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Abstract Book

13th Conference of the
European Human Behaviour and Evolution Association
4th -7th April, 2018, Pécs, Hungary



PÉCSI TUDOMÁNYEGYETEM
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CONTRIBUTIONS

Invited Speakers

Genes, aggression and reproduction in traditional African societies: an evolutionary perspective

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The goal of this paper is to discuss the gene-gene environment association in human aggressive behavior and possible relevance of such associations with reproduction in men and women. For these purposes we analyze the data, collected by our team in Tanzania between 2004 - 2017. Four traditional African societies, different in socio-economic practices were selected: Hadza (monogamous, egalitarian hunter-gatherers), Datoga and Maasai (polygynous, semi-nomadic pastoralists), Isanzu (monogamous, farmers). Cultural differences in aggression were demonstrated. Considering these differences, the genes of serotonergic, dopaminergic, and androgenic systems were tested in Hadza and Datoga societies. The role of *HTR2A* gene polymorphism in aggression in men and women from these traditional African societies will be discussed, particularly, that *G*-allele carriers of rs6311 SNP were rated higher on total aggression than *AA* homozygous. *DRD2* gene polymorphism effect on anger was significant only for Datoga men. There were no evidence that *5-HTTLPR* and *HTR1A* were serotonergic, and *DRD4* dopaminergic genes were involved in controlling the aggressive behavior. We found that men with lower repeat numbers of CAG of androgen receptor were rated higher on aggression and produced more offspring when compared to carriers of higher CAG numbers. Negative association was demonstrated between the right hand 2D:4D and physical aggression in Maasai males, besides young men with lower 2D:4D reproduced earlier than their groupmate, thus Maasai data supplement the former findings. Our findings will be discussed in line with the differential susceptibility perspective and challenge hypothesis. Studies were supported by RFBR grants, and this paper in prepared due to the grant from OFI_I 17-29-02203 and approved by COSTECH Research permits.

What We Know (and Don't Know) about Women's Intrasexual Competition

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My talk on women's same-sex competition is divided into two sections. The first part pertains to women's competition for access to and potential retention of mates. The topic of women's intrasexual mating competition has greatly expanded within the last few decades. Here I will provide a brief recap of some of the empirical findings that point to the hormonal influences on this phenomena, as well as the role of romantic relationships, the presence of others, and characteristics of those involved. Much of this past work uses the vehicle of attractiveness evaluations to measure competitive strategy use. Relatedly, the four strategies used in mating competition (self-promotion, competitor derogation, competitor manipulation, and mate manipulation) will be examined. In the second part of the talk, I quickly provide a theoretical review that shows that the ultimate purpose of mating competition is to increase one's fitness. Thus, non-mating related avenues for enhancing one's fitness relative to others (i.e., potential rivals for limited resources) are also important to examine. I discuss various issues surrounding the terrain of women's competition as mothers, and end the presentation with ongoing research on this particular topic. Depending on time, I will present findings related to women's characteristics in so-called "mommy judging," as well as a study on single mothers as potential mating rivals. These two preliminary studies serve as a bridge for my work on mating competition and competition involving mothering.

Importance of culture in the evolution of human genetic diversity

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A specificity of our species is the fact that we transmit several cultural traits. Since some of these transmitted traits impact our survival, reproduction and migration, cultural transmission can influence the biological evolution of our species. One way to assess the importance of cultural variation on our evolution is to measure the impact of these cultural traits on genetic diversity. This lecture will specifically assess the importance of various cultural factors in shaping patterns of genetic variation in human populations, in particular focusing on sex-specific migration, social organization, inbreeding, and cultural transmission of reproductive success. I will present results of our studies in Central Asia and Central Africa based where we collected genetic data on different markers. In particular, our data in these two geographical areas clearly show that men and women follow different patterns of migration. In addition, we test the hypothesis that migration can be a strategy to limit inbreeding. Finally, we detected, in these two areas, a substantial level of transmission of reproductive success that can be explained by cultural factors such as patrilineality. In conclusion, our studies show how different cultural processes have impacted human genetic diversity supporting the hypothesis of co-evolution between genes and cultures.

On dogs and humans: An ethological approach to a friendship

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Although in many languages dogs are often described as ‘man’s best friend’ there had been very little research on dogs, and particularly there was no ethologically oriented research on human-dog interaction during the last century.

The main question we asked was the following: How did dogs’ behavioural potential change during evolution that made them fit for the human (anthropogenic) environment? We have assumed that in the course of domestication dogs adopted specific potential to develop behavioural skills which increased their fitness when living with humans.

In general, it is assumed that dogs in the human family develop specific relationship with their owners that is functionally similar to friendship which is defined as a form of cooperation among genetically unrelated individuals who tolerate the absence of immediate mutual reciprocity.

This cooperation is based on evolutionary and developmental social competence which assumes that individuals living in the same group should display compatible social skills, and avoid conflicts by attending a set of social rules. As a result, during their domestication dogs have evolved specific abilities which can be regarded as being functionally analogous to corresponding traits in humans. This line of investigations was supported also by direct comparison of the behaviour of intensively socialised dogs and wolves.

In our research we have provided evidence that attachment, some aspects of human dog visual (eye gaze) and acoustic (barking) communication, cooperative skills, and social learning have peculiar attributes that indicate the effect of domestication. The presence of such traits in concert allow for more relaxed and complex collaboration between humans and their dogs, provided that the dogs experience adequate socialisation during their development.

In summary, dogs may be special because they were able to shape their mammalian social skills to fit into a complex social system of humans.

Androgens, masculinity, and immunity in men – Testing the Immunocompetence Handicap Hypothesis

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Sex hormone-dependent morphological traits are considered to signal an individual's biological condition. According to the Immunocompetence Handicap Hypothesis (ICHH) only high quality males can maintain high levels of testosterone and afford the physiological cost of hormone-derived immunosuppression. There are many experimental and correlational studies testing the ICHH hypothesis on non-human animals, but the results are mixed. While the experimental studies show that androgens negatively affect immunocompetence in males, correlational studies reporting positive, negative or no relationship between androgens or androgen-dependent morphological traits and immune functions are inconclusive and on average do not confirm the ICHH. There are, however, only a few human *in vivo* studies in this respect, and they are usually limited to either one hormone, one morphological trait and either one immune trait or one immunity arm parameters. The immune system, however, is very complex and studying only one parameter without strictly controlling for age, health status or adiposity, might lead to unreliable conclusions. I will present our recent findings on the relationship between both innate and adaptive arms of immunity in men and a.) different androgens, b.) morphological traits of masculinization influenced by androgens during puberty and c.) body height. In general, our study shows that in well-fed population androgens are rather immunomodulators than implicit immunosuppressants in healthy men. Together with some other studies, our results undermine unconditional ICHH applicability. The factors limiting ICHH usage in explaining the physiological cost of androgen-dependent, sexually dimorphic (potentially attractive) traits, will be also discussed.

Faith in the Faithful: Religious Practice, Reputation, and Social Networks in Rural South India

ELEANOR POWER the New Investigator of 2018

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In South India, as in many places around the world, people perform impressive acts of religious devotion, going on pilgrimage to temples and churches, sacrificing animals, walking barefoot across hot coals, and even piercing their bodies with spears. Given the costs and risks associated with such acts, what motivates people to undertake them, and what are the social returns to doing so? Drawing on reputational and social support network data gathered as part of ethnographic fieldwork in two Tamil villages, I first show that people who invest more in the religious life of the village are more likely to be seen as devout and prosocial, but that they are not more likely to be seen as influential. I then ask how these reputational qualities might impact a person's livelihood by looking at the relationship between reputational standing and social support. I find that reputation alone does little to change the likelihood of supportive relationships, and that a reputation for influence has the weakest effect and a reputation for generosity the strongest. I therefore leave measures of prominence to the side to ask how a person's religious action may directly relate to his/her ability to get support. I find that while costly public religious acts do increase the likelihood of a supportive relationship, regularly worshipping at a church or temple has a more consistent and stronger effect. Overall, these findings suggest that it is neither the eye-catching, flashy acts of devotion nor the explicit markers of prominence that most substantially effect a person's social capital. Rather, it is the relatively more subtle and consistent acts of devotion and the smaller acts of generosity and mutual support that are most crucial to building a person's social capital. Our focus on the former, and on the few privileged men who are able to undertake such acts, has likely led us to overstate and potentially misunderstand the productive potential of prominence. I therefore argue that the evolutionary social sciences should look more closely at the subtle and the interpersonal, rather than focusing solely on the flashy and the aggrandizing.

Oral Presentations

Hunger, impulsivity, and early life adversity

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Objective Impulsivity refers to the valuation of future rewards relative to immediate ones. From an evolutionary perspective, we should expect impulsivity to be sensitive to the current state of the organism (for example, hunger), and also its long-term developmental history. There is some evidence that both current hunger and early life experiences are individually associated with impulsivity, and we aimed to investigate whether these two factors had an interactive effect on impulsivity.

Methods In study 1 participants' (n=95) hunger was manipulated by having them skip breakfast or have breakfast as usual. They then completed an impulsivity task (experiential discounting task) and measures of early life deprivation (postcode and a questionnaire measure of family support). Study 2 built upon the first by recruiting participants with a broader range of childhood deprivation. We conducted a survey (n=330) in which participants reported their current hunger, completed two measures of early life deprivation (postcode and a measure of material needs), and completed a hypothetical monetary discounting task (measure of impulsivity).

Results Study 1 revealed a significant interaction between current hunger and early life adversity, such that individuals who experienced less deprivation showed larger differences in impulsivity scores in relation to their current hunger state. In study 2 we found that childhood deprivation and the amount of time since someone had last eaten both significantly predicted impulsivity scores, however, self-reported hunger did not, and we also did not find an interaction between hunger and childhood deprivation.

Conclusions Our findings suggest that early life adversity is associated with increased impulsivity in adults, and that this potentially interacts with current hunger levels. Further research is needed to investigate this interaction, in order to fully understand the effects which childhood deprivation and current hunger state have on adult behaviours. Plans for future research addressing this will be discussed.

Keywords: Impulsivity, Hunger, Developmental history, Childhood deprivation

Does he sound cooperative? Acoustic correlates of cooperativeness

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Objectives It has been recently suggested that voice could be a cue of cooperativeness because high pitched-voice (i.e. high fundamental frequency) and high pitch variations (i.e. less monotonous voices) are associated with perceived cooperativeness. However, no study has showed that these components are associated with actual (and not perceived) cooperativeness. Therefore, we examined whether high cooperative individuals have a higher pitched-voice with higher pitch variations compared to low cooperative individuals. We also investigated whether cooperativeness can be assessed through vocal cues.

Methods We quantify cooperativeness of 67 native French men by a one-shot public goods game. Speakers were recorded while describing a picture regarding global warming. Fundamental frequency (mean F0) and pitch variations (F0-SD) were measured using Praat software. Moreover, we selected the highest (3rd quartile, n=15) and lowest (1st quartile, n=16) contributors to the public good to form a series of 240 pairs of vocal samples consisting of high vs. low contributor. Then, 336 French judges listen to 10 pairs of voice (randomly selected from the 240 pairs) and distinguish between the highest vs. the lowest cooperative men in the pair.

Results We found a significant correlation between contributions to the public good and F0-SD ($r=0.36$, $P=0.03$) but not for F0mean ($r=-0.15$, $P=0.35$). A linear model also showed a significant effect of contributions on F0-SD ($\beta=0.19$, $P=0.01$), suggesting that high cooperative men produce more pitch variations. Finally, in our perception task, judges did detect the highest cooperative men in the pairs above chance expectations (proportion test: 57%, $P<0.02$ for both men and women judges).

Conclusion Our results are the first to show that acoustic correlates of cooperativeness (especially pitch variations) do exist and are used to assess cooperativeness. The honesty of this trait has now to be investigated.

Keywords: cues of cooperation, voice, detection

Memory suggestibility in an evolutionary perspective

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In memory development research, there is an empirically proven link between source retrieval and executive functions (e.g. Perner, Kloo & Lang, 2007). From an evolutionary perspective, the typical functioning of these cognitive processes at different stages of the development has an important role in helping the child to explore and study her/his environment in an adaptive way (Nelson, 2005). The aim of our study was to explore this connection between source memory and cognitive control at different age groups in childhood.

Our test was a source memory test in which participants (preschool children: N=32, M age = 5,8; school-aged children: N= 28, M age= 11,6) were shown pictures in three different categories: a) congruent pictures were measured high in color diagnosticity and congruency; b) incongruent pictures were seen with high color diagnosticity and low in colour congruency; c) neutral pictures have average points on color diagnosticity and actual color congruency scale. After a very short delay, there was a recall phase where participants were shown the grayscale version of the previously seen pictures and new pictures in random order with an old/new recognition and a source memory task. Beside our source memory task, we used the DCCS test and the Day-Night Stroop test in the preschool group and the Stroop test and WCST in the school-aged group.

Our results showed differences in the performance between the two age groups. The pattern of the memory answers of the preschool children showed a tendency of naming the associative color instead of the new color in the incongruent category, known as “match to average heuristic” (Mitchell & Johnson, 2000). This result connected with the weaker cognitive control processes might be a proof to the evolutionary assumption of cognitive development (e.g. Bjorklund and Sellers, 2005).

Keywords: memory suggestibility, cognitive control, retrieval, evolutionary perspective

Atherosclerosis as a Culturally-Transmitted Disease among Acculturating Horticulturalist

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Objective We look for coronary artery disease (CAD) in subsistence horticulturalists that are experiencing increased contact with the market economy, to test the hypothesis that CAD is an evolutionarily novel "disease of civilization".

Methods Approximately 800 adult members of a Bolivian forager-horticultural group were brought to a hospital and given CT scans to measure coronary atherosclerosis. We also took biochemical measures and asked questions about market participation, education and household wealth. These were used as predictors of coronary calcium score in hierarchical logistic and log-linear statistical models.

Results Only one-seventh of individuals over the age of 40 showed any atherosclerosis progression at all, the lowest average in any studied population. Of the remaining one-seventh of the sample who had any coronary calcium, acculturation predictors - bilingualism, market wealth, and tobacco use - were all strongly predictive of which members of the population had highest coronary calcium levels, and at the highest risk for heart attack.

Conclusions We present evidence that atherosclerotic heart disease is mostly absent from a population of forager-horticulturalists, but that individuals who engage with the marketplace show high, Western-like levels of atherosclerosis progression. This is compelling demonstration of atherosclerosis as a "disease of civilization". Our results also have broad implications for understanding of cardiovascular disease from an evolutionary perspective, and the prospects for cultural adaptations to such market-diffused health risks.

Keywords: atherosclerosis; cultural transmission; diseases of civilization; acculturation; evolutionary medicine

Seven deadly sins of potential romantic partners: dealbreakers in mating preferences

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Objective Most of the research on mate preferences has focused on what people desire in a partner, and not on dealbreakers, i.e. what traits make people reject a potential mate. Recently, Jonason et al (2015) published a multi-study paper presenting extensive research on dealbreakers, emphasizing their importance. However, their items loaded on a single factor, so they turned to sorting the items by independent coders into face-valid categories to establish more distinguished facets of dealbreakers. The goal of the present research is to identify dealbreakers in a large sample with factor-analytic methods.

Methods In Study 1, potential dealbreakers were collected with open-ended questions from a sample of 173 participants. Based on their responses, in Study 2 a closed-ended questionnaire was compiled and administered to a large sample (N = 2,445) of heterosexual respondents (48% female), who had to rate each dealbreaker trait according to how likely it would make the participant reject a potential partner. First exploratory, then confirmatory factor analyses were performed on these ratings. Participants also rated themselves on 23 desirable traits representing 7 factors of mate preferences (from Csajbók & Berkics, 2017).

Results Seven factors of dealbreakers were confirmed: losersness, hostility, bad hygiene, arrogance, ugliness, overattachment, and abusiveness. Women in general were more selective, i.e. they were more likely to reject prospective partners with undesirable traits, except for ugliness, where males scored higher. Individual differences were also found, as participants' ratings of themselves predicted which dealbreakers they found to be more or less repulsive.

Conclusions Dealbreakers can be measured as factors just as desirable traits in a potential mate. This offers a more nuanced method to study sex and individual differences with regards to what traits make people reject a candidate when looking for a partner.

Keywords: mating preferences; dealbreakers; sex differences; factor analysis

Desperate times & desperate measures: Existential threats and fast life history traits do not predict voting for Brexit or Trump

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Objective Immigration and terrorism are argued as influences in the outcomes of the EU referendum in the UK (Brexit) and US Presidential election (Trump). In the current study, Life History Theory was used as a framework for examining the relationship between perceptions of existential threats and fast life history traits, and voting for Brexit or Trump. Essentially, was a vote for Brexit or Trump a symptom of shift to a fast life-history strategy – quick fixes for a world perceived as more hazardous?

Methods An online survey was administered to UK (N = 154) and US (N = 289) citizens. In the UK survey, participants indicated if they voted to leave or remain in the EU; in the US version, participants indicated whether they voted for Trump, Clinton or neither. A range of life history strategy related psychometric measures were completed.

Results Multinomial regressions were performed. Contrary to expectations, existential threats did not significantly predict votes for Brexit or Trump. Higher levels of perceived illness vulnerability and impulsivity predicted higher levels of perceived vulnerability to crime, that in turn predicted voting for Clinton compared to Trump. Higher levels of perceived self-control, illness vulnerability and secure parental relationships in childhood predicted higher levels of perceived terrorism threat, which predicted voting for neither candidate compared to Trump and Clinton.

Conclusions Brexit was, for the most part, influenced by other factors not examined here. Following, individuals fearing terrorism and crime did not vote for Trump, and those fears were influenced by a combination of both fast and slow life-history strategy factors. Results suggest that people faced with actual hardship did not consider either Trump or Clinton as worthy of office, perhaps because they are too focused on survival to be fearful of terrorism. Thus, despite predictions, voting for Brexit and Trump were not reactionary responses to existential threats.

Keywords: Life-history strategies, voting behaviour

Whence pseudoscience? An epidemiological approach

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We develop an epidemiological approach to account for the typical features and persistent popularity of pseudoscience. An epidemiology of pseudoscience aims at explaining why some beliefs become widely distributed whereas others do not and hence seeks to identify the factors that exert a causal effect on this distribution. We pinpoint and discuss several factors that promote the dissemination of pseudoscientific beliefs. In particular, we argue that such beliefs manage to spread widely because they are intuitively appealing, manage to hitchhike on the authority of science, and successfully immunize themselves from criticism.

Keywords: Pseudoscience – epidemiology of representations – human cognition – epistemic vigilance – science mimicry

Are mothers less likely to breastfeed in harsh environments? Environmental quality and breastfeeding in Bradford, UK

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Objective Life history theory predicts lower parental investment in lower-quality environments. We used data from the Born in Bradford cohort study to investigate whether women in lower-quality environments are less likely to breastfeed. As newborn health and viability are key factors in determining parental investment decisions, we further predicted that poorer birth outcomes would mediate this association. In the evolutionary behavioural sciences, previous research linking life history outcomes with environmental quality has proxied environmental quality through social and economic measures. Here, we include measures of actual environmental quality alongside socioeconomic indicators, and explore in detail how different aspects of environmental quality influence breastfeeding.

Methods Indicators of environmental quality were: exposure to water disinfectant by-products (DBPs), air pollution, neighbourhood deprivation, feelings of neighbourhood unsafety, passive exposure to cigarette smoke, household damp/mould, and central heating access. Infant birth weight, head and abdominal circumference, and gestational age were used in mediation analyses. Relationships were tested using structural equation modelling in Mplus.

Results We found several associations between environmental quality indicators and breastfeeding outcomes, but not all in the predicted direction. Water DBP and cigarette smoke exposure were negatively associated with both breastfeeding initiation and duration, but the other environmental quality indicators showed positive associations, suggesting that overall, poorer environmental quality was associated with higher maternal investment. We found little evidence for mediation by birth outcomes.

Conclusions Different environmental aspects have different associations with breastfeeding, a key indicator of maternal investment, highlighting the importance of considering the environment holistically in life history analysis. Given our lack of evidence for mediation by birth outcomes, associations between the local environment and breastfeeding are unlikely to be explained by environmental impacts on the developing foetus. We discuss potential explanations for our results, including cultural factors which may confound relationships between breastfeeding, birth outcomes and environmental quality.

Keywords: life history theory, environmental quality, breastfeeding, maternal investment, birth outcomes

Explaining Parochialism: A Causal Account for Political Polarisation in Changing Economic Environments

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Objectives Political polarisation is a significant cause of civil unrest; as such its causes are of considerable importance. Here we demonstrate that shifts in socialisation strategy similar to political polarisation could be a constructive response to periods of economic uncertainty or environmental decline. We start from the observation that both ecologies and economies are seldom at equilibrium. Rather, they often suffer both negative and positive shocks – periods of feast and famine. We then adopt an explicitly evolutionary perspective to understand how members of an adapting population update their socialization strategy in a shifting environment.

Methods We develop an evolutionary model under which individuals face a binary choice between low-risk, low-expected payoff in-group interactions and high-risk, high expected payoff out-group interactions. We determine the evolutionary stable strategies (ESS) of the system as a function of the quality of the environment, and show that this predicts the evolved behaviour of the system in simulations.

Results We show that in a good environment, interacting with diverse outgroups can be adaptive, but as the environment declines, a strategy of seeking homogeneous groups can be important to maintaining individual solvency. We further show that while polarisation may increase gradually in response to shifts in the economy, decreasing polarisation gradually is in many cases not an available strategy; thus returning to heterogenous social investment may require structural change.

Conclusions Sudden shocks, or even gradual shifts in the environment can lead an evolving population to adopt a risk-averse, parochial socialization strategy. This can be adaptive, especially in the short-term, but it can also lead to a population becoming stuck at a sub-optimal equilibrium such that behavior remains parochial even when the environment returns to a state where cooperation with diverse outgroups would yield higher payoffs for all.

Keywords: parochialism; polarisation; risk; public goods investment

A higher ‘GPA’ or at least a passing grade in all ‘subjects’? Passing the exam as a potential mate

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Objective A potential mate can be assessed along several factors (e.g., warmth, attractiveness, status, intelligence). How do these evaluations determine the overall desirability of a potential partner? Using a school/exam analogy, one could devise at least two strategies: (1) taking some overall evaluation based on the distinct ‘grades’ (e.g., ‘GPA’), or (2) requiring the candidate to achieve at least a ‘passing grade’ in all ‘subjects’. In other words, which potential mates do people like better: those with a higher overall value but scoring low in one dimension, or candidates with mostly mediocre (but never low) scores?

Methods An experiment was conducted where potential mates were introduced in a form of vignettes, with traits of the candidates manipulated at three levels (low, medium, or high). Some fictitious mates were high in three traits but low in one, while others were medium in three traits and high in one. College-age (18-26) participants (255, 71% female) rated eight different vignettes according to how desirable they found them and whether they would consider them as a long-term partner. They also rated the general importance of each trait in an ideal partner, as well as their own mate value.

Results While sex and individual differences (one’s own mate value as well as the importance attached to each trait dimension) had significant effects on the desirability of the potential mates, the general pattern was that ‘mediocre’ candidates fared better than those who were high on three trait dimensions but were low in something that was important for the participants (especially warmth and intelligence).

Conclusions Consistent with earlier work on ‘dealbreakers’ (Jonason et al, 2015), it seems humans were selected to avoid mating mistakes, as the presence of excellent qualities does not compensate for being low in a single but important dimension.

Keywords: mate choice, threshold, vignette, dealbreakers, mate evaluation

Does social information enhance or inhibit understanding?

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Both reasoning ability and social learning play a crucial role in human adaptation. Cognitive abilities like enhanced reasoning skills have combined with cumulative cultural adaptation to allow our species to dominate the world like no other. However, the relationship between reasoning skills and social learning has been controversial. Some have argued that social learning is a substitute for reasoning, while others suggest that they are complements. Here we describe a laboratory experiment designed to investigate the effect of social learning on individuals' ability to infer a general rule about unfamiliar problems. In this experiment, social information had both positive and negative effects on individuals' likelihood of inferring the rule. Social learners required more evidence to infer the rule than did individual learners, suggesting that social learning inhibits cognitive effort but social learning provided individuals with information that individual learners were unlikely to gather on their own, especially when the task got more difficult. When information is costly to acquire, social learning can thus potentiate understanding even though it reduces individual cognitive effort.

Keywords: Cultural evolution, Social learning, Reasoning

New Evidence for the recent Evolution of Religions

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Since Charles Darwin, evolutionary biology has been interested in the evolution of religions and during the last years, the interest in evolutionary biology in the emergence of religions has even grown. It has been argued that during the agricultural revolution, religion may have changed its characteristics from “small gods” of tribal societies to the moralizing and punishing “big gods”: this emergence of “big gods” may have assured group cohesion among strangers in the emerging larger agglomerations of individuals (for instance cities) and may have helped to overcome tribal and ethnic borders. We examined whether religious homogamy may have played a role. We found that both religious intensity and religious homogamy increase biological fitness in terms of a woman’s number of children. In addition, in the case of ethnically mixed couples, religious homogamy seems to compensate for lower reproduction. This finding indicates that during the agglomeration of individuals from different tribes and ethnicities, a common religion may have helped to overcome a potential outbreeding depression. We further investigated whether the increased number of children in highly religious individuals and in religiously homogamous couples may not only have social reasons but may also be rooted in our genomes. In a genome-wide association study, we found that religious intensity is related to genetic loci on the X-chromosome and that a “genetic correlation” exists between religious intensity and reproduction. We therefore conclude that both religious homogamy and the genetic basis of religiousness could be an impressive indicator for a culture-gene co-evolution.

Keywords: Evolution, Religion, Homogamy, Genetics

Examining long-run determinants of modern-day economic development: State history affects the quality of modern institutions

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Objective Modern countries show substantial diversity in economic development. A huge number of theories have been put forward to explain this variation, with typical explanations focusing on the role of cultural or ecological differences. There is a growing appreciation that cultural evolutionary processes may have played an important role in determining present day economic development. Historical factors such as how long societies have had experience with centralized political governance, or how long they have employed agricultural subsistence strategies have been argued to be determinants of present day economic productivity. However, it is not clear whether ancestral statehood and agriculture exert direct effects, or whether they influence economic development indirectly by shaping the evolution of norms or formal institutions. We seek to adjudicate between these hypotheses.

Methods Using cross-country data, we conduct multilevel structural equation modelling to test between competing hypotheses involving a range of direct and indirect pathways between ancestral statehood and agriculture, ecological factors, institutions, social norms and economic performance.

Results We show that ancestral statehood and agriculture affect economic performance only through their effects on present-day institutions.

Conclusions Our results provide support for the idea that cultural evolutionary processes have been important in creating effective institutions in present-day societies, and enabling large-scale cooperation."

Keywords: Cultural evolution, institutions, economic development, state history, structural equation model

Large-scale cooperation driven by reputation, not fear of High Gods

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How cooperation is maintained in large scale societies is an evolutionary puzzle. One explanation claims that religion promotes large scale cooperation through the fear of punishment from High Gods. Others have argued that reputational considerations favour cooperation, and also that religious devotion itself acts as a badge of cooperativeness. Here, we test whether donations to non-religious charities are more motivated by reputation among observers than are donations to religious institutions. Players choose between donating to institutions, or keeping money for themselves, with decisions made in public or private contexts. We conducted both these tests on 502 people in 17 communities in northwestern China, ranging from small villages to large cities. We found that in public decisions, more money was donated by those in small communities, where reputation should be more salient. In private decisions (in a dice experiment in which the role of dice was secret and enabled players to cheat), people who has chosen religious institutions as recipients were more likely to exhibit dishonesty. Religiosity only influenced donations in the public decisions. These results suggest donations to both religious and non-religious institutions are largely motivated by reputational considerations, not by fear of divine punishment.

Keywords: cooperation, religion, evolution, reputation, punishment

Can life history strategy predict assortment in personality traits?

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Slower life history (LH) strategies are adaptive in stable, predictable and controllable environments. Assortative mating, which implies a lower rate of genetic recombination, is also favored in such conditions because it preserves locally well-adapted genomes. This led to the prediction that assortative mating will be greater for slower than for faster LH strategists (Figueredo & Wolf, 2009).

On a sample of 215 heterosexual married and cohabitating couples, we explored assortment in LH strategy and whether women and men's LH strategy and its assortment can predict assortment in five-factor personality traits. LH strategy was assessed by Mini-K (Figueredo et al., 2006), and Five-factor traits by Big Five Inventory (John et al., 1991).

As hypothesized, positive assortment in LH on the magnitude similar to other personality traits was found. In addition, initial assortment rather than convergence, and active assortment rather than social homogamy hypotheses were supported. Next, slow LH strategists tended to assort in LH strategy more strongly than fast LH strategists, which also appeared to be the consequence of initial and active assortment. Regarding personality traits, a moderate positive assortment for extraversion and openness was found. Additionally, higher levels of extraversion, agreeableness, conscientiousness, and openness were related to positive assortment in these traits. This was interpreted in the context of observed correspondence between these traits and LH strategy. Finally, both men and women's LH, and their interaction predicted assortment in conscientiousness, while women's LH predicted assortment in neuroticism. However, assortment in LH correlated positively only with assortment in extraversion and conscientiousness.

It was concluded that LH strategy underlies the assortment in more specific characteristics in a way that slower LH strategists tend to mate with those more similar to them in both LH strategy and certain general personality traits.

Keywords: life history strategy; five-factor personality traits; assortative mating; romantic couples

Social image promotes cooperation more than altruistic punishment

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We contrast two theories that have been proposed to explain cooperation in “one-shot” anonymous interactions. The theory of indirect reciprocity claims that individuals are concerned with their reputation and social image in their community. Individuals cooperate because they are rewarded by others if their social image is deemed to be positive. According to the altruistic punishment theory, cooperation hinges upon individuals' disposition to both cooperate and punish social norms defectors.

We test these two theories experimentally in the small-scale society of horticulturalists of Teop, Papua New Guinea. Subjects play standard Prisoner's Dilemma games in situations of anonymity (baseline), or having the possibility of engaging in costly punishment (punishment condition), or being observed by their local Big Man (social image condition), or having the punishment option and being observed. In a correlated study, we also examine the effectiveness of third-party punishment.

Cooperation in the social image condition is significantly higher than in baseline, and no less than in both punishment conditions. Punishment is nonetheless extensive, so payoffs are significantly higher in the social image condition than in the other conditions. In fact, payoffs are lower in punishment conditions than baseline. Another condition where subjects are observed by a non-local Big Man does not bring about any benefit compared to baseline, confirming that social image is mainly relevant to the local community. Punishment of cooperators (so-called anti-social punishment) is widespread, and emerges also in third-party punishment. In third-party punishment third parties earn no less than subjects involved in the cooperation game, hence inequality aversion can be ruled out as a motivation. Here we observe a positive correlation between amount spent for punishment and the recipient's payoff. This suggests that punishment is driven by the desire to better one's earnings in comparison to others' earnings, rather than by a sense of fairness.

Keywords: Anonymous Cooperation; Social Image; Second-Party Punishment; Third-party Punishment; Anti-social Punishment

Relatedness, rather than co-residence mediates the relationship of half and full siblings

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Objectives Having both full and half siblings was a recurring feature of the ancient social environment. Hence, solving conflicts and allocating resources among individuals with different levels of relatedness was a major adaptive problem even in the sibling context. Our aim was to explore whether people differentiate between half and full siblings on an emotional level as implied by the theory of inclusive fitness, and to test whether co-residence or genetic relatedness improves sibling relations to a larger extent.

Methods We administered the Sibling Relationship Questionnaire (SRQ) to 78 individuals who reported whether they lived together either with their full or half siblings in their childhood. We conducted independent samples t-tests to compare SRQ scores, and built GLMM models to test for the effects of relatedness, co-residence, and the interactions between these, on sibling relations.

Results Relatedness was a significant predictor of the admiration by sibling factor, full siblings having higher scores. Co-residence influenced this score also significantly, but it did not contribute to the model. Prosocial behavior and perceived similarity differed between full and half siblings, that is full siblings were more prosocial with each other, regardless of whether they lived together or not. However, the later effects were non-significant tendencies. In general, genetic relatedness was more important in sibling relations than co-residency.

Conclusions The results suggest that even in recent industrial societies inclusive fitness drives siblings' relations. The investigation of family relations in an evolutionary perspective is becoming more important as it might contribute to our knowledge about the functioning of so called „mosaic” families. These „non-typical” families might in fact be the evolutionary norm. Their number is steadily growing again, and full siblings, maternal and paternal half siblings and non-related children are raised up together, and eventually genetically related children are separated.

Keywords: kinship, inclusive fitness, family network, prosocial behaviour

Giving guys get the girls - A study showing that displays of altruism predict reproductive success in males regardless of pers

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Fitness benefits for the evolution of altruism have been explored from the perspective of natural selection, but more recently from the perspective of sexual selection. Based on competitive altruism (Roberts, 1998) and costly signalling theory (Zahavi, 1975) it has been argued that altruists, especially males, may gain reproductive fitness benefits by showing off altruism in the presence of females (Farrelly, 2016; Iredale et al, 20018; Van Vugt & Iredale, 2013). Whilst we know females perceive males who give money to help others as more sexually attractive (Arnocky et al, 2017), this could be because giving away money signals wealth/ resources rather than altruism. To fully distinguish between the resource / altruism argument we asked heterosexual female participants to rate a male actor in a video on a number of mate qualities. Whilst the actor in the video remained the same, his helping behaviour towards a homeless man differed. Either the actor gave the homeless man ?30, ?1 or nothing. Females were also told as to whether the actor was a poor man or a rich man. Females found the male actor to be significantly more sexually attractive when he helped the homeless man compared to when he did not. The wealth of the actor did not significantly change the sexual attraction to the actor; he was perceived as more sexually attractive when he helped the homeless man regardless of his own personal resources. We therefore conclude that altruism may be a signal of good mate quality in males regardless of resources, and may explain why costly signals of altruism by males may be driven by reproductive benefits.

Keywords: Altruism, Sexual Selection, Mate Choice, Costly Signalling

Sex, lies and Y-chromosomes: The secret love lives of our genealogical ancestors

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In many pair-bonding species, fathers may be cuckolded into raising children that genetically are not their own. In human populations, however, the incidence and driving factors of such “extra-pair paternity” (EPP) remain contentious. Here we use a large-scale genetic genealogy approach based on Y chromosomal genotyping to reconstruct spatio-temporal patterns of human EPP rates. Using patrilineal genealogies from the Low Countries spanning a period of over 500 years and Y chromosomal genotyping of living descendants, our analysis reveals that although EPP rates were low on average, they were 4-fold higher and reached 5% among the lower socioeconomic classes in the larger cities of the late 19th century. In addition, EPP rates were found to be higher if the legal fathers could exert less social control by working away from home. Together, these results suggest that human extra-pair paternity varied in relation to its potential benefits, opportunity and prevailing levels of social control.

Keywords: Extra-pair paternity; genetic genealogy; cuckoldry behaviour; Low Countries, Y-chromosome

Investigating mate preferences through a data-driven analysis of online personal descriptions

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Objectives Previous research investigating mate preferences has often used top-down, theory-driven approaches, where traits of interest are chosen based on biological theories. Such approaches have emphasised universally agreed upon preferences. Here, using a data-driven approach and a large sample of personal advertisements, we aim to identify and assess traits important for mating decisions, as well as test for assortative mating patterns.

Methods Personal descriptions were collected from publicly available online dating websites ($N = 10,024$). Latent Dirichlet Allocation (LDA; a clustering method common in quantitative text analysis) was used to identify common recurring topics amongst the profiles, as well as the probability that each profile included each topic. A subset of profiles ($N = 468$) were rated for desirability by separate participants ($N = 100$, 49 men, 51 women). These participants were also asked to write a personal description of themselves as if they were writing for a dating website.

Results The LDA identified 25 topics. Men were more likely to advertise education/status, while women were more likely to discuss animals and being honest/caring. Both men and women who discussed outdoor activities, a healthy lifestyle, and music/culture were rated as more desirable. Men who discussed sex and women who discussed being a single parent were rated as less desirable. To assess assortative mating patterns, we compared the topic probabilities between profiles collected online and those written by the raters and found that raters preferred profiles when the written description included similar topics to their own.

Conclusions Our results provide insight into human mate preferences. Some findings are in line with what would be predicted by biological models, for instance, men advertising education/status and women advertising a nurturing nature. However, other findings emerged that are not straightforwardly predicted by biological theories. We also find support for assortative mate preferences.

Keywords: mate preferences; attraction; assortative mating; data-driven methods; online dating

Dominance, power and relationship quality in long-term heterosexual couples

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Objective Relationship power belongs to the most important dimensions explaining the variance in behavior of romantic partners, despite the growing tendency of both men and women to report an equal distribution of power in their heterosexual relationships. Relationships characterized by equality were found to be associated with higher relationship quality. In our study, we explore how different power bases (resources, personality dominance, attractiveness) contribute to balance of power in adult long-term heterosexual couples.

Methods We analyzed data from 84 romantic couples (mean age 26.9 years). Relationship dominance was assessed with a single direct question. We used Spanier's Dyadic Adjustment Scale to measure relationship adjustment and the International Personality Item Pool to measure dominance. We used the Trait-Specific Dependence Inventory to assess partners' commitment and resource accruing potential.

Results Couples with equal distribution of power tended to be more adjusted ($p=.067$). Couples with the dominant woman (59%) and man (41%) did not differ in adjustment ($p=.166$). Relationship adjustment was associated with education difference in favor of men ($p = .004$). Relationship dominance was associated with partner's commitment (love; $p = .002$), and own attractiveness ($p = .011$). Furthermore, men's relationship dominance was associated with his resource gaining potential ($p = .008$), whereas women's relationship dominance was related to her social dominance ($p = .020$).

Conclusion We found a non-expected stronger effect of women's than men's personality dominance on relationship hierarchy. It may be that socially submissive women prefer or encourage higher relationship dominance of men. Lower adjustment in male dominated couples could be related to higher tendency of dominant men to use aggression. The association of higher relationship adjustment with higher male than female education can be connected to access to resources, or such couples could profit from higher social communication skills or wider spectrum of interests of the male partners.

Keywords: dominance, power, relationship adjustment, education

Social bonds, integration and reproduction in an immigrant population during World War 2

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Understanding the conditions that affect the integration and reproductive outcomes of immigrants into host societies is of considerable interest to researchers across disciplines. In 1940, the Soviet Union invaded Finland and seized an part of eastern Finland called Karelia leading to the displacement of over 400,000 individuals. Approximately half of these migrants returned to Karelia when it was temporarily recovered by Finland in 1941, but were once again forced to evacuate when this territory was recaptured by the Soviet Union in 1944. We use detailed records tracking the migrations and life histories of these refugees to analyze how age, education, occupation, movements and population density affect their marriages and fitness outcomes. We report that: 1) Evacuees who were most likely to return home between the wars were older, less educated, more likely to work in agricultural occupations and were evacuated to areas with smaller populations; 2) evacuees who were more likely to marry into the host populations (i.e. to marry resident Finns) were younger, more educated, worked in non-agricultural occupations and were less likely to return to Karelia between the wars 3) evacuees who married other Karelians and those who returned to Karelia between the wars have more children than those who remain in Finland throughout the war and than those who married into the host population. Overall, these results suggest that more educated migrants who are relocated to more populated areas are more likely to integrate into the host population while stronger ingroup bonds amongst immigrants produce higher fitness outcomes. We discuss these results within the framework of hypotheses on social capital, integration and life history theory and suggest how they can inform our understanding of evolutionary adaptations that affect tribalism and attitudes towards outgroups.

Keywords: immigration, tribalism, social capital, bonding social capital, bridging social capital, contact hypothesis, integration

Economic inequality and violence in London neighbourhoods

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Objective Previous research has indicated that economic inequality levels predict homicide rates, and it has been theorised that this is due to the way inequality increases the intensity of male intrasexual competition, and therefore levels of interpersonal violence more generally (Daly, 2016). However, some contention remains as to whether inequality or poverty is the better predictor of violent crime. Most previous studies have looked at large areas (e.g. variation between countries, states, or provinces). Therefore, we investigated the association between economic inequality and levels of non-lethal violence in the UK (where homicide rates are low), and at a finer geographical resolution, aiming to provide further support for the theory that inequality increases rates of violence.

Methods Greater London Authority income estimates for small geographical census areas (Lower Super Output Areas) were used to calculate Gini coefficients (our measure of income inequality) for London wards. Following exclusions due to census boundary changes, multiple linear regression analyses were performed examining ward average income and ward income inequality as potential predictors of violence for 553 wards. Separate analyses were performed for two independent measures of interpersonal violence; per capita violent crimes recorded by the Metropolitan Police, and per capita assault rates recorded by the London Ambulance Service.

Results Both income inequality and average income were significant independent predictors of both ambulance service and police recorded measures of non-lethal violence.

Conclusions These results were consistent with the hypothesis that economic inequality is associated with increased levels of interpersonal violence, and therefore suggest that lowering inequality could reduce levels of violent crime. Further research looking at cognitive and behavioural responses to economic inequality at the individual level will improve our understanding of how it increases interpersonal conflict, and may help inform methods for decreasing rates of violence.

Keywords: Economic inequality; violence; intrasexual competition

Evolutionary trade-offs can explain inter-individual variance in psychopathy

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Objective One of the key problems in behavioral ecology of personality is to explain inter-individual variation in behavioral traits. Variation can be maintained if a trait shows adaptive trade-offs: in a case where phenotypes with both high and low expression of a certain trait can have adaptive benefits, natural selection cannot deplete its variance. We applied this theoretical framework to psychopathy - a set of behavioral characteristics depicted by manipulation, lack of emotional empathy and impulsiveness.

Methods We conducted two studies: in the first one (N=440) we searched for mating-parenting trade-off in psychopathic traits - all measures have been collected via self-report methodology in a sample of middle-aged adults; the second one (N=1220) was aimed in exploring quantity-quality trade-off in psychopathy - psychopathic traits and parental investment in parents have been rated by their children (adults in their twenties and thirties), together with the estimation of physical and mental health of raters themselves.

Results Both studies provided findings which are congruent with our hypotheses. In study one; we obtained positive correlations between psychopathy, status seeking and mating behavior and negative associations between psychopathy, mate retention and care for children. In the second study positive associations between psychopathy and number of children have been found; on the other hand psychopathy was negatively associated to parental investment, together with the physical and mental health in offspring.

Conclusions It seems that psychopathy shows adaptive trade-offs. Individuals with elevated psychopathy traits have fitness benefits related to fast life-history strategy - enhanced status seeking, mating and reproductive success. On the other hand, individuals with low psychopathy show a slow life-history trajectory - pronounced ability to stay in longer relationships, heightened parental investment and higher physical and mental health in their offspring. This way the variance in psychopathy can be maintained in contemporary human populations.

Keywords: evolutionary trade-offs, psychopathy, mating, parenting, reproductive success

Why war is a man's game

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Objective & Methods Interest in the evolutionary origins of warfare and its drivers in ancient and contemporary hunter-gatherer and small-scale human societies has greatly increased in the last decade, and has been particularly spurred by exciting archaeological discoveries that suggest our ancestors led more violent lives than previously imagined. Mathematical models have provided key insights, especially on the role for kin selection to explain altruistic behaviour in the context of warfare. However, the striking observation that warfare is an almost-exclusively male activity remains unexplained. Among the hypotheses that have been suggested to explain this robust empirical pattern are (i) greater male effectiveness in warfare, (ii) relatively smaller costs for men than women and (iii) female-biased dispersal (patrilocal) leading to reduced kinship of women to their groupmates who will stand to benefit from triumph in battle; but it is unclear whether such quantitative sex differences could explain the striking qualitative difference in male versus female participation in warfare. We develop a mathematical, kin-selection model to provide a formal assessment of these hypotheses.

Results & Conclusions Surprisingly, we find that exclusively-male warfare may evolve even in the absence of any other sex differences, though sex biases in these parameters – greater male effectiveness in warfare, lower male costs, female-biased dispersal and a lower tendency for a group's children to be fathered by men from different warring groups – can make this outcome more likely. These results suggest that human societies may become locked into exclusively-male warfare (even after the selection pressures responsible for this sex difference have long ceased to apply) thus revealing a potentially key role for ancestral ecology in shaping our species' patterns of sexual division of labour and violence-related adaptations and disorders.

Keywords: warfare, altruism, kinship, sex-biased dispersal, behavioural sex differences

Do Men or Women Promote Sexual Double Standards? Evidence for Sex-Specific Control Theory

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Throughout human ecologies, females are punished for overt displays of promiscuity. However, it is unclear whether punishment evolved to raise paternity certainty (male control theory), or to maintain a high price for sexual access (female control theory). This report seeks to rectify this gap by proposing a third alternative (sex-specific control theory). Specifically, both men and women promote sexual double standards, but the mechanisms that underly double standards differ between the sexes. In Study 1 (N = 31), we developed and validated photographic stimuli of models signalling sexual-accessibility or sexual-selectiveness. Study 2 (N = 374) found that both men and women rated sexually-accessible women as more sexually desirable and less pleasant. In Study 3 (N = 400), both sexes demonstrated prejudice by offering sexually-accessible (vs. sexually-selective) women lower sums in a one-shot Dictator Game. In Study 4, we tested participants' (N = 323) willingness to inflict costly punishment on a sexually-accessible woman. Women were more likely to inflict costly punishment when their game partner signalled sexual-accessibility; men's costly punishment was not predicted by sexual-accessibility. Hence, although both sexes demonstrated bias towards sexually-accessible women, costly punishment was specifically done by females. This supports sex-specific control theory's view that different mechanisms promote male- and female-driven sexual double standards.

Keywords: Sexual suppression, sexual economic theory, punishment, intrasexual competition, Ultimatum Game, Dictator Game

A Life History Perspective on Maternal Emotional Investments During Infancy

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Objective Life history approaches to parental investment have typically highlighted trade-offs humans make by measuring variations in the transfer of resources such as knowledge, wealth, or social status. Such transfers often occur later in the life of offspring, yet parents make investments in their offspring from conception. Mother-infant emotional bonding is associated with infant development, thus may reflect an early form of maternal investment. Bonding may also guide long-term investment motivations, thus have both direct and indirect effects on offspring quality. We use two measures of bonding to assess whether access to emotional support from allocarers affects maternal emotional investment trade-offs, and measures of a mother's available emotional resources to assess whether emotional investment is costly.

Methods A longitudinal survey study tracked 67 Western women from pregnancy to 6 months postpartum. Multiple regression models assessed whether: 1) emotional support positively predicts maternal investment; 2) maternal investment positively predicts a decline in maternal emotional resources. Moderation analysis assessed whether 3) emotional support acts as a buffer against declines in emotional resources.

Results Level of overall emotional support from allocarers positively predicted bonding strength, as did support from own family and friends. However, support from the infant's father negatively predicted bonding strength and time taken to bond, while support from the father's family negatively predicted the time taken to bond. Bonding strength positively predicted falls in overall emotional resources and emotional intelligence; level of overall support received moderated a variety of dimensions of this relationship.

Conclusions Maternal emotional investments appear contingent on circumstance, with bonding incurring a cost when access to emotional support from allocarers is low. Mothers make higher emotional investments in association with higher support from friends and kin, but may offset costs when support is available from their infant's paternal kin.

Keywords: Maternal investment, mother-infant bonding, life history trade-offs, allomothers

No evidence for consistent eye colour preferences across relationship histories

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Objective Much evidence implies that people should demonstrate consistent preferences for eye colours across different relationships. For instance, people tend to select partners whose eye colour matches that of their parents. More anecdotally, online dating websites typically include eye colour information. Accordingly, we investigated whether people exhibit consistent preferences for eye colour in their short-term and long-term relationship partners.

Methods 186 participants (age [mean +/- SD] = 23.3 +/- 7.55; 40 males) provided the hair and eye colour and ethnicity of themselves and as many of their former partners (long term and short term) as they could remember in an online survey.

Results We wanted to determine whether our dataset provided evidence for consistent preferences that were not simply a consequence of the prevalence of a particular eye colour in the population. Accordingly, we first created 100,000 new datasets by creating permutations of the original raw matrices, i.e. full permutations, shuffling both rows (participants) and columns (colours). Next, we compared the maximum proportion of a chosen colour for each participant in the actual dataset against those in the permuted datasets using paired-samples t-tests. We found no evidence that people had consistent individual preferences for specific eye colours, regardless of length or type of relationship.

Conclusions Eye colour may not be of great importance in partner choice. Future research should examine whether people have consistent preferences for other physical features, particularly given that research indicates overlap between the physical appearance of people's partners and their parents.

Keywords: Mate choice, physical preferences, imprinting

Mate choice copying: the next replication issue for psychology?

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Objective Recent influential studies have suggested that some findings in social and cognitive psychology have low experimental replication rates. This “replication crisis” raises concerns about the validity of large volumes of research. Evolutionary psychology, however, has yet to come under this same scrutiny. Mate choice copying (MCC), a phenomenon in which female mate selection is influenced by observing the mate choices of other females, has been a popular topic of study across the last few decades. Consequently, substantial evidence exists to suggest that human females, like their animal counterparts, mate choice copy. Literature, however, is mixed and methodologically varied. This research program aimed to deepen the evidence supporting mate choice copying.

Method 462 female participants took part in five methodological and theoretical MCC replications. Participants rated facial images of men in one of three experimental conditions: i) men pictured alone and described as romantically single. ii) men pictured with an unattractive woman. iii) men pictured with an attractive woman. In both these latter two conditions, men were described as in a relationship with the woman he was pictured with. On a 1 to 9 Likert scale, participants rated men on various attributes. Including attractiveness, faithfulness as a potential partner and ease of acquisition as a mate.

Results MCC failed to convincingly replicate. Single men were rated no differently than men with women. In a total of seven analyses, MCC replicated just once. However, this single replication was not in line with expectations predicted by wider literature.

Conclusions Failed replication occurred for both standard methodology used across wider literature and for novel methodology specific to this research program. In light of the replication crisis, it may be beneficial to perform meta-analysis upon existent data to clarify effect sizes, effect heterogeneity, and possible publication bias that may be present in MCC data.

Keywords: Evolution, Psychology, Mate Choice, Attractiveness

Extrinsic mortality effects on out of wedlock fertility in 18th and 19th century Krummhörn, Germany

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Life history theory predicts that exposure to high extrinsic mortality in early childhood leads to faster and riskier reproductive strategies. More specifically, individuals who grew up in a high mortality regime will not wait until they find a suitable partner and form a stable union – conditions which would favor reproductive success in a safe environment – as premature death might prevent them from reproducing at all. In order to test these propositions, Cox proportional hazard models are estimated to determine whether women who experienced the death of brothers and sisters during childhood reproduced earlier and were at an increased risk of giving birth to an illegitimate child, whereby illegitimacy serves as a proxy for risky sexual behavior. The models are fitted on pedigree data from the eighteenth- and nineteenth-century Krummhörn population in Germany. The results are in line with life history theory and show that there is a relationship between experience sibling death in early childhood (0-7 years) and the timing of the first birth, as well as the risk of reproducing out of wedlock.

Keywords: Life history theory, extrinsic mortality, sexual behavior, illegitimacy

Cooperation and Conflict in Paranoia

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Paranoia is present throughout the population and can range from occasional suspicious thoughts to frank paranoid delusions. Previous research has shown that paranoia is associated with reduced prosocial tendency, and has explained this in terms of distrust. Using a large ($n > 2,000$), pre-registered experiment (recruiting across the full clinical and non-clinical spectrum of paranoia) we show that highly paranoid participants made less prosocial offers than non-paranoid participants in the Dictator Game (where donations are not based on trust) and in the Ultimatum Game (where distrust would predict higher, rather than lower offers). Moreover, paranoia positively predicted punitive responses, with paranoid participants being more likely to choose this option in the Dictator Game – and for relatively more generous offers. These findings suggest that distrust of social partners is not a complete explanation of reduced cooperation in paranoid participants and that alternative explanations, such as reduced sensitivity to social rewards or increased aversion to being betrayed by others, may be more viable.

Keywords: psychosis, paranoia, trust, cooperation, punishment

The dynamics of cooperation and social status in a small-scale society

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Humans operate in multiple webs of interaction. Whether it's gossiping between friends, neighbours helping each other when in need or emergence of a coalition to raid a neighbouring community, the properties of these social networks have large effects on an individual's or group's fitness and are an important factor in the evolution of human cooperation. Prestige – a pathway to social status founded upon respect and admiration – may influence these networks to generate cooperation. The current research provides a theoretical outline of the dynamic relationship between prestige and cooperation. Specifically, the current research proposes that individuals high in prestige are sought more as cooperative partners and that the prestige of an individual's cooperative partners may also increase their prestige over time. Moreover, the present findings deliver the first longitudinal empirical assessment of this relationship.

Three waves of panel data, encompassing nine years, were collected from one village among the Tsimane forager-horticulturalists of Bolivia. Cooperation networks were constructed using peer-nominations of food sharing and production partners. Prestige status was measured through aggregated peer photo-rankings of respect and community-wide influence.

Data were analysed using stochastic actor-oriented modelling for the co-development of networks and behaviours (RSiena). The model accounted for kinship, physical strength and size, age and income. Results indicate that cooperation networks exhibit important network tendencies, such as reciprocity, transitivity and cooperation among kin. Importantly, individuals high in prestige status were more likely to receive cooperative partnership nominations and that, over time, the prestige of an individual's cooperative partners increased their prestige (often termed contagion).

Cooperation and prestige have a dynamic relationship that is important for the emergence of cooperation in a preindustrial setting. The current research indicates that there may be a co-evolutionary process, whereby prestige generates cooperation and cooperation concurrently generates prestige over time.

Keywords: Cooperation, Social Status, Prestige, Social Networks, Social Hierarchy

Gender differences in real-life friendship groups

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Objective Human sympathy groups, comprising around 15 individuals, have been surprisingly little studied in adults, partly due to a lack of data. Evolutionary theory predicts significant gender differences in the composition and function of such groups, usually related to known gender differences in aggressive behaviour, defence and foraging. As a part of a larger longitudinal study of human friendship and social-network formation, we have investigated gender differences in real-life friendship group formation and success.

Data and methods We use retrospective and prospective data from a unique study of friendship groups at a European student fraternity. During their first year, students form same-sex groups, which often provide the basis for a lifelong association. Using three consecutive surveys we have explored how psychological measures and sociosexuality relate to group formation and group success among men and women (N=26 groups, mean group size =15). Group success was measured as popularity, a goal for such groups, and as bonding, using the inclusion-of-other-in-self (IOS) scale. A retrospective study investigates how long such groups last after the university years and the intensity of interaction (N=190 individuals).

Results Gender differences in group formation were especially prominent with regards to dating status and sociosexual orientation. Both male group formation and ensuing group popularity were predicted by dating status and socio-sexuality of the members. Group longevity and strength was not related to gender differences.

Conclusions In friendship groups of young Westerners, gender was relevant for whether individual sociosexuality affected group formation, but was not relevant for the longevity of groups.

Keywords: friendship, groups, sociosexuality, gender

The Relationship between Dating Application “Matches” Attractiveness and Sexual – including Unsafe – Intentions

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Objective This study developed a dating application simulation to explore the relationship between the attractiveness of potential mates (“matches”) on heterosexual individuals’ 1) desire to have sex with the match and 2) likelihood of using a condom with the match during sexual intercourse.

Method We created a dating application simulation called ImeetU and used photos from two face databases to prepare 114 user profiles (57 female, 57 male), which were rated by an independent sample of raters (Nfemale = 31, Nmale = 33) on dimensions such as physical attractiveness. After study participants (Nfemale = 21, Nmale = 19) created their own profiles in ImeetU, they were asked to respond to all of the opposite-sex profiles with either a “like” or a “dislike”. We coded ImeetU so that, for each “like” the participant indicated, there was a 60% probability of being “matched”. Subsequent to each match, the participant indicated his or her 1) desire to have sex with the match and 2) likelihood of using a condom with the match.

Results The independent ratings of attractiveness 1) positively predicted both male and female participants’ desire to have sex with their “matches” and 2) were inversely related to male participants’ reported likelihood of using a condom.

Conclusions Attractiveness has been hypothesized to be a social perception in response to physical cues to underlying health and genetic quality. The first finding is consistent with this view. The second finding appears to reflect a ceiling effect among women, the majority of whom indicated maximum likelihood of using a condom, irrespective of the attractiveness of the match. This greater cautiousness may be a consequence of women’s greater susceptibility to sexually transmitted infections, the greater potential costs to women of an injudicious mating decision resulting in pregnancy, or both.

Keywords: Mate preferences; sex differences; dating application; physical attractiveness; condom use

O Brother, where art thou? Investment in siblings for inclusive fitness benefits, not father absence, predicts earlier menarche

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Objective Numerous studies have indicated that father absence is associated with earlier age at menarche, with many evolutionary theories proposing that father absence is a causal factor which accelerates reproductive development. However, an alternative interpretation suggests that offspring may reproduce earlier in the presence of half- or step-siblings as the indirect fitness benefits to investing in them are lower, relative to delaying reproduction and investing in full siblings. Here, I aim to explore the relative merits of each of these theories.

Methods Using data from the Avon Longitudinal Study of Parents and Children (ALSPAC), multivariate regression models were employed to assess the impact of sibling relatedness and father absence on age at menarche.

Results I find that individuals with only half- or step-siblings reach reproductive age on average five months earlier than those with only full siblings. This finding held when controlling for father absence and other potentially confounding variables, such as socio-economic status. Controlling for sibling relatedness, no independent effect of father absence was reported.

Conclusions These results suggest that inclusive fitness benefits to investing in siblings, rather than father absence, may predict variation in age at menarche. These findings provide a greater understanding of the adaptive mechanisms involved in reproductive decision-making, as well as potential implications for human life history evolution and cooperative breeding more broadly.

Keywords: Inclusive fitness, Siblings, Father absence, Menarche, Life history

A Noisy Signal: Hadza hunting reputation and the costly signalling hypothesis

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The measurement of hunting ability has been central to several debates about the goals of men's hunting among the Hadza and other hunter-gatherer populations. Despite the centrality of the hunting ability concept, some authors have expressed scepticism that such measures accurately capture individual differences in actual hunting ability.

In this talk, I present a new method of measuring hunting reputation among the Hadza which, unlike previous measures, allows fine-grained distinctions to be made at all levels of ability. I discuss the extent to which interviewees agree about the hunting abilities of their present and former campmates. I further discuss the degree to which aggregated hunting reputation measures reflect skill on actual hunting tasks.

The costly signalling hypothesis posits that one of the central goals of hunting in forager groups is to signal otherwise cryptic information about their health, vitality and skill to an audience of prospective mates or allies. In order to be effective, such signals must be 'honest'. Based upon my results, in this talk I further reflect upon the extent to which hunting conveys information about hunting skill to a hunters campmates - and whether or not hunting is a sufficiently reliable heuristic for potential signal recipients.

Keywords: Foragers, Hunting Reputation, Honest Signalling, The Show-off Hypothesis

Mismatch or misnomer?

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The western world is very different from those environments in which our species has roamed around for most of the time. Biology 101 tells us that with rapidly changing environments, (genetic) adaptation may fall behind rendering animals maladapted or “mismatched” to their environments. Some forms of human behaviour in the industrialised world might be similarly “mismatched”, and this idea is gaining in popularity in the medical and psychological sciences.

In this talk, we try to argue the following points: 1) although the idea of “mismatch” provides a valuable perspective, it is often rather uncritically used; 2) the predictive ability of this perspective is often limited; even in rather clear cases such as obesity; 3) supposed cases of mismatch are often not backed up by appropriate empirical data; 4) this perspective is more valuable for the peculiarities of our body than of our mind.

We conclude that the “mismatch” perspective is valuable in understanding (some) contemporary human behaviour, but that its use should be more stringent. Instances of surprising human behaviour shouldn't uncritically be linked to mismatch. We further argue that maladaptive behaviour in contemporary populations is not so much a consequence of a “stone-age mind”, but rather of a mind containing fundamentally novel ideas.

Keywords: mismatch; adaptive lag

Human vocal behavior within competitive and courtship contexts and its relation to mating success

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Beyond the linguistic content of their speech, speakers of both sexes convey diverse biological and psychosocial information through their voice in order to exploit listeners' perceptions in the context of same-sex competition and mate choice. However, studies investigating the evolutionary benefits of modulating vocal behavior as a function of social contexts, most specifically its correlation to mating success, are scarce. In this study, we investigated the way French native speakers of both sexes vocally behave in courtship vs. competitive interactions using an experimental design based on a simulated dating game. We assessed which vocal behavior, and in particular which of its acoustic and prosodic parameters, best predicted mating success. In the courtship context, men who increased their speaking rate and reduced their speech duration reported more sexual partners whereas in the competitive context, men who raised their voice pitch, had a more dynamic speech and spoke longer significantly reported less sexual partners. On the other hand, women who raised their voice pitch, decreased their vocal roughness and breathiness reported significantly less sexual partners whereas for the competitive context, no vocal parameter predicted the number of sexual partners. Our results show that modulating specific acoustic and prosodic features of speech as a function of social contexts influence speakers' mating success. It also reveals the existence of a vocal sexual dimorphism when seducing and competing for mates and a cultural variation as the vocal behaviors observed in this study do not completely match those previously found for English native speakers.

Keywords: Sexual selection; vocal modulation; vocal behavior; mating success; voice; human language

Facial emotion recognition in violent men: The role of female expression of disgust in sexual coercion

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Objective The objective was to test several hypotheses by exploring the ability of violent men to recognize facial affect. According to social learning theory and evolutionary hypothesis, sadness, fear and disgust were expected to be recognized with higher accuracy on female than male faces, while the opposite effect was expected for angry faces. Considering different types of violent behavior, sexual coercion perpetrators were expected to either have an impaired ability to recognize female disgust, since disgust has a function to decrease sexual arousal, or to be more sensitive to female disgust than violent men without a history of sexual coercion, because female facial disgust can be interpreted as a cue of infidelity.

Methods The participants were 71 married or cohabiting couples who were attending treatment at a Social Welfare Centre. All male participants exhibited some sort of violent behavior towards their partner. To avoid social desirability bias, Revised Conflict Tactic Scale was administered to females, while males were requested to complete the emotion recognition test.

Results Violent men recognized facial expressions of fear and disgust more accurately when displayed by female than male models. The opposite was found for angry faces, whilst the models' sex did not affect the recognition of sad, happy and surprised facial expressions nor neutral faces. Furthermore, perpetrators of sexual coercion were more accurate than other violent men in the recognition of female facial disgust.

Conclusions We propose that by expressing disgust towards their partner, women signal their low mate value and the availability of alternative men with a higher mate value. Therefore, female facial expressions of disgust could be subtle cues to sexual infidelity that motivate sexual coercion in some men.

Keywords: facial affect, sexual coercion, violent behavior, disgust

Caring for parents: an evolutionary rationale

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Objective The evolutionary roots of human moral behavior are a key precondition to understand human nature. Investigations usually depart from a social dilemma situation and end up with a norm that can provide some insight into the origin of moral. We take the opposite direction by investigating whether a biological version of Fifth Commandment ("Honor your father and your mother, that your days may be long"), respected in different variants across cultures, can spread through Darwinian competition.

Methods We consider a "family" Leslie-model, in which the survival and the fecundity parameters depend on the costs and benefits of intra-familial support (i.e. backward help). The dominant positive eigenvalue of the Leslie matrix is widely accepted as the Darwinian fitness in the framework of the Leslie model.

Results We show that a corresponding Fifth Rule ("During your reproductive period, give away from your resources to your post-fertile parents") will spread even if the cost of support to post-fertile grandmothers considerably decreases the demographic parameters of fertile parents but radically increases the survival rate of grandchildren.

Conclusions Selection on such behavior may have produced an innate moral tendency to honor parents even in situations, such as experienced today, when the quantitative conditions would not necessarily favor the maintenance of this trait.

Keywords: 5th commandment, intra-familial resource transfer, kin demography, menopause, grandmother

The Discounting of Evolutionary Explanations in Sociology

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This study analyzes the inclusive or exclusive standpoint of sociology concerning human evolution, the human ancestral past, and social behavior of other species. A range of related factors are considered, including the evolution of social behavior, a study of small-scale societies, sociobiology, evolutionary psychology, and the “sociology” of non-human species. The standpoint of sociology is assessed by three methods: a review of major sociology textbooks, a descriptive quantitative text analysis of introductory course outlines at top ranked universities, and a keyword search in the all-time most emblematic classical books in sociology. Despite being internally fragmented by clashes of paradigms, sociology textbooks and introductory courses show a remarkable similarity in their content topics, while they share a peculiar neglect of small scale societies, non-human social relations, as well as evolutionary explanations. The mistreatment is explained by the strong position of sociology in the nature vs. nurture debate, by failures of previous synthesis attempts, by certain unresolved issues of evolutionary explanations of human sociality, and by epistemological critiques of evolutionary explanations. In reaction to this mistreatment, the benefits of synthesis of sociological explanations with evolutionary thinking are discussed.

Keywords: sociology, textbooks, teaching, evolutionary explanations, sociobiology

Cultural evolution of artistic traditions in a laboratory: Entropy and aesthetic preferences

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Objective Cognitive attraction is a driving force for cultural evolution and aesthetic preference is one such example. Using a linear transmission chain method, we experimentally explored how artistic traditions emerge in the course of cultural evolution, and what kinds of aesthetic preferences contribute the evolution of artistic traditions.

Methods Participants were shown a picture of 4 x 4 rectangle blocks each filled with a different color. In the aesthetic transmission condition, participants changed colors of maximum six blocks as they would think beautiful. In the memory recall condition, they were asked to recall the color combinations of 4 x 4 blocks which they observed for 20 seconds. A modified or recalled picture was shown to a participant in the next generation, and this was repeated for six generations.

Results A different group of participants made aesthetic judgments for all the pictures obtained (n = 9 chains x 6 generations x 2 conditions = 108). The aesthetic judgments linearly increased in the aesthetic transmission condition but not in the memory recall condition. The entropy was calculated as a measure of the complexity of the color combinations. The entropy was positively correlated with the aesthetic judgments and increased only in the aesthetic transmission condition across the generations. The similarity of the two different color combinations was measured with the KL divergence. Similarities of the color combinations between different chains gradually decreased across the generations. These results imply that divergence of the color combinations between the chains gradually increased while the complexity of the combination decreased unanimously across the board.

Conclusions Past research showed that the aesthetic judgment of visual stimulus is negatively correlated with the complexity of the stimuli. Our experiment showed that such aesthetic preference for stimuli with low entropy shapes the cultural evolution of artistic traditions.

Keywords: cultural evolution of art, aesthetic preferences, artistic traditions, entropy, divergent evolution

The impact of paternal and maternal grandmothers on their grandchildren survival in 17-19th century West Bohemia

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It was previously shown that grandmothers contribute to the number of their children's offspring. One can expect maternal grandmothers to invest more in their grandchildren compared to paternal grandmothers due to higher paternity certainty. Previous studies on this issue are however inconclusive. In this study, we aim to evaluate the impact of this difference on the actual survival of children using church records from four villages of rural, mostly farming community with a substantial proportion of independent craftsmen in West Bohemia between 1651-1834.

Individual church records including family relationships were transcribed into a database. Unambiguously 2704 paternal and 2299 maternal grandmother-grandchild dyads were identified. The association between the grandmother presence (alive and living in the same or nearby village) or absence (dead or living in a distant village) and the survival of their grandchildren was evaluated.

Survival analysis showed no significant differences between the contributions of paternal and maternal grandmothers. In the presence of maternal grandmother probability of individuals survival up to age 5 was 0.61 (95% pointwise CI = 0.59-0.64). In the presence of paternal grandmother it was 0.61 (95% pointwise CI = 0.58-0.64). The pointwise 95% probability corridors coincided. Absence of both grandmothers lowered the probability of survival. Child without an access to any grandmother was 1.11 (95% CI = 1.00-1.22, $z=2.03$, $p=0.04$) times more likely to die before the age of 5 than a child who could benefit from a presence of at least one grandmother.

Our results do not support the hypothesis of higher relevance of maternal grandmothers. The possible disproportion might be easily distorted by cultural practices of patrilocality - when newlyweds move to the husbands household.

Keywords: grandmothers, paternity certainty, church records, demography, patrilocality

Shaping rating studies: social perception of facial morphs calibrated by body fat

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Objective Inferences from studies of social perception become more powerful when the behavior of the raters can be separated from the variability of the stimuli. We explain and demonstrate a new, rigorous method for revealing the trends that govern how people evaluate diverse human traits as a function of just one single variable, the extent of body fat as expressed in the face.

Methods Twenty-two landmark-semilandmark configurations of faces from Austrian female adolescents were regressed on body fat percentage (BFP). Predicted facial forms were computed for a BFP score at the average (this prediction would be the Procrustes mean) and at ± 2 SD and ± 5 SD of BFP from that mean. Unwarping the original photographs and averaging them produced five facial stimuli that were rated by 274 raters of both sexes in three age groups (adolescent, young adult, senior) for maturity, dominance, masculinity, attractiveness, and health.

Results We found systematic effects of facial correlates of BFP in female adolescents on social perception by adolescents and adults. With increasing BFP, all age-sex groups showed a flat trend for maturity, a linearly increasing trend for dominance, a flat-rising pattern for masculinity, a cap-shaped pattern for health, and an asymmetric cap shape for attractiveness (with a preference for leaner faces).

Conclusions The work reported here improves on the standard research design for exploring the link between biological causes and psychological effects. Geometric morphometrics allowed us to isolate, quantify and depict the facial shape features associated with BFP. Morphs calibrated in this way force the human rater to attend to a specific underlying dimension, which in turn permits the interpretation that this dimension is causally related to the rating behavior.

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Keywords: Body fat percentage, facial shape, geometric morphometrics, morphs, ratings

I know you love me: Eyetracking Study of Courtship Behaviors

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The main function of courtship behavior is to maximize reproductive success of an individual. Men and women have different thresholds for perception and interpretation of some courtship behavioral displays – in men is a bias toward attributing more sexual interest to target women.

The aim of our study is to find whether the female nonverbal courtship behaviors attract more attention (longer gaze fixation, pupil dilatation) than negative behaviors in male (M) and female (F) participants. 3 types of video-stimuli were developed: 1. Positive (courtship) 2. Negative (rejection), 3. Neutral behaviors. 6 target female actresses were recorded from 1st person perspective. For each videostimuli, participants (N = 42; 21 M, 21 F) rated target female interest in potential partner on a scale (1 - no interest at all, 9 – obvious interest) and Eyetracker Eyelink 1000Plus was used.

M and F accurately recognized the displays of interest/rejection ($F(6, 246) = 263,5; p < 0,001$). F ratings were more accurate than M. M attributed higher interest to target women in negative condition and lower interest in positive condition than F ($F(6, 245) = 3,621; p = 0,002$). Repeated measures ANOVA showed significant differences in perception of negative and positive behaviors: mean length of fixation was higher for positive stimuli than for negative ($F(2, 490) = 3,475; p = .032$) and pupil size was significantly greater in positive context ($F(2, 490) = 3,589; p = .028$).

The results confirm that F and M pay more attention to positive behaviors than to negative. This may increase biological fitness of both sexes. Higher female sensitivity for any female courtship/rejective behavior helps women in potential mate competition. Lower male sensitivity to rejection can on one hand lead to pointless investment in female who is not interested, but it may keep their interest in some yet undecided potential mates.

Keywords: nonverbal behavior; courtship; eyetracking

Poster presentations

Walk the Plank: Sex and gender equality policy impact self-expected performance

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Objective Biases in self-perception can be considered systematic deviations in judgment from objectively measurable facts. Error management theory predicts that if the cost of trying and failing is low in the face of potential success, an illusionary positive belief is to be preferred. Due to asymmetric minimal parental investment men may generally benefit from risk-taking and women from risk-avoidance. This study aimed to (a) test whether this tendency holds outside the previously investigated mating contexts (b) and if it might be modulated by cultural attempts to strengthen gender equality.

Methods Young Austrian and Danish men (n=108) and women (n=122) between the ages of 18 and 34 (M=22.85±3.11) were asked whether they believed they were able to separate two small planks connected with strings (mind puzzle “Walk the Plank”, which does not require skills in which one sex is typically better). In terms of gender equality, Denmark scores 2nd and Austria 13th in the European Union. Reported statistics are Fisher’s Exact tests.

Results Almost 40% of the men thought they could solve the puzzle, whereas only 28% of the women were equally confident (p=0.038, n=230). Furthermore Austrian women tended to be less optimistic compared to their Danish counterparts (p=0.069, n=122), while there was no difference in men (p=0.468, n=108). In relation to actual performance, men overestimated and women underestimated themselves (p=0.052, n=230). Additionally, men tended to externalize and women to internalize failure (p=0.068, n=78).

Conclusions The investigated phenomenon of predicting one’s performance in a game is likely to touch a variety of cognitive and motivational biases. Our results confirm that evolutionarily-predicted behavioral differences between the sexes extend to outside direct mating contexts. The observed national difference further suggests a cultural component: with higher gender equality, the difference diminishes.

Keywords: self-perception, sexual dimorphism, cross-cultural comparison, error management theory, risk taking

Associations between Life History Strategy and Perceived Stress factors mediated by the Dark Triad

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Previous studies indicated strong associations between life history strategies and stress experiences. We therefore assumed that life history strategy affects perceived distress and self-efficiency in coping. However, life strategies might not affect perceived stress directly, but rather indirectly through certain personality traits. According to the known associations of Dark Triad personalities with fast life strategies and perceived stress, this study examined the possible mediator role of these traits on the relationship between life strategies and perceived stress. Our results about the significant mediation effects of Dark Triad traits on both perceived distress and perceived coping indicate that these personality traits are part of the process in which faster life strategies predict higher level of perceived stress and lower levels of coping ability.

Keywords: Dark Triad; Perceived Stress Scale; Life History Strategy; Mini-K; perceived stress

Pride and social status: The role of subjective and objective social status regarding pride and status maintenance strategies

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Pride has a fundamental affective role in status seeking, attainment and signaling. Despite pride is a status-related emotion, we have limited knowledge about how this self-conscious emotion is related to the two main forms of social status by considering its subjective and objective aspects. In this research we aim to fill this gap by subjective and objective social status, prestige and dominance as status maintenance strategies, as well as the authentic and hubristic facets of pride. 4 studies were conducted to investigate the relationship pattern between the measured constructs. Study 1 and 2 were self reported online questionnaire studies (N1= 552, N2=509), Study 3 was a self reported vignette study (N=345) and Study 4 was a situation evaluation vignette task (N=497). In both vignette studies subjective and objective social status were manipulated in a 2×2 design (high-low). Structural equation modeling was performed to analyse the relationship patterns. All 4 studies confirmed that subjective social status is indirectly related to authentic pride via prestige. Objective social status was unrelated or very weakly related to both facets of pride and status maintenance strategies as well in Study 1 and 2. In Study 3 it was directly related to authentic and hubristic pride. In Study 4 it was directly related to authentic pride and indirectly to hubristic pride via dominance. We conclude that these results clearly demonstrate that different types of social status are more dominantly related to different facets of pride if we consider the related status maintenance strategies. If subjective social status is high, so the individual perceives respectedness in relevant social groups and use prestige based strategies to maintain status authentic pride is experienced. In case objective social status, namely financial status, education and material possessions the picture is less clear. High objective status is associated with dominance only when it has to be declared on others but not ourselves.

Keywords: subjective social status, objective social status, prestige, dominance, pride

Women's attractiveness is linked to expected age at menopause

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A great number of studies have shown that features linked to immediate fertility explain a large part of the variance in female attractiveness. This is consistent with an evolutionary perspective, as men are expected to prefer females at the age at which fertility peaks (at least for short-term relationships) in order to increase their reproductive success. However, for long-term relationships, a high residual reproductive value (the expected future reproductive output, linked to age at menopause) becomes relevant as well. In that case, young age AND late menopause are expected to be preferred by men. However, the extent to which facial features provide cues to the likely age at menopause has never been investigated so far. Here, we show that expected age at menopause is linked to facial attractiveness of young women. As age at menopause is heritable, we used the mother's age at menopause as a proxy for her daughter's expected age of menopause. We found that men judged faces of women with a later expected age at menopause as more attractive than those of women with an earlier expected age at menopause. This result holds when age, cues of immediate fertility and facial ageing were controlled for. Additionally, we found that the expected age at menopause was not correlated with any of the other variables considered (including immediate fertility cues and facial ageing). Our results show the existence of a new correlate of women's facial attractiveness, expected age at menopause, which is independent from immediate fertility cues and facial ageing.

Keywords: sexual selection, mate choice, face, menopause, fertility

Is women's facial attractiveness a valid health cue?

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Objective: Previous reports that women with attractive faces are healthier have been widely cited as evidence that sexual selection has shaped human mate preferences. However, evidence for correlations between women's physical health and facial attractiveness is equivocal. Moreover, positive results on this issue have generally come from studies of self-reported health in small samples.

Methods: The current study took standardized face photographs of women who completed three different health questionnaires (Ns=582, 583, 572) and provided a saliva sample. Saliva samples from 221 women were assayed for immunoglobulin A (a marker of immune function). Color-calibrated versions of the face images were then rated for attractiveness by 32 raters.

Results: Analyses showed no correlations between rated facial attractiveness and either scores on the health questionnaires or immunoglobulin A.

Conclusions: These null results do not support the common assumption that women's facial attractiveness is a health cue.

Keywords: attractiveness; health; mating; immune system

Human sexual imprinting

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Objective Studies that have explored sexual imprinting propose that humans learn a mental model of their opposite-sex parent's phenotype for use as a mate choice template. This review will summarise current literature and findings on sexual imprinting in humans.

Methods Photos of faces have often been used to test hypotheses about human homogamy, with raters assessing the facial similarity of real and control pairs, or matching an individual's partner to their other-sex parent. Other studies use categorically describable phenotypic traits, such as hair and eye colour. Personality traits have also featured in testing for sexual imprinting. Many studies also explore potential moderating effects of the parent-child relationship on sexual imprinting-like effects.

Results Findings suggest that sexual imprinting is a viable explanation for homogamy in mate choice and preferences. There is some evidence that the quality of the parent-child relationship moderates imprinting-like effects. Adequate data to test for a critical period are lacking.

Conclusion Studies assessing self-partner or partner-parent similarity through human ratings may be assessing compatibility rather than phenotypic similarity. Future studies should focus on the mechanisms by which experience with parents might translate into mate preference, as well as explore more direct methods for comparing phenotypic similarity.

Keywords: sexual imprinting; parental imprinting; mate choice; homogamy

Having other-sex siblings predicts moral attitudes to sibling incest, but not parent-child incest

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Objective Previous research suggests moral attitudes towards sibling incest are more negative in individuals with other-sex siblings (versus those without). We tested whether this effect replicates and generalizes to moral attitudes toward parent-child incest.

Methods The moral judgments scale (Lieberman et al. 2007) and a sibling questionnaire were completed online by 515 heterosexual women and 145 heterosexual men having only full siblings of a single sex. Following Lieberman et al. (2007), we measured sibling incest aversion as the summed ranks of two items involving sibling incest. We also calculated an equivalent measure of parent-child incest aversion as the summed ranks of two items involving other-sex parent incest.

Results We used linear mixed effects modeling to predict incest aversion scores from target (sibling vs. parent), sex, and sibling sex. Incest aversion scores were higher for parent than sibling targets (estimate = -0.51, se = 0.03, $p < .001$) and higher for women than men (estimate = -0.49, se = 0.08, $p < .001$). The significant interaction among sex, sibling sex and target was interpreted using separate linear models. For sibling incest aversion, there was a significant interaction between sex and sibling sex (beta = -0.62, se = 0.18, $p < .001$), where women with brothers had greater sibling incest aversion than women with sisters (beta = 0.20, se = 0.08, $p = 0.014$), while men with brothers had lower sibling incest aversion than men with sisters (beta = -0.42, se = 0.18, $p = 0.025$). For parent incest aversion, there was no such interaction between sex and sibling sex (beta = -0.22, se = 0.18, $p = 0.23$).

Conclusion We replicate previous findings that moral attitudes towards sibling incest are more negative among individuals with other-sex siblings than those without. This effect does not generalise to moral attitudes towards parent-child incest.

Keywords: incest aversion; kinship; siblings; parents

Physical strength as cue for women reproductive success in Datoga semi-nomadic pastoralists

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It is suggested that in the process of human evolution physical characteristics, signaling good health, were used as of good reproductive qualities of women (Buss, 1989, Singh 2002, Frederick et al., 2010, Swami, Furnham 2008). It was demonstrated that a number of physical traits, such as height, BMI, skin quality, WHR influence the choice of marriage partner by men. Low WHR ratio is not only an indicator of youth, but may solve a cue of the number of children already born to particular women (Butovskaya et al., 2017). In the paper we tested the hypothesis that physical strength (hand grip strength) may be a good predictor of reproductive success in women from traditional societies. We conducted the study among the population of the Datoga, traditional semi-nomadic pastoralists, who live in Tanzania (East Africa). The sample consisted of 154 women, with age range from 16 to 80 years. The data on demography and anthropometry were collected, including age, marriage status, number of children born, died and alive at the moment of our study, height, weight, hand grip strength, waist and hip circumferences and pressure were collected. It was demonstrated that controlling for age, the BMI has been positively associated with the number of children born and remained alive. Controlling for age, the hand-grip strength was significantly positively correlated with the BMI and negatively with the number of children die. Negative association between hand-grip strength and the number of children die remained significant with control for age and BMI. We conclude, that women with a weaker strength in traditional society (limited access to medical help) have lower reproductive success. Thus, physical strength may be reliable separate cue of reproductive success in women, along with BMI.

Acknowledgement: This study was supported by the RFBR grant 16-06-00223.

Keywords: reproductive success, hand grip strength, BMI, datoga

Strategies for making important life decisions

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Objective To evaluate the effectiveness of decision-making strategies used in making important choices.

Methods. 33 men and 35 women aged 35-50 years were examined by means of repertory grid technic, the obtained data were processed by multidimensional scaling.

Results. The effectiveness of the decision-making strategies was determined by the proximity of the scaled objects to the ideal (calibration) objects. An effective / right choice is one that changes the respondents' life for the better. The most effective strategies for making important life decisions contain an irrational component.

Flash insight strategy. This is an instant choice, when important meaningful but poorly realized motives are working, whose deep meaning is revealed through sensual discretion. The decision is perceived as obeying to the "heart command".

Sensitivity strategy. The problem solver relies on sensitivity to his own weak emotional signals, anticipating the results of the choice. The solution is the result of trust in his irrational processes.

Cognitively prepared insight strategy. Long and difficult cognitive work and evaluation of alternatives are completed with sudden enlightenment, which is accompanied by positive emotional signal. It is interesting that men give greater importance to the complex cognitive work preceding the insight, and women – to the very moment of insight and a positive emotional flash.

Conversely, the most distanced from the right choice, which has changed life for the better, are strategies based on rational estimation. These strategies are evaluated as deeds that respondents should regret or which have caused some life difficulties.

Conclusions. Emotional evaluation plays role of a subtle indicator of the effectiveness of making important life decisions. Evolutionarily earlier mental structures provide clues for making more effective decision. The results open up new aspects of the discussion about the ratio between neo- and paleo- in modern psychic life.

Keywords: decision-making, strategy, choice, deed

Children resemble women more than men, regardless of kinship status

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Objectives Unrelated third parties can judge kinship with some accuracy from facial appearance alone. However, evidence is mixed on the relevance of gender and age to kinship detection. Previous studies have variously reported increased resemblance or kinship detection between father-child pairs, mother-child pairs, mother-daughter and father-son pairs, or woman-child pairs, with some effects increasing or decreasing with child age. Here we investigate the role of adult and child gender and child age on kinship judgments.

Methods Raters viewed 240 pairs of photographs of one adult and one child (age 2-18), and indicated whether each pair was related or unrelated. Half of the pairs were related parent-child pairs and half were age- and gender-matched unrelated adult-child pairs. No image was shown more than once, related pairs were not related to any other image in the study, and individuals from unrelated pairs were not related to any other image in the study.

Results We used binomial logistic mixed effects modelling to predict kinship judgments from relatedness, adult gender, child gender, and child age (with image pair and rater as random factors). Relatedness was the main factor driving kinship judgments; parent child-pairs were more than twice as likely as unrelated pairs to be judged as kin. Raters were about 20% more likely to judge woman-child pairs as kin than man-child pairs, regardless of the actual kinship of the pair. This effect was qualified by an interaction with child age and was larger for older children. Kinship judgments were unaffected by child gender or its interaction with adult gender.

Conclusions These findings indicate that adult gender biases kinship judgments, but not the accuracy of kinship judgments, especially for older children. This can not be explained by younger children resembling women more than men because of their neotenous facial features, as previously hypothesized.

Keywords: kin recognition; kinship; faces

Attachment and relationship functioning in heterosexual couples

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Attachment behaviour is performed by children to obtain or maintain proximity to a caregiver who provides protection and care. This pattern of behaviour persists into adulthood where romantic partners represent the attachment figures. Here, secure attachment style was found to be related to relationship adjustment. Studies are inconsistent, as to whether securely attached individuals tend to mate with secure (similarity) or insecure (avoidant/anxious; complementarity) partners. It is also unclear whether the association of attachment and relational adjustment is same for both sexes.

Our aim was, firstly, to investigate the pattern of mating considering attachment of both partners. Secondly, to test the association between relationship adjustment and attachment style in couples.

We evaluated data from 20 heterosexual couples (average age 27, SD=7.6 years). The avoidant and anxious dimensions of adult attachment were measured by the Experiences in Close Relationships-Revised (ECR-R). Relationship adjustment was determined by the Dyadic Adjustment Scale. We applied the Actor-Partner Interdependence Model (APIM) for dyadic data.

We found a positive intra-individual association between anxiety and avoidance (men: $r=.58$, women: $r=.50$). Anxiety of women was also positively associated with her partner's anxiety ($r=.33$) and avoidance ($r=.37$). Woman's anxiety was negatively associated with both her ($p=.005$) and her partner's ($p<.001$) relationship adjustment. Man's anxiety was not related to either his ($p=.43$) or his partner's ($p=.89$) relationship adjustment. Both woman's ($p=.024$) and man's ($p=.046$) avoidance was negatively associated with their partner's relationship adjustment. Moreover, woman's avoidance was negatively associated with her ($p<.001$) relationship adjustment.

Our results support the hypothesis of homogamous mating regarding the level of attachment security. We further confirmed previous findings that insecure attachment styles are related to lower relationship adjustment.

Keywords: heterosexual couples, attachment, relationship adjustment

Does sexual orientation moderate perception of tattooed men?

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Objective. Topics of influences of tattooing and sexual orientation on perception of attractiveness are understudied in the up-to-date literature. It has been shown in studies based on heterosexual individuals, that tattoos have an impact on men's and women's perception of a male subjects. However, there is no such studies based on non-heterosexual individuals, or including comparison between hetero- and homosexual participants.

Methods We photographed nine shirtless men without tattoos from the waist up. We digitally modified these pictures by adding a black arm tattoo with an abstract, neutral design. We asked 2436 heterosexual women, 230 heterosexual men, 50 homosexual women and 60 homosexual men to rate a randomly selected version of each photo in four categories: masculinity, dominance, aggression and attractiveness.

Results Heterosexual men and women rated tattooed men as more masculine, dominant and aggressive, however only heterosexual men rated tattooed versions of pictures as more attractive. In contrast, although homosexual men perceived tattooed men as more dominant and aggressive they also rated them as less attractive. Among homosexual women, we observed no significant difference between assessments of tattooed and non-tattooed men. Moreover, sexual orientation significantly moderated relationship between perceived aggression and attractiveness of tattooed men. Among homosexual men increased perceived aggression was connected with lower assessments of attractiveness and in a group of heterosexual women with increased attractiveness of tattooed men.

Conclusions Both, sexual orientation and gender differentiate not only attractiveness and masculinity judgments of tattooed men, but also the perception of their dominance and aggression. We suggest that attractiveness studies require a more nuanced approach to that of simply dividing participants according to their gender or preferred gender of their sexual partner.

Keywords: Tattoo; attractiveness; sexual orientation

Evolutionary Perspectives of Helping Disabled People

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The topic of this pilot research addresses why is prosocial, helping behavior towards disabled people is an adaptive tendency for humans. We investigated the evolutionary basis of helping disabled people, why is it adaptive on group and individual levels. The social representation of disability was used, which is an understudied but very essential issue in Hungary. In this paper disability covers physical disability, deafness and blindness. Besides these, the distinction and similarity of social representations of disabled and healthy families are also discussed.

The sample consists of 84 healthy Hungarian people (18-25-year-olds). Method of association network is used to get a representative view of people with physical or sensory disability and of families concerned with disability. People had to associate to words like “disability”, “deaf person”, “blind person” and to pictures describing families with or without a disabled person. IRaMuTeQ multidimensional text-analyzing software was used to investigate the central core and peripheral system of social representations. We focused on how often people associate to words in connection with helping. Results are intended to compare with evolutionary adaptive tendencies of people to help disabled people. Our hypothesis is that people will associate to “helping words” in connection with physical disability most often. Social representation of deaf people will contain the less amount of association in connection with prosocial behavior and helping.

In the future, different age groups (25 to 34 years, 35 to 44 years and 45 to 54 years) are planned to add to the research and compare regarding the social representations of disability types. Polarity and neutrality of associations are also planned to be investigated regarding disability types. The importance of this research is undoubted for many reasons. Beyond that, no similar study has been conducted yet in Hungary, further investigation of healthy and disabled family interactions is intended in our research, which requires a representative perspective, how Hungarian people have disability in mind.

Keywords (max. five): disability, social representation, evolutionary basis, helping

Individual Differences in Music Preferences. Life History Strategy reveals distinct variation

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Music has been an essential part of human culture for thousands of years. It serves as a medium of communication and has signalling qualities. In the past 2 decades numerous studies explored the relationship of personality traits and music preferences on the basis of the big five of personality, but findings offered not very distinct results. Basically openness for experience revealed positive correlations with several types of music genres, e.g. intense music genres (heavy metal, punk) are more likely preferred by individuals who rate high on openness to experience. At the same time sophisticated music genres (classical music, jazz) and mellow music genres (pop, musicals) are also preferred by individuals who rate high on openness to experience. What is more, effect sizes were predominantly small. This study extends research on individual differences in preferences for musical styles by applying the evolutionary informed concept of life history strategy to that stream of research.

376 participants from Austria (mean age = 37, SD = 14, 58% female) took part in an online survey. Each participant completed a questionnaire with an adapted version (26 music genres) of the revised Short Test of Musical Preferences (STOMP-R). The 20 item Mini-K scale was used to measure life history strategy.

Findings were more selective than in previous big five studies. Results for example revealed a distinct positive relationship between sophisticated music genres like classical music and slow life history and a significant negative relationship between intense music genres like heavy metal and slow life history strategy.

It was figured out that application life history strategy could enrich our understanding of individual differences of music preference. Further studies should go beyond mere music preferences and examine life history strategies of members of music scenes and subcultures.

Keywords: life history strategy, music preferences

Moving' beyond static faces: Assessing social and personality judgements in static and dynamic face stimuli

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Objective Many experimental studies highlight social (e.g. attractiveness, trustworthiness, dominance) and personality (e.g. extraversion, neuroticism) traits as important judgements made from static 2D faces. However, motion is an important parameter not considered in many studies exploring facial judgements. Due to the methodological importance, two studies explored the consistency of such judgements across ecologically valid dynamic face stimuli.

Methods In one study, participants ($N = 74$) rated 48 faces (23 male, 25 female) on social traits (attractiveness, trustworthiness, dominance) using a 7-point Likert Scale. Participants were randomly allocated to one of four movement conditions: static, control (reading vowels out loud), natural unscripted speech, and scripted speech (reading out a weather forecast). All videos were muted providing participants with only dynamic information.

Results Overall, weak to moderate correlations were found for all static and dynamic presentations in each social trait judgement. Further, there were no significant differences in mean Likert scale scores across static and dynamic conditions. Results of personality ratings will also be discussed. Aligned with previous work exploring the similarities in facial judgements across different face stimuli types, these results suggest that there are similar social trait ratings in static and moving faces.

Conclusions The results extend our understanding of social perception beyond solely using rigorous standardised laboratory face images.

Keywords: Face perception; Personality: Social trait; Motion

Facial correlates of body fat percentage affect perceived job qualification

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Objective There is a known weight-based stereotype when selecting job applicants. Slimmer and more attractive persons are preferred over individuals with a higher body mass index, especially for positions with face-to-face customer contact. In this study, we isolated and systematically manipulated facial correlates of body fat percentage (BFP) in female faces to test stereotyping in suitability assessment for several kinds of jobs.

Methods Fifty-seven female and 53 male Austrian students (18–31 years) rated five facial morphs in random order. These morphs were average pictures warped to the positions of 72 landmarks and semilandmarks predicted by linear regression on BFP at five different levels (the average, $\pm 2SD$, $\pm 5SD$) after Procrustes superimposition. Participants were asked to rate each person's suitability for six jobs on continuous scales (not at all – very qualified).

Results Generally, each morph was perceived to be qualified, yet the extent varied with BFP. For retail front-office and event management, the ?2D morph received the highest ratings with a stronger decline for higher BFP values. This preference shifts towards the average morph for the nanny and the scientific assistant (the latter with very little discrimination between all five morphs). In contrast, perceived suitability for retail back-office and museum attendance increased linearly with BFP. All repeated measurement ANOVAs were significant with $p < 0.05$ and did not show an effect of rater sex.

Conclusions This study confirmed some of the previously reported preferences consistent with a beautiful-is-good stereotype, but also demonstrated that there were other contexts in which shape features associated with high BFP were favored, especially for the museum attendant. It remains to be tested whether this persists when presenting body shapes so that the weight context becomes explicit. This might help distinguishing between dominance- and health-related aspects of weight bias in female occupational attainment.

Keywords: body fat percentage, facial adiposity, facial shape, job application, stereotype

Which 3D shape cues drive perceptions of facial similarity?

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Objective Previous studies have used rated similarity of faces as a means to investigate kin recognition as well as homogamy in romantic partners. Little is known, however, about which facial cues drive perceptions of similarity. Here, we use a bottom-up, data-driven approach to investigate whether perceived facial similarity is linked to similarity in 3D face morphology, and which facial dimensions are most important in eliciting perceptions of similarity.

Methods We took three-dimensional images of 139 heterosexual couples aged 19-72. Paired images of each couple were presented to 26 raters (13 male, 13 female), who were blind to the nature of the pictures and asked to rate how similar each face pair looked. 3D face models were subjected to a principal component analysis of shape, and two sets of similarity measures were derived: closeness in 3D face space, as well as distance on individual face dimensions (shape PCs). The same set of measures was also derived for locally circumscribed regions, i.e. eye, nose and mouth regions.

Results Mixed-effect models showed that faces were perceived as more similar the closer they were in face space. In particular, similarity in face width vs height (PC2) was a strong predictor of perceived similarity. Looking at individual facial regions, similarity in eye (size) and nose (width/height) but not mouth regions predicted perceptions of similarity.

Conclusions When asked to judge the similarity of opposite-sex faces, raters mainly relied on similarity in facial dimensions that explained substantial parts of general variance in face shape (higher-order shape PCs).

Keywords: kinship, perceived similarity, 3D face shape

Transactional relationships in the 21st century - researching Sugar Dating in Hungary

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Objective The spread of web-based solutions and services deeply changed the contemporary dating habits. The popularity of the online dating sites and apps brought the appearance of services fostering transactional intimate relationships. Beside the traditional prostitution a less clear-cut mating construction, the Sugar Relationships rose recently. Websites fostering Sugar Relationships promise financial or in kind support, carefree and exciting life for the potential Sugar Babies, who seek for the bliss on the side of a support-provider Sugar Daddy. These discretion and transaction based relationships are gaining ground globally, which draws attention to several psychological and societal research questions. How do the parties involved in the agreement define their relationships? How they define themselves in their relations? What are the consequences of the agreement and what physical and mental health risks they do pose?

Methods We used convenience sampling on our target group and carried out semi-structured in-depth interviews with 20 registered users (10 Sugar Baby and 10 Daddy) of the Hungarian sugar dating site.

Results However the main motivation for Sugar Babies is the provision of financial security, adventurousness also plays a significant role. The Sugar Babies involved in our research do not have any other intimate relationships outside their agreements which make them emotionally vulnerable. The Sugar Daddies are looking for intimate relations without strong strings attached, and they don't necessarily consider their agreements as romantic relationships.

Conclusions Parties involved in our research do not consider their agreements as prostitution. Services fostering such relations should not only provide useful tips for the Babies to hold discretion and cope with inexclusiveness, but prepare Daddies for the emotional consequences of their actions.

Keywords: Sugar Dating, online dating, relationships, mating, casual relationships

Charity giving - Is it in the eyes? Do blinking eyes on screens make us feel we should give more?

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Costly signalling theory argues people behave more altruistically when they feel they are being observed (Van Vugt & Hardy, 2010). Photographs of eyes can make people feel like they are being watched and may help online charity donations (Ekström, 2011). However, the effectiveness of 3-D eyes cues (Krátký et al., 2016) and direct gaze (Frischen et al., 2007) suggests mixed results in online environments and that stimuli needs to be more realistic i.e. non-static (Conty et al., 2016). This study explores whether realistic (blinking as opposed to a static eyes) increases feelings of being watched and charitable behaviour in online environments. Participants were recruited via two different crowd-sourcing methods; 'Call for Participants' and mtURK. Call for Participants is a recruitment site whereby people give their time freely to complete online studies, whereas mtURK recruiters were paid \$2 for their time. All participants completed an online game in which they could earn up to a ?2.50/\$1.13 bonus, after which they could offer a percentage of their earned money to charity. These online donations were made in one of three conditions; either the online screen presented participants with an image of static eyes, blinking eyes or no eyes. Whilst no significant difference in charity giving was found between the eye conditions; suggesting that the realism of the eyes do not make an effect on charity giving, there was a significant difference in the amount donated to charity between participants recruited from 'Call for Participants' and mTurk. Participant motivation may therefore be a key factor in the watching eyes effect. We argue that to fully understand eye stimuli in online charitable scenarios, we need to know more about where people look on screen (via eye-tracking software) and whether eyes on screen really make people feel they are being watched or not.

Keywords: Watching Eyes Effect; Altruism; Cues

Assortative mating in dominance and Big Five characteristics

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Previous research suggests that people tend to select partners who resemble each other in various characteristics (e.g. educational level, age, facial features). This effect is known as positive assortative mating or homogamy. The homogamy was also observed in some personality characteristics. A potential exception might be dominance where heterogamy was also found (i.e. submissive individuals tend to mate with dominant ones) while other studies do not show consistent pattern.

The main objective of our study was to test the assortative mating in dominance and Big Five characteristics of long-term couples. Based on previous studies, we expected homogamy in Big Five characteristics and heterogamy in dominance.

Total sample consisted of 199 heterosexual couples (mean age = 23.7 years, SD = 4, range = 18 - 40; mean relationship length = 35.8 months, SD = 30.9, range = 1 - 180). In an online survey, both partners completed a questionnaire on dominance by using International Personality Item Pool (IPIP) and Big Five characteristics by using Ten-Item Personality Inventory (TIPI, with domains of Extraversion, Emotional Stability, Openness, Agreeableness, and Conscientiousness).

We found significant positive correlations between partners' scores in dominance ($r=0.15$, $p=0.04$) and scores in Openness ($r=0.17$, $p=0.02$). No other significant positive correlation between personal characteristics was observed. The observed pattern was not affected by the length of relationship.

The results of our study show that couples tend to resemble each other in dominance and Openness, but not in any other Big Five traits. This indicates that homogamy or heterogamy in dominance might vary across different measures of dominance. Further research should aim at the effect of homogamy in dominance on relationship satisfaction and stability (i.e., frequency of relationship termination).

Keywords: homogamy, mate choice, personal characteristics

A Study of Personality and Marital Readiness among Young Adults in Indonesia

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Background Not only affects the world economy, globalization also affects individual's personal aspects, one of which is decision to marry. The wider the opportunities to have better education and better job relates to a shift in individual's age to marry, including in Indonesia. However, an increase in age to marry doesn't always mean that couple becomes more ready to marry. It is indicated by the increase of divorce rate in Indonesia, especially among young couples. Some literatures have investigated marital readiness in terms of demographic factors, but not many literatures investigate marital readiness using personality perspective.

Objectives This study investigated relationship between personality trait and marital readiness. We also investigated any differences in marital readiness if viewed from demographic variables. Methods: We used Big Five Inventory (BFI) as a personality trait measurement and Preparation for Marriage (PREP-M) to measure marital readiness. Both measurements were proven to be valid and reliable to use in this study. Participants in this study are unmarried Indonesian young adults, who are committing in a romantic relationship, whether dating or engaged (N = 207).

Results Using Pearson's Correlation, it was found only Conscientiousness ($p = .003$; $r = .208$) and Neuroticism ($p = .032$; $r = -.149$) traits that significantly correlated with marital readiness. Using T-test and One-Way ANOVA, we also tested demographic variables, and it was found marital readiness differs significantly if viewed from educational ($p = .00$; $F = 9.536$) and relationship status ($p = .007$; $F = 7.462$) variables.

Conclusions From these findings, it can be concluded that some key features of conscientiousness and neuroticism traits may play a role as mediator or moderator variables in marital readiness. Furthermore, more study is needed to explore the role of personality factors, specifically Conscientiousness and Neuroticism, in determining marital readiness.

Keywords: marital readiness, personality, young adults, Indonesia

Bisexual women show positive sexual imprinting on the partner-sex parent for eye colour

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Objective Humans show an assortative mating pattern. Multiple hypotheses have been tested by studying partner eye colour and its relationship to parent and own eye colour. Most evidence is consistent with positive parental imprinting, whereby mate choice is biased towards the traits of one parent. Research on heterosexual people found that the best predictor of partner eye colour was maternal eye colour for men and paternal eye colour for women. However, research into those with same-sex attraction found that the best predictor of partner eye colour was maternal eye for those with a female partner and paternal eye colour for those with a male partner, regardless of the sex of participant. The current study investigates the relationship between partner and parent eye colour in a population of bisexual participants.

Methods We collected data online. Participants described the eye colours of themselves, their most recent male and/or female partners, and their male and female parents. We analysed data from participants who reported a known eye colour for self, a male partner, a female partner, a male parent, and a female parent. Because very few men met these criteria, we restricted analyses to women ($n = 556$).

Results Following previous studies, black, dark brown, and light brown were coded as “dark”, while hazel, green, blue green, blue, and grey were coded as “light”. We used binomial logistic regression models to predict partner eye colour from various combinations of own, maternal, and paternal eye colour. Comparison of models revealed that male partner eye colour is best predicted by paternal eye colour and that female partner eye colour is best predicted by maternal eye colour.

Conclusion Our results show that bisexual women follow a positive sexual imprinting pattern for human eye colour with partner-sex parent eye colour predicting partner eye colour.

Keywords: sexual imprinting; mate choice; sexual orientation

Pupil Dilation as a Measure of Disgust

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Objective Recent work on disgust's evolutionary role has focused on self-report measures. However, arguments for the existence of discrete emotions and research into specific emotions, including disgust, have suggested the need for a distinct physiological response for each emotion. The current research establishes the validity of one physiological measure, pupillometry, as a method of directly measuring and distinguishing between discrete emotions. This would extend prior research where pupillometry has been used to measure emotional arousal and valence, with both negative and positive hedonic valence causing pupil dilation, reflecting sympathetic activity.

Methods Participants ($n = 80$) were presented with emotionally engaging imagery and sounds. Pupil size was measured in response to the stimuli. Following presentation of each stimulus, participants rated the extent to which they felt happy, sad, angry, fearful or disgusted.

Results Data were analysed using a mixed effects linear model to predict pupil size from the emotion ratings, accounting for natural pupil size and low-level stimulus properties. We found that overall only increases in disgust predicted significantly larger pupils. Additional mixed effects analyses revealed that for images alone, only disgust significantly predicted pupil dilation. However, for sounds alone, disgust, fear, and sadness were all significant predictors of pupil dilation. In all cases, neither anger nor happiness predicted pupil dilation or constriction.

Conclusion In contrast with prior research, not every negative emotion caused significant pupil dilation and neither did the positive emotion. Feelings of disgust were related to pupil dilation more consistently than other emotions. The present findings suggest some discrete activation, and that measures of pupil diameter would be useful when investigating disgust. Additionally, fear and sadness predicted pupil dilation only when sounds were used, which has implications for the effect of stimuli choice used in emotional research.

Keywords: Emotion, Disgust, Pupil Dilation, Autonomic Nervous System

Beauty stereotypes affect the perceived severity of a sexual assault

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Objectives Beauty stereotypes affect the process of social perception in nearly all walks of life (Langlois et al., 2000). In their classic paper Sigall and Ostrove (1975) demonstrated that the physical attractiveness of a criminal defendant influenced the severity of the punishment meted out by the participants. In this study we investigated how the harshness of punishment changed as a function of the perpetrator's and the victim's physical attractiveness. We were also interested in the extent of victim-blaming (Ullman, 1996), as well as the perceived unfairness of the crime (Callan, Powell & Ellard, 2007).

Methods Participants were asked to evaluate eight scenarios describing a male perpetrator committing sexual assault against a female victim. The level of attractiveness of the stimuli varied across the panels (i.e. attractive / unattractive perpetrator vs. attractive / unattractive victim). Participants used a 7-point Likert-scale to indicate the severity of punishment (1 – The most lenient possible; 7 – The most severe possible), the extent of responsibility of the victim (1 – Not at all; 7 – Absolutely), and their own level of anger (1 – Not at all upset; 7 – Very upset), respectively.

Results Participants meted out more severe punishments if the victim was unattractive, regardless of the perpetrator's level of attractiveness. In sum more attractive victims were blamed more than less attractive ones, however, unattractive victims who got assaulted by a more attractive perpetrator were seen as being more responsible for the crime, too. Participants found the assault committed by an unattractive perpetrator against an attractive victim the least upsetting.

Conclusion We discuss the results based on the beauty stereotypes and cognitive schema literature. In sum the results suggest that our participants relied heavily on rape myths while evaluating the stimuli (Suarez & Gadalla, 2010).

Keywords: sexual assault, punishment, victim-blaming, anger, beauty-stereotypes

Is women's sociosexual orientation related to their hair length?

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Objective Previous study (Hinsz, Matz & Patience, 2001) explored the possibility that women's hair length signals their reproductive potential. From evolutionary perspective hair quality was correlated with women's health. As younger women tend to wear longer hair than older ones, longer hair can signal the owner's health and sociosexual orientation.

Methods 247 women filled our questionnaire anonymously via internet (age=35.7 years±10.75 years, min: 18y, max: 67y). It contains Hungarian version of SOI-R, Physical Attractiveness (Rational Scale) (Goldber et al. 2006), and Dominance Scale from CPI (Gough, 1956) and several questions about the participant (hair length, BMI, duration of mate relation).

Results No correlation was found between sociosexual orientation and hair length of women. At the same time correlation was found between self perceived attractiveness (SPA) and all of the SOI dimensions (behaviour, attitude, desire). Moreover positive correlation was found between SPA and dominance, and negative correlation was found between SPA and BMI.

Conclusions It seems that women's hair length does not correlate with their sociosexual orientation, but their own perceived attraction, their own perceived dominance, and the BMI is all linked to the sociosexual orientation. These results are in line with the recent similar research findings (Fisher et al., 2016).

Keywords: sociosexual orientation, women, attractiveness, head hair

Heat of the moment. Changes in sociosexuality across the menstrual cycle

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Objective Sociosexual orientation is understood as a personality construct reflecting individual differences in the tendency to restrict ones sexual activity to the context of intimate, long-term relationship (restricted orientation) or being more comfortable engaging in casual sexual contacts (unrestricted orientation). It is widely regarded as a stable construct and applied as such in a variety of studies. The purpose of this study was to verify if this understanding of sociosexual orientation is justified especially in the context of powerful body of research demonstrating that female sexuality is subjected to changes throughout the menstrual cycle.

Methods A group of 102 Polish women (aged 21-37, $M=28.8$; $SD=4.58$) participated in the study throughout one entire menstrual cycle starting from the first day of menstrual bleeding. During this time participants attended three meetings: the first one scheduled for the early follicular phase, second around the ovulation (in most cases not later than 48 hours after a positive result of the LH test) and third meeting approximately one week after the ovulation. During each meeting women completed a survey including socio-demographic questions and revised socio-sexuality inventory (SOI-R).

Results A one-way repeated measures ANOVA was conducted to compare the effect of menstrual cycle phase on sociosexuality scores in studied sample. Women revealed significantly less restricted sociosexual orientation at the time of ovulation compared to the luteal phase. Interestingly, this effect was observed for both SOI-R desire and SOI-R attitude component.

Conclusions Our results suggest that sociosexuality, at least in women in reproductive age, is not a stable construct. Studies applying measures of sociosexuality conducted in such samples should simultaneously control for the phase of participants menstrual cycle.

Keywords: sociosexuality, menstrual cycle

Are women in the luteal phase of menstrual cycle more disgusted?

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Objective According to the compensatory behavioral prophylaxis hypothesis, women should behave more preventive and feel more disgusted during periods of increased susceptibility to infection, caused by high concentrations of progesterone (e.g. luteal phase of menstrual cycle). However, results of previous studies are inconclusive. Therefore, our aim was to investigate differences in disgust sensitivity during phases of menstrual cycle, in healthy, regularly menstruating, young women.

Methods The level of disgust sensitivity was measured using Three Domain Disgust Scale and Padua Inventory – Washington State University Revision Questionnaire during the internet-based surveillance. Furthermore, photographs used in previous studies on the phenomenon of aversion were used to analyze the level of disgust. Based on reported cycle length and the number of days since the onset of their most recent period of menstrual bleeding 418 women were assigned to two groups: luteal phase (15-28 days of menstrual cycle, N=249) and late follicular phase (6-14 days of menstrual cycle, N=169).

Results Women in the luteal phase, in comparison to women in the late follicular phase, did not differ in their scores in Three Domain Disgust Scale, Padua Inventory and ratings of photographs depicting sources of infection. Adjusting analyses to age of participants and recently having an infection did not change the results.

Conclusion We did not confirm the compensatory behavioral prophylaxis hypothesis and this could be due to methodological limitations of our study. Even in regularly menstruating women significant inter-individual variation in sex steroid levels is present. Thus, information about being in a particular cycle phase does not allow for a reliable estimation of levels of hormones. In order to understand if indeed progesterone levels are responsible for disgust sensitivity, levels of this hormone must be measured.

Keywords: menstrual cycle, disgust, luteal phase, progesterone

Long term psychosocial effects of flooding events observed through focus groups in Hungary

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Objectives Record level floods have long lasting effects on local communities and individuals who experienced them. Depending on the actual circumstances these events might put people to “live in the fear of rain”, but the massive response and recovery efforts that communities could observe and benefit from external sources could generate a false sense of safety. As the number of flooding events are expected to increase in the future, it is important to understand how local communities cope with the burden of such events on a longer run.

Methods As part of the project Community Resilience in Urban Areas (CRUA) this current research included three focus groups in flood experienced urban communities. Following the research framework of the Psychosocial Support Reference Centre of Red Cross Red Crescent, I demonstrate different results from three target areas in Hungary.

Results Using data captured during the focus group discussions I was able to draw two contradictory pathways how a community and its members could react on the long run to a historical flooding event. The other aim of the focus groups were to identify good practices and lessons learned to increase the effectiveness of psychosocial interventions both in-country and internationally.

Conclusions Large scale external support during recovery could comfort the affected population into a false sense of safety, while inefficient dyke infrastructure and elevating flood levels could put them into everyday fear and anxiety. As dyke risk (risk of dam failure) could be never eliminated, preparedness actions on both protected and unprotected areas should include activities strengthening psychosocial capacities of the affected communities.

Keywords: floods, disasters, community resilience, social vulnerability

Do babies affect mate preferences in young men?

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From an evolutionary perspective men may consider babies of their potential mates as a disadvantage. Any future parental investment to a child that is not own descendant is a wasting of energy. How men react to women with a baby from her previous relationship is scarcely investigated. Since many of our mating preferences work subconsciously based on very simple cues, we hypothesized the presence of some basic visual cue that help men to avoid evolutionary costly decisions. In order to test this hypothesis we investigated whether young men differentiate between the photos made from young women with or without a model baby. Our preliminary results show that men's rating on women attractiveness did not correlate with women's self-rating of their own attractiveness. Average rating of women's attractiveness with or without a baby also did not differ. We will show whether men's preferences are modified by the measured morphological traits, e.g. asymmetry and digits ratio.

Cultural difference in the behavior of self-reported measure

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Objective To reveal that the response-style attributes, in other words the behaviour of self-reported measure, for example the extreme response style is a constant attribute at personal level, but beyond that, at population level the different countries can be differentiated as well.

Methods We have conducted the analysis of data gained by filling out Facet5 (Buckley; 2002) Big Five-based personality-questionnaires by over 260 thousand respondents in closely 30 languages, as an international cooperation.

Results According to the results, during the process of testing the personality, the form of the responses (meaning their extremity) and the content of the responses (meaning the scores of the personality scale) are in correlation. Even in such cases, when the mensuration targets such Big Five personality areas that are independent from each other. And this becomes the source of shared variance among the personality scales, in other words, measurement noise.

On new methodology grounds, we formulate standardized scores based on response-style cluster groups. With that, the differences of the significant Big Five scores among the different countries modify, transform in many cases. The extent of the distortion per respondent regarding certain personality dimensions can be over +/-1 Sten-point, and this affects 8-10% of the total sample.

Conclusions Overall, with this methodology innovation, it might be possible to avoid drawing false consequences or creating artifacts during the interpretation of the intercultural differences – due to the behaviour of self-reported measure.

Keywords: Big Five, Facet5, extreme response style

Correlating disgust and incest avoidance

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Objective Incest aversion enables individuals to avoid negative consequences of inbreeding. Disgust sensitivity is also related to mating decisions and can influence morality judgements. Research has identified three functional domains of disgust; pathogen, sexual, and moral. This study investigates which domain(s) of disgust are related to incest aversion.

Methods 588 women and 265 men completed the three-domain disgust scale (Tybur et al. 2009) and the moral judgments scale (Lieberman et al. 2007). Our measures of disgust were summed and we scaled ratings of the seven items from each domain (pathogen, sexual, and moral). Positive scores indicate greater-than-average disgust sensitivity. Our measure of incest aversion was the sum of the ranks of all six items from the moral judgments scale involving incestuous acts. These summed ranks were scaled and reversed so that positive numbers indicate greater-than-average perceived moral wrongness of incestuous acts.

Results General linear regression was used to predict the incest aversion score from the pathogen, moral, and sexual disgust scores. Overall, women had higher incest aversion scores than men ($\beta = 0.156, p = 0.084$). Pathogen disgust positively predicted incest aversion scores ($\beta = 0.098, p = 0.006$) and was not qualified by sex ($\beta = -0.012, p = 0.872$). Sexual disgust positively predicted incest aversion scores ($\beta = 0.234, p < 0.001$) and was qualified by sex ($\beta = 0.249, p = 0.005$), such that the positive relationship was stronger for men than for women. Moral disgust negatively predicted incest aversion scores ($\beta = -0.137, p < 0.001$) and was qualified by sex ($\beta = -0.191, p = 0.007$), such that the negative relationship was stronger for men than for women.

Conclusions Our data indicate potential relationships between incest aversion and all three domains of disgust. However, the incest aversion measure (derived from Lieberman et al, 2007) confounds attitudes towards incest with attitudes towards the other items in the ranking task. Further research with better measures of incest aversion is required to understand how incest aversion is related to each domain of disgust.

Keywords: disgust, incest aversion, moral judgements

Witchcraft belief does not co-evolve with descent or post-marital residence systems in Bantu societies

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Objective Witchcraft beliefs exist in many societies, and can have serious consequences for accused individuals. Kinship structures such as descent, which determines inheritance, and post-marital residence, or where couples live after marriage, produce different forms of conflict and competition. We investigated whether witchcraft belief in Bantu societies of sub-Saharan Africa co-evolved with such systems. We tested two alternative hypotheses: 1) Societies with matrilineal descent (traced through the female line) and matrilineal residence (couples reside with the wife's family after marriage) have higher belief in witchcraft than others. Such societies may have lower post-marital dispersal overall and higher competition for resources. 2) Societies with patrilineal descent (through the male line) and patrilineal residence (with the husband's family) would lead to higher levels of competition among unrelated females for reproductive resources, and potentially higher levels of belief in witchcraft and accusations. This would maintain cooperation among kin and damage the reputation of competitors.

Methods We used a combined dataset. Variables were levels of witchcraft belief in Bantu cultures (n=65), and their post-marital residence and descent systems. These were matched with a pre-existing linguistic phylogenetic tree. We applied Bayesian phylogenetic comparative methods to evaluate models of dependent evolution (traits evolve together), and independent evolution, (traits evolve separately). Analyses examined the co-evolution of witchcraft and patterns of matrilineality and matrilineality, and patrilineality and patrilineality.

Results Our results suggest it is unlikely witchcraft belief co-evolved with matrilineal or matrilineal, or patrilineal and patrilineal forms of social organisation, but evolved independently from these structures.

Conclusions Witchcraft beliefs are a labile cultural trait. Descent and post-marital residence may not influence the strength of witchcraft belief in a society, but influence its phenotype within individual cultures.

Keywords: witchcraft, social organisation, cultural phylogenetics, competition

Eating behavior models in the everyday consciousness

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Objective To identify implicit statements and beliefs (constructs of everyday consciousness), using which people organize their behavior connected with providing for the needs for food in a culturally specific way.

Methods 174 participants took part in the pilot study. Age, gender and education were recorded. The study was conducted using a modified semantic differential. Obtained data were processed by factor and cluster analysis.

Results Several factors as a result of processing data by factor analysis were obtained. These most significant factors are represented in the common mindset of participants. Extracted factors could be easily sorted along the evolutionary axis – from the very earliest forms that are common for all species (1, 2) to the last forms were gained during human and social evolution (4, 5).

1. Food as a “fuel” (presented as a way of maintaining the vital functions of the body);
2. Food as a “status” (as one way to support and to project power, preferred position in the hierarchy, affluence);
3. Food as a “pleasure / festivity” (the very transitional stage common to the humans and other species)
4. Food as a “tradition” (the way to support keep up the family’s traditions and symbolic identification with the representatives of a sort);
5. Food as a “treatment” (as the way to maintain the health, is strongly correlated with negative emotions).

The outcome of statistical analysis using cluster analysis shows the comparable results.

Conclusions The research revealed latent, implicit statements and beliefs that are common to the participants. Obtained data show like an evolutionary axis of the participants constructs of eating-behavior represented in the everyday consciousness. The results provide an opportunity for the further analysis and the better understanding of eating behavior and it’s organization.

Keywords: eating behavior, semantic differential, constructs of everyday consciousness

Kin recognition in 2D and 3D human faces

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Objective Kin recognition plays a major role in human social behaviour, with an effect on perceived trustworthiness, cooperation, and partner choice. Maloney and Dal Martello (2006) showed that humans can discriminate between photographs of biological siblings and unrelated pairs, finding a high correlation between perceived similarity and judgments of relatedness. Since 3D visualization produces an experience more similar to real life, the present study compares third-party kinship judgments using 2D and 3D face stimuli, testing whether the latter can produce more accurate discrimination.

Methods Raters viewed 100 pairs of faces and judged whether each pair was blood-related or not. Each rater saw 25 related 2D pairs, 25 unrelated 2D pairs, 25 related 3D pairs, and 25 unrelated 3D pairs (image type was counterbalanced between raters). Related pairs were comprised of adult siblings, while individuals in unrelated pairs were matched on age and ethnicity. Pairs of faces were presented on a black background, with 3D faces animated to move side-to-side (-40 to +40 degrees).

Results We found a positive effect of 3D visualization on perceived relatedness, but 3D visualization did not have any effect on the accuracy of kinship judgments. 3D pairs were more likely to be judged as related than 2D pairs, regardless of their actual kinship status.

Conclusion 3D visualization may not improve the accuracy of kinship judgment, but it does increase the bias to judge pairs as related. Along with the finding that kinship judgments are not impaired by face inversion (Dal Martello et al., 2015), this finding suggests that kinship judgments do not require complex or configural processing. They may, instead, rely on relatively simple cues that are equally accessible in 2D and 3D faces.

Keywords: kinship, kin recognition, faces

Sizing up the competition: Investigating individual differences in men's sensitivity to facial dominance cues

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Objective There is considerable evidence that ratings of men's facial dominance contain valid cues to their threat-potential. Communicating dominance through facial cues and accurately judging the dominance of others would have been adaptive for our ancestors, particularly males engaging in violent intrasexual competition. However, men vary in their ability to detect these cues in other men's faces. Previous research indicates that less dominant men, as well as shorter men, are more sensitive to cues of facial dominance/threat, which may be because the consequences for incorrectly judging these traits are more severe for them. The current study aimed to replicate previous results, and investigate several other possible biological and social factors on men's sensitivity to facial dominance cues.

Methods Eighty-six men of varying ages completed a facial dominance sensitivity task: they viewed twenty pairs of faces that were transformed to be higher or lower in masculinity (a trait very highly correlated with dominance). Participants indicated which of the two faces appeared most dominant. How often they correctly chose the high masculinity face as more dominant served as their facial dominance sensitivity (FDS). We also measured height, age, weight, bicep circumference, self-rated dominance and exposure to violence during childhood.

Results Mixed-effect models failed to replicate associations between height and FDS. Only age and self-perceived dominance were related to FDS. Older men showed lower sensitivity to dominance cues in other men's faces, and men who reported being more dominant showed higher FDS, controlling for dominance differences between themselves and stimulus faces. The effect of age remained when controlling for age differences between participant and stimuli. Both effects contrast findings from previous studies.

Conclusions We propose that older men show reduced FDS because of reduced motivation for intrasexual competition. Dominant men's higher FDS may reflect more experience of intrasexual competition, but requires further investigation.

Keywords: faces, dominance, intrasexual-competition, masculinity

Precuneus and higher order language skills – cortical integration of social, cognitive and linguistic information in discourse

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Objective: The study sets out to identify the cortical equivalent of the pragmatic meta-module of meaning construction (Sperber-Wilson 2002, Wilson-Sperber 2012), uncovering its role in higher-order cognitive tasks and mechanisms crucial in social cognition and communication, operating as a functional integration zone which synthesizes information from several domains and modalities of human communication, and neural input from several cortical regions involved in the mentalization network.

Method: The study investigates the pragmatics of irony processing and contextual effects in schizophrenia from a neurolinguistic perspective (Varga et al. 2013, 2014, 2016). Relying on neuroimaging (fMRI) techniques the research reveals the brain networks involved in social cognition and non-compositional processing, identifying an area with an integrative role (Schnell et al 2016).

Results: The area of the precuneus appears to be specifically important in pragmatic meaning construction as this cortical region plays a central role in a number of higher order cognitive functions and highly integrated tasks, including visuo-spatial imagery, episodic memory retrieval, self-processing operations (linked to executive control), like first-person perspective taking and experience of agency, and self-consciousness engaged in self-related mental representations during tasks. These functions are all crucial in processing a complex social context, and are typically known to be central in human specific social and linguistic behavior rooted in pragmatic competence.

The study also gives an insight into the evolutionary background of how the precuneus evolved, uncovering that this cortical area belongs to the associative cortices which have undergone considerable development and an increase in the complexity of its organization during primate and hominid evolution, due to which this regions is poorly developed in monkeys (Cavanna-Trimble 2006).

Conclusions: This highlights the role of the precuneus in higher-order cognitive functions we call human specific, such as social use of symbolic systems such as language, social cognition and pragmatic interpretation (Schnell 2016).

Keywords: Pragmatics, discourse processing, cortical integration zone, precuneus, mentalization

Cepstrum based measures of short utterances and shouts are related to threat potential in Mixed Martial Arts fighters

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Honest vocal advertising of individuals' threat potential may prevent unnecessary/costly physical confrontations. Previous studies have shown that listeners can indeed assess upper body strength from utterances alone, however, acoustic markers of body strength using most frequent measures such as fundamental frequency (F0) or formants have not been found. It can be argued that shouting, in comparison to habitual voice, represents vocalisation more ecologically relevant to diminish an already escalated conflict scenario and intimidate potential opponent. Therefore, our study focuses on acoustical correlates of short utterances and intimidating vocalisations of amateur MMA fighters in relation to measures of their threat potential. Apart from common F0 measurement, cepstrum based measures (inverse Fourier transformed spectrum analysis) were used which were found by previous studies to correlate with assessed vocal quality.

We collected short utterances (counting to ten in native language) and intimidating shouts, hand-grip strength, body height, and weight as proxy measures of threat potential from 44 amateur MMA contestants (mean age = 24.2 years) attending Amateur European MMA Championship. Recordings were analysed for intensity, F0, and cepstrum based measures - cepstral peak prominence (CPPs), quefrency of first rahmonic (R1), and rahmonics-to-noise ratio (rHNR).

Linear regression analyses showed that utterances F0 was related to height only. Both shouts' and utterances' F0 were strongly correlated with intensity. However, most robust acoustic feature related to threat potential was R1 quefrency of both utterances and shouts, which were related to all three proxies of threat potential – height, weight, and hand-grip strength. Also lower shouts' CPPs and higher utterances' rHNR were related to hand-grip strength.

Our results suggest that men with higher threat potential possess deep and less breathy sounding voices, and produce more grunt-like shouts. Our study also shows significance of using cepstrum based metrics, which may better reflect actual glottal folds properties.

Keywords: cepstrum, F0, hand-grip strength, height, weight

Father-partner similarity: Is there a difference between partners with whom women do and do not have offspring?

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Background Similarity between father and partner (imprinting-like effect) was observed in several physical and personality characteristics. Moreover, this effect is positively modulated by quality of relationship with father during childhood (i.e., better reported relationship relates to stronger paternal effect).

Objective However, it remains unclear, whether fathers have equal influence on all partners of their daughters. In other words, we tested whether father-partner similarity differs between partners with whom women have children and their long-term ex-partners with whom they have no offspring. We expected that father-partner similarity will be higher (in case of positive relationship with father) or lower (in case of negative relationship with father) in those with whom they reproduced, since from an evolutionary perspective this partner is viewed as the most important in comparison to the effect of non-reproducing relationships.

Methods In total, 386 heterosexual mothers (range 18-45 years, mean=30.97, SD=5.83) with offspring reported quality of relationship with their own father during childhood (s-EMBU), and physical characteristics (body weight, body height, by using image stimuli: facial masculinity, level of beardedness, muscularity BMI, level of body hairiness) of their father, partner with whom they reproduced, and ex-partner with whom they did not reproduce.

Results Results showed significant correlation in body height, body weight and facial masculinity between father and current partner ($r=0.22-0.26$) as well as father and ex-partner ($r=0.14-0.22$). Interestingly, no difference was found between those with whom they do and don't have any offspring. Furthermore, quality of relationship with father during childhood had no effect on father-partner similarity.

Conclusions Our results revealed no difference between father-partner similarity in partners with whom women do and don't have any offspring, which suggests that women might consider each partner as a potential father of their children. These results might be interpreted via high female investments in reproduction."

Keywords: mate choice; imprinting-like effect; physical characteristics

Cognitive representations of pet-keeping, motherhood and their correlates

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Findings suggest that dogs' relationship to humans is analogous to child-parent attachment and human adults exhibit parental behaviour both towards pets and children. Accordingly, cognitive representations of pet-keeping and parenthood may be related. In addition, pet-keeping is associated with lower stress and health problems and data also indicate that animal-assisted interventions reduce the number and severity of depressive symptoms. Thus, pet ownership may also protect against postpartum depression.

To test these hypotheses, in an online questionnaire study we examined cognitive representations of motherhood and pet-keeping as well as cognitive correlates of motherhood and pet ownership in 715 Hungarian women (age range=18-35 years).

Results indicate that among those who perceive maternity as a burdensome female role, but not among those who do not perceive it as such, pet ownership is associated with an increased likelihood of having had any postpartum depression feelings. Among those who have children, pet owners perceive maternity as more burdensome than non-pet owners. However, among childless women, pet owners find maternity less burdensome than non-pet owners. Pet owners with a more positive attitude towards their pets are more likely to find maternity as a burdensome role that has to be consciously prepared for.

Our findings indicate that there is a relationship between women's thoughts regarding motherhood and pets and suggest that, to some degree, women perceive pets as playing a similar role in the family as children. Supposedly, mothers who have a child and a pet try to take care for the child and the animal in a similar manner, and thus may find motherhood burdensome. Childless women who own a pet perceived motherhood as less difficult. This effect of pet keeping can be very important from a therapeutic point of view for women whose psychological characteristics play a dominant role in their infertility.

Keywords: cognitive, pet-keeping, motherhood, postpartum depression

A longitudinal analysis of men's intrasexual competitiveness, state anxiety, salivary testosterone, and salivary cortisol

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Previous research suggests that competition-induced increases in men's testosterone levels are associated with increases in their intrasexual competitiveness. Similarly intrasexual competitiveness tracks naturally occurring (i.e., non-induced) within-male changes in testosterone in many non-human primate species. However, whether these relationships are also evident when considering naturally occurring changes in human male testosterone levels is an open question. To investigate this issue, we carried out a longitudinal analysis of salivary testosterone and salivary cortisol levels and men's responses on the Intrasexual Competitiveness Scale. We used linear mixed models to test for possible effects of hormonal status on intrasexual competitiveness and state anxiety. We found no evidence that men's intrasexual competitiveness tracked naturally occurring changes in salivary testosterone, cortisol, or their interaction. However, men did report greater current (i.e., state) anxiety when cortisol was high, replicating previous findings. Our null results for steroid hormones and intrasexual competitiveness suggest that findings for relationships between competition-induced changes in testosterone and men's intrasexual competitiveness may not necessarily generalize well to relationships with naturally occurring variation in steroid hormones.

Keywords: Testosterone, Cortisol, Intrasexual Competition, State Anxiety, Longitudinal

Is women's facial width-to-height ratio (fWHR) correlated with sexual desire?

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Objective: Facial width-to-height ratio (fWHR) has been linked to many different behavioural tendencies. However, many of these correlations have replicated poorly across samples. Arnocky et al. (in press, Archives of Sexual Behavior) recently reported that sexual desire was correlated with fWHR. The current study aimed to replicate this finding in a large sample of women.

Methods: fWHR was measured from face images of 754 women. Each woman completed the Sexual Desire Inventory, which measures total, dyadic, and solitary sexual desire.

Results: Analyses revealed no significant correlations between fWHR and any of our measures of sexual desire.

Conclusions: These results do not support the hypothesis that fWHR is related to women's sexual desire.

Keywords: fWHR; sexual desire; morphology; faces

A preregistered test for cultural differences in preferences for facial morphology using a bottom-up, data-driven approach

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Objectives. Previous research investigating cross-cultural agreement in facial attractiveness judgments used top-down, theory-driven approaches in which putative cues of condition identified from theories of attractiveness (e.g., symmetry, averageness, sexual dimorphism) were experimentally manipulated in face images using computer graphics. Two important limitations of this approach are that it focuses on facial cues that may not necessarily play an important role in attractiveness judgments and does not examine how people use facial cues when assessing natural face images that vary simultaneously on multiple dimensions. To address these limitations we compared Chinese and White UK participants' face-shape preferences using a bottom-up, data-driven approach.

Methods: Chinese (N=30) and White UK (N=30) participants rated the attractiveness of opposite-sex Chinese (N=50) and White UK (N=50) faces. We used a bottom-up, data-driven approach (Principal Component Analysis), to identify the shape principal components (shape PCs) along which the face images naturally varied. Methods and analysis plan were preregistered on the Open Science Framework prior to data collection.

Results: Regression models showed that the shape PCs explained ~28% and ~21% of the variance in attractiveness ratings of female and male faces, respectively. Importantly, none of the effects of shape PCs were qualified by interactions involving rater ethnicity, suggesting Chinese and White UK participants used the available shape information in similar ways.

Conclusions: Our results suggest cross-cultural similarities in how Chinese and White UK participants use shape information when assessing facial attractiveness.

Keywords: attractiveness; culture; mate preferences; data-driven; PCA

Comparing matrilineal and patrilineal parental investment strategies in the eastern Tibetan Plateau of China

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Trivers and Willard hypothesized that parental investment might be biased according to different conditions of the parents, and there are studies showing that parents adjust their investment strategies to differences of ecology and social factors. Moreover, son preference is strong in China. In this paper, We compared the parental investment in the agro-pastoral patrilineal group Amdo and agricultural matrilineal group Zhaba populations in the eastern Tibetan Plateau and examined the factors affecting different parental investment strategies. We collected demographic and social-economic status data as well as self-narrative offspring sex preferences of parents in a demographic survey in 2017. We used Cox's mixed-effects model to analyze interbirth interval to compare in these two groups what are the factors affecting interbirth intervals as a measure of parental investment behavior. Our results showed that in matrilineal Zhaba population the sex difference of interbirth interval and self-report sex preference is not significant, whilst in patrilineal Amdo population the son preference is more significant. This difference in parental investment might be due to the difference of socio-ecology in two populations or cultural factors lead by kinship system difference.

Keywords: matrilineal, patrilineal, interbirth interval, parental investment

Can a modern threat be processed similarly to an evolutionary relevant? - Introducing a novel paradigm to study visual search

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Objective A large body of evidence suggests that threatening stimuli with evolutionary history have an advantage in visual processing. Later, it has been proposed that threatening stimuli are prioritised irrespective of evolutionary age. However, the classical method used to produce the results had been met with criticism. We present a new visual search task and provide evidence that it is an appropriate tool for future research. We use this novel paradigm to see whether evolutionary age does matter when it comes to the visual processing of threatening stimuli. Our hypothesis was that it is possible for some modern cues to be similar to evolutionary relevant ones.

Method Participants performed on a visual attentional task, while emotional pictures - gathered from the International Affective Picture System - were presented in the background. We used non-threatening and threatening images with evolutionary relevant (e.g. fish, snake, respectively) and modern (e.g. chair, gun) content. The level of arousal (medium and high) and low-level visual features (colour brightness, contrast, spatial frequency, image complexity) were controlled. We used a touchscreen monitor to track search performance.

Results Our results showed that negative valence decreased search performance more compared to non-threatening stimuli, however, higher levels of arousal compensated for this i.e. increased performance. Interestingly, the evolutionary history of the stimulus had not been found significant. Furthermore, our results underscore the importance of controlling for arousal.

Discussion Our results support the idea that the visual processing of some modern threatening cues could be similar to those acquired throughout the course of evolution. Furthermore, we claim that the level of threat, i.e. the arousal level, has to be taken into account in future research.

Keywords: visual search; arousal; threat; evolutionary age; valence

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