who seek care may be incentivised to use treatments for reasons besides the therapeutic benefit. The need to signals authentic need for care may help explain the prevalence of harmful and "unnecessary" medicine.

Poverty, inequality and social immobility lead to low trust and antisocial behaviour: A theoretical model

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Objective

Data suggest that poverty reduces investment in cooperation and interpersonal trust. However, no model has yet explored how deprivation might have this impact. The present study aims to bridge this gap.

Methods

We model agents having three ways to obtain resources: (i) foraging cooperatively; (ii) foraging alone, which is less profitable but avoids risk of theft; and (iii) stealing, which is more lucrative but carries the risk of costly punishment. We assume a “desperation threshold”, i.e. a level of resources below which agents’ fitness is damaged. By stochastic dynamic programming, we derive the optimal strategy for each level of resources, given the surrounding population.

Results

Below a critical level of resources, agents steal to maximise the probability of getting back above the desperation threshold. When they have enough resources, agents cooperate if they estimate the probability of being stolen from to be low enough (a variable we describe as “social trust”), and forage alone otherwise. At the population level, scarcity of resources can prevent cooperation from spreading: a minority of desperate individuals suffices to undermine the trust of others, causing social withdrawal.

Conclusions

We argue that low trust and cooperation could be an emergent effect of poverty: the antisociality of rare, desperate individuals triggers low trust in others, causing cooperators withdrawal. The model also predicts low trust and social withdrawal where inequality in resources is high or social mobility low. Interestingly, it predicts antisocial behaviour to be insensitive to the severity of punishment, consistently with observations in criminology.

Strategic social learning in experience-structured groups

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Cultural evolution is partly driven by the strategies individuals use to learn behavior from others. Previous experiments on strategic learning let fixed groups of individuals engage in repeated rounds of a learning task and analyzed how individuals' choices are affected by their own payoffs and the choices of other group members. While groups in such experiments are fixed with participants always having the same level of experience in their current environment, natural populations are characterized by overlapping generations, frequent migrations and hence different levels of experience. We present a "microsociety" lab experiment with 200 participants where experience structure is simulated through a schedule of migration and environmental change. In each session, two groups of four individuals engage in 100 rounds of a four-armed bandit task; every five rounds two participants switch group membership and migrate into another region. In addition to these spatial changes, the environment also switches temporally (different option becomes optimal for all). We used Bayesian multilevel experience-weighted attraction (EWA) models including time-varying learning parameters. In line with theoretical predictions, individuals' reliance on social learning, their tendency to copy the majority ('conformity') and their use of experience cues changed both as a function of experience and time since an environmental change. These differences in learning dynamics after temporal and spatial changes can be explained as adaptive responses to different informational environments. Summarizing, we provide empirical insights as well as novel modeling tools to understand the adaptive logic of culture in experience-structured groups including both spatial and temporal variability.

The interaction between parenting styles and hormone levels explains children's aggressive behavior

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The aim of this study was to explore if cortisol and testosterone moderate the effect of parenting style on aggressive behavior. Also, to explore whether the interactions between these variables are explained by the diathesis stress or the differential susceptibility theories, that is, taking into account their hormonal profiles if they are vulnerable to negative parenting styles (diathesis stress) or if they are vulnerable to negative parenting as well as benefit more from positive parenting (differential susceptibility). To this end, the sample group comprised 279 eight-year-old children (154 boys and 125 girls) from Spain. Aggressive behavior was assessed using the “Reactive and Proactive Questionnaire” (RPQ) and the parenting styles were measured through the “Parenting Styles and Dimensions Questionnaire” (PSDQ). Finally, to measure testosterone and cortisol 3 saliva samples were collected at 9 am and analyzed by ELISA. The results revealed that girls with low cortisol levels were more reactively aggressive when their mothers were more authoritarian. This result was explained by the diathesis-stress theory. Furthermore, there was also a relation between authoritarian mothers and reactively aggressive girls when testosterone levels were high and cortisol levels were low or medium and when testosterone levels were medium and cortisol levels were low. These results are in line with the dual hormone hypothesis. The study points out the importance of studying biological and social characteristics that may influence aggressive behavior. It also highlights the need to develop statistical tools that allow us to analyze the different behavioral theories in a more complete way.

Gossip and reputation in everyday life

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Objective

Theory suggests that gossip could be essential to establish reputation-based cooperation. While reputation-based cooperation is observed in different animals, the spread of information through gossip is uniquely human. As such, gossip is hypothesized to impact reputation formation, partner selection, and thereby cooperation. Lab experiments support this, however, there is a lack of observations of gossip in its natural setting. Here, we move beyond the lab and test several predictions from theories of indirect reciprocity and partner selection in the field.

Methods

In a Dutch community sample (N = 309), we sampled participants' social networks consisting of the people they most frequently interact with and followed this up by sampling daily events in which people either sent or received gossip about a target 4 times a day over 10 days (n = 5,154).

Results

First, senders of gossip frequently shared information about the cooperativeness of their gossip targets and did so in ways that minimize potential retaliation from targets. Second, receivers overwhelmingly believed gossip to be true and this was related to their perception of conflicting interests between the target and the sender of gossip. Finally, receivers of gossip updated their evaluation of targets in their network based on the gossip they received. In turn, a positive shift in a gossip target's evaluation led to higher intentions to help that target in future interactions, along with lower intentions to avoid that target in future interactions.

Conclusions

Gossip enables reputation-based partner selection and indirect reciprocity and thus can promote human cooperation.

The cultural evolution of imaginary worlds

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Imaginary worlds are extremely attractive. The most culturally successful fictions produced in the last decades contain such a fictional world. They can be found in all fictional media, from novels (e.g., Lord of The Ring, Harry Potter, The Chronicles of Narnia) to films (e.g., Star Wars), video games (e.g., The Legend of Zelda), graphic novels (e.g., One piece, Naruto) and TV series (e.g., Star Trek, Game of Thrones), and they date as far back as ancient literature (e.g., the Cyclops Is-lands in The Odyssey, 850 BCE). Why such a success? Why so much attention devoted to nonexistent worlds? We propose that imaginary worlds co-opt our exploratory preferences, which have evolved in humans and non-human animals alike to propel individuals toward new sources of reward. Humans find imaginary worlds very attractive for the very same reasons, and under the same circumstances, as they are lured by unknown and unfamiliar environments in real life. After reviewing research on exploratory behaviors and preferences in environmental aesthetics, neuroscience, evolutionary psychology and behavioral ecology, we identify a cognitive bias for novel environments, associated with both our evolutionary past and the modern psychological factor 'Openness to experience'. We argue that this content bias has shaped the cultural evolution of imaginary worlds. This hypothesis explains the massive success of fictional devices such as maps, props, paratexts and adventurous protagonists in fictions, as well as the cultural distribution of imaginary worlds.

A mega-radiation of ethnolinguistic groups coincides with the Neolithic revolution

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Approximately 7,000 ethnolinguistic groups in the world have highly uneven geographic distribution and form linguistic families of uneven sizes. How these dramatic differences in cultural diversity emerged remains largely unknown due to the lack of global, well-resolved, and time-calibrated phylogeny. Here we use phylogeny of ~2,000 ethnolinguistic groups (~100 language families), based on genetic and linguistic data, to study geographic and historical patterns of cultural diversification. We found that cultural diversity accumulates at dramatically different rates across regions, over time and across lineages. Diversification rates were highest in the tropical (e.g., SE Asia, Central and N South America) and montane regions (e.g., Himalaya, Andes), whereas temperate regions displayed only moderate rates. Diversification rates show steady decline toward the present, punctuated by an abrupt increase ~10 kya, which coincides with the Neolithic revolution. Agricultural language families show highest rates of diversification (e.g., Tibeto-Burman branch of the Sino-Tibetan family), whereas hunter-gatherers (including the most diverse Pama-Nyungan family) are among the most slowly diversifying groups. These findings stress the role of mid-Holocene agricultural expansions in forming the present-day diversity and distribution of ethnolinguistic groups.

Investigating executive function involvement in cumulative cultural evolution through a grid-search task

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We investigated whether access to executive functions is required for cumulative cultural evolution. We restricted access to adults' executive functions via a dual-task paradigm, to assess whether this reduced their ability to improve upon information provided by a computer model.

206 participants completed a grid-search task in conjunction with a working-memory task and a matched control, with the aim of outperforming a hint provided vicariously by a computer. Half the participants completed the task with the hint visible (visible cues), and half with hints that disappeared after 1 second (transient cues). Participants' behaviour was then used to simulate the outcome if the task was iterated over multiple generations.

Participants scored higher when presented with a higher scoring hint, even under dual-task conditions. However, accuracy in the working-memory task was significantly lower than in the control, indicating offloading of additional task demands to the concurrent task. Correct strategy use differed significantly between the dual-task and control blocks and between the visible and transient cue conditions. Many participants in the transient cues condition copied the hint exactly, even when it contained explicitly incorrect information. Similar sub-optimal behaviour across conditions meant participants did not always outperform, or even match, the vicarious information.

The simulation showed that across conditions participant behaviour would lead to cumulatively increasing scores over successive generations, that plateaued without reaching the maximum score.

Overall, the task did not provide clear evidence that working-memory directly facilitates cumulative cultural evolution. However, differences between conditions may have been masked by offloading task demands to the concurrent working-memory task.

Super-additive cooperation

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Objective

Identifying the evolutionary mechanisms responsible for one-shot cooperation among humans remains a contentious puzzle. Repeated interactions provide a canonical, if paradoxical, explanation. Group competition has exactly the opposite status, heterodox but intuitively appealing. Our objective is to examine, theoretically and empirically, if and how the two mechanisms interact.

Methods

We use a combination of analytical modeling, simulation modeling, and an incentivized behavioral experiment with Perepkas and Ngenikas in the Western Highlands of Papua New Guinea.

Results

With respect to models, neither repeated interactions nor group competition in isolation can reliably support cooperation when actions vary continuously. Specifically, ambiguous reciprocity, a strategy generally ruled out in models of reciprocal altruism, completely undermines cooperation in repeated interactions and by extension one-shot settings. Group competition alone has feeble effects because groups tend to be similar under relevant conditions. Although repeated interactions and group competition do not support cooperation by themselves, combining them triggers powerful synergies because group competition stabilizes cooperative strategies against the corrosive effect of ambiguous reciprocity. With both mechanisms at work, evolved strategies often consist of cooperative reciprocity with ingroup partners and uncooperative reciprocity with outgroup partners. Results from a one-shot behavioral experiment in Papua New Guinea fit exactly this pattern.

Conclusions

As a robust explanation for human cooperation, neither repeated interactions without group competition nor group competition without repeated interactions can suffice. Instead, our results are only consistent with social motives that evolved under a past selective regime in which the two mechanisms acted together.

Group identities make fragile tipping points

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Objective

Evolved social learning strategies, such as conformity, and benefits to coordination lead to characteristic patterns of cultural variation and punctuated cultural change. Endogenous social processes can amplify small changes, leading a society to tip from one behavioral regime into another. These dynamics are relevant for cultural evolution but also for policy. Here, we ask whether tipping dynamics are interrupted when existing conventions are tied to social identities in the context of global incentives to coordinate.

Methods

We ran an online experiment examining the role of social identity in tipping dynamics during the contested 2020 U.S. federal election. Participants played a repeated, incentivised coordination game in anonymous groups, designed to be maximally conducive for tipping. Groups made choices using payoff-irrelevant neutral labels or labels designed to activate partisan group identities.

Results

Political labels initially facilitate coordination by creating socially salient focal points in the absence of communication. However, they undermine transitions to a new cultural evolutionary regime by interrupting endogenous social change. The revelation of election results exacerbate these effects among the losing group.

Conclusions

Endogenous social change can lead to the rapid emergence of new norms and create characteristic patterns of cultural variation, i.e. local homogeneity, global heterogeneity. Homogeneous social groups can facilitate coordination on existing norms, but can also impede rapid cultural transitions, even when socially beneficial. New information that favors one group can heighten ingroup/outgroup identities and animosity, further eroding the emergence of new norms, which has implications for cultural evolution but also policy in polarized contexts.

Community science approaches to understanding the evolution of everyday cooperation

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Objective

To advance methodological development for student-driven research projects using evolutionary theories of cooperation to investigate and interpret sustainability-relevant cooperation dynamics in their everyday lives.

Methods

Based on the Prosocial research framework, students engaged in programs at our Community Science Lab develop a multiple methods approach to structuring case studies of sustainable development initiatives in their communities. Using climate action groups and school garden projects as key contexts for exploratory methods development, we document the practical, ethical, and research quality issues in engaging secondary school students in evolutionary approaches to community science methodologies.

Results

Exploratory work demonstrates the suitability of evolutionary theories of cooperation to frame more traditional community science projects in secondary school general education programs in Germany.

Conclusions

Community science methods offer promise both as an education outreach strategy for evolutionary human sciences, as well as for the development of research networks focused on developing mixed methods databases relevant to human cooperation and sustainable development. Research challenges remain in strengthening and ensuring data quality, as well as the development of infrastructure for more decentralized research collaborations across schools and cultures. Additionally, challenges of school implementation remain in terms of basic challenges for interdisciplinary teaching practice more generally, and conceptual clarification regarding evolution and human science perspectives more specifically.

Great Ape curiosity compared: implications for socially triggered curiosity in hominids

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Curiosity encompasses behaviors that express interest in new information. Modern humans, who lack natural predators, thrive with curiosity, but our ancestors faced more hazardous environments that not necessarily favor individual curiosity. Our closest living relatives, the great apes (henceforth apes) have evolved facing conditions more like human ancestors and as such, can help us understand the functions of curiosity and its expression in non-human species. In this study we examined curiosity across ape species (*Pan troglodytes*, *Pan paniscus*, *Pongo abelii* and *Pongo pygmaeus*). To capture multiple behaviors potentially involved in curiosity, we measured novelty seeking in three distinct contexts: novel foods, a novel toy and a novel human. With the intention to compare intrinsic differences, we studied captive apes that experience more similar environments, compared to the variation across and within species in their natural habitats. Further, to control for possible social effects we tested all apes alone. Results revealed that, individuals of the genus *Pongo* showed higher curiosity scores than apes of the *Pan* genus. We hypothesize that the genus difference is a consequence of distinct social systems, reflecting that bonobos and chimpanzees are regularly in the company of multiple conspecifics, and thereby accustomed to higher abundance of social cue, which may lead to inhibited curiosity when facing novelty alone, compared to solitary orangutan species. As such, our results support the theory that hominin curiosity evolved as a socially triggered mechanism.

The more fertile, the more creative: Changes in women's creative potential across the menstrual cycle. No mediating role of arousal.

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The claim that females are the choosier sex is well known in evolutionary psychology, but it does not apply easily to humans. Men are even choosier when it comes to the attractiveness of a prospective mate. Due to Miller's signaling theory creativity evolved through sexual selection as a potential fitness indicator. The motivation of women to present one's creativity should then be stronger during the increased fertility, which occurs during the periovulatory period. In our study (N = 749) we tested the creative potential of women in three phases: early follicular (menses), periovulation, and luteal (premenstrual). We found a positive correlation between the probability of conception and creative originality, and marginally with creative flexibility. We also tested arousal as a mediator of this relationship. The results of our study are discussed in terms of signaling theory, due to which women advertise their fitness with their creativity. Being original can be particularly eye-catching to a potential partner.

Gender inequality and market integration among the Hamar of Southwest Ethiopia

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Objective

Globally, small-scale societies are increasingly transitioning to market-based economies. Such economic transitions stand to significantly impact cultural and behavioral patterns, including status hierarchies, gender roles, material culture, and diet. Understanding which aspects of acculturation and economic development have the greatest impact on dimensions of traditional culture can provide unique insight into the dynamics of cultural evolution as well as the potential for applied benefits in the preservation or improvement of gender equality. We introduce the Gender Inequality and Market Integration (GIMI) survey, present results on relationships between market access and gender inequality, and discuss the benefits of longitudinal research of cultural transitions.

Methods

Data collected among Hamar agropastoralists in southern Ethiopia captured variation in market integration, wealth inequality, decision-making autonomy, dietary profiles, social networks, and political participation, across 98 individuals from 49 households. Exploratory analyses investigated drivers of gender inequality within and between households and gender differences in social, cultural, and economic life.

Results

Initial results reveal, 1) a uniform lack of significant market integration and formal education, 2) relative gender equality in nutritional access, and 3) substantial gender differences in access to material wealth, social networks, and travel.

Conclusions

The Hamar demonstrate markedly low market integration and educational access, even relative to “small-scale societies.” They concomitantly demonstrate aspects of egalitarianism and stark inequality. Pastoralism may buffer market integration and therefore, such populations are uniquely suited for the study of gender differences and cultural transitions over time.

How gossip and reputation shape high-stakes cooperative decisions among Turkana warriors

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Gossip is essential to sustaining cooperation through indirect reciprocity, but it is unclear if and how individuals obtain accurate information through gossip. We examine how information acquired through hearsay influences cooperative decisions in warfare among the Turkana, a politically uncentralized semi-nomadic pastoral population in Kenya. The Turkana engage in cattle raids against neighboring groups in which there is a substantial risk of injury or death. Using vignettes and surveys with 63 Turkana warriors, we obtained information regarding warriors' ratings of the qualities of other warriors, norms about information sharing over different social scales (from kin level to the cultural group at large), the level of consensus in reputation, and real-world instances of decision making in warfare based on gossip. The results indicate that 1) a warrior's reputation is associated with altruistic bravery, generosity, and combat skill; 2) there are norms regulating sharing other warrior's reputations; and 3) warriors actively assess reputation when determining who to cooperate with. The findings suggest norms may play a role in making gossip sufficiently accurate, thus facilitating indirect reciprocity as a mechanism of human cooperation.

Reticulation and synergistic trait evolution in human communities

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Besides by means of natural selection or drift, evolution can proceed by means of symbiosis, symbiogenesis, lateral gene transfer, infective heredity, and hybridization. These mechanisms and processes are nowadays grouped together under the umbrella of reticulate evolution because they all bring forth horizontal and network-like structures within the lineages that make up the tree or web of life. As such, reticulate evolution differs from the vertical descent theories adhered to by Neodarwinian scholars. We will demonstrate that reticulate evolution necessitates an understanding of behavioral and cultural evolution as happening at a community level, where synergistic organizational traits evolve. We look into how such traits underlie the rise of 1) human-animal and plant interactions; diet-microbiome relationships; and 3) host-pathogen interactions, and we point out how human behavioral and cultural studies can benefit from incorporating results from the study of reticulate evolution.

When staying home is not safe: An investigation of the role of the attachment-moderated links between stress and intimate partner violence in the time of COVID-19

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Intimate partner violence (IPV) is a major public health concern, with increasing rates of IPV being seen around the world during the COVID-19 pandemic. Previous research has linked the perpetration of IPV and other forms of sexual violence to aspects of romantic attachment, with anxious/preoccupied attachment styles most often linked to higher rates of IPV. In the present study, we investigated whether event-related anxiety and depression during times of COVID-related stress predict increased IPV perpetration and whether this relationship was moderated by attachment style. Given that anxiety should function to increase activity preceding a stressful event, whereas depression should function to decrease activity following a stressful event, it was expected that higher COVID-related anxiety (as indexed via post-traumatic stress disorder; PTSD) would activate IPV perpetration and that higher COVID-related depression would deactivate IPV and that these relationships would be moderated by insecure attachment. Our findings indicated that higher COVID-related stress was significantly associated with increased IPV perpetration only in securely attached individuals, whereas depression was significantly linked with decreased IPV perpetration only in securely attached individuals. Insecurely attached individuals displayed different patterns. These findings suggest those with secure attachment styles and their partners may be particularly susceptible to external life stressors. Our findings are discussed within evolutionary frameworks of attachment and the adaptive functions of anxiety and depression. The present findings may serve to raise awareness and motivate clinical or behavioral interventions to more efficiently help both victims and perpetrators of IPV stay safe while staying home.

Poverty, temporal discounting and social trust

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Social trust is a belief central to decision-making processes, it affects a range of prosocial behaviors (Sønderskov, 2011, Balliet & Van Lange, 2013), and it is linked to a host of positive societal outcomes, for example improved economic growth (Knack & Keefer, 1997; Bjørnskov, 2017). Knowing its positive outcomes, why does social trust vary considerably between individuals and societies (Albanese & de Blasio 2013)? While the association between social trust and socioeconomic status is robustly established (Stamos et al., 2019; Alesina & La Ferrara, 2002; Brandt et al., 2015), the psychological mechanism by which this takes place is not known. Social trust is associated with certain and immediate costs and with uncertain and delayed benefits. Therefore, one possibility is that social trust reacts to individual variations in temporal preferences, which are themselves affected by socio-economic status (Green & Myerson, 1996, Harrison et al., 2002, Reimers et al. 2009). Our goal was to experimentally manipulate perceived poverty, to then study whether experimentally induced fluctuations of temporal discounting impact social trust. We acted on participants' misperception of socioeconomic status, by randomly informing a subsample of participants about their true relative income position in the British society, and tested the causal effect of time discounting on social trust. This treatment had no effect on temporal discounting or social trust, but we found that temporal discounting partially mediates the effect of socio-economic status on social trust. We successfully replicated this result (the mediation) on a sample representative of the British population.

The mother-offspring conflict: Do maternal sleep problems and postpartum depression symptoms due to infant night waking predict longer interbirth intervals?

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Objective

Based on the theory of mother-offspring conflict and the premise that infant night waking is an adaptation to increase interbirth intervals (IBIs; the time between a mother's consecutive births) by debilitating the mother, the aim of the present study was to investigate whether maternal sleep problems due to infant night waking predict longer IBIs.

Methods

The sample consisted of 729 Finnish mothers (Mage = 41.3) with at least two children, recruited via social media platforms. The retrospective survey included validated questionnaires and self-constructed items related to infant night waking, maternal sleep problems, postpartum depression symptoms, and the two first IBIs. We conducted structural regressions for the two first children at two age intervals (0-1 years; 1-3 years).

Results

Infant night waking was associated with maternal sleep problems for both children at both age intervals. Maternal sleep problems were associated with postpartum depression symptoms for both children at both age intervals. Contrary to our hypothesis, maternal sleep problems were associated with shorter IBIs, and only for the first child. Postpartum depression symptoms were, however, associated with longer IBIs, and only for the first child.

Conclusions

We discuss our mixed results. To our knowledge, this is the first study to investigate whether maternal sleep problems and postpartum depression symptoms due to infant night waking predict longer IBIs, setting the stage for future research on infant night waking as an adaptive trait by debilitating the mother.

“Life is uncertain, eat desert first”: Associations between early adversity, health-behaviours, risk-taking and discounting of future misery

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Objective

Many health- and risk-taking behaviours involve trade-offs between immediate gratification and future health and well-being, e.g. enjoying a chocolate now at the expense of long-term weight management. Early Childhood Adversity has been found to be associated with accelerated sexual maturation, increased mating effort and earlier reproductive timing as well as lower efforts in preventative health-behaviour and less risk-avoidance. The current research aims to verify these associations and includes the novel construct of Misery Delay Discounting, i.e. the future discounting of expected misery caused by serious future illness.

Methods

This study used an online survey design to collect responses from 371 adult USA residents (160 females; 210 males; one other gender; Mage = 29.98). Retrospective and current self-report measures were used to build a Structural Equation Model of early childhood environment, markers of ontogenetic trajectories and present health- and risk-related behaviours.

Results

A second-order factor of Early Adversity predicted increased mating effort as well as less preventative health-behaviour, higher risk-taking propensity and a tendency to prioritise short-term gratification over long-term health and safety. The model fit the data well (RMSEA = 0.058 [90% CI = 0.052; 0.063]; CFI = 0.968; TLI = 0.958).

Conclusions

Results corroborate theory and previous empirical evidence and show how Early Adversity is associated with a range of bio-psycho-social variables such as pubertal onset, adults' present-day health-related behaviours, as well as their future-oriented health-related cognitions. The model provides a base for future cross-sectional and experimental research that seeks to advance health intervention programmes from an evo-devo point of view.

Chimpanzees' behavioral flexibility, social tolerance, and use of tool-composites in a progressively challenging foraging problem

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Objective

Behavioral flexibility is a critical ability allowing animals to respond to changes in their environment, and is thought to be key in supporting the evolution of cumulative culture. Previous studies have reported evidence of remarkable inflexibility when our closest relatives, chimpanzees, are faced with changing task parameters. The current study investigated chimpanzees' capacity for behavioral flexibility when a changing 'ecological' experimental context required behavioral alteration for the continued gaining of rewards.

Methods

We provided two groups (N = 22) of sanctuary-housed chimpanzees in Zambia with a foraging task in which possible solutions were progressively restricted over time. Initially, juice could be retrieved from within a tube by hand or using tool materials, but effective solutions were then limited in a second phase by narrowing the tube, necessitating the abandonment of previous solutions and adoption of new ones in order to retrieve the juice.

Results

Group differences were found in the extent to which chimpanzees showed behavioral flexibility, with chimpanzees in one group continuing to attempt solutions which had been rendered ineffective, whilst the second group primarily used effective solutions appropriate to the task phase, and spontaneously invented multiple novel composite tool solutions. The more flexible group also showed higher rates of socio-positive behaviors, such as tool transfers and co-action, and fewer socio-negative behaviours, such as displacement, at the task.

Conclusions

In conjunction, these findings support the hypothesis that social tolerance may facilitate the emergence and spread of novel behaviors.

Which kin matter? The impact of allomaternal care on children's health in north-western Tanzania

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Allomaternal care impacts children's health variably across societies. However, existing studies in low-income settings largely use proxy measures for caregiving behaviours (e.g., absence/presence of kin) that may mask variation in care and its impact on children's health. To overcome this, we measure two types of childcare (low- and high-intensity) from seven categories of allomothers (fathers, maternal grandparents, paternal grandparents, siblings, maternal aunts/uncles, paternal aunts/uncles and distant/non-kin) for 808 children under 5-years in rural Tanzania. Child health is assessed using height-for-age (HAZ) and weight-for-height z-scores (WHZ). We test whether receiving care is beneficial for children's health; if children residing without mothers have poorer health than children with co-resident mothers; and if allomaternal care is especially important for child health living without mothers. We find little support for our predictions. For children with co-resident mothers, there is no association between care and HAZ; and few associations with WHZ. There is no evidence that children's HAZ or WHZ vary between mother resident and non-resident households. For children not co-residing with mothers, evidence is mixed: paternal care is associated with better HAZ; care from siblings with better WHZ; care from paternal grandparents with better WHZ but poorer HAZ; and care from maternal aunts/uncles with poorer HAZ. In sum, our findings are inconclusive, illustrating either that allomaternal care is not a key determinant of children's health in this population, or that our measures of care - while more nuanced than proxy indicators - still do not fully capture the complexity of children's caregiving environments.

Do humans process emotional faces of dogs the same way they do humans? An eye-tracking study.

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Research has shown that humans demonstrate an attentional bias toward face stimuli and show a fixation bias towards the eye region of human faces. However, there is limited research into whether humans demonstrate these same fixation patterns for non-human faces, and whether this differs between faces expressing different basic emotions. Humans share their evolutionary history with domestic dogs, and across the world demonstrate close emotional bonds with the dogs they keep as pets. This study was therefore interested in whether humans process the emotional faces of dogs the same way they do human faces. Thirty adult participants took part in an eye-tracking experiment in a psychology lab within a university. Fifty-two images were randomly presented for 5000ms each on the screen; stimuli included black and white photographs of human and dog faces expressing basic emotions (neutral, happy, fear, aggression). Differences in fixation durations and fixations counts for each area of interest (eyes, nose, mouth, face, background) between dog and human faces, and across emotions, were analyzed. In accordance with previous studies, participants fixated longer on the informative regions (eyes, nose, mouth) compared to other features, with significant fixation bias towards the eyes. The same was found for both human and dog faces across emotions (i.e. human and dog faces were processed the same). This study helps us to better understand how humans process non-human animal emotional stimuli and provides insight into the biological underpinnings of human-dog bonds.

Disgust sensitivity predicts sociosexuality across cultures

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Objective

Using the behavioral immune system framework, which posits that humans experience disgust after exposure to pathogen cues, we replicate and expand on previous studies by analyzing the influence of three domains of disgust (sexual, moral, pathogen) on psychological (desire and attitude) and behavioral domains of sociosexuality (SOI).

Methods

In four diverse samples (American university students (N =155), Salvadoran community members (N = 98), a global online sample (mTurk; N = 359), and a four-country online sample (mTurk; US, India, Italy, and Brazil; N = 822)), we assessed how each domain of SOI was predicted by pathogen and sexual disgust, while controlling for age and sex.

Results

In both large samples, sexual disgust and pathogen disgust had opposing effects on composite SOI; that is, higher sexual disgust and lower pathogen disgust were associated with more restricted sociosexuality. Further, these effects appear to have been driven largely by the psychological facets of SOI. Results were consistent with indirect effects that in three out of four samples, SOI attitude mediated the inverse relationship between sexual disgust and SOI behavior and SOI desire mediated the positive relationship between pathogen disgust and SOI behavior.

Conclusions

These results suggest that the relationship between disgust and SOI may be obscured by their opposing effects. We discuss these findings in light of the behavioral immune system and the bet-hedging hypothesis, which make opposing predictions on the relationship between infection risk and sexual behavior.

Kinship term borrowability: Aunties more than sisters?

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Objective

Kin terms are often considered basic vocabulary, and they linguistically denote central categories of social organisation – family relatives. More broadly, aspects of kinship are considered more likely to be “vertically transmitted” both at individual and population level but this has not been well tested. Up to 15% of kin terms are likely borrowed, according to the World Loanword Database (WOLD). Debates over horizontal and vertical transmission are longstanding cultural evolutionary questions, so we consider 1) closeness vs distance in kin and 2) consanguineal vs. affinal kin terms as potential drivers of borrowability.

Methods

We use WOLD and our custom-built database KinBank, which includes 1,012 languages belonging to 21 language families. We first describe the kinds of kin concepts that have more linguistically-identified borrowings. We then categorise groups of kin terms (close vs distant, affinal vs consanguineal) and use Congruence Among Distance Matrices to compare distances to two proxies (vertical: phylogenetic distance based on non-kin linguistic data, and horizontal: geographic distances).

Results

We find that close kin terms are less likely to be borrowed than more distant kin terms, but affinal and consanguineal terms show little difference.

Conclusions

Kinship have been considered a “conservative” semantic and social domain. Although kin terms are mostly vertically transmitted, certain terms are more likely to be borrowed. We discuss potential explanatory factors such as frequency, contact, and age of acquisition.

Autism explained evolutionarily: A novel method

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Evolutionary scientists may provide illuminating ultimate explanations of mental disorder, but the heterogeneity found within mental disorder categories makes general explanations of whole diagnostic categories an intractable task. Here I provide a novel systematic method of review, combining principles from evolutionary psychology and evolutionary psychiatry to deal with this complexity. I apply it to autism spectrum disorder, distinguishing functional and dysfunctional subtypes and strengthening Baron-Cohen's account of non-dysfunctional autism as a hyper-systemising cognitive specialisation.

Just as bio-archaeological evidence can be used to infer the evolutionary history of physical traits, genetics, epidemiology and anthropology can be used to infer the evolutionary function of psychological traits. Formulaically systemising these principles of inference, I present the 'DCIDE method', an acronym for its stages of Description; Categorisation; Inference; Depiction; Evaluation. This categorises autism as functional or dysfunctional: around 10-20% of cases can be attributed to dysfunction via de novo mutations and environmental insults, often associated with intellectual disability. The remaining cases are caused by common alleles, without signs of clear neuropathology, thus eligible for adaptive explanations. Evidence of autism's prevalence, onset and course, and male-skewed sex ratio then provide inferences of the function of autistic cognition, strengthening Baron-Cohen's account of autism as hyper-systemising and undermining alternative proposed adaptive hypotheses.

This DICDE method can be widely applied to any trait of interest. Although it is particularly useful for assessing psychopathology, it may also lend strength to hypothesising in evolutionary psychology and biology more generally, providing further evidence that evolutionary hypothesising is not 'just-so' storytelling.

Wealth-health gradients and health effects of material inequality in a small-scale subsistence society

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Objective

Socio-economic status and wealth inequality are associated with health outcomes in high-income countries. These effects are thought to be mediated by psychosocial stress, arguably triggered by evolved tendencies for status striving and increased risk-taking under skewed payoff distributions. Here we test for wealth-health gradients and wealth inequality effects in relatively egalitarian horticulturalists, the Tsimané.

Methods

We associated household wealth (n=1003) and community-level wealth inequality (n=35, Gini = 0.15 – 0.43) with psychosocial stress (depressive symptoms [n=663], urinary cortisol levels [n=828], blood pressure [n=1614]) and health (BMI [n=9378], self-rated health [n=809], and clinical morbidity [n=3140]) using Bayesian multilevel models controlling for age, sex, community size, average wealth, and distance to the market town.

Results

Higher household wealth was associated with lower odds of respiratory illness (OR=0.89, P <0.001) but increased gastrointestinal illness (OR=1.27, P <0.001). Wealth inequality was associated with increased blood pressure (systolic: $\beta=0.07$, P <0.001; diastolic: $\beta=0.1$, P <0.001) and respiratory illness (OR=1.20, P <0.001), but decreased general infections (OR=0.58, P <0.001). Other associations were negligible or contingent on other factors such as age or sex.

Conclusions

Wealthier Tsimané have fewer respiratory infections, while inequality is associated with greater respiratory morbidity and increased blood pressure. However, some of these associations were not robust and there were many null effects. Hence there was little support for consistent effects of wealth or inequality on psychosocial stress and consequently health outcomes. We argue that these associations may only emerge in high-income countries due to evolutionary mismatch.

Testing the Compensatory Prophylaxis Hypothesis: associations between disgust sensitivity and immune activation in the 1st trimester of pregnancy

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Objective

The aim of this study was to test the Compensatory Prophylaxis Hypothesis by examining associations between disgust sensitivity and immune system activity (cytokine levels and white blood cell count; WBC count) in early pregnancy.

Methods

The sample consisted of 77 women who completed the Disgust Scale-Revised (DS-R) and provided blood samples for analyses of cytokine levels and WBC count in the 1st trimester of pregnancy. Multivariate regression with a reduction of dimensionality (orthogonal projections to latent structures) was performed to assess associations between disgust sensitivity and immune activity indices. Covariates included maternal age, maternal BMI before pregnancy, gestational age on the day of blood collection, a method of conception, parity, and fetal sex.

Results

Higher disgust sensitivity was significantly associated with lower levels of IL-1 β , IL-2, IL-4, IL-7, IL-17, Eotaxin, G-CSF, MCP-1 (MCAF), PDGF-BB and RANTES in women's blood serum ($p < 0.01$). This model explained 22% of the total DS-R scores variability (18.2% after cross-validation). Contamination disgust subscale (but not Core and Animal-reminder disgust subscales) was significantly associated with the cytokine levels (FGF basic, Eotaxin, IFN- γ , IL-1 β , IL-2, IL-4, IL-7, IL-17A, MCP-1 (MCAF), PDGF-BB, RANTES, TNF- α) ($p < 0.01$), with 9.6% of this subscale scores variability being explained by the model. We observed no association between disgust sensitivity and WBC count.

Conclusions

Our results support the Compensatory Prophylaxis Hypothesis as disgust sensitivity appears to compensate for insufficient immune activation, suggesting that disgust may function as a part of behavioral immune system in early pregnancy.

Competition and inter-group relationship in human cooperation: a case study in a historic Italian city

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Objective

Cooperative behaviour is known to be biased: across societies, people cooperate more with in-group members than with out-group members. Yet the precise effect of various factors on the level of bias remains unclear. For example, does competition increase in-group cooperation, and/or does it decrease out-group cooperation? Does the level of cooperation differ when faced with members of a rival out-group, vs. members of a neutral out-group? The Contrada system in the city of Siena, Italy provides a real-world setting to address these and related questions.

Methods

Members of the 17 Contrade participate in year-round activities and rituals, identifying strongly with their in-group, and experiencing intense competition during the Palio horse race in the summer. We recruited 367 members to play a modified dictator game in a lab-in-the-field setting. We conducted the study during periods of low and high competition, and exploiting variation in relationship across Contrade: some pairs are neutral competitors, whereas others are designated allies or rivals.

Results

Contrada members showed a general propensity to favour in-group members over out-group members. However, we found limited evidence for an effect of the level of competition (low vs. high) on cooperation. We found an effect of group relationship, with cooperative behaviour between neutral out-groups and hostile behaviour predominantly between rival out-groups.

Conclusions

We discuss the findings in the context of the literature on the evolution of human cooperation, and against the ethnographic background for the Contrada system. Human prosociality is influenced by inter-group competition, although understanding the precise effect of this factor requires further investigation in natural settings. The study also highlights the variety of relationships that exist between human groups, and it encourages investigations of cooperation to include a more prominent role of inter-group relationship.

Facial fluctuating asymmetry and reproductive success – a mediating role of age at first reproduction

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Objective

The level of facial fluctuating asymmetry (FA) is a biomarker of developmental stability and genetic quality. It is also a predictor of the physical attractiveness of an individual. Hence, FA should be negatively related to reproductive success, as a better biological condition and higher attractiveness (reflected in the lower level of FA) both contribute to the greater reproductive potential.

Methods

One-hundred and sixty-two women aged 46-92 (mean 64.3; SD 9.93), living at the Mogielica Human Ecology Study Site in Poland, took part in the study. The population was characterized by high parity for many decades. Demographic and reproductive data (age at marriage, age at first and last reproduction, number of children), were collected via questionnaire. Level of overall (OFA) and central (CFA) facial asymmetry were measured from facial photographs according to standard procedures. The two-step analyses included multiple regression and analysis of mediation (path analysis).

Results

The mediation analysis revealed a negative association between OFA and number of children, mediated by age at first reproduction, when controlled for year of birth of a woman, education and age at marriage ($p=0.031$).

Conclusions

Our results suggest that FA might be an important factor shaping the timing of first reproduction and, ultimately, reproductive success. This study sheds a light on the possible complex role of FA in relation to females' biological condition which is crucial for shaping selected aspects of their reproductive trajectory.

Different mating strategies: Do women spend more time than men on enhancing their appearance?

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Objective

According to evolutionary theories, our ancestors faced different adaptive challenges (Buss, 1989; Puts, 2010). One of such challenges was acquiring a potential partner. As this was a recurring problem, both sexes learnt to pay attention to certain partner's cues, which increased their reproductive success. Men looked for women who were young and beautiful, as this indicated women's fertility, while women looked for men who had resources and high social status, as this indicated that men could provide for their partner and offspring. This pressure, called sexual selection, resulted in different mating strategies in both sexes. In case of physical appearance, this would translate into women spending more time on enhancing their beauty than men. Drawing on this theory, we aimed to test whether modern women do indeed spend more time than men on enhancing their attractiveness.

Methods

Sixty-two participants (58% women) were recruited into a week's length study. They kept a diary and reported the time they spent on enhancing their beauty.

Results

Sex was significantly related to the intensity of daily performed behaviors aimed at increasing one's attractiveness ($\beta = 0.213$, $SE = 0.09$, $p < .05$). However, when taking into consideration time spent on exercises, sex differences were no longer observed ($\beta = 0.06$, $SE = 0.09$, $p = .50$).

Conclusions

The present results provide evidence that nowadays, there may not be so wide sex differences in the intensity of improving one's appearance as has been previously thought.

Inequity aversion in pre-schooler and school age children

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Inequality aversion promotes fair resource sharing which is key in human cooperation. We measured the inequity aversion of children between the ages of 4 and 9 to examine how young children respond to disadvantageous inequity (when their partner gets more) and advantageous inequity (when they get more than their partner).

Children played with same sex individuals from another (pre)school group a simple choice game in which they decided between two allocation of candies. One of them acts as the decider who directly affect the choice between allocations of candies. In each treatment, they had to decide between equal amounts to both of them and different unequal amounts. Additionally, we asked the children about the reason of their decisions.

We found that children do not exclusively attend to their own pay-off, and at times they seem to make random decisions. For the most part, girls and boys did not differ in their choices, although boys are more prosocial and have shown other-regarding choices (neutral for them, advantageous for the other children). In line with social development, older (from 7 to 9) children pursue equality more often than pre-schooler children. In preschool, two-third of them chose more candies instead of sharing it with their partners, this proportion drops below 40%, but 65% of them still choose more candies if the quantity is big.

Children can use different (egalitarian, competitive or mixed) strategies through the game, although they cannot or do not want to tell the cause of their decisions.

Unconfident voters undermine the accuracy of majority decision-making

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Objective

Group decision-making (e.g. majority decision) reduces the noise of individual information, thus often yielding the wisdom of crowds. However, group decisions usually impose opportunity costs on voters, and it remains unknown whether collective intelligence results from voting even when the voters can exit from the group to maximize their payoffs. We hypothesize that the people that are confident about their ability exit from the group because individual decisions are expected to return the higher reward than voting.

Methods

Sixty-three students participated in our laboratory experiment. Participants performed a perceptual task individually and then chose whether to vote on the task or exit from a 25-person group (i.e. abstention). To examine what disposition affects the voting rate, we also estimated participants' risk-preferences, perceptual accuracy, and confidence in their task performance, using incentivized tasks and a hierarchical Bayesian method.

Results

Less confident participants voted more frequently, which supports our hypothesis. Such biases in the voters made majority decisions worse than individual decisions of the loners, who exited from the group. This madness of crowds was more noticeable when the task was easier and when the voting cost was higher. The majority in our experiment was also inferior to the majority which we simulated as if all participants had voted. Moreover, the accuracy of actual majority decisions did not increase monotonically as the number of voters increased.

Conclusions

Our findings suggest that majority decision-making is vulnerable to participation bias resulting from individual voluntary voting.

Mommy's baby, daddy's maybe: Confronting cuckoldry references in art history with historical-genetic data on extra-pair paternity

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Objective

After many years of speculation, empirical data on extra-pair paternity (EPP) behaviour in humans has only recently been provided due to the use of new interdisciplinary methods. One major step in this progress was the development of genetic genealogical approaches that enable the estimation of human EPP rates across the past five centuries. Here, we want to test if the traditional stereotype of cuckoldry in western art history correlates with the socio-demographic factors that impacted the historical EPP incidence in West-European populations.

Methods

A representative set of paintings and drawings related to cuckoldry behaviour were compiled using digital collections of European art history museums. The effect of the most observed motives in this compilation on the historical EPP frequencies were tested using a new empirical logistic regression model based on genetic genealogical data from the Low Countries.

Results

The historical stereotype of a cuckolded man in artwork includes an old age, a huge age difference with his partner and being a member of the aristocratic class. Genetic genealogical data shows that EPP rates in western society varied in function of population density and social class of the legal father, however, they do not correspond with the historical stereotype.

Conclusions

Although the EPP rates in western society varied strongly in function of social context, the numerous cuckoldry references in western art give a false impression about the main socio-demographic factors that have influenced this behaviour. These main factors and the reasons for this mismatch with art references will be discussed in an evolutionary behaviour perspective.

Cooperation and adversity

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Objective

To explain the relationship between cooperation and environmental adversity.

Methods

I briefly review the data on cooperation and adversity across diverse taxa, focussing on psychological and anthropological studies of humans. I then present a simple graphical model to explain the data.

Results

From plants to microbes to vertebrates cooperation is enhanced under adversity. The same is generally true for our own species except in extremis when this relationship is reversed.

The model assumes:

- Fitness/human well-being increases as adversity declines
- Where cooperation is the norm it enhances fitness/well-being
- The fitness/well-being consequences of cooperative and non-cooperative alternatives converge at extremes of environmental quality (adversity)

Conclusions

Consequently, in the model the net benefit of cooperation compared to non-cooperation at first increases and then declines with adversity. Therefore, and in accord with most of the data, the occurrence of cooperation is predicted to be an inverted-U function of adversity. The well-being of individuals and societies in extremis may be particularly sensitive to small changes in adversity. Rigorous tests of this explanation require sampling from many levels of adversity; two – as in current studies – is not enough.

The observed pattern and hidden process of female reproductive trajectories across the lifespan in a nonhuman primate

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Objective

Reproductive aging has been difficult to characterize with cross-sectional data, where late-life patterns such as senescence can be confounded by the non-random death of individuals over time. The recent accumulation of longitudinal, individual-based data from free-ranging vertebrates has allowed for overcoming the challenge. However, such data are still limited in primates including contemporary humans, where reproductive potential is often not fully realized.

Methods

We present the first within-individual characterization of fertility trajectory across the entire reproductive lifespan in primates, based on 5,763 annual observations of reproductive states in 673 female rhesus macaques (*Macaca mulatta*) of Cayo Santiago, Puerto Rico.

Results

First, we identify three distinct phases of age-dependent changes in the reproductive trajectories of females, and note how the pattern reveals some degree of asynchrony in the onset and rate of senescence between reproduction and survival. We further demonstrate an age-independent terminal decline a year before death, which is in line with the growing literature suggesting time to death, in addition to chronological age, as an important parameter for life history behaviors. Second, by fitting a hidden Markov-chain model to the data, we demonstrate that the underlying process of these observed patterns is one in which distinct states of reproducing and not reproducing alternate, until individuals enter a frailty state with a low chance of reproduction, from which they cannot recover.

Conclusions

These findings provide evidence for both age-dependent and age-independent senescence, and also identify an underlying frailty state that is likely to be a key component of individual life history.

The male intimidation pose

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Objective

Within the animal kingdom, certain species are known to display their formidability through the presentation of an 'intimidation pose' to potential opponents. The current study investigated whether human males also present an intimidation pose prior to the occurrence of a physical altercation.

Methods

During phase one of the current study, motion capture was used to record the gait patterns of 19 males within both the baseline and intimidation conditions. These stimuli were then presented to an opportunity sample of 27 females and 24 males within phase two of the study, where participants were asked to rate the intimidation of each male walk through a series of Likert scales.

Results

Three repeated-measures ANOVAs revealed that male intimidation walks were perceived to be more intimidating than baseline gait patterns. Furthermore, significant correlational analyses showed that participants' physical girth scores were positively associated with higher ratings of intimidation.

Conclusions

The findings therefore suggest that males purposefully alter their bodily movements in an effort to intimidate potential opponents within the social environment. Future research should therefore aim to identify the key characteristics which underlie this human intimidation pose.

Masculinity matters – but mostly if you’re muscular: A meta-analysis of the relationships between sexually dimorphic traits in men and mating/reproductive success

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Objective

Male sexually dimorphic traits are influenced by developmental exposure to testosterone (T). Two main hypotheses have been proposed explaining the evolution of such traits in men. Based on hypothesised immunosuppressive properties of T, dimorphic traits are posited to function as honest signals of heritable good genes. Thus, dimorphic men should produce better quality offspring as well as be able to accrue more partners; this suggests that male sexual dimorphism evolved through female choice (i.e. intersexual selection). Alternatively, dimorphic traits may have evolved by giving physically formidable men an advantage in male-male competition for resources, status, and partners (i.e. intrasexual selection). Hence, both hypotheses predict that sexual dimorphism should be associated with increased mating/reproductive success. Thus far, evidence for this prediction is inconclusive.

Methods

We meta-analysed the relationship between dimorphism in six domains (faces, bodies, voices, height, 2D:4D ratios, and T levels) and mating/reproductive success; the analyses comprised 434 effect sizes from 91 studies.

Results

While all dimorphic traits bar facial dimorphism positively predicted men’s mating success ($r = .13 - .03$), only body dimorphism significantly predicted reproductive success ($r = .12$).

Conclusions

Our findings lend stronger support to the male-male competition hypothesis, but effect sizes are small. We are also constrained by lack of reproductive data, particularly from naturally fertile populations. Our data thus highlight the need to test evolutionary hypotheses outside of industrialised populations.

Message in a bottle: one-shot generosity may have evolved as an honest signal of willingness to cooperate

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Objective

Why do we cooperate even when no one is watching? Theoreticians traditionally invoke a “smoke detector principle”, following which the costs of such repeated mistakes may be upset by avoidance of the far greater costs of defecting when observed.

We aim to offer a complementary perspective, using costly signaling theory. For its potential audience, cooperating under unlikely observation may be a particularly informative signal of willingness to cooperate elsewhere. Perpetrators could thus unlock particularly strong reputational benefits.

Methods

We rely on a simple mathematical framework linking cooperation and signaling (inspired by Jordan et al., 2016). Players engage in asymmetric prisoner’s dilemmas, with varying probabilities of observation. “Choosers” only have access to limited information about prospective partners’ past behavior. If chosen, these “signalers” may cooperate or defect, depending on a continuously distributed underlying quality (their temporal discount rate).

Results

When probability of observation is sufficiently small (but not negligible), cooperation under unlikely observation is an evolutionary stable signal. Signalers of high quality and their partners thus unlock high levels of cooperation which would otherwise be unattainable due to generalized uncertainty.

Conclusions

Besides risks of detection, low observational contexts may provide individuals with opportunities to demonstrate genuine willingness to cooperate (Bliege Bird et al., 2018). By investigating the constituents of reputational benefit in this instance, we further hope to have provided a venue to better understand the nature of human cooperation.

Same sex and opposite-sex friendships in school class

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School age children form more friendships with same-sex than opposite-sex friends, and social networks with central and peripheral individuals are formed within sexes. Opposite-sex friendships might either compensate for a lack of same-sex friendships, or be rather a by-product of social network expansion of highly social individuals. We studied 119 children aged 8-14 years from 6 school classes. Opposite-sex friends among classmates were named by 17% of children aged 8-9 years, but these friendships were never mutual. In 11-12 year old children, none of the children named an opposite-sex friend. In children aged 13-14 years, 57% named an opposite-sex friend. Children aged 13-14 years named 14% of opposite-sex classmates as friends on average and were also named to be one's friend by 14% of opposite-sex classmates on average, but only 1/3 of these friendships were mutual. Children with less same-sex friends (peripheral children) named more opposite-sex friends (18% of opposite-sex classmates on average) than children with more same-sex friends (central children) (9%; $F=2.65$; $\eta^2=0.070$). However, being named as an opposite-sex friend was more frequent for central (17%) than for peripheral children (10%) of both genders ($F=2.21$, $\eta^2=0.060$). Mutual friendships were more frequent in peripheral (formed with 8% of opposite-sex classmates on average) than central children (3%; $F=2.92$, $\eta^2=0.076$). The results show that the frequency of opposite-sex friendships is very low before, but significant after reaching puberty. They also show that opposite-sex friendships might compensate for a lack of same-sex friendships. However, when naming an opposite-sex friend, central children are preferred.

Who deserves my trust: The pleasant or the genetically similar?

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Objective

Identifying trustworthy partners is an important adaptive challenge for establishing mutually cooperative relationships. Previous studies have demonstrated a marked relationship between a person's attractiveness and his apparent trustworthiness (beauty premium). Kin selection theory, however, suggests that cues to kinship enhance trustworthiness. Here we directly tested predictions of the beauty premium and kin selection theory by using body odours as cues to trustworthiness. Body odours reportedly portray information about an individual's genotype at the human leucocyte antigen system (HLA) and thus olfactory cues in body odours serve as a promising means for kin recognition.

Methods

Ninety men played trust games in which they divided uneven sums of monetary units between two male trustees represented by their body odour and rated each body odour for pleasantness. Half of the odours came from HLA-similar men (suggesting closer kin) and half from HLA dissimilar men (suggesting non-kin).

Results

Multilevel linear regression analysis including HLA-difference scores and pleasantness difference scores as covariates revealed that a man's body odour pleasantness significantly predicted how much money he was entrusted with. However, HLA similarity between the truster and trustee had no effect on the amount of money that was transferred.

Conclusions

We found that apparent trustworthiness was not related to HLA-similarity, but to the pleasantness of the trustee's body odour. By showing that people with more pleasant body odours are trusted more than people with unpleasant body odour we provide evidence for a "beauty-premium" that overrides any putative effect of kin.

The pervasive influence of ecology on behavioural variation

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Humans exhibit a high diversity of habits and practices, but it remains unclear to what extent our behaviour might be shaped by local environmental conditions in the same way as it is in other animals. In this project, we matched the behaviour of 339 human populations to the behaviour of other mammals and birds found in the same location. We find that human, mammal, and bird societies living in a given environment show high similarity in their foraging, reproductive, and social behaviour. Humans appear to have more flexibility to change their behaviour than another wide-ranging primate, baboons. Our findings suggest that, even if the processes shaping behaviour might differ, local conditions continue to select for specific behaviours in humans and other animals.

Pandemic leadership: Sex differences and their evolutionary-developmental origins

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Objective

There have been substantial cross-national differences in the kinds of policies implemented by political decision-makers to prevent the spread of the SARS-CoV-2 virus. Among other factors, these policies may vary with politicians' sex.

Methods

We reviewed existing findings on sex differences in pandemic leadership and compared them with sex differences in other research areas, including psychology, leadership, and developmental, cognitive, and behavioural neuroscience.

Results

Early findings indicate that, on average, female leaders seem more focused on minimizing direct human suffering caused by the SARS-CoV-2 virus, while male leaders implement riskier short-term decisions, possibly aiming to minimize economic disruptions. These sex differences are consistent with broader findings in psychology, reflecting women's stronger empathy, higher pathogen disgust, health concern, care-taking orientation, and dislike for the suffering of other people—as well as men's higher risk-taking, Machiavellianism, psychopathy, narcissism, and focus on financial indicators of success and status.

Conclusions

Differential sexual selection and parental investment between males and females, together with the sexual differentiation of the mammalian brain, drive sex differences in cognition and behavioral dispositions, underlying men's and women's leadership styles and decision-making during a global pandemic. The sexually dimorphic leadership specialization hypothesis suggests that general psychobehavioral sex differences have been exapted during human evolution to create sexually dimorphic leadership styles. Early evidence indicates that against the invisible viral foe that can bring nations to their knees, the strategic circumspection of empathic feminine health “worriers” may bring more effective and humanitarian outcomes than the devil-may-care incaution of masculine risk-taking “warriors”.

Is age difference between partners associated with the level of anxiety in pregnant women?

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Objective

Several studies demonstrated gender differences in the mate-selection preferences related to the age of the prospective partner: women usually prefer slightly older men and men tend to prefer much younger women. Some women may feel safer in a relationship with an older partner given the associations between age and both maturity and social position of men. The current study aimed to explore whether the level of anxiety in pregnant women is related to age differences between partners.

Methods

We analyzed data from 1151 pregnant women (aged 18–43). The data was collected by an online survey advertised via social media. The Polish adaptation of the State-Trait Anxiety Inventory (STAI) was used to measure state and trait anxiety.

Results

The mean age difference between partners was 2.38 ± 4.07 years. Neither linear nor quadratic (U-shape) relationship between partners' age difference and state anxiety among pregnant women was found, after controlling for woman's age, socioeconomic status, trimester of pregnancy, pregnancy complications, and trait anxiety.

Conclusions

Although the theoretical background suggests the importance of the age difference in mate-selection preferences, our results showed that it is not related to the well-being of women during pregnancy. Perhaps it is a result of greater independence of modern women and decreased importance of age of the partner for stability and happiness of the relationship. It can be concluded that age difference between partners might be less important for the well-being of pregnant women in modern societies.

Making sense of the chaos: Intra- and inter-individual variation across the peri-menopausal period

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The perimenopausal period is characterized by increasingly variable ovarian hormone levels in response to changes in the hypothalamic-pituitary-ovarian axis. As viable oocytes fail to mature, ovarian cycles start to become more variable in length and the frequency of ovulatory events declines to the point of complete anovulation. The perimenopausal period represents the last life history transition for women and marks the end of physiological investment in new offspring.

We present here an analysis of urinary progesterone metabolite (uPdG) levels in 24 Qom women who we followed longitudinally across the perimenopausal transition. The Qom, traditionally hunter gatherers, now participate in market economies to varying degrees.

Based on the occurrence of menses, we divided participants into three subsamples: post-menopausal (menses had ceased), pre-menopausal (regular cycles observed) and transitional (amenorrhoeic periods shorter than 6 months). A total of 844 hormonal measurements were conducted and individual hormonal profiles were computed.

We found remarkable variation in uPdG levels across all three groups. Inter-individual median levels varied from 248.42 ng/ml to 5568.45 ng/ml (SD=1082.15 ng/ml, medians counted based on all hormonal measurements per participant). Due to high within group variation (SDs=435.20 – 1562.25 ng/ml) we could not say that the median values of the uPdG differed between three menopausal groups (Kruskal Wallis test $H=3.97$, $p=0.14$).

Despite the methodological and interpretation challenges of making sense of variation in non-clinical, non-western settings, including these populations broaden the range of normal variation in women's reproductive physiology.

The affiliative effects evoked by behavioural mimicry disappear in the presence of ostensive group markings

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Introduction

In a previous study, we demonstrated that watching the silhouettes of two actors imitating each other's movements evokes notions of affiliation and entitativity between them, while watching the same actors moving in time but displaying different gestures has the opposite effect.

Objective

The current study explores what happens when the information provided by the contingency of the actors' movements is supplemented by ostensive information on their entitativity (i.e. phenotypic traits and clothing style).

Methods

Three videos were recorded in which two actors with different styles and phenotypes (e.g. one was dark-haired and dressed smartly, the other fair-haired, dressed casually and sporting a tattoo) performed a series of small gestures which were either contingent in time, in form, or not contingent at all. Participants (Spanish university students, $n=63$) were randomly assigned to watch one of the three videos in a between-subject design and asked to rate the degree of affiliation they would attribute to the actors on a scale from a minimum of 1 to a maximum of 7.

Results & Conclusions

A Kruskal-Wallis Test of the affiliation scores revealed no significant differences between the three videos (Chi square = 0.495, $p = .78$, $df = 2$). The fact that actors received low affiliation scores across conditions (M no contingency=4,05; M time contingency=3,66; M form contingency=3,8) suggests that phenotype and clothing style trump behavioural contingency when it comes to inferring others' affiliative status.

Integrating social ecology into phenotypic selection and quantitative genetic studies of human behavior

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Objective

Sociality is central to the maintenance of human life history and has been identified as a key determinant of individual variation in health, longevity, and reproductive success. Despite extensive research on the proximate causes of human social behavior, behavioral genetic and phenotypic selection studies rarely incorporate social ecology into statistical models. The goal of the present study was to explore the limitations of current modeling approaches and formally demonstrate their consequences for evolutionary inferences about human behavior.

Methods

We used Bayesian simulation studies to examine the risk of inferential error with common statistical approaches, considering both classical family study designs as well as observational approaches applicable for field settings. Under a range of plausible conditions consistent with prior research, we investigated bias in the direction and magnitude of selection, heritability estimates, and environmental effects on trait variance.

Results

Models excluding social ecological effects bias estimates of the proximate causes and microevolutionary consequences of human behavior, although the direction and magnitude of these biases are contingent on the nature of social interactions and strength of assortment between social partners. Additionally, we observe that Bayesian techniques can enhance the statistical power of observational study designs.

Conclusions

Our results demonstrate that current modeling approaches often mischaracterize central features of human trait expression and its fitness effects, leading to biased inferences about the evolution of behavior. Fortunately, quantitative genetic models are now available that can explicitly incorporate human social ecology, providing exciting opportunities for future research on social selection and gene-environment interplay.

Psychological origins of political revolutions: Quantifying the rise of prosocial emotions in early modern theatre plays

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Objective

Automatized text analysis has been increasingly used as a tool to measure the dynamics of norms, values, emotions and subjective preferences across history. Here we will use these tools to provide insights into the psychological mechanisms of democratizing revolutions. In particular, we will measure how preferences towards cooperation (vs. dominance) relate with the French Revolution and English Civil War.

Methods

Using Python's Natural Language Toolkit, we analyzed theatre plays from the pre-industrial and early industrial periods in England (N = 932, ranging 1550-1800 A.C.) and France (N = 1060, ranging 1550-1900 A.C.) and explored the relationships between democratizing political change, GDP per capita (GDPpc), and the frequency of words related to cooperation (sympathy and trustworthiness) and dominance (anger and strength). We operationalized cooperation as Trustworthiness-to-Strength and Sympathy-to-Anger ratios, and measured how the growth rate of these ratios related to political revolutions. Finally, we performed a lag analysis to measure the relationship between GDPpc and cooperation.

Results

We found an increase of cooperation-related words across history relative to dominance-related words in both countries. Furthermore, we find that the accelerated rise of cooperation-related words preceded both the English Civil War (1642) and the French Revolution (1789). Finally, when accounting for global trends, short-term variations of GDPpc per capita preceded the variations of a Sympathy-to-Anger ratio, but not of Trustworthiness-to-Strength.

Conclusions

These results highlight the role of long-term psychological changes in explaining political revolutions and the rise of modern democracies. Furthermore, affluence explains the cycles of Sympathy and Anger.

The demography of human warfare can drive sex differences in altruism

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Objective

Recent years have seen great interest in the suggestion that between-group aggression and within-group altruism have coevolved. However, these efforts have neglected the possibility that warfare – via its impact on demography – might influence human social behaviours more widely, not just those directly connected to success in war. Moreover, the potential for sex differences in the demography of warfare to translate into sex differences in social behaviour more generally has remained unexplored. In this study, we tackle these questions to clarify how sex and the demography of warfare might influence altruism.

Methods

To achieve this goal, we develop a kin-selection model of altruism performed by men and women for the benefit of their groupmates in a population experiencing intergroup conflict.

Results

We find that warfare can promote altruistic, helping behaviours as the additional reproductive opportunities winners obtain in defeated groups decrease harmful competition between kin. Furthermore, we find that sex can be a crucial modulator of altruism, with there being a tendency for the sex that competes more intensely with relatives to behave more altruistically and for the sex that competes more intensely with non-relatives in defeated groups to receive more altruism. In addition, there is also a tendency for the less-dispersing sex to both give and receive more altruism.

Conclusions

Four altruism patterns emerge from our results and we term them ‘boy’s club’, ‘women help men’, ‘men help women’ and ‘girls’ club’. We discuss which patterns we expect to find in current human societies in the light of our analysis and of demographic variation.

Minority stress and habituation of HPA axis in a sample of gay and straight men

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Objective

According to minority stress model, stigma affecting LGBTQ community contribute to greater prevalence of health problems in this population. One of the possible pathways linking minority stress with health adversities involves dysregulation of the hypothalamic–pituitary–adrenocortical (HPA) axis response to stress and adaptive mechanisms such as habituation to homotypic stressors that navigate stress reaction and overall cortisol exposure. The aim of this study was to test if gay men demonstrate decreased habituation to repeated homotypic stressor as compared to heterosexual men.

Methods

Both gay (n=49) and heterosexual (n=40), healthy men completed the Trier Social Stress Test (TSST) on two consecutive days in a laboratory setting. Cortisol was measured in the saliva samples collected at following time points: 5 minutes before the TSST, as well as 10, 20, 40 and 80 minutes after the TSST. Multilevel growth curve mixed model was used to predict induced cortisol (log) response in gay and straight men and compare it between consecutive days.

Results

Gay men had consistently higher cortisol output in each sample in both days, yet the overall profile of cortisol curve was not significantly different between groups. Straight men had higher cortisol level at initial saliva sample on second day and steeper cortisol profile, which was not observed in gay men.

Conclusions

Our results suggest impaired habituation of cortisol response to stress in gay men as compared to heterosexual men and therefore offer new insight into current understanding of physiological mechanisms of minority stress.

Tax Man

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Objective

Investigating behaviour that achieves significant species success and failure. Experience as semi-professional sportsman, naval officer, businessman and trainer, all areas involving stranger interactions and critical outcomes. Behaviours that lead to the success of organisations, corporations and nations, concluding with that of the global expansion by the human race.

Methods

Using techniques from behavioural competency, transactional analysis and objective observation, and ignoring propaganda and other dualistic interpretations, I have studied behaviour and isolated the specific actions and players. I compared these actions across species, time, geography and activity to create consistent behavioural transactions.

Conclusions

I conclude that most humans possess a unique instinct, a gene. The tax gene explains our economic and demographic growth and decline as instinctive processes. It explains the success of Homo sapiens compared to other species, compared to extinct (sub)species of Homo, and the extant subspecies that I call First Leavers.

Theory

I propose that Homo sapiens' place as supreme predator comes only from an inhibition of mammalian fight/flight/freeze instincts when faced with strange same-sex members of his own species. He replaces this with the demand and payment of homage, service and a 10% contribution, which defines his subspecies, Tax Man, or Homo sapiens acquiescans. Tax is much more than just a financial transaction; it is a behavioural transaction and these behaviours are observable, every day. Taxation allows Tax Man to co-operate with others in ever-larger groups to hunt, build, explore, fight and farm. Groups who adopt tax outnumber and dominate those who avoid it.

Increase in disgust sensitivity between follicular and luteal phases in two different menstrual cycles – within-subject study

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Objective

It is hypothesized that during periods of increased susceptibility to infections, e.g. caused by high concentrations of progesterone, women should feel more disgusted and thus increase behaviors related to avoidance of infections (CPH hypothesis). Physical activity can alter levels of sex hormones during menstrual cycles. Our aim was to investigate increase in disgust sensitivity in young, healthy women during phases of two menstrual cycles varying in the level of physical activity.

Methods

Disgust was assessed in 39 women, aged 20-35, twice in each of two menstrual cycles: during sixth day of the beginning of a cycle and during sixth day after the ovulation. During 1st menstrual cycle women limited their physical activity, while during 2nd cycle they increased physical activity. Disgust was assessed by Pathogen Disgust Subscale from Three Disgust Domain and photographs showing sources of infection. The increase in level of disgust between phases were analyzed using one-sample t-tests. Then, the differences in increase between the phases were compared between two cycles using Student's t-test.

Results

The increase in level of disgust between phases was significant only in ratings of photographs during first cycle ($p < 0.001$). The increase in ratings of photographs was significantly lower in second cycle ($p = 0.003$).

Conclusions

Our results support the CPH hypothesis. We have shown that during the cycle with high physical activity (thus probably with lower progesterone concentrations) differences in mean ratings of photographs depicting sources of infections between follicular and luteal phase were lower than differences during a cycle with higher progesterone levels.

Cultural adaptation is maximised when intelligent individuals rarely think for themselves

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Objective

Humans are remarkable in their reliance on cultural inheritance, and the ecological success this has produced. Nonetheless, we lack a thorough understanding of how the cognitive underpinnings of cultural transmission affect cultural adaptation across diverse tasks.

Methods

Here, we used an agent-based simulation to investigate how different learning mechanisms (both social and asocial) interact with task structure to affect cultural adaptation. Specifically, we compared learning through refinement, recombination or both, in tasks of different difficulty, with learners of different asocial intelligence.

Results

We found that for simple tasks all learning mechanisms are roughly equivalent. However, for hard tasks, performance was maximised when populations consisted of highly intelligent individuals who nonetheless rarely innovated and instead recombined existing information. Recombination drove the population to converge on a medium-diversity subset of high-mixability traits, i.e. traits that combine well with each other to achieve high payoff under a variety of conditions.

Conclusions

Our results thus show that cumulative cultural adaptation relies on the combination of individual intelligence and ‘blind’ population-level processes, although the former may be rarely used. The counterintuitive requirement that individuals be highly intelligent, but rarely use this intelligence, may help resolve the debate over the role of individual intelligence in cultural adaptation.

Smaller families, lower helpfulness? Testing a theoretical model.

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Objective

According to the prediction of Tamas David-Barrett's (2019) model, to protect your child from free-riders, you should provide as many siblings as possible. His theoretical study showed that falling fertility changes the structure of social networks that weakens the mechanism for eliminating free-riders and could lead to less cooperative societies. Urbanization, increasing population, and migration decreases the number of interacting relatives and could cause the same effect. The recent demographic transition enhances the importance of this topic. We aimed to test his hypothesis using worldwide data.

Methods

In a meta-analytic framework, data of dictator games' (DG) results were collected from the literature and used as a measure of cooperativity. The relationship between cooperativity and socio-economic and demographic indices (from the time and space of the birth of the subjects) were studied.

Results

However our study is still ongoing, our preliminary data (using the results of DGs published in 2018-2019) shows a weak but clear negative relationship between cooperativity and fertility, that contradicts the prediction of David-Barrett's model, even though using the full dataset (containing the results of DGs published in 1994-2020) and other explanatory variables could change this pattern.

Conclusions

If David-Barrett's hypothesis is supported, demographic transitions have a significant effect on alienation, our trust in each other, and how we solve large-scale cooperation problems. If the effect operates differently, the model needs to be revised. Either of the results helps us to understand how the demographic transition affects our society, everyday life and human relationships.

Social influence in adolescence as a double-edged sword

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Social learning is a fundamental driving force of human development. In childhood parents are the main source of social information, but when people transition into adolescence the focus shifts to peers. During adolescence, peer influence is associated with risky and unruly conduct, with eminent negative long-term effects on adolescents' educational, economic and health outcomes. Here we show that the impact of peers on adolescents' behaviour can be both negative and positive, and steadily declines between ages 10 and 20. Exposure to disobedient peers provoked rule breaking, and selfish peers reduced prosocial behaviour, particularly in early adolescence. However, compliant peers also promoted rule-following and fair-sharing peers increased prosociality. A belief formation task confirmed that early adolescents tend to assimilate social information, while older adolescents prioritise personal views. Our results suggest that these developmental patterns reflect a decline in an underlying domain-general factor of social sensitivity during adolescence, and highlight early adolescence as a key window for interventions to improve developmental trajectories.

Playing of dating: Adult playful individuals have more long- and short-term relationships

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Number of romantic/sexual relationships is suggested as a proxy of potential reproductive success. Cross-culturally, both sexes desire playful long-term mates and playfulness predicts relationship quality. It is yet to be tested, however, if playfulness is associated with number of long-term and short-term relationships. We hypothesized that specific playfulness dimensions would correlate with the number of lifetime short- and long-term relationships. Specifically, we expected that Lighthearted playfulness would be associated with more short-term relationships, while Other-directed playfulness would be associated with the number of long-term relationships. In total, 1191 Brazilian adults (mean age=28.7 years, SD=10.2) responded to online sociodemographic questions and playfulness inventory (OLIW). Other-directed playfulness positively predicted the number of short-term and long-term partners in men and Whimsical playfulness predicted number of short-term relationships in women. This suggests that playfulness is used by both sexes to compete for access to more and better mates, but in slightly different ways. For the first time, we show that playful adults have more partners and that playfulness can be used as a part of mating strategies.

The shortlist effect: Cultural selection based on appeal can generate nestedness patterns

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Objective

Understanding the forces responsible for the success of cultural items is the central question of cultural evolution research. Two of them are drift (i.e., success caused by random copying) and context-biased selection (e.g., conformity: success caused by preferential copying of widely adopted items). This paper focuses on selection based on content: success differentials based on the intrinsic appeal of cultural items, as opposed to chance or social circumstances. Researchers have identified types of content associated with cultural success, but we lack a general tool for detecting content-biased selection. This paper proposes such a tool.

Methods

To detect cultural selection, we apply methods from ecology, used for studying bipartite networks consisting of, e.g., species and their habitats. These are metrics for measuring nestedness (e.g., NODF) and nestedness contribution: the contribution of an individual item to the overall nestedness pattern. We apply them to two large datasets of cultural items (MovieLens and Netflix), consisting of personal film collections and ratings.

Results

We show that the nestedness of a set of collections increases when diffusion depends on intrinsic appeal, rather than chance or conformity. Highly rated movies are more frequent in small collections (controlling for their basic frequency), and movies under strong content-biased selection make higher contributions to the overall nestedness pattern.

Conclusions

Selection based on content is stronger in small collections because their owners prioritize appealing items: the “Shortlist Effect”. The proposed approach could track content-biased selection with sparse real-world data in a wide range of datasets.

Parental psychological condition and parenting behaviour mediate the associations between childcare support and child social development in Japan

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Objective

A variety of support from others is crucial for child-rearing in humans. It can be predicted that childcare support will improve both children's and parents' outcomes, but the pathways behind the associations have not been sufficiently examined. This study investigates the associations among (1) childcare support (partner's childcare participation, support from children's grandparents, and support from non-kin), (2) child social development (social and problem behaviour), (3) parental psychological condition (stress and depression), and (4) parenting behaviour (care and abuse). We primarily aim to test a hypothesis that the association between childcare support and child social development can be mediated by parental psychological condition and parenting behaviour.

Methods

We analysed data from an online questionnaire survey in Japan in 2016. The subjects were 618 parent couples of three- to five-year old children. The path analysis was adopted to capture the complex associations among factors surrounding childcare.

Results

Variables on childcare support were associated with child social development, both directly and indirectly through parental psychological condition and parenting behaviour. In the direct paths, contrary to our prediction, greater availability of support was related to lower levels of child social development. The indirect paths supported our mediation hypothesis. In the pathways, there were some differences between mothers and fathers.

Conclusions

This study has shown novel information on childcare support and its direct and indirect associations with both children's and parents' outcomes in Japan.

Dissociative use and production of sharp-edged stones by orangutans: implications for the origins of lithic technologies

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Objective

Using a phylogenetic approach, we addressed the question of whether the acquisition of early stone tool making and using abilities could have relied in learning mechanisms other than copying social learning.

Methods

We used extant great apes (specifically orangutans) as behavioural models of hominoid cognition and tested them in two complementary experiments: The first experiment included a series of behavioural baselines where we explored the spontaneous abilities of orangutans to make and use sharp stone tools as well as their ability to recognize human-made sharp stones and to use them as cutting tools. The second experiment implemented was a token exchange experiment in which the salience of sharp tools was enhanced via a series of sharp stone-food exchanges.

Results

Although the orangutans did not make sharp stones initially, they spontaneously engaged in lithic percussion and sharp stones were produced under later experimental conditions. Furthermore, when provided with a human-made flake, one orangutan spontaneously used it as a cutting tool.

Conclusions

Our study shows that two pre-requisites for the emergence of early lithic technologies – lithic percussion and the recognition of sharp-edged stones as cutting tools – might be deeply rooted in our evolutionary past (perhaps as old as 13 Ma). Furthermore, our study shows that (at least) orangutans do not need to copy a model in order to acquire these behaviours.

The differential role of practical and emotional support in breastfeeding duration and maternal experience in the UK

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Objective

The UK has one of the lowest breastfeeding rates globally and public health interventions have had limited success. Adequate social support is considered a key determinant of breastfeeding duration; yet, a number of studies demonstrate opposing relationships of practical and emotional support. From an evolutionary perspective, this is predictable: practical support may both increase a mother's resources, allowing her to extend breastfeeding, or substitute breastfeeding effort, encouraging breastfeeding cessation. Conversely, emotional support may both bolster a mother's commitment to breastfeeding and influence it via biological pathways, as stress impedes milk ejection. Furthermore, infant feeding decisions often involve psychosocial stress; thus, understanding how different forms of support also influence the experience of infant feeding is important for protecting maternal mental health.

Methods

We test the differential impact of emotional support and different forms of practical support on the duration of breastfeeding and maternal experience using data from 700 UK mothers. Pre-registration: <https://osf.io/b4yx2>.

Results

Practical support with childcare predicted increased breastfeeding duration. Help with infant feeding typically predicted earlier cessation, though post-six months fathers feeding help prolonged breastfeeding. Emotional support shows variable relationships by time and source.

Help with infant feeding predicted poorer maternal experience. Other forms of practical support generally predicted positive experience, though some indicators of experience varied by kin relationship. Higher emotional support predicted positive experience.

Conclusions

The relationship between 'support' and infant feeding varies by type and source of support; support-based interventions to increase breastfeeding and protect maternal mental health would benefit from taking this into consideration.

Social network and collective intelligence under non-stationary uncertain environment: A group experiment and computer simulations

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Objective

Collective intelligence in the highly connected, uncertain world is a major topic of interests across various social and natural-science disciplines. We define “collective intelligence” as an emergent property whereby social interaction yields group-level performance superior to individual-level performance on some objectively-definable dimension. We focus on collective performance in a non-stationary uncertain environment. Specifically, we are interested in how well a group of people can track temporal changes in environment, the issue common in social foraging by animals where resource-levels of several patches may change over time.

Methods

We report results of a behavioral experiment with a total of 250 human participants and a computer simulation about emergence of collective intelligence in a non-stationary uncertain environment. We implemented a two-armed bandit (2AB) task in a laboratory, where the expected rewards of the two options were changing over time. We then observed how a group of 10 people could track the changes through social interaction in a centralized or decentralized network. Participants could learn how their neighbors in the network had decided in a preceding round.

Results & Conclusions

Results confirmed that participants in the social networks could track the environmental changes more precisely than when working alone. Yet, the overall effect of network structure was minimum. Through a series of computer simulations that used parameter values estimated from the experiment, we investigated boundary conditions in which centralized vs decentralized networks have differential impacts on the emergence of collective intelligence. Implications of these findings for network and social sciences will be discussed.

I like the way you move: A pilot study investigating similarities and features of body language in couples

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Objective

Telling couples apart from strangers may be evolutionarily beneficial: knowing who is coupled with whom can help in allocating resources for mating efforts effectively. We know that individuals seem to mimic each other more when there is a connection, a bond - can individuals recognise who are romantically involved and who are strangers, and is it based on body language mimicry?

Methods

10 couples (8 m/f couples, 1 m/m couple, 1 f/f couple) and 10 strangers (2 m/m pairs, 4 f/f pairs, 4 m/f pairs) were filmed using Vicon motion capture camera system carrying out a team-building task. Genderless avatars were then animated using participants movements to scrutinise patterns without confounds such as gender, height, weight and build.

Results

Independent raters were more accurate at identifying which pairs of avatars were strangers, and similarity ratings for the body language and movement of each pair were significantly higher in the couples (4.66/7 vs. 3.96/7 for strangers). Frequency analysis suggested that proximity of the pairs to each other was a driving factor for the raters' decisions, with mimicry featuring in decisions, but not to the same extent.

Conclusions

Couples were identified as more similar in body language than strangers were, however proximity was discussed most by participants. Further work needs to be done to address the questions that have arisen from proximity as a cue to identifying couples from strangers. We will conduct a larger study investigating this.

Facial femininity in Indonesian homosexual men

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Objective

Several studies in occidental societies found that homosexual men are feminized at various levels. In this study we evaluated whether the femininity is a universal feature of male homosexual preference (MHP).

Methods

We collected facial photographs of Indonesian homosexual and heterosexual men and heterosexual women to create the stimuli. We tested whether homosexual men are more feminine than heterosexual men using these stimuli which were rated by 350 Indonesian judges. A morphological analysis was also conducted to see the degree of feminization of homosexual men.

Results

When the shape of photographed men's faces was partially transformed using an average homosexual face (Homo+), the resulting faces appeared more feminized compared to similar transformation using an average heterosexual face (Hetero+). This result was supported when the raters evaluated Hetero+/Homo+ faces regarding which was more masculine, Hetero+ faces were chosen significantly more often ($p = 2.9 \times 10^{-4}$) than Homo+ faces. However, when the morphological difference between males and females was maximized during the discriminant analysis, homosexual men were not distributed differently compared to heterosexual men. Thus, any feminization displayed by homosexual men is not readily captured by the set of point coordinates or by their linear combinations.

Conclusions

Even if the morphological correlates remain to be identified, MHP in Indonesia are partially feminized. Feminization of MHP is perhaps a cross-cultural phenomenon.

The role of social context in cultural evolution of traditional Ryukyuan songs

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Objective

We analyze the geographic variation in traditional songs in the Ryukyu Archipelago, southern islands of Japan, to study cultural evolution of songs and compare it with linguistic and genetic evolution, with a focus on the role of social context in which the songs are sung.

Methods

Published scores of 1,342 traditional songs from the Ryukyu Archipelago were coded using the CantoCore song classification scheme (Savage et al., 2012). A NeighborNet network of islands/regions was generated from pair-wise song distances, and the delta score was obtained to evaluate the "treelikeness" of the network. AMOVA was performed to calculate Φ_{ST} as a measure of song diversification among the regions. The analyses were repeated separately for each of four song categories distinguished by their social context (children, rituals, work, and amusement). We also examined associations among songs, languages, genes, and geography by means of Mantel and partial-Mantel tests.

Results

The song networks had larger delta scores than the corresponding linguistic network, suggesting a role of horizontal transmission in song evolution. The Φ_{ST} values varied depending on the social context, with "work" songs being the most diversified. A significant association was found between "work" songs and languages, whereas no association was detected between songs and genes.

Conclusions

We highlight the possible role of social context in cultural evolution of songs. "Work" songs exhibited high degree of between-region diversity and association with languages, partially supporting the social bonding hypothesis of music.

Who cheers pregnant women up?

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Objective

Women may go through a range of emotional states during pregnancy, including increased anxiety caused by multiple environmental and social factors. Having a strong support system and the direct presence of significant others may contribute to reduced anxiety. The aim of this study was to explore the relationship between living with family members in the same household and the level of anxiety in pregnant women.

Methods

Our sample consisted of 1152 pregnant Polish women (aged 18-43). Information on family structure, pregnancy and anxiety was collected by an online survey advertised via social media. State and trait anxiety were measured with the Polish adaptation of the State-Trait Anxiety Inventory (STAI).

Results

Living with a partner/husband in the same household was significantly associated with decreased state anxiety in pregnant women, after controlling for woman's age and socioeconomic status, trimester of pregnancy, pregnancy complications, and trait anxiety. Living with parents was associated with increased state anxiety. Yet, living with parents-in-law did not influence the anxiety level.

Conclusions

Our results show that living with a partner, but not with own or spouse's parents is linked to the reduced anxiety experienced by pregnant women. In a broader perspective, the alleviation of anxiety during pregnancy may be beneficial for women's health and pregnancy outcomes.

Woman's facial attractiveness and latent pathogens carriage

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Objective

According to evolutionary hypotheses a woman's face attractiveness signals biological condition including health status. Persistent carriage of latent pathogens is associated with chronic immune activation, inflammatory state, oxidative stress, higher risk of metabolic syndrome or coronary heart disease development. In consequence, latent infection might negatively affect actual health and therefore facial attractiveness. The aim of this study is to test the differences in perception of women's face attractiveness between non carriers and those who are carriers of such common latent pathogens as Cytomegalovirus (CMV), Herpes simplex virus (HSV) or *Toxoplasma gondii* (TG).

Methods

193 healthy nulliparous women aged 25-34 were studied. Serum levels of specific anti-pathogen antibody were determined using ELISA method. Each woman's face attractiveness was assessed by ca. 100 men. Participant's age, BMI, oestradiol level were also controlled. 110 participants were anti-CMV IgG positive, 125 were anti-HSV IgG positive and 149 were anti-TG IgG positive.

Results

When analysed separately, each group of carriers did not differ in attractiveness with non-carriers. However, when carriers of at least one pathogen (N=171) were compared with women's without any of the analysed pathogens (N=22), the latter appeared to be marginally significantly ($p=.07$) more attractive than the former ones. Yet when BMI was controlled, this relationship became not significant ($p=.24$).

Conclusions

Carrying pathogens might negatively affect a woman's face attractiveness, but the relationships between face attractiveness and pathogen load seems to be mediated by a woman's BMI, as non-carriers have lower BMI than carriers.

The study was founded by the National Science Centre, Poland; Contract grant no 2015/19/B/NZ8/02061

Livelihood diversity and childcare in a foraging population, the Agta of Palanan, Philippines

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A wide range of cross-cultural, contemporary and historical studies have highlighted that mothers are not alone in raising their children. Fathers, grandmothers, older siblings and non-kin are all pointed to as key allomothers (non-maternal caregivers). Nonetheless, little exploration has occurred into why we see such diversity in allomothers. Arguably, human cooperation evolved as a response to environmental and resource unpredictability, promoting cooperation when individuals could not reliably reproduce on their own. Wide cooperative childcare networks, thus, can be understood as a form of risk transfer (an informal insurance network) associated with an unpredictable foraging livelihood. When individuals settle, farm and increase storage and wealth (risk retention) they may rely on their own ability to absorb losses and remove themselves from wider cooperative networks. Thus, who provides childcare may be a function of how individuals deal with risk, a hypothesis we test in data from the Agta (78 mother-child dyads), a diverse Philippine population who demonstrate variability in mode of subsistence, degree of mobility and household wealth. Using mixed-effect models on childcare observations, we found that fathers and older siblings invested significantly less in foraging households. Likewise, households with increased wealth received less childcare from distant and non-kin. Thus, foraging was associated with wider, less related cooperative networks while settled cultivation was associated with childcare from within the nuclear family. This finding supports our hypothesis that different forms of livelihoods promote different types of risk mitigation. Overall, our results reinforce the necessity of exploring diversity in who supports mothers raising children.

Bottom-up kinship categories: a new global kinship space

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Objective

Kinship terminologies are structured linguistic categories for family relationships. To explain their systematicity and variation across cultures, cultural norms, biosocial adaptiveness, and cognitive constraints have all been invoked. Here we use a data-intensive approach, to avoid imposing preconceptions, in conjunction with optimality theory to extract drivers of terminological variation and determine likely patterns of change.

Methods

Using 405 globally representative languages from our database, KinBank, we compare concepts within a language to create a numeric representation of kinship structure. From these vectors we calculate structural distance between languages, and use dimensionality reduction techniques to build a 'kinship-space'. We analyse the space using density-based clustering and random forests, interpreting the result as a set of ordered violable rules. We explore evolutionary patterns of change using phylogenetic ancestral reconstruction and use the derived set of rules to build a network of change, allowing us to identify patterns that are influenced by cultural norms.

Results

The diversity and complexity in our kinship-space is greater than the widely-used six-piece typology suggests (e.g. Hawaiian, Iroquois). We observe constrained patterns of change and show where cultural norms influence the frequency of these patterns, beyond the influence of wider grammatical, historical, and cognitive constraints.

Conclusions

Our new approach to kinship terminology demonstrates clear "attractors" in kinship space. These incorporate the complexity of internal coherence in this semantic domain while still providing useful focal points for how languages carve up kinship social relationships.

Witchcraft accusations and their outcomes

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Objective

Witchcraft beliefs are historically and geographically prevalent, but little research examines them from an evolutionary perspective. Accusations may be a negative reputational ‘tag’, enabling accusers to remove competitors or vulnerable individuals to acquire various benefits. We examined 1) why some accusations ‘stick,’ or have a lasting effect on the reputation of the accused and 2) why some accusations have more severe outcomes than others. Predictions were derived from literature on witchcraft and evolutionary theories of cooperation and ostracism.

Methods

We used a sample of historic case studies of individuals accused of witchcraft (N= 240) in Bantu societies from sub-Saharan Africa. Variables were coded from ethnographic records. We performed logistic multilevel regressions. Outcome variables were whether the accusation ‘stuck,’ and whether or not the outcome was severe for the accused (resulting in death or expulsion from the community). We examined whether the reputation of the accused, and circumstances surrounding the accusation, impact these factors.

Results

We found no clear association between the reputation of the accused, circumstances of accusations and severity of outcome. The strongest predictor of accusations ‘sticking’ was the involvement of multiple accusers. Disputes between the accuser and the accused were precipitating causes for accusations.

Conclusions

Consensus appears to be important in determining whether an accusation ‘sticks’. In line with evolutionary theory, reputedly uncooperative people may be accused, but competition between accused and accuser may be more significant. Factors influencing the severity of outcomes remain unclear.

Perceived extrinsic mortality risk and health behaviour

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Extrinsic mortality (mortality which is independent of physical state), is a key parameter in evolutionary theoretical models of senescence. This has inspired work that extends the concept of extrinsic mortality to that portion of mortality risk which is beyond behavioural control, and uses this idea to explain why there are socioeconomic gradients in health behaviour: If people who are poorer also have less control over the health hazards to which they are exposed, it may make them relatively less likely to invest in their future health, given that they could expend their resources on more-immediate concerns. We have found support for this hypothesis in a number of observational and experimental studies, including a recent study carried out during the COVID-19 pandemic. In this talk, I will review these empirical findings and discuss their implications. I will discuss the measurement of perceived extrinsic mortality risk, highlighting ways in which our operationalisation of the concept of extrinsic mortality risk differs from extrinsic mortality as typically defined in the original evolutionary theoretical models.

Jealousy as a function of rival characteristics: Two large replication studies and meta-analyses support gender differences in reactions to rival attractiveness but not dominance

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Jealousy is a key emotion studied in the context of romantic relationships. One seminal study (Dijkstra, P., & Buunk, B. (1998). Jealousy as a function of rival characteristics: An evolutionary perspective. *Personality and Social Psychology Bulletin*, 24(11), 1158–1166. <https://doi.org/10.1177/01461672982411003>) examined the effect of rival characteristics on jealousy. In a vignette-based study, they found that women's jealousy was more responsive than men's to a rival's attractiveness, whereas in contrast, the rival's dominance evoked more jealousy from men than from women. Here, we attempt to replicate these findings in two samples (N=339 and N=456), and present subsequent meta-analyses (combined Ns= 5,899 & 4,038, respectively). These meta-analyses showed a weak, significant effect of gender on jealousy provoked by rival attractiveness, but no such response to rival dominance. We discuss the potential reasons for these findings, and future directions for research on jealousy and rival characteristics.

The Darwinian paradox of male homosexual orientation: towards an understanding of the older sibling effect

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Male sexual orientation remains a Darwinian paradox, as there is no consensus on its evolutionary determinants. One intriguing features of homosexual men is their higher birth rank, and two phenomena could contribute. First a higher maternal fecundity (HMF), explained in the context of sexually antagonistic selection. Second the older brother effect (OBE), which proposes that each additional older brother increases the chances for a male embryo to develop an homosexual orientation, due to a maternal and progressive immune response towards specific male antigens. An older sister effect has recently been also proposed.

However, as these two phenomenon have the same effect of increasing birth rank of homosexual men, it is unclear if both HMF and OBE are indeed present. A quantitative measure and tests of the relative importance of the sexually antagonistic effect and the older sib (brother, sister, or both) effect, based on Bayesian statistics, was applied to several datasets. Results show that when both effects were introduced simultaneously, statistical support favoured only older sibs effects, and not an antagonist effect. All aggregated data available in the published literature were gathered to get quantitative estimate of the effect across a large fertility range: the older sibling effect linearly increased with fertility, after controlling for the effect of fertility on birth rank. The evolutionary implications of these findings are discussed.

Automatic social categorization of minimal sexual orientation cues: An evolutionary psychological perspective

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Objective

The homosexual orientation paradox has attracted considerable attention from evolutionarily-minded scientists. However, evolutionary psychological research about the perception of sexual orientation seems insufficient. Thus, our study aimed to investigate whether the evolved social mind prioritizes verbal sexual orientation cues as an implicit social categorization criterion, and if so, which possible selection pressures might underlie this information-processing mechanism.

Methods

Using the “Who-Said-What?” memory confusion paradigm, we created a group psychotherapy context in which supposedly homosexual and heterosexual targets share their romantic relationship issues. In this paradigm, whether targets’ statements referred to same-gender or opposite-gender partners was the mere indicator of the sexual orientation. Perceivers’ task was to recall who had said each of the statements, so two types of errors were possible to be made: within-category error (e.g., confusing a homosexual target with another homosexual target) or between-category error (e.g., confusing a heterosexual target with a homosexual target).

Results

Results showed that (a) participants implicitly categorized the targets based on sexual orientation via limited verbal cues, (b) female participants’ categorization levels were higher than the males’, and (c) negative attributions toward homosexual targets did not influence the categorization tendency.

Conclusions

Our findings are compatible with the evolutionary psychological perspective offering that the sensitivity for others’ sexual orientation might be due to its implications for intersexual selection (e.g., to determine potential mates and regulate mating tactics) and intrasexual competition (e.g., to identify potential rivals for mate competition). Sex differences in categorization levels are also explicable given that the statements were presented in a long-term relationship context and women’s greater choosiness for long-term mates.

The co-evolution of subsistence and societal 'complexity': re-examining core assumptions using novel comparative methods

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The transition from mobile foraging lifeways to intensive agriculture is broadly implicated in the rise of 'complex' societies during the Holocene. However, the extent to which subsistence accounts for a generalized rise in societal complexity has been challenged by studies of 'complex hunter-gatherers' and other populations that subvert the notion of social complexification as a domain-general process. Here we disentangle the relative contributions of subsistence, population history, and a general 'c-factor' of complexity, utilizing generalized network modelling (GNM) and Bayesian phylogenetic multilevel models. Using a globally-representative sample of 186 diverse non-industrial societies, model comparison strongly favored models that included pairwise interactions between complexity and subsistence variables, and disfavored a simple 'agri-centric' model. Our results also identified 'complexity' as a domain general factor that loaded positively onto all measured dimensions and accounted for more variance than either pairwise interactions or population history. In addition to the positive manifold of complexity, agriculture strongly covaried with fixity of residence, population density, and urbanization--a suite of resource-use intensification. These results motivated a novel dynamical model where subsistence intensification was identified as a leader, not a follower in the rise of societal complexity. Rather than a singular process, we suggest that the global distribution of 'complexity' is best understood as a result of 1) a self-reinforcing process of subsistence intensification, 2) monotonic relationships between domains such as population density and urbanization, and 3) the emergence of technological innovations such as writing in just a few centers around the world.

‘Odd one out’: Attentional bias and memory of plant food location

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Objective

Humans show attentional biases toward certain evolutionary relevant stimuli like dangerous animals or high-caloric foods and an enhanced memory for these items. However, little is known about plant foods, while they have been fundamental components of human diets throughout evolutionary history. Here, we investigated attentional bias and memory of plant food location, and whether these two processes are related.

Methods

20- to 30-year-olds (N = 148, divided into 2 conditions) participated in a visual search task and a memory task with three object categories: plant foods, natural kinds, and familiar human-made artifacts. The visual search task showed 3x3 grids, composed of one target from one category and eight distractors from another category. We recorded participants’ reaction time to find the target in the experimental condition, or their preferred picture in the control condition. The memory task was the same across conditions and showed targets from the visual search task or new distractors. Participants were asked whether they had already seen the items and if so, where it was located on the grid. We recorded participants’ accuracy.

Results

Preliminary results indicate no attentional bias towards foods. Nevertheless, while participants detect artifacts faster than foods, their memory performances are equivalent towards these two categories. No attentional bias nor enhanced memory performance were found for natural kinds. Finally, memory performances are better in the experimental condition compared to the control condition.

Conclusions

Considering the adaptive problems humans faced with respect to plant foods can provide insights into the development of food cognition.

The benefits of being seen to help others: indirect reciprocity and reputation-based partner choice

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When one individual helps another, it benefits the recipient but in doing so the helper may also gain a reputation for being cooperative. This may induce others to favour the helper in subsequent interactions. As a result, investing in being seen to help others may be adaptive. The best-known mechanism through which this may come about is indirect reciprocity, in which the profit comes from a third party who pays a cost to benefit the original helper. Indirect reciprocity has been the subject of considerable theoretical and empirical interest, and has often been equated with a concern for reputation. In this talk I highlight how it is not the only way in which cooperative reputations can bring benefits. Signalling theory proposes that paying a cost to benefit others is a strategic investment which benefits the signaller through changing receiver behavior, in particular by being more likely to choose the signaller as a partner. Where there is a choice of partners, this reputation-based partner choice can result in competitive helping whereby those who help are favoured as partners. These theories have been confused in the literature, and there is a need to distinguish the mechanisms more clearly. I therefore set out the assumptions, the frameworks and the predictions of each theory for how developing a cooperative reputation can be adaptive. I consider how the benefits of being seen to be cooperative may have been a major driver of sociality, especially in humans.

The importance of intact senses in mating and social assessments made by deaf individuals

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Objective

Senses play a big role in social perception. We acquire socially-relevant information mainly through vision, however auditory, olfactory, and tactile cues also have an impact on our perception of others. Despite knowing that audition is important for self-presentation and creating impressions of others, so far little was known about how people who lack the auditory input compensate for this loss in interpersonal perception. This study explored the relative importance of sensory modalities other than audition (vision, smell, and touch) in the assessments of the opposite- and same-sex strangers by deaf people.

Methods

The sample consisted of 74 deaf individuals aged between 16 and 55 years (M age=30.74 \pm 11.46; 37 females) and 100 hearing controls aged between 16 and 57 years (M age=31.13 \pm 11.59; 53 females). To assure profound deafness, we performed auditory testing, comprising vocal audiometry and the triplet test. Participants then completed a pen and paper interview, based on the Sensory Stimuli and Sexuality Survey.

Results

Results showed diminished importance of vision and smell in deaf subjects as compared to controls in both targets. When it comes to touch, tactile cues were rated similarly by both groups when assessing opposite-sex strangers, but regarding same-sex strangers, the importance of touch was increased in deaf participants in comparison to controls.

Conclusions

Results suggest deaf people's overall restraint in social judgment and highlight a possible role of sign language in shaping interpersonal tactile experience in non-romantic relationships.

Conceptualising multiple identities within the changing Mauritian culture

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Objective

The purpose of this study is to understand how Mauritians conceptualise their multiple cultural identities within a rapidly evolving, inherently multicultural context.

Methods

We conducted three case studies online using a two part qualitative methodology. Participants listed the cultural groups they belong to and over a one month time period, they wrote cultural narratives about how their experiences have helped to shape those identities. Those cultural narratives were analysed using a thematic analysis and then followed up with participant interviews.

Results

These results are based on preliminary findings from the first part of the case studies. Participants described identifications with their religious groups and the importance of this identification. Other cultural groups discussed, such as sexuality, fan-clubs, and differences in values, were more abstract. They described how their different identities are embedded within their cultural context and how exposure to new cultures outside of Mauritius has shaped some of their identities. Participants also described a disillusioned and fragmented image of the Mauritian culture.

Conclusions

This highlights the complexities of the Mauritian culture and the population's struggle to understanding what this culture represents. Although religion is viewed as one of the basic forms of cultural differences between groups, the emerging identifications with abstract groups demonstrate how Mauritians are incorporating influences of 'new' cultures from outside the island within the already complex Mauritian culture. Future research should look at what constitutes the Mauritian culture, how this conceptualisation varies across generations and how new domains gradually become part of this existing culture.

Multimodal mate choice: exploring the differential effects of sight, sound, and scent on partner choice in a speed-date paradigm

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Objective

Given that recent work suggests that multimodal cues are important for mate choice (Groyecka et al., 2017), our main objective was to study the differential effects of static visual, olfactory, and auditory attractiveness ratings on initial partner choice.

Methods

We combined a naturalistic speed-date paradigm, in which individuals had multiple 4-minute speed dates, with multimodal rating tasks. First, participants rated the visual attractiveness, vocal attractiveness and olfactory attractiveness independently. Then, they had a maximum of 10 speed dates with the individuals whose multimodal attractiveness they had rated. After each speed date, they indicated their willingness to go on another date with their partner.

Results

Using hierarchical Bayesian modeling, we found that visual attractiveness ratings showed a strong positive correlation with propensity to meet the partner again, while the effects of olfactory and auditory attractiveness were negligible or not robust. Furthermore, we found no robust sex differences in the importance of the three modalities.

Conclusions

Our findings that show the importance of visual attractiveness in mate choice, while casting doubt on the relative importance of voice and smell during first interactions. Possibly, ratings of static attractiveness do not per se translate into clear preferences for these modalities, as their attractiveness might be especially affected by dynamic interactions during the dates (e.g. pitch modulation). This should be further investigated to elucidate the importance of multimodal cues in initial mate choice.

Global WEIRDing: Transitions in wild plant knowledge and treatment preferences in Congo hunter-gatherers

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Objective

The use of plants has historically been an essential function of culture. The intergenerational transmission of plant knowledge is especially important for health and nutrition in small-scale populations. Some extant hunter-gatherers are characterized by their highly mobile and egalitarian social structure along with multi-local co-residence patterns where both sexes disperse. Together these factors result in large interaction networks where the knowledge can be easily transmitted, however cultural and economic transitions associated with globalisation may weaken this extensive sharing of knowledge. Here, we examined the process and causes of changes in cultural traits concerning wild plant knowledge and treatment preferences in Mbandjele BaYaka Pygmy hunter-gatherers from Congo.

Methods

We investigated the knowledge and use of 33 plant species in over 200 BaYaka residing in forest camps and a camp located at a market town. We have also conducted interviews on treatment preferences (traditional versus modern medicine) and collected health measures (white blood cell counts, HbA1c and blood pressure levels, BMI).

Results & Conclusions

Our results showed that the BaYaka who were born in town knew and used fewer plants than the BaYaka who were born in forest camps. Plant uses lost in the town-born BaYaka related to medicine. Unlike the forest-born participants, the town-born BaYaka preferred modern medicine over traditional practices, suggesting that the observed cultural loss is the result of replacement of cultural practices with the new products of cumulative culture. We are going to discuss health implications of these results by presenting preliminary findings on health measures.

The role of fundamental social motives in risky behaviors in adolescents and young people?

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Objective

The aim of the present study is testing what fundamental social motives encourage adolescents and young people to engage in risky behaviors. Under an evolutionary approach, we suggest risk taking may serve as an adaptive and functional mechanism for obtaining gainings in survival, socialization and/or reproduction; in contrast to others perspectives which propose a psychopathological view for these behaviors.

Methods

Participants: 1375 Spanish individuals participated in the study (male = 694; female = 681), mean age 21.54.

Instruments

Fundamental Social Motives Inventory, adapted to Spanish. This instrument tests the level of activation of seven evolutionary motives: self-protection, disease avoidance, affiliation (group, exclusion concern, independence), status, mate seeking, mate retention (general, breakup concern), kin care.

Risky Behavior Questionnaire, adapted to Spanish, which assess the participation in risky behaviors in the last three months. It evaluates six dimensions of risky behaviors: unsafe sexual practices, aggressive and/or violent behaviors, rule breaking, dangerous, destructive, and/or illegal behaviors.

Results

A structural equation model shows status motive cause risky behavior engagement in all the six dimensions of risky behaviors, having more effect in male than in female participants. Self-protection, affiliation (exclusion concern, independence), mate seeking and kin care have impact in risky behaviors too.

Conclusions

These results show the adaptive function of risky behaviors in adolescents and young people. Specifically, individuals that seeks status are more prone to engage in risky behavior in order to gaining reputation.

Prestigious vs. dominant leadership from the perspective of followers

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Recent research have demonstrated that people are predisposed to use two main strategies to attain a higher rank in social groups: a) dominance, (attaining a higher rank via using intimidation and coercion with a selfish attitude in terms of the judicious distribution of group resources); b) prestige, (attaining a higher rank via displaying valuable knowledge and skill with a fair attitude which favors public goals) (Case & Manner, 2016). In this study, we aimed to discover how followers are evaluating two different leadership styles and whether social exclusion and self-involvement level have an impact on those evaluations.

Using the Cyberball paradigm (Williams, 2006), we created two between subject conditions: exclusion and inclusion. After “social exclusion” manipulation, all participants were asked to imagine that they are a member of a volunteer group which consist of a leader and members. Then participants have been provided several hypothetical behaviors of the leader changes in terms of leadership style (dominant vs. prestigious) and self-involvement (behaviors intended to participant’s her/him selves vs. group as a whole). They rated favorability of all behaviors on a likert-scale.

Results showed that regardless of social exclusion and involvement level, participants showed a tendency to favor the prestigious behaviors of the leader than the dominant ones.

As service-for-prestige theory suggested (Van Vungt & Price, 2014), the relationship between follower and leader can be seen as collective action problem. Our results support this idea as our followers (participants) have appreciated prestigious leader behaviors who seeks public good in all experimental conditions.

Children aged 7 – 9 prefer cuteness in baby faces, and femininity in women's faces

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Objective

Infant facial features are typically perceived as “cute,” provoking caretaking behaviours. Previous research has focused on adults' perceptions of infant cuteness, and examined how these perceptions are influenced by events of the adult reproductive lifespan, such as ovulation and menopause. However, globally, individuals of all ages, including pre-pubertal children, provide notable proportions of infant care.

Methods

We recruited participants in and around northern England, and tested 330 adults and 65 children aged 7–9 using a forced-choice paradigm to assess preferences for infant facial cuteness in two stimulus sets and (as a control task) preferences for femininity in women's faces.

Results

We analysed the data with Hierarchical Bayesian Regression Models. The adults and children successfully identified infants who had been manipulated to appear cuter, although children's performance was poorer than adults' performance. Children chose the feminised over masculinised women's faces as more attractive, although again their performance was poorer than adults' performance. There was evidence for a female advantage in the tasks: girls performed better than boys when assessing the woman stimuli and one of the infant stimulus sets, and women performed better than men when assessing one of the infant stimulus sets. There was no evidence that cuteness judgements differed with exposure to infants, or with inferred menopausal status.

Conclusions

Children and grandparents provide notable portions of infant caretaking globally, and cuteness perceptions could direct appropriate caregiving behaviour in these age groups, as well as in adults of reproductive age.

The influence of social and asocial learning on exploration of design space and the cultural evolution of complexity

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Objective

The aim of the study is to examine how the cultural evolution of artefacts can be affected by social and asocial learning of their constituent parts. As a case study, we consider the construction of braids, for example in textiles or hair, composed by crossing over strands to form combinations of knots and links.

Methods

We developed a Markov Chain model of the cultural evolution of braid variants, where the orientation of a strand crossing (left over right, or visa versa) is learned socially with a probability s , and new crossings can be added by a probability of asocial learning, a .

Results

We report four qualitatively distinct equilibria, reflected by network topologies characterising transition probabilities (edges) between braid variants (nodes). Braid variants are highly connected in design space if there is some asocial learning combined with imperfect copying. Under these circumstances, the equilibrium frequencies of braid variants are relatively insensitive to the learning parameter values (a and s). Similar results are obtained for braids of two and three strands, and when learning events operate on chunks of crossings in the braid rather than individual strand crossings.

Conclusions

We show how evolvability through design space can be affected by asocial and social learning of constituent parts of an artefact structure. The cultural evolution of complex artefact structures does not necessarily require high copying fidelity. Instead, imperfect copying combined with copying error and asocial learning shape non-linear pathways by which variation in artefact structures evolve within design space.

Factors for religious heterogamy

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Objective

Social cohesion – particularly with regard to the integration of migrants – is primarily measured in terms of education, labour market participation, unemployment, income levels and poverty. When seen from a historical long-term perspective (considering the migrations of Homo sapiens in the past 300,000 years) admixture merged members of diverse groups and forged – in addition to social ties – ‘strong biological ties’ of kinship. Essentially, this approach applies William Hamilton’s concept of kin selection to the challenges intergroup relations, proposing that religious heterogamy is a long-term layer of social cohesion.

Methods

This study investigated, on the basis of more than 600,000 men and women aged 26–35 years from Austria 2001, Germany (West) 1987, Ireland 2011, Portugal 2011, Romania 2011 and Switzerland 2000, which demographic characteristics foster religious heterogamy, controlling for various confounding factors using linear mixed modelling.

Results

By far the most important factor explaining religious heterogamy was the share of adherents to an individual’s religious group in their area of residence.

Conclusions

It can be concluded that the rate of intermarriage declines with the increasing size of an individual’s religious group in their area of residence. From a long-term perspective the lack of familial ties (and conjoint offspring) between religious groups could lead to a lack of social cohesion.

Are human life histories really coherent strategies? Using sequence analysis to empirically test a widespread theoretical assumption.

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Objective

Life history theory, a prominent ecological model in biology, is widely used in the human sciences to make predictions on about human behaviour. However, its principle assumptions have not been empirically tested. We will address this gap with three research questions: 1) do humans exhibit coherent life history strategies, 2) do individuals adopt strategies along a slow-fast continuum, and 3) are socioeconomic circumstances during childhood associated with the pace of the life history strategy that an individual adopts?

Methods

Data from the Wisconsin Longitudinal Study will be used to reconstruct the life histories of US Women including information on puberty, fertility, menopause, and death. We will introduce a novel methodological approach to evolutionary anthropology, sequence analysis, to assess if human life histories are coherent strategies and how these strategies are patterned. In subsequent analyses we will use multinomial logistic regressions to test whether childhood socioeconomic status predicts the life history patterns women follow.

Results & Conclusions

This paper has been provisionally accepted as a Registered Report at Human Evolutionary Sciences. We are thus committed to conducting the analysis exactly as specified, which we will do before March 2020. Regardless of the outcome (i.e. potential null results), we will present and discuss them in light of implications for life history theory. We would like have the opportunity to promote both the new EHBEA journal and Registered Reports process.

Conformity decreases throughout middle childhood among ni-Vanuatu children: an intra-cultural comparison

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Multiple studies have shown that children conform to majorities even when they know better. Study results are, however, contradictory concerning the development of conformity. Here, we focus on two explanations for previous inconsistencies in children's age-dependent tendencies to conform: A child's motivation evoked in an experimental setting and a child's cultural background.

We examined conformity in both a public and a private setting among 5 to 11-year olds from eight different communities in Vanuatu ($n = 125$), a highly diverse society in the South Pacific. We investigated age patterns of normative and informative conformity and, to better understand how flexible these are, the extent of intra-cultural variation in these patterns. Moreover, we assessed whether selected socio-demographic variables help to explain variation in children's conformity.

We found that both informative and normative conformity decrease in ni-Vanuatu children between the ages of five to eleven years, with normative conformity being subject to more developmental and intra-cultural variation. Moreover, we find that conformity is negatively associated with the school class of the child.

Our application of a developmental perspective to an intra-cultural comparison is the first study to investigate children's normative and informative conformity in middle childhood. We demonstrate the importance of both the specific experimental circumstances on the probability of conforming to a majority and the investigation of intra-cultural variability. We also discuss the implications of our findings for theories of conformist-bias and cultural diversity, i.e., the maintenance of within-group homogeneity and between-group variation.

A tale of destiny: how heavy newborns grow up to be strong women

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Objective

Size at birth is influenced by conditions in the womb and genetic factors. Furthermore, it is an important predictor of long-term health. The aim of this study was to investigate whether birth weight, birth length, and the fatness at birth (Ponderal Index, PI) are associated with muscle strength and muscle mass in adult women.

Methods

The participants were 55 healthy, urban women aged 22-37 (mean=27.8, SD=4.20). Grip strength was the indicator of muscle strength and it was measured using a hand-held dynamometer. The maximum value achieved by a woman was used in the analysis. Muscle mass was measured with a Tanita bioimpedance scale and calculated as a percent of a total body mass. Size at birth was collected from personal birth records. Participant's age and number of years of education were included as potential covariates.

Results

Birth weight was positively associated with grip strength ($p=0.038$) when controlling for age and education. There were no statistically significant relationships between the other variables.

Conclusions

Our results indicate that birth weight may correlate with adult muscle strength. It was suggested that birth weight may be related to the number of muscle fibers which, in turn, may affect the muscle strength. As grip strength is related to risk of various diseases, quality of life, and longevity it could be a one of potential links between the conditions in utero and health status in adult life.

“May I present you: my disgust!”- Declared disgust sensitivity in the presence of attractive models

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Sex differences in disgust sensitivity are universal and their size stands out from other psychological traits. However, the reasons for magnitude of this effect have never been validated empirically. This study verifies one hypothesis that explain these sex differences, showing elevated disgust sensitivity in women in the light of differences in self-presentation. Three groups of participants (N = 299) completed the Three Domains of Disgust Scale (TDDS) and rated repulsiveness of sensory stimuli. The first experimental group presented their responses aloud to an attractive male experimenter, the second group—to an attractive female experimenter, and the control group completed the questionnaire in solitude. It was hypothesized that male participants in the female experimenter group would declare decreased levels of disgust sensitivity and female participants in the male experimenter group would declare increased levels of disgust sensitivity. The sex differences in pathogen and sexual disgust were particularly salient, but the hypothesized effects of the experimental manipulation were not observed. However, both men and women self-presented as more sensitive to sexual disgust in the presence of the attractive female experimenter. These findings are discussed in the light of evolutionary and social theories.

Anaemic women are more at risk of injectable contraceptive discontinuation due to side-effects in Ethiopia

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Objective

This talk will report findings of a study investigating the importance of women's physiological condition for predicting the risk of discontinuation due to side-effects of the injectable contraceptive in Ethiopia. It uses principles of reproductive ecology to indirectly test the hypothesis that women with lower absolute levels of reproductive hormones may experience a greater burden of side-effects from hormonal contraception.

Methods

Contraceptive calendar data from the 2016 Ethiopian Demographic and Health Survey were analysed. Women aged 15-49 who had initiated the injectable contraceptive in the two years prior to interview were included in the analysis (N=1,513). Associations between physiological and social risk factors and discontinuation due to either side-effects (DSE) or other reasons (DOR) were estimated using multivariate Cox proportional regression analyses.

Results

1 in 4 women who had initiated the injectable in the last two years had discontinued use by the time of the interview. Of these, 1 in 5 discontinued due to side-effects. Women with anaemia were at twice the risk of DSE compared with non-anaemic women, while anaemia status was not associated with DOR. Sociocultural factors including religion, wealth and relationship status were significant predictors for DOR, but not for DSE.

Conclusions

Accounting for diversity in physiological condition, rather than social factors, may be key for understanding contraceptive discontinuation due to side-effects. These findings lend support to the hypothesis that women under physiological stress, such as having anaemia, who are predicted to have lower reproductive hormone levels, may experience a greater burden of contraceptive side-effects.

A morphospace of early Upper Palaeolithic art

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Objective

Explanations for the so-called Upper Palaeolithic creative explosion may be grouped into cognitive vs. socio-technological hypotheses. Innovations in material culture often burst out and diversify quickly until one or few successful types become established. Therefore, cognitive hypotheses predict early diversity and a trend towards standardization. Conversely, when drivers are technological, forms are constrained by materials, techniques, and knowledge, predicting early generalized, nonspecific, and nonintensive forms, with a trend towards diversity. I apply the concept of the morphospace to test these scenarios.

Methods

Due to our focus on morphological diversification, the concept of the morphospace is useful. The morphospace is a theoretical approximation to the universe of possible forms of a given entity, mapped as a multidimensional space. Despite disagreements on what drives or constrains art, it is accepted that artworks are artefacts created through human intervention whose purpose is to transmit information. Therefore, labour investment and semantic content serve as the two axes of our morphospace.

Results

The results suggest that the forms of Palaeolithic art were highly constrained by technological processes and social organization (e.g. resource acquisition, available techniques, knowledge management, etc.) and not by cognitive ability, corresponding to a more general trend towards the specialization of material culture throughout the Upper Palaeolithic.

Conclusions

The morphospace reveals that the alleged UP creative explosion constituted a relatively continuous process of specialization in art practices over time, and shows the potential of this concept as an analytical tool to test archaeological hypotheses.

Cognitive biases favour folk tunes of intermediate complexity

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Objective

Cognitive biases are generally expected to favour cultural forms that are easier to learn, remember and transmit. For example, shorter words should out-compete longer alternatives with equivalent information content over time. Such predictions are largely based on research within the domains of language and technology, but may apply less to the arts in which complexity for its own sake is often appreciated. Music psychology research suggests an inverse-U shaped relationship between complexity and musical appeal, in which melodic catchiness trades off against aesthetic interest. Traditional folk session tunes are an ideal case study for investigating the influence of cognitive biases on cultural diversity since session tunes are almost always still played from memory.

Methods

Here, I investigate relationships between popularity and complexity using a large online folk tune database (thesession.org, $N > 15,000$ tunes). I extract multiple measures of tune complexity and entropy, which capture the predictability of melodic patterns, along with simpler measures of playing difficulty including tune length, note density and pitch range. I measure tune popularity as the number of times a tune has been selected and added to virtual tune ‘sets’ by website users.

Results

For all measures, I find that users select tunes of intermediate complexity more often than expected by chance.

Conclusions

These results suggest that cognitive biases shape culture in distinct ways depending on the domain. Where cultural fitness is less influenced by utility and more by aesthetic appeal, the simplest cultural forms will not necessarily be the most successful.

Spatial evolution of Japanese dialects explained by a network model of cultural evolution

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Objective

Many quantitative studies in linguistic geography correlated geographic and linguistic distance, often discovering a sublinear growth of linguistic distance (dissimilarity) as a function of geographic distance. Our study aims to elucidate the factors which underlie the observed geographic distribution of Japanese lexical variation using a mathematical model of cultural evolution.

Methods

Based on extensive lexical data published in Linguistic Atlas of Japan Database (LAJDB), we calculate the linguistic distance between the survey locations of the linguistic atlas. In addition, we model a network of the survey locations based on their geographic positions and population sizes. Borrowing the concept of individual and social learning from cultural-evolution theory, we simulate invention, transmission, and mutation of lexical variants on the network and compare the result with empirical data.

Results

Observed linguistic distance is positively correlated with geographic distance, but the strength of correlation varies depending on regions. Simulation shows that linguistic distance increases in proportion to geographic distance if lexical variants transmit between geographically distant locations, while linguistic distance exhibits a sublinear growth if variants transmit only between proximate locations. Comparison between observed and simulated linguistic distance permits us to estimate the parameter values like range of linguistic interaction, innovation rate, and mutation rate of lexical words.

Conclusions

Spatial distribution of dialect words is influenced by geographic contact pattern among locations and innovation/mutation rates. Our model would probably be applied to other cultural traits beyond languages.

Examining the relationship between pair stability and fertility in women from life course perspective: A case study of Botswana

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Human pair stability varies between and within populations. However, it is unclear how pair stability variation over a lifetime affects the fertility of an individual woman.

The aim of this study was to analyze the relationship between pair stability and fertility across the lifespans of individual women by examining the duration of delay in subsequent births after she changes her reproductive partner from short- and long-term perspectives.

In this study, inter-birth interval data (n=166), as a measure of fertility, of 63 women in Botswana, who practiced serial monogamy, were analyzed. Pair stability was quantified from a short-term perspective (whether a woman changed reproductive partners after childbirth) and a long-term perspective (cumulative number of reproductive partners at birth).

Results showed that pair stability had short- and long-term effects on fertility. However, the effect of pair stability on fertility decreases over a woman's lifespan. Thus, pair stability is unlikely to affect the fertility of women practicing lifelong serial monogamy.

“Touch me if you can!”: Individual differences in disease avoidance and social touch

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Objective

Social touch, which corresponds to situations in which individuals touch each other, appears to be a universal need. The negative side of physical contact is that it can increase the probability of catching diseases, since most of these are transmitted directly by close physical contact. Being touched by someone who is contaminated can potentially compromise one's health. However, the threat of diseases varies considerably among individuals. To our knowledge, there is no study that has investigated possible links between disease-avoidance and the propensity to touch or being touched by others.

Methods

We investigated the impact of individual differences in the perceived vulnerability to disease (PVD) on social touch before (Study 1) and during the COVID-19 pandemic (Study 2). We also investigated the influence of personality traits in the covariation between these two dimensions. We surveyed French adults to collect scores from the PVD scale (Duncan et al., 2009), the social touch questionnaire (Wilhelm et al., 2001), and the French version of the BIG-5 (Plaisant et al., 2010).

Results and Conclusions

We found that people who are the most disease-avoidant are also the most reluctant to touching or being touched by others (this relationship also holds when personality traits are taken into account). Interestingly, the association between PVD and social touch increased during the COVID-19 pandemic compared to a few months before. The findings provide further evidence for the behavioral immune system (Schaller & Park, 2011), a psychological system acting as a first line of defense against pathogens.

Leg length and cardiovascular disease among adult women

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Objective

The leg length is suggested to reflect the environmental quality during childhood and adolescence. Long legs are putative indicators of good nutritional status and health during childhood. The quality of early-life environment is also related to a risk of cardiovascular diseases (CVD). Here we test the relationship between leg-to-body ratio (LBR) and the incidence of CVD in Polish, rural women.

Methods

The data come from 329 women between 45 and 65 years of age, living at the Mogielica Human Ecology Study Site. A structured questionnaire was used to collect information on age, education, history of past and present cardiovascular diseases (e.g., heart attack, stroke). Women were dichotomised as being either “diagnosed with at least one cardiovascular disease” or “healthy”. The leg length, height, and body weight were measured by trained study assistants. Binary logistic regression model was used to conduct the statistical analysis.

Results

Higher LBR was positively associated with a higher chance of the incidence of CVD (OR=1.30, 95%CI=1.09 to 1.54), when controlled for participant’s age, education level, BMI, and smoking status.

Conclusions

This study suggests that better nutritional conditions during childhood, indicated by higher LBR, were associated with increased risk of the incidence of CVD in adult women.

Honest signaling in academic publishing

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Academic journals provide a key quality-control mechanism in science. However, quality control is difficult when scientists try to pass off low-quality research as if it were high-quality. This difficulty is exacerbated by asymmetric information, as scientists know more about the quality of their research than do editors and peer reviewers. Information asymmetries and conflicts of interest incentivize scientists to deceive journals about the quality of their research. How can honesty be ensured, despite incentives to lie? Here, we address this question by applying the theory of honest signaling to the publication process. Using a simple model, we show that the conflict of interest between scientists and journals can be resolved by making journal submission sufficiently costly. Submission costs de-incentivize scientists from submitting low-quality papers to high-impact journals via two mechanisms: differential benefits (e.g., low-quality papers are less likely to be published than high-quality papers) and differential costs (e.g., low-quality papers have higher submission costs than high-quality papers). Costs to resubmitting rejected papers also promote honesty. Without any submission costs, scientists benefit from submitting all papers to high-impact journals, unless papers can only be submitted a limited number of times. Counterintuitively, our analysis implies that inefficiencies in academic publishing can serve a function by de-incentivizing scientists from submitting low-quality work to high-impact journals. Our model generates testable predictions and provides a tool for thinking about reforms to academic publishing.

Roles of low-pitched voice in Japan

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Objective

- (1) To check the reproducibility of voice pitch studies mainly conducted in western countries.
- (2) To examine the possibility that low-pitched voice acts as a signal of prosocial behavior, not only an antisocial behavior.

Methods

The psychological experiment was conducted. We performed the voice perception experiment in a similar way of O'Connor & Barclay (2017) in order to check the objective (1).

Participants were asked to choose between higher-pitched voices and lower-pitched voices from the same speaker. Next, the trust game was performed as Boksem et al (2013). This situation is known that people in higher testosterone act prosocially (reciprocating when they received a high offer, which signaled high trust from the trust person). Subsequently, participants were asked to answer which voice's person (high pitched voice vs. low pitched voice) is likely to invest more money/return more money in the previous trust game. Finally, the voice of participants was recorded to check the objective (2).

Results

- (1) Male's lower-pitched voice is perceived as attractive also in Japan. On the other hand, it seems to be different whether a lower-pitched voice is perceived as trustful in some contexts.
- (2) This hypothesis is not supported by the results.

Conclusions

The advantages of lower-pitched voices are still elusive in trusting behavior.

Collective behavioural rescue: social reinforcement learning promotes adaptive behavioural-shift in risky decision-making

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Objective

Gambling tasks, where high magnitudes of reward are associated with high risks of failure, elicit suboptimal risk aversion by myopic reinforcement learning. Here, our aim was to investigate whether and, if so, how social learning can promote behavioural-shifts toward more adaptive risk-seeking in such decision problems. Previous studies have suggested that biases in individual risk-taking behaviour may be amplified in collectives. One example is group polarisation in description-based gambling tasks, where conformist copying amplifies the initial distribution of risk preferences. Our research explores whether recursive feedback processes between learning and collective performance can rescue individuals trapped in the suboptimal risk aversion.

Methods

We simulated groups of agents' behaviour in 'two-armed bandits' consisting of one safe and one risky option. Especially, we focused on the situation under which individual reinforcement learning tends to converge on the suboptimal safer option. Agents in a group played the same task simultaneously and each could observe other agents' behaviour, allowing them to use the frequency-based social learning strategies.

Results

Although individuals were potentially risk-averse, moderate use of social information promoted more adaptive risk-seeking. The pattern was robust over different implementations of social learning strategies. Interestingly, when the risky option's mean payoff was lower than the safe option's so that the risk aversion was adaptive, social learning instead promoted risk-aversion.

Conclusions

Our results demonstrated an overlooked adaptive benefit of social learning. Results from behavioural experiments will also be given at the presentation.

Entropy trade-offs in artistic design: A case study of Tamil kolam

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Art from an evolutionary perspective presents many puzzles. Humans invest substantial effort to generate apparently useless displays and artworks that vary greatly from plain to intricate. From the perspective of signaling theory these investments into highly diverse or complex artistic designs can reflect information on individuals and their social standing.

Using a large corpus of kolam art from South India ($N = 3,139$ kolam from 192 women), we test a number of hypotheses about the ways in which social stratification and individual differences affect the complexity of artistic designs.

Consistent with evolutionary signaling theories of constrained optimization, we find that kolam art tends to occupy a “sweet spot” at which artistic complexity, as measured by Shannon information entropy, remains relatively constant from small to large drawings. This stability is maintained through an observable, apparently unconscious trade-off between two standard information-theoretic measures: richness and evenness. Although these drawings arise in a highly stratified, caste-based society, we do not find strong evidence that artistic complexity is influenced by the caste boundaries of Indian society. Rather, the trade-off is likely due to individual-level aesthetic preferences and differences in skill, dedication and time, as well as the fundamental constraints of human cognition and memory.

Magnet, magnet in the wall, who is the (fairest) scariest of them all? The neural correlates of facial perception within the intra- and inter-sexual selection.

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Social perception research has demonstrated an association between specific morphological facial features and behavioural traits like success in mating or physical confrontation. Although it was shown that people are attentive to the associated morphological cues, little is known about the underlying neurophysiological processes involved in their recognition and processing. This study aimed to evaluate neural activation involved in assessments of male quality in the context of male intra- and inter-sexual selection. We employed functional magnetic resonance imaging (fMRI) to investigate possible differences in the activation of specific brain regions involved in formidability and attractiveness assessments triggered by facial stimuli.

In total, 40 men and 40 women took part in the neuroimaging session where they assessed a set of 45 male facial images on both attractiveness and formidability while their brain activity was recorded.

The whole-brain analysis showed no differences in activation across brain regions in women when comparing evaluations of formidability and attractiveness. In men, right supramarginal gyrus, right middle frontal gyrus (areas related to emotional responses and attention processing), left somatosensory association cortex, and right cuneus showed increased activation when assessing formidability compared to attractiveness.

Our results show context-dependent sex differences in brain activation accompanying assessments of male quality. In men, intra- and inter-sexual competition involve different brain regions when potential threatening rivals in physical confrontation and rivals in contest for romantic partners are assessed. In contrast, the same brain areas are involved in both formidability and attractiveness ratings of men by women.

If you are strong is your immune system strong as well?

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Objective

One of the basic behaviours contributing to maintaining health is physical activity (PA). A common method of measuring muscle strength is grip strength. While muscle strength decreases with age, it is not clear if there is a connection between lower muscle strength and immune ageing. The aim of the study was to investigate the relationship between grip strength and inflammatory markers among post-reproductive women.

Methods

This study was conducted among 413 rural Polish women (aged 45-92) at the Mogielica Human Ecology Study Site which includes several neighbouring villages. Grip strength was measured 3 times using a hand dynamometer (the highest achieved value was used in the analyses). Levels of three inflammatory markers: C-reactive protein (CRP), interleukin-6 (IL-6) and tumor necrosis factor alpha (TNF- α) were measured in serum.

Results

There was no significant relationship between any of the analyzed inflammatory markers and maximum grip strength. After controlling for woman's age, education, BMI, and smoking status no relationship was found between grip strength and CRP ($p=0.412$), IL-6 ($p=0.362$) and TNF- α ($p=0.619$).

Conclusions

Lifetime PA is one of the most important factors determining health in older age, including reduction in diseases risk. However, in our study grip strength, which partly depends on lifetime PA, did not correlate with inflammatory markers. Women in our study were physically active due to agricultural activities, not recreational exercises. It is likely that work-related PA has a different effect on health than recreational activity.

Sexual dimorphism in human facial morphology

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Male and female faces differ partially due to the difference in body height between sexes.

In a multidimensional space of 72 2D coordinates from 1114 enface photographs of people from 8 different cultures, we identified an allometric (dependent on body height) and nonallometric (independent on body height) vectors separating male and female group means within each culture. The total Sexual Shape Dimorphism (SShD) collapsed onto these two components.

We found substantial differences in patterns of SShD between cultures. European and South American cultures manifested higher facial SShD than African cultures. Neither the cross-cultural differences in facial shape variation nor differences in body height between sexes fully explained this pattern. In South America, sexual shape dimorphism was driven by the allometric component. In European countries, the opposite was true and the nonallometric component contributed more to the total sexual dimorphism.

We can speculate that this is due to slightly different equilibria between ongoing sexual selection acting on males, where body height is perceived as attractive, and females, where facial femininity independent on body height is appreciated. Low sexual shape dimorphism in African countries might result from an overall low focus on facial morphology in mate choice. Previously, it was demonstrated that African populations show preferences for lighter skin tone in females, which might compete for attention with facial morphology.

The effect of variation in social encounters on human heuristic strategies

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Humans engage in many different types of interactions, some so subtly different from each other that they are difficult to distinguish. Recent theory has shown that even modest degrees of uncertainty about the nature of interactions individuals encounter lead to the evolution social heuristics: simple behavioural strategies that are applied across a range of interaction types (rather than perfectly tailoring behaviour to each specific situation). In this study, we experimentally investigated how the degree of variation in interaction types affects the use of heuristic strategies. We conducted a large on-line decision making experiment, in which individuals were paired and consecutively faced with various versions of the public goods game (PGG), each characterized by a different multiplication factor. Between experimental treatments, we manipulated how much the multiplication factor varied across the interactions that the participants were confronted with. We hypothesized that individuals would use more heuristic strategies (apply the same behaviour across different situations) if the social situations they encountered were more similar (i.e. in treatments where the multiplication factor does not vary much between interactions). However, we found the exact opposite pattern: participants more sensitively responded to differences in the multiplier if the overall variation in multiplier they encountered was smaller. Our results suggest that the absolute differences between social situations that people encounter are less important than the relative differences. In other words, people adjust their behavioural repertoire to fit the world they know.

The behavioral immune system is designed to avoid infected individuals, not outgroups

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Objective

What is the adapted structure of the behavioral immune system? By definition, the behavioral immune system motivates pathogen avoidance. One prominent suggestion is that the behavioral immune system also contains an additional component that generates motivation to avoid individuals from unfamiliar outgroups. The evolvability of this component has recently been questioned and it has been noted that all supportive evidence stems from WEIRD samples. The objective was to test experimentally whether the behavioral immune system generates motivations to avoid outgroup individuals.

Methods

In this paper, we conducted between-subject experiments in large samples of adult residents of the USA (N = 1615) and India (N = 1969). In the experiment, we measured comfort with physical contact with a depicted individual. The individual was either from an ethnic ingroup or outgroup and either showed a pathogen cue or not.

Results

In both samples, participants' comfort with contact was not lower for outgroup individuals than for ingroup individuals. Furthermore, participants expressed less comfort with contact towards individuals with a pathogen cue than for individuals without a pathogen cue.

Conclusions

Results were inconsistent with the view that the behavioral immune system motivates the avoidance of individuals from unfamiliar outgroups. The results supported the notion that the behavioral immune system motivates the avoidance of any infected individual regardless of their group membership.

Development and evaluation of the Mate Access Scale

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Objective

Mate access is evolutionarily fundamental and difficulties in finding a mate may have broad consequences for well-being. Previous studies often assume that only personal characteristics or competition limits mating success without considering the impact of the social context. The aim of this study was to create a measure for context-dependent mate access and to psychometrically evaluate this measure.

Methods

We conducted an online survey directed at a Finnish adult sample recruited via social media platforms. To measure the whole concept of mate access, we aimed at designing a two-factor scale divided into preferred encounters (i.e., the amount of interactions the individual has with potential mates) and perceived possibilities (i.e., the individual's perception of their mating opportunities). The two-factor model was examined through confirmatory factor analysis. We also investigated the relationship between these factors and respondents' social context, negative affect regarding poor mate access, mate value, and sociosexual desire.

Results

After an initial model showed close to acceptable fit, an adjusted model supported our two-factor model. Individuals in more sociable contexts reported higher mate access, and individuals with less perceived possibilities reported more negative affect. The between-factor correlations were in line with our expectations, as were correlations with associations with mate value and sociosexual desire.

Conclusions

The Mate Access Scale is a reliable and valid measure that could be incorporated in evolutionary and psychological research.

The emergence of professional religious specialists in hunter-gatherer societies

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Religious specialists played a central role in the evolution of organized religion by centralizing religious knowledge, standardizing religious beliefs, and coordinating ritual events. Theories differ over the conditions that enabled professional religious specialists to emerge in human history and the roles that they played in early societies. According to some theories, religious specialists arose to explain and try to control unpredictable ecological events, such as natural disasters and diseases. According to other theories, religious specialists served social functions in early societies, such as coordinating social behaviors and promoting cooperation. To test these theories, we built a dataset of 72 historic hunter-gatherer societies from around the world. Using exploratory phylogenetic path analysis, we model how ecological and cultural factors interact and are causally related to professional religious specialists in hunter-gatherer societies. Contrary to theoretical claims, we find that professional religious specialists are most likely to arise in societies that inhabit predictable and safe environments. Contrary to theories about the social functions of professional religious specialists, we also find that professional religious specialists are best explained as an outcome, rather than driver, of socio-economic change. Our findings show how cross-cultural methods and causal modelling can help untangle the complex pathways in human cultural evolution.

Children use ritual and instrumental competency to infer who is a more prosocial sharer and helper

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Objective

Prosocial acts require us to engage with other people and children must learn from a young age how to flexibly decide with whom to interact with. Following social norms, specifically adhering to social conventions, may be one cue to with whom one should engage with. The current research examined a potential cue to prosociality—ritual competency. We investigated whether children use ritual competency to decide who is a more prosocial group member, specifically examining sharing and helping.

Methods

In Study 1, 5-9-year-olds were presented videos of a social group performing a conventional sequence (shown an expert followed by a high/low competency performer), then evaluated the performers to assess expectations for prosocial sharing and helping. In Study 2 (5-8-year-olds), we assessed whether expecting the high competency performer to be more prosocial was specific to ritual knowledge, by adding an instrumental action sequence with the same measures.

Results

In Study 1, children were more likely to attribute helping behaviors and less likely to attribute antisocial behaviors to the high competency performer. Children were also more likely to expect the high competency performer to share with group members and contribute to a collective group good. In Study 2, there was no difference between conditions across measures, but we replicated the findings of Study 1.

Conclusions

We demonstrate that young children use both ritual and instrumental competency to infer who is a more prosocial sharer and helper. Our findings provide insight into the kinds of information children use as markers of cooperation.

Envy, magic, and distrust among Indo-Mauritians

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Envy-based magic beliefs, including witchcraft, are prevalent in societies around the world. These beliefs can create distrust and break down community ties through the belief that other's in the community may be secretly causing illness, misfortune, and harm. We examined the role envy plays in distrust and the attribution of harm to magic beliefs in a sample of 428 Hindus in Mauritius. Hindu Mauritians have ubiquitous magic beliefs that overlap somewhat with their religious practice. Despite this, magic is still largely taboo. Participants were shown a picture of fruits used in religious/magical sacrifices and told that they were purchased to either take to the temple (religious), the crossroads (witchcraft), or home for food (neutral). Participants were given a description of the purchaser as selfish, envious of another, or neutral. In a series of questions assessing their beliefs about the purchaser and the impacts their acts might have on the community, participants in the witchcraft condition rated the purchaser as less trustworthy, and more harmful to the community than in the other conditions. Participants given the envious description also gave lower ratings on these questions in the religious and neutral conditions. This decline was accounted for by the increased claim by participants in interview questions that the character was secretly doing witchcraft. This work suggests that a belief that others are practicing magic decreases trust and is believed to cause harm regardless of motivation, and that believing another is envious can increase the willingness to make a witchcraft accusation.

How are norms maintained and how do they change? A case study of cooperative farming division rules in Derung villages, Yunnan, China

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Objective

This study investigates how people in Derung, a small-scale subsistence society, make normative decisions, and how people's normative decision-making algorithms determine whether a norm persists or shifts when social, ecological or economic conditions change.

Methods

Behaviors and attitudes regarding how gains from cooperative farming should be divided were tracked in two geographically separated Derung villages for three years using semi-structured questionnaires, an ultimatum game experiment, and post-game surveys, and by recording people's daily activities. Multinomial logit models will be used to explain 1) how one's ecological conditions, relationship with farming partners, and personal ideology shape the individual private preference, and 2) how one's individual private preference and assessments of social consequences shape the behavioral decisions.

Results

How to divide the surplus from cooperative farming is an individual decision in one village, but a norm in the other. The norm is to divide equally by household regardless of land or labor contribution or need and is maintained by second-party policing and social learning. Contrary to prevailing theories, normative behaviors are uncoupled from expectations about what behavior others believe is good in this case.

Conclusions

The patterning of normative preferences, expectations and behaviors seen in the Derung are not consistent with current explanations of how norms direct behaviors. This suggests that we need to further investigate normative decision-making in different societies to develop empirically-informed theories of norm evolution.

It's important to keep in mind the things that keep us alive: effects of survival processing versus jealousy processing on memory

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Processing words in a survival context has been shown to enhance memory compared to processing them in non-survival contexts (Nairne, Thompson, & Pandeirada, 2007). Although survival-processing effect is shown to be robust, up to date, only a few studies examined the effects of other fitness-related domains on memory. The present study investigated the effects of survival-processing and sexual/emotional jealousy-processing on memory. Considering the gender asymmetry in the sensitivity to infidelity types (Schakelford & Buss, 1997), the present study also examined sex differences in memory performance for sexual and emotional jealousy contexts.

Adopting the survival-processing paradigm, two infidelity scenarios were constructed by using the sexual/emotional infidelity cues that were previously shown to activate jealousy mechanisms (Schützwohl, 2005). For each scenario, participants rated a list of words in terms of their relevance to survival and sexual/emotional infidelity, as well as pleasantness (the control condition). Lastly, a surprise free-recall task was given.

Preliminary analyses revealed that the words processed in relation to their survival relevance were recalled better than those processed in the other conditions, replicating the survival-processing effect. The number of words recalled after the sexual and emotional jealousy-processing did not differ across genders.

Although the present study included infidelity cues to allow the jealousy scenario as threatening as the survival scenario, consistent with the previous studies, there was no evidence for the jealousy-processing effect (Derringer, Scofield, & Kostic, 2017). These results are in line with previous research suggesting that survival is the strongest fitness-related domain that could improve memory performance.

Phylogenetic reconstruction of the cultural evolution of electronic music via dynamic community detection (1975-1999)

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Cultural phylogenies, or trees of culture, are typically built using methods from biology that use similarities and differences in artifacts to infer the historical relationships between the populations that produced them. While these methods have yielded important insights, particularly in linguistics, researchers continue to debate the extent to which cultural phylogenies are tree-like or reticulated due to high levels of horizontal transmission. In this study, we propose a novel method for phylogenetic reconstruction using dynamic community detection that explicitly accounts for transmission between lineages. We used data from 1,498,483 collaborative relationships between electronic music artists to construct a cultural phylogeny based on observed population structure. The results suggest that, although vertical transmission appears to be dominant, horizontal transmission is common and populations never become fully isolated from one another. In addition, we found evidence that electronic music diversity has increased between 1975 and 1999. The method used in this study is available as a new R package called DynCommPhylo. Future studies should apply this method to other cultural systems such as academic publishing and film, as well as biological systems where high resolution reproductive data is available, to assess how levels of reticulation in evolution vary across domains.

Evolutionary demography of cultural extinction – case study of Evenki reindeer-herders

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We examine the population dynamics of a critically endangered culture - Evenki reindeer-herders in China. Using published comprehensive demographic record surveyed over the past 50 years, we found that adult mortality in this group are more extreme than many other hunter-gatherer populations. Moreover, unnatural deaths were disproportionately prevalent among hunter-herders under privatization schemes. We investigate cultural extinction processes at the individual level using time-varying event history analyses. Our results showed that transitions away from traditional reindeer-herding subsistence were predicted by exogamy and loss of close relatives who died from suicide, after controlling for cohort, gender, and kin network size.

Subjective relatedness with nature as a protective factor for snake and spider phobias

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Objective

Urbanization worldwide has created a completely novel environment that might bring many conveniences but several drawbacks too. The most important one might be that people living in big cities often lose contact with nature, including reduced possible interactions with animals. In fact, the prevalence of animal phobias is lower in countries with lower levels of urbanization. Thus, here we sought to test whether nature relatedness and size of residence serve as protective factors to the most common animal phobias (i.e. snakes and spiders).

Methods

We used the Nature Relatedness Scale (NR) to measure participants' subjective connection with nature. NR has three subscales: experience, perspective, and self. Participants (N=1071, aged 18-65 years) were also asked to complete the Snake and Spider Questionnaires (SNAQ and SPQ, respectively) and to rate pictures of snakes, spiders, and other (nonthreatening) animals. To explore complex relationships between our variables, we used a generalized linear model, redundancy analysis, and structural equation modelling.

Results

Our results showed that fear of snakes and spiders were strongly associated with the NR total score. We found that people scoring higher on SNAQ and SPQ feel more aroused by snakes and spider images, less dominant over the stimuli, and score lower on the NR scale, especially its two subscales, experience and perspective.

Conclusions

The results demonstrated that the more people feel connected to nature, the less they are affected by animal fears or phobias. We believe this brings an important implication for both conservationist endeavours and therapeutic interventions.

Immune response after vaccination in relationship to a woman's birth weight - testing foetal condition and biological quality in adults

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Objective

It has been proposed that foetal developmental condition, that can be evaluated based on birth weight, produces adaptive changes in developmental trajectories according to the Predictive Adaptive Response hypothesis, resulting in altered biological condition and *fitness* in adulthood. Birth weight has been shown to predict adult height and weight, cardio-metabolic health, reproductive hormone levels, reflecting altered development, somatic maintenance, and reproductive functions. Also, some studies show that birth weight is related with immunity in childhood. The aim of this study was to test if foetal development may also alter women's immunity in adulthood.

Methods

Study sample included 147 healthy women at the peak reproductive age ($M_{age}=28.66$; $SD_{age}=2.38$). Birth weight and pregnancy week at delivery were derived from medical record. Immunity was evaluated based on the strength of immune response to a vaccination. Blood samples were collected before and four weeks after tetanus vaccination (Tetana, Biomed). The strength of the immune response to the vaccine was expressed as fold-increase between pre- and post-vaccination specific antibody titre. We controlled for BMI, testosterone, cortisol and estradiol levels.

Results

Women's birth weight was positively correlated with antibody response to vaccination ($r=0.16$, $p<0.05$), also when controlled for pregnancy week, BMI and hormone levels (E2, T, C) ($\beta=0.21$, $p=0.01$; $F(6,137)=2.38$, $p<0.03$).

Conclusions

The results showed that intrauterine development conditions are associated with differences in the adaptive immune response to foreign antigens. Positive relationship between birth weight and immune efficacy in healthy women is another evidence that foetal development is related to biological condition in adulthood.

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Is there a relationship between duration of breastfeeding and age at menarche?

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Objective

Conditions during development and parental investment can influence both life history and reproductive strategy. Breastfeeding is an important feature of maternal investment in a child and it positively affects its development and health. Long breastfeeding can be perceived by a signal of maternal investment and thus a favorable social environment. The timing of menarche (first menstrual period) is influenced by biological and social conditions, and it is hypothesized that in the unfavorable environment an earlier reproduction would be expected. The aim of this study was to examine the relation between the duration of breastfeeding and age at menarche.

Methods

This study was conducted amongst a rural Polish population at the Mogielica Human Ecology Study Site. We analyzed data from a final sample of 179 women aged 15-65. Demographic and reproductive data were collected via questionnaires. The mean (SD) age at menarche was 13.6 (1.27) years. Women were breastfed on average 6.1 (4.82) months. Multiple linear regression was used to adjust for woman's year of birth when analyzing the relationship between duration of breastfeeding and age at menarche.

Results

There was no significant relationship between duration of breastfeeding and age at menarche ($p=0.09$), after controlling for woman's year of birth.

Conclusions

We did not find a significant relationship between the duration of breastfeeding and age at menarche. Our results are inconsistent with recent research showing that an increase in the duration of exclusive breastfeeding decreases the chance of attaining earlier menarche. Therefore, it is likely that conditions during later childhood development and genetic factors have a greater impact on the age of the first menstruation than breastfeeding.