

HBES 2003

**The Human Behavior and Evolution Society
15th Annual Meeting**

June 4 - 8, 2003

**University of Nebraska-Lincoln
Lincoln, Nebraska**

<http://www.unl.edu/hbes>

Acknowledgements

Local Hosts: Raymond Hames
Patricia Draper
John Hibbing

Program Committee: Beverly Strassmann – Chair
Martin Daly
Frank Marlowe

Poster Award Committee: Elizabeth Cashdan
Bruce Ellis
Jane Lancaster

New Investigator Award Committee: Edward Hagan
Jeffrey Kurland
Mark Flinn
Donald McBurnney

Postdoctoral Research Award Committee Daniel Fessler
Donna Leonetti
John Manning

Organization Staff & On-site Volunteers Webmaster: Carl McCabe
Audiovisual Volunteers: Kyle Gibson, Beverly Hames, Christine Haney, Jennifer Kuzara, Carl McCabe
Registration Assistants: Christine Haney, Jennifer Kuzara
Program Assistant: Carl McCabe
Poster Session Coordinator: Patricia Draper
Accounting: Corrie Dolphens, Christina Dorsey

The meeting organizers would like to thank the University of Nebraska College of Arts and Sciences, the Department of Anthropology and Geography, the Department of Political Science, the Department of Psychology, the Geosciences Department, and the School of Biological sciences for their encouragement and financial support.

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QUICK TIMETABLE

WEDNESDAY, JUNE 4

- Check-in and on-site registration at Neihardt Residence Center
- **6:30** Reception at Morrill (Elephant) Hall

THURSDAY, JUNE 5

- **8:55AM** Welcoming Remarks (Auditorium, 211)
- **9:00AM** Morning Plenary by Ruth Mace, introduced by Beverly Strassman. (Auditorium, 211)
- **10:15AM** Morning Sessions
- **12:00PM** Lunch
- **1:00PM** Afternoon Plenary by Alan Kamil, introduced by Raymond Hames. (Auditorium, 211)
- **2:15PM** Afternoon Sessions
- **5:30PM** Executive Council Meeting (212 Nebraska Union). Bring takeout food from Selleck
- **7:00PM** Poster Session (Rotunda Gallery Nebraska Union)

FRIDAY, JUNE 6

- **9:00AM** Morning Plenary by Eric Alden Smith, introduced by Frank Marlowe. (Auditorium, 211)
- **10:15AM** Morning Sessions
- **12:00PM** Lunch
- **1:00PM** Afternoon Plenary by Steven Gaulin, introduced by Jeffrey Kurland. (Auditorium, 211)
- **2:15PM** Afternoon Sessions
- **6:30PM** Barbeque (Sheldon Sculpture Garden)

SATURDAY, JUNE 7

- **9:00AM** Morning Plenary by Ernst Fehr, introduced by Robert Boyd. (Auditorium, 211)
- **10:15AM** Morning Sessions
- **12:00PM** Lunch and Business Meeting. (Regency B)
- **1:00PM** Afternoon Plenary by Paul Rozin, introduced by Martin Daly. (Auditorium, 211)
- **2:15PM** Afternoon Sessions
- **6:30PM** Banquet and Awards Announcement (Union Ballroom)
- **8:30PM** Keynote Address by Boyd and Richerson, introduced by D.S. Wilson. (Kimball Recital Hall)

SUNDAY, JUNE 8

- **9:00AM** Morning Plenary by Jeff French, introduced by Patricia Draper. (Auditorium, 211)
- **10:00AM** Check-out of Neihardt Dorms (store luggage at front desk)
- **10:15AM** Morning Sessions

DETAILED TIMETABLE

NI = Paper Entered In New Investigator Competition

PD = Paper Entered In Post Doctoral Competition

The plenary lectures will be held in the Union Auditorium, Room 211. The keynote lecture will be held in Kimball Recital Hall.

WEDNESDAY, JUNE 4

- Check-in and on-site registration, Neihardt Residence Hall (540 North 16th Street).
- **6:30PM**: Reception at Morrill Hall

THURSDAY, JUNE 5

THURSDAY MORNING SESSIONS

- **9:00AM** Morning plenary by Ruth Mace: introduced by Beverly Strassman. (Auditorium, 211)
- **10:00AM** Break

Human Behavioral Ecology I: Chair, B. Strassmann

Heritage Room

- **10:15AM** Anderson, K. *Household coefficient of relatedness and investment in children in South Africa.*
- **10:35AM** Ellis, P. *Father vs. nonpaternal allomothering effects on child health among the toba of Northern Argentina.*
- **10:55AM** Leonetti, D.L. *The context of parental investment. A comparison of patrilineal Bengali and matrilineal Khasi.*
- **11:15AM** Pavard, S. *Motherless child mortality: the case of early Quebec.*
- **11:35AM** Strassman, B.I. *Kin selection and the Dogon: predicting survival outcomes for >1000 children.*

Darwinian Literary Studies: Chair, J. Carroll

Regency A

- **10:15AM** Carroll, J. *Darwinian literary criticism, Darwinian literary science, and Darwinian social science.*
- **10:35AM** Gottschall, J. *Testing evolutionary hypotheses with literary data: toward a Darwinian literary science.*
- **10:55AM** Fromm, H. *Muses, spooks, neurons: a cognitive model for creativity?*
- **11:15AM** Nettle, D. *Drama and the mirror of nature.*
- **11:35AM** Wilson, D.S. *Evolutionary social constructivism.*

Aggression, Homicide, Suicide I: Chair, S. Brown

Main Auditorium

- **10:15AM** Andrews, P. *Parasuicide as extortion.*
- **10:35AM** Brown, S. *Testing implications of kin selection theory for self-preservation.*
- **10:55AM** Faurie, C. *Fights and the evolution of handedness: a cross-cultural study.*
- **11:15AM** Hwang, H. *Patterns of sex difference in homicide: an empirical research on the 18th, 19th, and 20th century Korea.*
- **11:35AM** Sell, A. *The asymmetric war of attrition and human behavior.*

• ***Sex Differences:* Chair, K. Heath**

Regency B

- **10:15AM** Baker, M. *Parental mate preferences for self and child.*
- **10:35AM** Choi, J. *Shortest way home or retracing the route: sex differences in route-learning strategies.*
- **10:55AM** Weisfeld, C.C. *Sex differences in married adults.*
- **11:15AM** Schlomer, G. *Parental manipulation of romantic partner choice in the U.S..*
- **11:35AM** Schutzwahl, A. *Sex differences in jealousy: the processing of information about sexual and emotional infidelity.*

THURSDAY AFTERNOON SESSIONS

- **1:00PM** **Afternoon plenary by Alan Kamil:** introduced by Raymond Hames. (Auditorium, 211)
- **2:00PM** Break

***Brain & Cognition:* Chair, T.E. Dickins**

Regency A

- **2:15PM** Burkett, B.N. *Evidence for domain-specificity of trait-attribution: replication and extension.*
- **2:35PM** Dickins, T.E. (PD) *General symbol machines: the evolution of language and the modularity assumption.*
- **2:55PM** Harrison, M. *Spite and altruism.*
- **3:15PM** **10 minute break**
- **3:25PM** Stone, V.E. *The evolution of ontogeny and the development of the frontal lobes.*
- **3:45PM** Wang, X.T. *Reproductive variance and reproductive investment.*
- **4:05PM** Open Discussion

***Attractiveness I:* Chair, P.A. Rhode**

Main Auditorium

- **2:15PM** Boothroyd, L. *Facial masculinity is not associated with perceived health but is related to facial age.*
- **2:35PM** Johnston, V. *Women's facial preferences as a function of their digit ratio and mental rotation ability.*
- **2:55PM** Jones, B. *Individual differences in female preferences for healthy-looking male faces.*
- **3:15PM** **10 minute break**
- **3:25PM** Rhode, P.A. (NI) *Attractiveness, mating success, and abortion decision.*
- **3:45PM** Little, A. (NI) *Evidence against perceptual bias views for symmetry preferences in human faces.*
- **4:05PM** Brase, G.L. *Sex-specific sensitivity to cues of future parental investment.*

***Cooperation & GameTheory I:* Chair, J. Hibbing**

Regency B

- **2:15PM** Hibbing, J. *The perils of voice; the joys of influence: involvement and its consequences.*
- **2:35PM** Hiraishi, K. *Defection of oneself and defection to others: extension of the Wason selection task with the sharing-rule.*
- **2:55PM** Weissner, P. *The perils and pleasures of punishment among foragers.*
- **3:15PM** **10 minute break**
- **3:25PM** Ketelaar, T. *Emotional signaling in social dilemmas: insights from evolutionary game theory.*
- **3:45PM** Bromgard, G. *Emotional signaling in social dilemmas: evidence from the prisoner's dilemma and coordination game.*
- **4:05PM** Price, M. (NI) *Detecting and punishing free-riders in a collective action.*

Applied Evolutionary Psychology: Chair, R. Aunger

Heritage Room

- **2:15PM** Jenkins, M. *Bad smell as a proxy for danger and the implications for global improvements in sanitation.*
- **2:35PM** Rabie, T. *The evolutionary psychology of disgust.*
- **2:55PM** Scott, B. *Using evolutionary psychology to inform hygiene promotion in Ghana and India (Kerala state).*
- **3:15PM** **10 minute break**
- **3:25PM** Curtis, V. *A "dual network" model for changing habits.*
- **3:45PM** Lipchin, C. (NI) *Men, women and water: a case study of gender perceptions on water in the Southern Arava Desert, Israel.*
- **4:05PM** Mysterud, I. *To eat or what to eat, that's the question: A critique of the official Norwegian dietary guidelines.*

Thursday Evening Activities

- **5:30PM** **Executive Council Meeting** (212 Nebraska Union). Bring takeout food from Selleck.
- **7:00PM** **Poster Session** (Rutunda Gallery Nebraska Union)

FRIDAY, JUNE 6

FRIDAY MORNING SESSIONS

- **9:00AM** **Morning plenary by Eric Alden Smith:** introduced by Frank Marlowe. (Auditorium, 211)
- **10:00AM** Break

Human Behavioral Ecology II: Chair, F. Marlowe

Heritage Room

- **10:15AM** Blum, E. *Does natal territory quality predict human dispersal choices? A test of Emlen's model of family formation.*
- **10:35AM** Kurland, J.A. *Is there a paleolithic demography? Implications for evolutionary psychology and sociobiology.*
- **10:55AM** Marlowe, F. *The mating effort of Hadza men.*
- **11:15AM** Meehan, C. *The effects of maternal locality on parental and alloparental behavior among the Aka foragers of Central Africa.*
- **11:35AM** Cvorovik, J. *Gypsy reproductive strategy.*

Depression & Emotions: Chair, E. Hagan

Regency B

- **10:15AM** Campbell, B. *Household type and psychological status of adolescent boys in Rakai District, Uganda.*
- **10:35AM** Hagen, E.H. *Is postpartum depression an adaptation? Evidence from Shuar mothers.*
- **10:55AM** Keller, M. (NI) *What can quantitative evolutionary genetics tell us about why mental disorders exist?*
- **11:15AM** Nesse, R. *Mood and the regulation of goal pursuit.*
- **11:35AM** Poels, K. *The crucial role of emotions in advertising processing.*

Language & Voice Pitch: Chair, F. Gil-White

Colonial Room

- **10:15AM** Bryant, G. *Does vocal behavior communicate status information?*
- **10:35AM** De Backer, C. *Stone aged minds in tabloid space.*
- **10:55AM** Gil-White, F. *The evolution of prestige leads to the evolution of reference (and hence, language).*

- **11:15AM** Sokol, R. *An evolutionary psychological approach to prosody and whining.*
- **11:35AM** Falcon, R. *Adult perception of infant cries: a multidimensional analysis identifying salient features and associations.*

Mate Choice I: Chair, L. Cronk

Regency A

- **10:15AM** Campbell, L. *How the self-concept has been shaped by mating preferences of others.*
- **10:35AM** Cornwell, R.E. *Pheromones in relationship context: link between visual and olfactory cues.*
- **10:55AM** Cousins, A.J. (NI) *Women's resistance to mate guarding.*
- **11:15AM** Cronk, L. *Engagement rings as signals in American courtship.*
- **11:35AM** Dane, L. *Relation between individual differences in sex-roles and sex differences in mate preferences.*

Current Developments in Sexual Orientation: Chair, Bailey

Main Auditorium

- **10:15AM** Bailey, M. *Gender nonconformity and sexual orientation.*
- **10:35AM** Vassey, P. *Does homosexual behavior in Japanese macaques reflect an unconstrained sexual strategy?*
- **10:55AM** Chivers, M. *A sex difference in the specificity of sexual arousal.*
- **11:15AM** Rieger, G. *Do bisexual men exist?*
- **11:35AM** Open Discussion

FRIDAY AFTERNOON SESSIONS

- **1:00PM** **Afternoon plenary by Steven Gaulin:** introduced by Jeffrey Kurland. (Auditorium, 211)
- **2:00PM** Break

Sexual Conflict: Chair, D. Buss

Main Auditorium

- **2:15PM** Buss, D. *Sexual conflict.*
- **2:35PM** Demarest, J. *Stalking and spying: a mate retention tactic.*
- **2:55PM** Malamuth, J. *Sexual coercion and evolutionary psychology.*
- **3:15PM** **10 minute break**
- **3:25PM** Michalski, R. *Upset in response to a sibling's partner's infidelities.*
- **3:45PM** Pound, N. (PD) *A mammalian model of prudent sperm allocation.*
- **4:05PM** Apicella, C. *Paternality and parental investment in human males.*

Olfaction and Evolution of Superorganisms: Chair, D.S. Wilson

Regency B

Olfaction

- **2:15PM** Schank, J. *Whither human pheromones?*
- **2:35PM** Petrie, M. *Olfactory self-recognition revisited.*
- **2:55PM** Sergeant, M. (NI) *Evolution and olfaction; the role of sexual orientation in body odour.*
- **3:15PM** **10 minute break**
- **Evolution of Superorganisms**
- **3:25PM** Coming, P. *What is a superorganism and why do they exist?*
- **3:45PM** Richerson, P.J. *Why human superorganisms are crude: the evolution of strange and maladaptive cultural traits.*

- **4:05PM** Genet, R.M. *Human and leafcutter ant superorganisms, a comparison of two highly organized agricultural species.*
- **4:25PM** Open Discussion

Evolutionary Psychology: Chair, L. Cosmides

Regency A

- **2:15PM** Ellis, B. *Children's performance on a false belief task is impaired by activation of an evolutionarily-canaliz...*
- **2:35PM** Evans, D. *Motivational biases and decision making: an adaptive approach.*
- **2:55PM** Tooby, J. *Elements of Darwinian theory of Lamarckian inheritance.*
- **3:15PM** **10 minute break**
- **3:25PM** Vyncke, P. *Maslow revisited: towards a new motivation inventory based on evolutionary psychology.*
- **3:45PM** Larimer, C. (NI) *Behavior a function of publicity: its who knows that makes a difference.*
- **4:05PM** Friedman, B. *Cues to commitment.*

Aggression, Homicide, Suicide II: Chair, E. Cashdan

Heritage Room

- **2:15PM** Potts, M. *Why did 9/11 have such an impact?*
- **2:35PM** Sifferd, K. *Should commonsense psychology be eliminated from criminal law?*
- **2:55PM** Webster, G. (NI) *Sociosexual attitudes and behaviors as differential predictors of aggression.*
- **3:15PM** **10 minute break**
- **3:25PM** Weekes-Shackelford, V. *Motivational differences for filicide by stepparents and genetic parents.*
- **3:45PM** Cashdan, E. *Sexuality is more important than resource scarcity in predicting competition among women.*
- **4:05PM** Beasley, S. *Filicide-suicide by stepparents and genetic parents.*

Friday Evening Activities

- **6:30PM** Barbeque (Sheldon Sculpture Garden)

SATURDAY, JUNE 7

SATURDAY MORNING SESSIONS

- **9:00AM** Morning plenary by Ernst Fehr: introduced by Robert Boyd. (Auditorium, 211)
- **10:00AM** Break

Cross-cultural Research: Chair, C.R. Ember

Heritage Room

- **10:15AM** Ember, C.R. *Why is fat or thin desirable? A cross-cultural study.*
- **10:35AM** Huber, B. *Measuring paternal certainty using cross-cultural data.*
- **10:55AM** Kress, H. *Scars for war: a cross-cultural study of male initiation rites as costly signals of commitment for warfare.*
- **11:15AM** Parkhill, M. *The meaning of marriage: cross-cultural invariance testing of a marital satisfaction measure.*
- **11:35AM** Schmitt, D. *Sociosexuality from Argentina to Zimbabwe: the effects of gender equity, sex ratios, and ecological...*

Risk Taking & Lifespan: Chair, R. Nesse

Regency B

- **10:15AM** Ermer, E. *Social status and the taste for risk.*
- **10:35AM** Kruger, D. *The male:female mortality ratio across social contexts.*
- **10:55AM** Mueller, U. *Do late children indeed enhance female longevity? Findings from the European royalty (1790-1939).*
- **11:15AM** Pillsworth, E.G. *Emotional arousal and risk-taking: the interaction of sex and emotion.*
- **11:35AM** Wilke, A. *Human mate preference for risky behavior.*

Testosterone Research: Chair, J. Manning

Georgian Room

- **10:15AM** Burnham, T. *Men in committed, romantic relationships have lower testosterone.*
- **10:35AM** Hooven, C. *Testosterone and mental rotation performance in men.*
- **11:15AM** Manning, J. *The 2nd to 4th digit and the androgen receptor gene: implications for human evolution.*
- **10:55AM** Roney, J. (PD) *Behavioral and hormonal responses of men to social interactions with women.*
- **11:35AM** Schug, M. *Prenatal androgens and athletic ability.*

Paternal Uncertainty & Anti-cuckoldry Strategies: Chair, S. Platek

Main Auditorium

- **10:15AM** Schackelford, T. *When we hurt the ones we love: predicting violence against women from men's mate retention tactics.*
- **10:35AM** Burch, R.L. *The human penis as a semen displacement device.*
- **10:55AM** Goetz, A. *Mate retention, semen displacement, and human sperm competition: tactics to prevent and correct female infidelity.*
- **11:15AM** Platek, S. (PD) *Paternal uncertainty, the brain, and children's faces: neural correlates of child facial resemblance.*
- **11:35AM** Discussants *D. Buss, S. Gangestad, R. Thornhill*

Life History Strategy as an Individual Difference: Chair, A.J. Figueredo

Regency A

- **10:15AM** Figueredo, A.J. *The K-factor: individual differences in life history strategy.*
- **10:35AM** Tal, I. *Reproductive life history strategy and environmental conservation.*
- **10:55AM** Walsh, M. *Sexual restrictedness in adolescence.*
- **11:15AM** Murphy, M. *To cooperate or defect?: a life history theory explanation of individual differences in social dilemma games.*
- **11:35AM** Open Discussion

SATURDAY AFTERNOON SESSIONS

- **1:00PM** Afternoon plenary by **Paul Rozin**: introduced by Martin Daly. (Auditorium, 211)
- **2:00PM** Break

Kin Recognition: Chair, G. Weisfeld

Heritage Room

- **2:15PM** Cavalieri, M.B. *Helping behavior and perceptions of physical similarity between human siblings of varying genetic relatedness.*
- **2:35PM** DeBrune, L.M. *Facial resemblance increases attractiveness.*
- **2:55PM** Lieberman, D. *Investigating the cues used to detect genetic relatedness through patterns of altruism.*
- **3:15PM** **10 minute break**
- **3:25PM** Rushton, P. *Mate choice in identical vs. fraternal twins: a test of self-referent phenotype matching.*

- **3:45PM** Weisfeld, G. *Reactions to family members' body odors: possible mediation of the Westermarck effect.*
- **4:05PM** Speelman, T. *Evaluating evolutionary explanations of ethnocentrism and racism.*

Mate Choice II: Chair, TBA

Regency A

- **2:15PM** Duntley, J. *Mate choice adaptations for dealing with stepchildren.*
- **2:35PM** Fisher, M. (NI) *Attractiveness, estrogen, and female intrasexual competition.*
- **2:55PM** Frederick, D. *Male muscularity as a good-genes indicator: evidence from women's preferences for short-term and long-term mates.*
- **3:15PM** **10 minute break**
- **3:25PM** Scheyd, G. *Individual differences in attraction: facultative preferences?*
- **3:45PM** Pawlowski, B. *Preference for sexual dimorphism in height as a strategy for increasing the pool of potential partners in humans.*
- **4:05PM** Lycett, J.E. *Female height and reproductive success: the long and short of it.*

Sexual Selection & the Menstrual Cycle: Chairs, M.G. Haselton and S.W. Gangestad

Main Auditorium

- **2:15PM** Haselton, M.G. *Ovulation-contingent shifts in female desire and partner jealousy.*
- **2:35PM** Gangestad, S.W. *Changes in women's sexual interests across the ovulatory cycle: the moderating effects of mates' symmetry.*
- **2:55PM** Miller, G. *A great sense of humor is a good genes indicator: ovulatory cycle effects on the sexual attractiveness of male humor ability.*
- **3:15PM** **10 minute break**
- **3:25PM** Garver-Apgar, C.E. *Sexual coercion and women's evolved counter strategies: enhanced sensitivity to cues of sexual coerciveness across the menstrual cycle.*
- **3:45PM** Fessler, D. *Hungry for love: understanding the periovulatory nadir in human feeding behavior.*
- **4:05PM** Thornhill, R. *The evolution of woman's concealed fertility, extended sexuality, and permanent ornamentation.*

Cooperation & Game Theory II: Chair, G. Roberts

Regency B

- **2:15PM** Allen-Arave, W. *Is altruism competitive or guarded? Evidence from emergency intervention studies.*
- **2:35PM** Aktipis, C.A. *Cooperative agents with contingent movement rules resist invasion by tit-for-tat and Pavlov.*
- **2:55PM** Mashima, R. *The emergence of indirect reciprocity: is the standing strategy the answer?*
- **3:15PM** **10 minute break**
- **3:25PM** Roberts, G. *Cooperation through interdependence.*
- **3:45PM** Barclay, P. (NI) *Trustworthiness and competitive altruism can also solve the "tragedy of the commons"*
- **4:05PM** Zak, P. *The neurobiology of trust.*

Saturday Evening Activities

- **6:30PM** **Banquet and awards announcement** (Union Ballroom)
- **8:30PM** **Keynote address by Boyd and Richerson:** introduced by D.S. Wilson. (Kimball Recital Hall)

SUNDAY, JUNE 8

- **9:00AM** Morning plenary by **Jeff French**, introduced by Patricia Draper. (Auditorium, 211)
- **10:00AM** Break

SUNDAY MORNING SESSIONS

Literature & Culture: Chair, **C.T. Palmer**

Regency A

- **10:15AM** Jobling, I. *Dads and cads: alternative mating strategies and preferences for literary characters.*
- **10:35AM** Vandermassen, G. *Evaluating some feminist accounts of gender.*
- **10:55AM** Zunshine, L. *Theory of mind and fiction (or, can cognitive science tell us why we are afraid of Virginia Wolf?).*
- **11:15AM** Betty, G. *The evolutionary nature of Comanche Indian horse pastoralism.*
- **11:35AM** Steadman, L. *Totemism: descendant-leaving strategy of the Australian aborigines.*

Attractiveness II: Chairs, **D. Singh and J. Chen**

Heritage Room

- **10:15AM** Roberts, C. *Human facial attractiveness and the MHC.*
- **10:35AM** Beaulieu, D. *Am I pretty?: testing the domain-specificity as well as the adaptive significance of social comparison within the mating domain.*
- **10:55AM** Singh, D. *Anatomical location of body fat influences judgements of female attractiveness.*
- **11:15AM** Wilson, M. *Context specific modulation of temporal discount rates.*
- **11:35AM** Clark, A. *Masculinization and self-perceived attractiveness predict promiscuity in women.*

Cooperation & Game Theory III: Chair, **J. Patton**

Regency B

- **10:15AM** Kameda, T. *Adaptive group decision making and cultural group selection: robust beauty of majority rule.*
- **10:35AM** Patton, J. *Coalitional differences in experimental economic game performance in the Ecuadorian Amazon.*
- **10:55AM** Takahashi, N. *Indirect reciprocity in the selective-play environment*
- **11:15AM** Smith, K. *Keeping up appearances: rationalism, altruism, and information asymmetry.*
- **11:35AM** Pereyra, L. *Effective precaution rules and the hazard management algorithm.*

Trivers-Willard & Child Health: Chair, **M. Flinn**

Main Auditorium

- **10:15AM** Hopcroft, R. *Testing Trivers-Willard: parental status and differential investment in sons and daughters.*
- **10:35AM** Quinlan, R. *Tradeoffs between indirect parental investment and direct childcare: long-term effects of household production and breastfeeding duration on children's cortisol levels, fluctuating asymmetry, and growth.*
- **10:55AM** Shenk, M. *The evolutionary ecology of class differences in urban south India: strategies in relation to parental investment and marriage practices.*
- **11:15AM** Starkey, S. *Reading palms: a biocultural analysis of status and child health as indicated by fluctuating asymmetry.*
- **11:35AM** Barrett, H.C. *Hunting and theory of mind.*

POSTER SESSION (THURSDAY: 7-9pm Union Rotunda Gallery)

Posters will be displayed continuously from Thursday in the Union Rotunda Gallery until the end of the conference. Poster authors will be present for discussion from 7:00-9:00PM on Thursday.

- Amaro, R. *The reproductive priming effect II: replication and extension.*
- Anderson, U. *Reproductive value and parent-offspring conflict.*
An exploratory study of the effects of paleoclimatic variation on brain expansion in the genus homo.
- Ash, J.
- Bennett, K. L. *Infidelity in romantic relationships: what are people feeling guilty about?*
- Benz, J. *Sex differences in romantic jealousy re-examined.*
- Berlanga, P. *The wider impact of the cinderella effect.*
- Bressler, E. *The perceived attractiveness and prosociality of humorous individuals.*
- Brown, A. *Kin altruism and attractiveness.*
- Brown, J. C. *The evolution of phonological structure.*
Self-conscious emotions and social context: the predictive value of domain-specific self-esteem.
- Buttermore, N.
- Byrd-Craven, J. *Evolution and development of boys' social behavior.*
Symmetrical decorations enhance the perceived attractiveness of faces and abstract designs: possible clues to biological fitness.
- Cardenas, R.
- Chambers, M. *The costs and benefits of casual sex: gender and sociosexual orientation differences.*
- Chiappe, D. *Cheaters and cooperators are equally salient in social exchange situations.*
The influence of visual familiarity on judgments of attractiveness: university students' judgments of adult and infant faces.
- Cooper, P. A. *The conflict systems neurobehavioral (CSN) model: results and implications of multinational survey.*
- Cory, Gerald
- Davis, J. A. *Is preeclampsia adaptive? The role of unfamiliar semen.*
- DeSoto, M. C. *Waist to hip ratio reported null findings: the role of stimuli.*
- Duchaine, B. *Neuropsychological dissociations in family members with face recognition impairments.*
- Erlich, N. S. *Sex differences in reasoning about risk perception.*
- Faulkner, J. *Contagious disease threats and avoidance of foreigners.*
- Garcia-Rubio, A. *Sex differences in the ability to classify baby cries.*
- Gallup, G. G., Jr. *The composition of human semen and its possible effects on female behavior.*
Banking on prestige--applying costly signaling theory to economic development in the Hispanic context.
- Goldberg, R.
- Gottschall, T. *Income inequality and rape: an economic analysis.*
- Hadley, A. *Gender differences in perception of non-verbal cues to deceit.*
- Hagenah, B. *A cross cultural test of the adaptive functions of religion.*
- Haley, K. *Cooperative outrage: communicative functions of altruistic punishment.*
- Hensinger, S. *Primate peek-a-boo: evolutionary psychology says "everyone likes to watch."*
Bradley-Terry-Luce (BTL) scaling of sex differences in sexual jealousy: a psychometric validation study.
- Hofhansl, A. *The nature of culture - incorporating culture in the ultimate/proximate analysis of human social behavior: the Trivers-Willard effect.*
- Hrgovic, J.
- Hong, S. *An evolutionary study of filicide in modern Korea 1994-1999.*
- Hughes, S. M. *The sound of symmetry revisited.*
Patterns of sex difference in homicide: an empirical research on the 18th, 19th, and 20th century Korea.
- Hwang, H.
- James, J. *Sociosexuality and self-perceived mate value: a multidimensional approach.*
- Kopeliov, L. *Beyond averageness and symmetry: configural effects on facial attractiveness.*
- Kydd, D. *The psychodynamic structure of mimetic ideation in the cultural evolution of religion.*
- Lupo, S. A. *Choosing our mates: a test of psychoanalytic versus evolutionary theories of mate choice.*

- Mackewn, A. *Ignorance is bliss: nutritional choices gone wrong.*
- Miller, E. *Origin of population differences in intelligence.*
- Mills, M. *Toward a classification of human psychological adaptations.*
- Myles, S. *The evolution of lactase persistence in the Berber.*
- Navarrete, C. *Intergroup bias and adaptive challenges.*
- Newlin, D. B. *A self-perceived fitness (SPFIT) theory of substance use disorders.*
- Oeckher, M. *Changes in facial proportion over the past 50 years.*
- Orr, M. *The effect of paternal absence on female sexual development and gender role.*
- Ozdemir, A. *Interpersonal distance, personal space, and group behavior: effects of different spatial arrangements.*
- Palmer, J. *Deciphering the signal value of pupillary responses.*
- Panchanathan, K. *Freemasons, the kula ring, and E-bay: group size, cultural workarounds, and generalized exchange.*
- Perilloux, H. *Using natural variation in male mating strategy to probe the meaning of female attractiveness.*
- Provost, M. P. *The differential effect of social dominance on the mating strategies of young male and female adolescents.*
- Putz, D. *Sexual selection and men's voices.*
- Reese, V. *Why sex? A new contribution to the hypothesis that sexual reproduction facilitates a mechanism that can directly remove deleterious mutations from the germ cell line.*
- Roloff, K. *Nipple erection: does it serve as a sexual stimulus in humans?*
- Russell, D. C. *Emotional reactions to receiving a compliment for successful foraging: happiness, embarrassment, and contempt as signals in social interactions.*
- Ryland, A. *The effect of resemblance on sibling rivalry.*
- Sakaguchi, K. *Reproductive risk faced by females and the control of movement synchrony.*
- Sharp, D. J. *Gossip and reputation management.*
- Smith, L. C. *The evolution of useful techniques.*
- Snyder, J. *The dominance dilemma: dominance, status, and female mate preferences.*
- Sporter, R. J. *Ratio of 2nd to 4th digit length (2D:4D): no correlation with two predictors of reproductive success.*
- Stanik, C. *An examination of the relationships between 2D:4D finger ratio and: standard as well as sexual personality characteristics, dating patterns, guilt, and shame in college students.*
- Stevens, C. *Can sociobiology shed new light on the archaeological record?*
- Streeter, S. A. *Age trends and sex differences in human diet.*
- Strout, S. *Sexual differences in jealousy: the effects of vivid imagination.*
- Surbey, M. K. *The role of self-deception, just world belief, and vengeance in cooperation on prisoner's and common's dilemma-based games.*
- Tamura, R. *Collective vigilance and anxiety contagion: exploring adaptive basis of our anxiety-resonant minds.*
- Tsukasaki, T. *Culture also affects basic cognitive processes: Japan-US comparison of cue efficacy in object identification.*
- Thompson, N. *Adult perception of infant cries: a multidimensional analysis identifying salient features and associations.*
- Voracek, M. *Sexual jealousy, finger ratios, and fluctuating asymmetry.*
- Wang, M. *Eating disturbance and estrogen levels across the menstrual cycle.*

ORAL PRESENTATION ABSTRACTS LISTED BY CHRONOLOGICAL ORDER & SESSION

THURSDAY, JUNE 5

Plenary (Auditorium, 211)

9:00PM

Ruth Mace (University College London)

Human Behavioral Ecology I, Chair: B. Strassman Heritage Room, Thursday Morning

10:15AM

- Anderson, Kermyt (University of Oklahoma)

HOUSEHOLD COEFFICIENT OF RELATEDNESS AND INVESTMENT IN CHILDREN IN SOUTH AFRICA

A basic tenet of kin selection is that the amount an adult invests in a child will increase as the coefficient of relatedness (r) between them increases. For example, $r = 0.5$ between ego and biological parents or full siblings, 0.25 between ego and half siblings, grandparents, and aunts/uncles, 0.125 for cousins and nephews/nieces, etc. This project analyzes the relationship between investment in a child and the child's mean relatedness to the adults in the household, using a nationally-representative sample of 11,635 black households in South Africa. One child between the ages of 6 through 17 was selected at random from each household for analysis. Measures of investment in children include whether the child is enrolled in school; the amount of money spent on the child's school fees; the amount spent on other school-related expenses; the highest grade the child has completed; and whether the child is behind in school for his or her age (an indirect measure of grade repetition). The average coefficient of relatedness between focal children and the adults in their households is $r = 0.388$. The average child lives with 3.0 adults, though the number ranges from 1 to 10; mean relatedness decreases with household size. Controlling for household size and a number of other factors, the coefficient of relatedness remains a strong positive predictor of investment in children. The results show that in South Africa, adults preferentially invest in children who are more closely related to them.

Keywords: *kin selection, coefficient of relatedness, investment, education*

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10:35AM

- Ellis, Patricia (Harvard University)
- Vallengia, Claudia (Harvard University)

FATHER VS. NONPATERNAL ALLOMOTHERING EFFECTS ON CHILD HEALTH AMONG THE TOBA OF NORTHERN ARGENTINA

Nonpaternal allomothering may have played a large role in the shaping of our species. Today, cross-culturally, only a minority of child care is performed by men. Women need assistance in raising children; however, does it matter where that assistance comes from? Are there advantages to having a father in the home, if mothers have access to other caretakers? Such questions were investigated with the Toba of NamQom in Argentina. The Toba are one of eight ethnic groups currently inhabiting the Argentine Chaco. Originally hunter-gatherers, many groups have moved to urban and periurban environments over the last fifty years. Childrearing traditions have, however, remained largely intact. Mothers use extensive kin networks; older daughters, grandmothers, aunts, cousins – everyone helps mothers raise children. Among the Toba of NamQom, two alternative hypotheses were

tested: 1) the presence of a father is associated with better health outcomes in infants and young children, and 2) the presence of alternative kin caretakers (nonpaternal) is associated with better health outcomes. Health records of children under 4 years of age were obtained and analyzed. Interviews were conducted with the mothers to see whether or not fathers were present within the household and/or if kin were present within the village during the rearing of the children. Sex and age of nearby kin were noted. Preliminary results indicate that, among this population, the presence of a father positively affects child nutritional health (regardless of the father's work status) while increasing number of maternal kin contacts negatively affects child nutritional health.

Keywords: *allomothers, paternal care, child health, hunter-gatherers*

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10:55AM

- Leonetti, Donna L. (University of Washington, Seattle)
- Nath, Dilip C. (Gauhati University, Guwahati, Assam)
- Hemam, Natabar S. (Gauhati University, Guwahati, Assam)
- Neill, Dawn B. (University of Washington, Seattle)

THE CONTEXT OF PARENTAL INVESTMENT. A COMPARISON OF PATRILINEAL BENGALI AND MATRILINEAL KHASI

Kinship and household organization are basic ecological dimensions of resource extraction, varying widely in our species. Women and men carry out parental investment within associated constraints. We compare kin roles, household composition, and contributive efforts in relation to child survival and growth in two low socioeconomic groups in N.E. India, in which roles of gender and generation differ widely. Among patrilineal Bengali who are plow agriculturalists, a wife joins her husband's household and female mobility is restricted; women do not work in the fields. Men control all property and economic transactions. In contrast, among matrilineal Khasi who are swidden cultivators, women own property, run the markets, work in the fields, run businesses and work for wages. When a Khasi woman marries, she may continue to reside with her mother and may marry serially more than once. Among the Bengali, mother-in-law/daughter-in-law domestic teams have limited direct access to resources, while Khasi mother/daughter domestic teams have direct access to resources. The men in these two groups also differ in their vested household interests. Survivorship of children born 1980-2001 (Bengali, n=2,089; deaths, n =261/ Khasi, n=2,763; deaths, n = 162) and growth of those under age 7 (Bengali, n = 900/Khasi, n=1,046) are contrasted. The effects of household composition and resources, and mother's condition are considered. Labor contributions by mothers, husbands, and grandmothers are analyzed to see if they have independent effects on these outcome variables. Constraints on women's capacities to access resources directly are hypothesized to hamper the efficacy of their efforts.

Keywords: *parental investment, child survival and growth, kin roles, household composition and resources*

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11:15AM

- Pavard, Samuel (Museum National d'Histoire Naturelle, Paris, France)
- Gagnon, Alain (Max Planck Institute for Demographic Research, Rostock, Germany)
- Desjardin, Bertrand (Programme de recherches en démographie historique, Université de Montréal, Montréal, Canada)
- Heyer, Evelyne (Muséum National d'Histoire Naturelle-CNRS-Paris7, Paris, France)

MOTHERLESS CHILD MORTALITY: THE CASE OF EARLY QUEBEC

In the present study, we focused on motherless child mortality resulting from the loss of maternal care in the early French population of Quebec, for which a comprehensive longitudinal observation is available.

Given that the loss of maternal care follows the mother's death whatever its origin may be, any factors that influenced mortality of both mother and child must be taken into account in our study design. In order to do that, effects of mother reproductive life history (as birth spacing and previous child status) and effect of sporadic factors (as epidemics) were minimized through data selection. Due to a possible heterogeneity among families, a lower child survival rate was expected in families in which mothers were more likely to die. Here we provide a methodological approach to measure this phenomenon and we used it to refine our analysis.

Results show a higher risk concerning motherless children if the mother's death occurs at any time during childhood and this risk remains significant long after the mother's death. Even if this risk decreases with child's age and with child's age at mother's death, the mother status appears to be a major determinant of child's survival until adult age. No differences in maternal investment between genders were detected before age 3 but elder girls suffered a two to three fold higher susceptibility to mother's death than boys. This result suggests that grown-up girls assuming the responsibilities of the mother therefore have fewer chances to survive.

Keywords: *maternal care, infant survival, child survival, early population of Quebec*

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11:35AM

- Strassmann, Beverly I. (University of Michigan)
- Hug, Brendan F. (University of Michigan)
- Welch, Kathy (University of Michigan)

KIN SELECTION AND THE DOGON: PREDICTING SURVIVAL OUTCOMES FOR > 1000 CHILDREN

We tested predictions from inclusive fitness theory (Hamilton 1964) against an anthropological null model in a prospective study of family composition and child survival among the Dogon of Mali. We used a Cox proportional hazards model in SAS Proc Phreg, adjusted for mother. Time varying covariates were measured the initial year (1998) and in each of two follow-up years (1999 and 2000). Mortality was extreme: 137 deaths occurred in a sample of 1382 children in nine villages. As predicted, the higher the putative genetic relatedness of a child to the work-eat group (weg) boss, the lower the mortality risk (hazard ratio = 0.19, $p = 0.02$). If the child's father was living but was not the weg boss, then child survival was similar to that of offspring of deceased fathers. If the child's mother was living, then the hazard of death was 79% lower ($p = 0.0004$) despite women's lack of political power in the weg. Offspring of women in arranged marriages had 35% ($p = 0.03$) lower mortality than other offspring, perhaps because their mothers enjoyed greater kin support from their husbands' families. Except in the largest and most wealthy village, weg polygyny was associated with mortality. Controlling for weg wealth, as the ratio of married women to men in the weg increased by one, the child's hazard of death increased 1.5 times ($p = 0.03$). Women were found to be instrumental in causing wogs to fission, which increased the relatedness of children to the weg boss.

Keywords: *survival, kin, family, fitness*

Darwinian Literary Studies I, Chair: J.Carroll
Regency A, Thursday Morning

10:15AM

- Carroll, Joseph (University of Missouri--St. Louis)

DARWINIAN LITERARY CRITICISM, DARWINIAN LITERARY SCIENCE, AND DARWINIAN SOCIAL SCIENCE

The most frequent challenge issued to Darwinian literary critics runs something like this: "Aren't you just selecting texts that happen to conform to your expectations? In this respect, aren't you doing the same thing that Marxists, Freudians, deconstructionists, feminists, and members of other theoretical schools do?" The answer to this question is "no," for the following reasons: (1) Darwinian literary criticism deals with ALL literary texts, since all literary texts emerge from the adapted mind; (2) Darwinian literary criticism is constrained by Darwinian literary science, that is, Darwinian social science that takes literature as its subject matter; (3) Darwinian literary science, as a subset of Darwinian social science, seeks to smooth out atypical cases in statistical averages (we call such statistical averages "human nature"); (4) no matter how culturally curious or idiosyncratically odd or perverse or anomalous any given literary text might be, the author of that text must have recourse to "human nature" as the common frame of reference through which he or she establishes a common basis of understanding with his or her audience. Darwinian literary critics aim (1) to assess the specific configuration of meaning (culturally and idiosyncratically specific) within any given literary text; (2) to identify the intuited (implied or explicitly formulated) concept of elemental or universal human nature that serves as the common frame of reference within that text; and (3) to compare that intuited concept of human nature with the findings of Darwinian social science.

Keywords: *Literature, universals, culture, individuals*

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10:35AM

- Gottschall, Jonathan (St. Lawrence University)
- Carpentier, Keith (St. Lawrence University)
- Masland, Turner (St. Lawrence University)
- Ritchie, Trisha (St. Lawrence University)

TESTING EVOLUTIONARY HYPOTHESES WITH LITERARY DATA: TOWARD A DARWINIAN LITERARY SCIENCE

The psychologist William McDougall wrote that "The wise psychologist will regard literature as a vast storehouse of information about human experience, and will not neglect to draw from it what he can" (*An Outline of Psychology*. 1923:9). Yet psychologists generally, and evolutionary psychologists specifically, have never devoted sustained and systematic effort to mining literature for information about the human mind. The research presented in this paper represents an attempt to take McDougall's advice seriously by generating predictions from sexual selection theory regarding the portrayal of male and female protagonists in world literature and testing them against data gathered in quantitative content analyses of 658 randomly selected folk tales from 49 different culture areas and 240 plot and character summaries of western canonical literature. The results of this test, strongly supporting the predictions as well as existing research on sex differences, suggest the promise of literary works as vast sources of unmined data about human behavior, psychology, cognition, and culture. At the same time, these results point the way to a Darwinian literary science. The most satisfying test of a scientific theory is

when its logically derived predictions lead researchers to discover things that were not known before. The existence of distinct cross-cultural regularities in the psychological and behavioral attributes of male and female protagonists was not only not known before, but was actually diametrically at odds with the prevailing expectations of the dominant schools of literary criticism and theory.

Keywords: *literary universals, literary studies, evolution, quantitative methods*

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10:55AM

- Fromm, Harold (U. of Arizona)

MUSES, SPOOKS, NEURONS: A COGNITIVE MODEL FOR CREATIVITY?

If we cast aside the self and free will as illusory virtualities, as residing in a motivationless, “free” (to do nothing) homunculus watching sequential movies in the Cartesian Theater (to draw upon Daniel Dennett), the question arises: what is the locus of aesthetic creativity if the creative artist is a fiction? Using two creative critical essays of my own, I want to explore what happens during the reading and research phase, the thinking phase, and the writing phase. What does the creativity consist of, who is doing it, and where do the actual written sentences come from? It seems like a case of pure materiality (read: “biology and physics”), on which I can shed some light, though the nature of consciousness continues to stump much greater minds than mine.

Keywords: *creativity, literature, cognition*

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11:15AM

- Nettle, Daniel (The Open University)

DRAMA AND THE MIRROR OF NATURE

In Hamlet, Prince Hamlet tells the players that the function of drama is ‘to hold the mirror up to nature’. This is a theory of drama that goes back at least to Aristotle. But is it correct, and if so, which aspects of nature is drama a mirror of? In recent work, we have been exploring the plays of William Shakespeare with the hypothesis that the dramatic world he creates is a mirror (albeit an intensifying mirror) of the recurrent features of social world in which we evolved. We show that the dramatis personae of Shakespearean dramas are structurally similar to hunter-gatherer networks in terms of overall size, clique structure, and social differentials. We also consider the two archetypal Shakespearean plot structures, status competition amongst males (what Jan Kott calls ‘the grand mechanism’ at work in the history plays and tragedies), and the game of mate choice which characterizes the comedies. Both of these represent recurrent unsolvable dilemmas of human social existence.

Keywords: *Shakespeare, drama, Darwinian literary studies*

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11:35AM

- Wilson, David Sloan (Binghamton University)

EVOLUTIONARY SOCIAL CONSTRUCTIVISM

An evolutionary approach to literature is controversial in part because of a larger set of issues involving the potential of individuals and societies to change their natures. The position known as social constructivism has been largely rejected by evolutionary psychologists as part of the Standard Social Science Model (SSSM), while social constructivists have rejected sociobiology and evolutionary psychology as a form of genetic determinism. I show how social constructivism can be given an evolutionary formulation, based on the fact that there is more to evolution than genetic evolution. When the environment becomes too diverse and fast-changing, specialized "modules" are inadequate compared to "Darwin machines," or evolutionary processes built by evolution. The immune system provides an excellent example of a Darwin machine and comparable psychological and cultural processes almost certainly have evolved, enabling people and societies to adapt to their current environments. Narratives play a fundamental role in psychological and cultural Darwin machines, giving stories a gene-like quality and centrality that they have always enjoyed within traditional literary theory.

Keywords: *Social constructivism, Cultural evolution, Nongenetic evolutionary processes, Darwin Machines*

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Aggression, Homicide, Suicide I, Chair: S. Brown Main Auditorium, Thursday Morning

10:15AM

- Andrews, Paul (University of New Mexico)

PARASUICIDE AS EXTORTION

Suicidal behavior in human beings is either true suicide (intent to die, lethal methods, "completers") or parasuicide (ambivalence about death, less lethal methods, "attempters"). The hypothesis that suicide is favored when residual reproductive value is low and the burden on kin is high can explain why suicide increases with age, but not why attempts peak in young adults whose reproductive value is high. Watson and Andrews (2002) noted that suicide attempts impose a risk of loss on close social partners and suggested that parasuicide may have evolved to extort help or concessions by threats of repeated, escalating attempts, exposing partners to further risk unless they make the concessions or provide the help. This hypothesis suggests that suicide attempts peak in young adulthood when constraints on reproduction are prominent and the marginal fitness benefits of eliminating those constraints are at their greatest. A game theory model indicates that the minimum risk of death needed to extort is inversely related to the value of the attempter's continued existence to the social partner. Group differences in this risk may explain differences in both the incidence and severity of suicide attempts. For instance, middle-borns have less leverage over their parents and should make fewer attempts, but more severe ones, than first- or last-borns. In the National Longitudinal Study of Adolescent Health, only 307 of 4,794 adolescents made suicide attempts over a 2-year period. Birth order was a significant predictor of both the incidence and the severity of attempts in the predicted direction.

Keywords: *parasuicide, extortion, birth order, sex differences*

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10:35AM

- Brown, Stephanie (The University of Michigan)
- Brown, R. Michael (Pacific Lutheran University)
- Vinokur, Amiram (The University of Michigan)
- Swartz, Richard (The University of Michigan)
- Perry, Erica (The University of Michigan)
- Swartz, June (National Kidney Foundation of Michigan)

TESTING IMPLICATIONS OF KIN SELECTION THEORY FOR SELF-PRESERVATION: WHAT HAPPENS WHEN WE FEEL LIKE A BURDEN

The proposed project uses de Catanzaro's (1986) evolutionary theory of self-destructive behavior and Brown's (1999) selective investment theory of social bonds to examine factors that influence suicidal ideation among individuals with chronic illness. Based on previous research, we hypothesized that being a burden to one's children would create suicidal thoughts and wishes. To examine this possibility, a 2-wave longitudinal study of 40 dialysis patients within the University of Michigan Health Care system was conducted over the course of 1 year. The results of regression analyses indicated that an increase in feeling like a burden to one's children was associated with an increase in suicidal ideation over time. The deleterious effect of feeling like a burden to one's children existed above and beyond changes in depressive symptoms and changes in physicians' ratings of physical health status. Similar effects were not found for patients who felt like a burden to the staff members on the unit. This pattern of results supports the possibility that self-destructive tendencies may be a product of kin selection pressures that favored investment in offspring. Moreover, these findings challenge the prevailing tendency to assume that suicidal behavior reflects underlying levels of clinical depression.

Keywords: *burden, kin selection, self-preservation, self-destruction*

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10:55AM

- Faurie, Charlotte (Université Montpellier II)
- Raymond, Michel (Université Montpellier II)

FIGHTS AND THE EVOLUTION OF HANDEDNESS: A CROSS-CULTURAL STUDY

A polymorphism of handedness exists in all human populations so far investigated, at least since the Paleolithic. Handedness is a heritable trait, with a significant genetic contribution. A possible evolutionary explanation for the higher prevalence of right-handers is the association of left-handedness with some deleterious traits, shown by many authors. However, some sort of balancing selection must be acting, to maintain the polymorphism. Thus, some advantages of left-handers have to be found. The polymorphism of handedness is often viewed as a mere consequence of indirect selection. The only explanation proposed so far for a direct selective cause of this polymorphism is the fighting hypothesis: As left-handers are less frequent, one is more likely to be confronted with a right-handed opponent. Left-handers thus get the benefit of being rare. This frequency-dependent superiority of left-handers in fights would confer them fitness advantages, directly and indirectly. Not only their survival would be enhanced, but also their social status and reproductive success, as real or ritualized fights have important consequences on social status. The fighting hypothesis is supported by the study of interactive sports in western societies. To test further the fighting hypothesis, we use a cross-cultural comparison. As levels of male/male aggression vary cross-culturally, we expect to observe matching cross-cultural variation in the frequency of left-handedness. The data presented, collected in traditional societies, are consistent with this prediction of the fighting hypothesis.

Keywords: *polymorphism, handedness, violence, frequency-dependence*

11:15AM

- Hwang, Heesun (School of Biological Sciences, Seoul National University)
- Choe, Jae C. (School of Biological Sciences, Seoul National University)
- Hong, Seung-hyo (School of Biological Sciences, Seoul National University)
- Jang, Dayk (Program in History and Philosophy of Science, Seoul National University)
- Ho, Kim, (Senior Research Fellow, Kyujanggak Archive, Seoul National University)
- Choe, Jae C. (School of Biological Sciences, Seoul National University)

PATTERNS OF SEX DIFFERENCE IN HOMICIDE: AN EMPIRICAL RESEARCH ON THE 18TH, 19TH, AND 20TH CENTURY KOREA

It is well known that males are predominant both as victim and offender in overall homicide. However, SROKs (Sex Ratio Of Killing) in conflict situations will differ. In some homicide types, SROK is expected to be relatively female-biased. Adopting largely Daly and Wilson's criterion (1988), we categorized homicide types and examined their SROKs. We analyzed three datasets from Korea: homicide records from 1775-1794, 1895-1907, and 1994-1999. All datasets come from official documentations of central government organizations, which are considered to reflect the actual homicide patterns with high credibility. Our results showed that SROKs vary according to the nature of the conflict. The patterns were consistent with those of Daly and Wilson's. Our study is important in four respects. First, this is one of few homicide studies of which general patterns are analyzed with evolutionary psychological methods. Second, the data cover a wide spectrum of homicide types. Third, the data are highly historical, encompassing three centuries. Fourth, the study provides a rare dataset from Asia and thus enables cross-cultural comparisons in the analysis of human adaptation.

Keywords: *Sex Ratio Of Killing, Sex difference, Homicide, Historical data*

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11:35AM

- Sell, Aaron (UCSB)
- Cosmides, Leda (UCSB)
- Tooby, John (UCSB)

THE ASYMMETRIC WAR OF ATTRITION AND HUMAN ANGER

The Asymmetric War of Attrition, an evolutionary biological model of animal conflict, is used to synthesize a range of findings regarding human anger and aggression and make novel predictions about what induces human anger. Predictions of the model are compared to the existing literature on intentionality, magnitude of offense, and status insults showing that human anger seems well designed to engage in contests of the type modeled by the AWA. Three predictions that were not as thoroughly addressed in the existing literature were: one, anger should be less if the offender gained a large benefit for the offense, two, anger should be greater when the offender knew who would be harmed, and three, humans should have an intuitive model of these effects and

argue effectively against them when they are the targets of anger. These predictions were tested and supported using a variety of methods.

Keywords: *anger, War of Attrition, revenge*

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Sex Differences, Chair: K. Heath
Regency B, Thursday Morning

10:15AM

- Baker, Jr., Michael (Sam Houston State University)
- Miller, Rowland (Sam Houston State University)

PARENTAL MATE PREFERENCES FOR SELF AND CHILD

This study examined parents' preferences for the mates of their children. Two hundred fourteen parents of college-aged sons and daughters rated and ranked the desirability of several characteristics that their children might find in their mates. They were also asked to imagine that they were starting new relationships at mid-life and then reported their own preferences for the same characteristics. Consistent with the predictions of evolutionary psychology, parents sought more ambitiousness in their daughters' mates than in their sons', and fathers (but not mothers) sought sexy partners for their sons but not their daughters. In addition, parents preferred more warmth, generosity, social status, and other characteristics for their children than they sought for themselves.

Keywords: *mate, preference, parent, child*

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10:35AM

- Choi, Jean (University of Lethbridge)
- McKillop, Erin (Micheal Ward)

SHORTEST WAY HOME OR RETRACING THE ROUTE: SEX DIFFERENCES IN ROUTE-LEARNING STRATEGIES

Spatial sex differences are believed to be the result of differential selection pressures due to navigation demands. However, the mechanisms of how we navigate are unclear. Spatial theories identify three strategies that are used to various degrees, namely, landmarks, routes, and configurations (Siegel & White, 1975). Although the relative predominance of each strategy is presumed to reflect spatial abilities, the nature of the relationships has yet to be specified. The present experiment investigated these relationships, as well as whether sex differences in spatial strategies described in self-report surveys (e.g., Lawton, 1992) correspond to the use of differential spatial strategies in a large-scale environment. Males report using the shortest route back to a point of origin whereas females report the use of a "route-method" in which the route is re-traced. In this project, males and females were taken through an unfamiliar indoor route, and asked to find the point of origin using one of three methods: (1) the most direct route (2) the same route (3) any route they wish. Results reveal sex differences in route-finding strategies and suggest males and females attend to different cues in the environment, lending support for evolutionary theory of spatial sex differences.

Keywords: *Sex Differences, Spatial, Route-Finding Strategies*

10:55AM

- Weisfeld, Carol Cronin (University of Detroit Mercy)
- Karana, Dunia (University of Detroit Mercy)

SEX DIFFERENCES IN MARRIED ADULTS

Previous studies of gender-related differences in American adults have revealed that the most robust differences may appear in non-verbal communication. For example, Weisfeld and Stack (2002) found significant sex differences in smiling, laughing and visual contact behavior in married couples engaged in conversation. This current study examines sex differences in 400 married adults, based on their responses to the all-purpose marriage questionnaire of Russell and Wells (1993). Four hundred American couples participated, producing a sample of males and females matched naturally on many relevant variables such as age, social class, and intelligence. Sex differences were explored in the areas of sexual arousal, marital fidelity, marital history, parental behaviors, and affiliative behaviors. Cross-sectional analyses revealed fairly consistent gender differences in older and younger adults, suggesting that the role of socialization is complex rather than simple, and that socialization may elaborate on predispositions which are selected for because of their potential to enhance fitness.

Keywords: *marriage, marital infidelity, sexual arousal, sexual infidelity*

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11:15AM

- Schlomer, Gabriel (Indiana State University)
- Sheets, Virgil (Indiana State University)
- Heath, Kathleen (Indiana State University)

PARENTAL MANIPULATION OF ROMANTIC PARTNER CHOICE IN THE U.S.

Inclusive fitness theory implies that parents will be motivated to insure their offspring are reproductively successful in order to enhance their own fitness. One way parents might do this is by controlling their children's choice of romantic partners, either by limiting access to poor quality mates or enhancing access to high quality mates. Questionnaires were given to undergraduate students assessing whether or not their parents had ever encouraged or discouraged their romantic interest in a particular person, and if so, the methods used, and the characteristics of that person. The results revealed that parents attempt to influence their daughters' partner-choices more than their sons', frequently by controlling contact with mates of differential quality. In addition, the results show that daughters are specifically encouraged to date people who show a potential for resource acquisition more than sons and discouraged from dating people who lack this potential. These findings are consistent with a view that parents attempt to manipulate their offspring's reproductive opportunities to maximize their own fitness.

Keywords: *Parent-Offspring Conflict, Gender Differences, Family Relations*

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11:35AM

- Schützwohl, Achim (Abteilung für Psychologie, University of Bielefeld)

SEX DIFFERENCES IN JEALOUSY: THE PROCESSING OF INFORMATION ABOUT SEXUAL AND EMOTIONAL INFIDELITY

Three experiments are presented testing the hypothesis derived from the evolutionary view of jealousy that men and women differ in the processing of information about a mates sexual and emotional infidelity. Experiment 1 examines the kind of information men and women actively request from their partner when suspecting her or his infidelity. Experiment 2 tests the hypothesis that men preferentially process information about a mate's sexual infidelity, whereas women preferentially process information about a mates emotional infidelity. Finally, the focus of Experiment 3 is on sex-differences in the recall of cues to sexual and emotional infidelity. Based on the findings of the present experiments, a preliminary picture of the cognitive functioning of men's and women's evolved jealousy mechanism is depicted.

Keywords: *sex differences, jealousy, cognitive processes*

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Abteilung für Psychologie
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Plenary (Auditorium, 211)

1:00PM

- Alan Kamil (University of Nebraska)

THE EVOLUTION OF INTELLIGENCE: A BIRD'S EYE VIEW

The evolution of intelligence is often considered in the context of human evolution. However, many of the hypothesized about cognitive evolution are quite general, not inherently limited to mammals or primates. As a result, hypotheses about the evolution of intelligence can be tested in broad taxonomic context. In this paper, I will review studies of cognitive evolution among birds, with an emphasis on the modularity of cognition and the predictions of the 'Machiavellian' or social complexity hypothesis.

Brain and Cognition, Chair: T.E. Dickins
Regency A, Thursday Afternoon

2:15PM

- Burkett, Brandy N. (University of California, Santa Barbara)
- Cosmides, Leda (University of California, Santa Barbara)
- Kirkpatrick, Lee A. (College of William & Mary)

EVIDENCE FOR DOMAIN-SPECIFICITY OF TRAIT ATTRIBUTION: REPLICATION AND EXTENSION

The fundamental attribution error (FAE) suggests that people attribute others' behavior, more than their own behavior, to dispositional rather than situational factors. The FAE is assumed to be domain-general, applying equally to the attribution of all kinds of attitudes and personality traits. Based on social exchange theory (Cosmides, 1989), according to which humans have evolved specialized psychological mechanisms dedicated to detecting and identifying cheaters in social exchange, we reasoned that people should be particularly vigilant about inferring dispositional traits associated with dishonesty. We therefore hypothesized that dispositions associated with dishonesty would enhance the magnitude of the FAE. In two previous studies (Burkett & Kirkpatrick, HBES 2002), we adapted methods from previous FAE research in which participants rated personality traits of themselves and others. Results confirmed the primary predictions: Participants gave higher ratings to others on dishonesty than on other comparable negative traits, whereas self-ratings of dishonesty were lower

than self-ratings of other negative traits. The reverse pattern was observed for positive traits, with participants attributing more honesty than other comparable positive traits to themselves, but less honesty than other positive traits to others. Two new studies were designed to replicate these results using alternative experimental designs (e.g., between- rather than within-subjects) and measurement refinements (e.g., multidimensional measurement of dispositional vs. situational attribution). In addition, these two studies are designed to more effectively rule out a potential alternative explanation for both previous and new results in terms of overall positivity-negativity of rated traits.

Keywords: *fundamental attribution error, Correspondence Bias, Cheater Detection, Social Exchange Theory*

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2:35PM

- Dickins, Thomas E. (Nottingham Trent University) **PD**

GENERAL SYMBOL MACHINES: THE EVOLUTION OF LANGUAGE AND THE MODULARITY ASSUMPTION

Humans uniquely form stimulus equivalence (SE) classes of abstract and unrelated stimuli, i.e. if taught to match A with B and B with C, they will spontaneously match B with A, and C with B, (the relation of symmetry), and A with C (transitivity). Other species do not do this. The SE ability is possibly the consequence of a specific selection event in the *Homo* lineage or it might be predicated upon other selected cross-species abilities and a consequence of specific learning environments. SE is of interest because it appears to demonstrate a facility that is core to symbolic behaviour. Linguistic symbols, for example, are arbitrarily and symmetrically related to their referent such that the term *cake* has no resemblance to cakes but when processed can be used to discriminate cakes. Equally when cakes are perceived the term *cake* is readily produced. This relation is arguably the defining mark of symbolic representation (Hurford, 1989). In this paper I shall detail the SE phenomenon and argue that it is evidence for a cognitive device that I term a General Symbol Machine (GSM). The GSM not only sets the background condition for subsequent linguistic evolution but also for other symbolic behaviors such as mathematical reasoning. In so doing the GSM is not particularly domain-specific. The apparent domain-specificity of, for example, natural language is a consequence of other computational developments. This introduces complexity to evolutionary arguments about cognitive architecture because it suggests differing degrees of computational specificity as a consequence of selection.

Keywords: *symbols, stimulus equivalence, modularity, General Symbol Machine*

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2:55PM

- Harrison, Mark (Daniel Webster College)

THE EVOLUTION OF ALTRUISM AND SPITE

This paper presents a group-selection model showing how a social species such as homo sapiens could evolve a genetic predisposition towards both altruism and spite. Specifically, the model predicts that humans may exhibit altruism towards “the poor” while at the same time exhibiting spite towards “the wealthy”. The paper also presents the results of experiments, using a modified dictator’s game, that test these predictions. The experimental results support the predictions of the model.

Keywords: *group selection, economic games, altruism, spite*

Mark Harrison

University of Michigan

3:25PM

- Stone, Valerie E. (U. of Denver, U. of Queensland)

THE EVOLUTION OF ONTOGENY AND THE DEVELOPMENT OF THE FRONTAL LOBES

Ontogeny does not recapitulate phylogeny, but ontogeny has undergone significant selection over hominid evolution. However, these ontogenetic changes may have affected domain-general much more than domain-specific abilities. Since *Homo erectus*, both cranial capacity and extent of adolescence have increased. In primates, adolescent development includes specific changes in cortical neuroanatomy, so we can make some inferences about how neural development may have evolved in hominids. This talk presents evidence for three key points. 1) Extension of adolescence may have been an important genetic change underlying brain expansion in hominids. I present analyses showing that in primates, extent of adolescence is strongly related to neocortex size ($r^2=0.90$), and that humans lie exactly on the regression line for nonhuman primates relating neocortex size and development. 2) I argue against recent claims that the selection pressure creating larger brains in hominid evolution was longevity rather than extent of childhood. I present analyses showing that in primates, extent of adolescence predicts neocortex size better than does longevity ($\beta=0.78$ vs. $\beta=0.19$). 3) Within neocortex, extent of adolescence is most strongly related to size of lateral prefrontal cortex, which handles domain-general cognitive abilities, rather than size of the more "social" areas, orbitofrontal cortex and temporal lobes. Extent of adolescence is also uncorrelated with size of the limbic system, involved in socio-emotional behaviors. I conclude that humans are cognitively unique because of our domain-general frontal lobe abilities, not our domain-specific social abilities. The appropriate reference period for domain-specific abilities may be the Miocene, not the Pleistocene.

Keywords: *brain evolution, frontal lobe, domain-specificity, hominid evolution*

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3:45PM

- Wang, XT (University of South Dakota)

REPRODUCTIVE VARIANCE AND REPRODUCTIVE INVESTMENT

From an evolutionary perspective, risks should ultimately be measured in terms of variations in reproductive fitness. According to a Bounded Risk Distribution (BRD) model with three referent points (Wang, 2002), reproductive decisions and parental investment would vary as a function of differential reproductive variances (potentials) among sons and daughters in reference to the reproductive goals, minimum requirements and the wealth status quo of the parents. In a field study conducted in Yankton, a rural farming area in the Midwest of the US, predictions derived from the BRD model were examined using interbirth interval, breast-feeding frequency and duration as measures of parental investment. In the families with higher perceived wealth, the breastfeeding frequency was higher for daughters than for sons. In contrast, in the lower perceived-wealth families, this pattern was reversed. According to the BRD model, parents whose status quo is more distant from their wealth or reproductive goals would prefer sons than daughters because a higher variance in sons' financial and reproductive success would increase the chance of reaching the goals, and vice versa for richer parents. These effects of perceived wealth were primarily psychological and independent of real income of the families. However, the higher the real income, the more likely a child would be breastfed. These findings suggest that real wealth level affects overall investment whereas the perceived wealth determines differential investment in daughters and sons. The findings are compared with those from a previous field study conducted in a rural farming area in mainland China.

Keywords: *Reproductive variance, Parental investment, Reproductive decisions, Sex of children*

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Attractiveness I, Chair: P.A. Rhode
Main Auditorium, Thursday Afternoon

2:15PM

- Burt, D. Michael (University of St Andrews)
- Cornwell, R. Elisabeth (University of St Andrews)
- Jones, Ben C (University of St Andrews)
- Little, Anthony C (University of St Andrews)
- Perrett, David I (University of St Andrews)

FACIAL MASCULINITY IS NOT ASSOCIATED WITH PERCEIVED HEALTH BUT IS RELATED TO FACIAL AGE

There has been speculation in psychological literature that facial masculinity in males could be a cue to immunocompetence or age. I report research designed to clarify the relationships between masculinity, health and age. Study 1 assessed whether preferences for facial masculinity were associated with preferences for facial health and preferences for facial age. It was found that masculinity and age preference co-varied, but that masculinity preference had no association with health preference. Study 2 assessed the impact of manipulations of apparent masculinity, health and age on perceptions of each trait. While there was a positive relationship between perceived age and perceived masculinity, there was a negative relationship between perceived masculinity and perceived health. These data do not support the immunocompetence explanation of preferences for facial masculinity and I consider the association between masculinity, age and dominance as an alternative explanation.

Keywords: *immunocompetence, masculinity, mate preference, age*

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2:35PM

- Johnston, Victor (Department of Psychology, NMSU)
- Scarbrough, Pamela S. Department of Psychology, NMSU)

WOMEN'S FACIAL PREFERENCES AS A FUNCTION OF THEIR DIGIT RATIO AND MENTAL ROTATION ABILITY

Mental rotation ability (MR) and 2D:4D digit ratio (DR) are well established sexually dimorphic traits that appear early in development and are believed to be a function of early exposure to androgens. This study examines how DR and MR differences within a group of Anglo women (N=41) are related to (1) their masculinity / femininity score on the BSRI and (2) their preferences for male faces (Attractive male, short term mate (STM), long term mate (LTM), etc.). Facial preferences were measured using a 1200 frame movie that morphed a very masculine male face, with pronounced testosterone markers, to a very feminine female face, with pronounced estrogen markers. To examine preferences over the menstrual cycle, the participants' choices were collected during two experimental sessions separated by two weeks. The results indicate that a woman's (1) femininity score decreases with decreasing DR and (2) masculinity score increases with increasing MR ability. (3) Women prefer a more masculine male face for a STM than a LTM and (4) the magnitude of this STM-LTM difference varies with DR because (5) high DR women prefer a less masculine LTM. Finally (6) women's attractive male preference varies over the menstrual cycle as a function of their DR. These results are interpreted as support for a hormonal theory of beauty wherein facial attractiveness depends upon the interaction between displayed facial hormone markers and the organizational effects of hormones on the brain of the observer

Keywords: *Facial Attractiveness, Digit Ratio, Mental Rotation, Hormones*

2:55PM

- Jones, Ben (University of St Andrews)
- Little, Anthony (University of St Andrews)
- Perrett, David (University of St Andrews)

INDIVIDUAL DIFFERENCES IN FEMALE PREFERENCES FOR HEALTHY-LOOKING MALE FACES: THE EFFECTS OF OWN ATTRACTIVENESS

Although studies of human facial attractiveness have typically emphasized high agreement between individuals on what is an attractive face, individual differences in mate preferences are evident in many non-human species. For example, healthy female sticklebacks are more likely to prefer immunocompetent males than are relatively unhealthy female sticklebacks. Preferences such as these are potentially adaptive if, given intra-sexual competition for mates, only females with a high market value are able to obtain the healthiest mates. Here we report a similar pattern of preferences when human females judge the attractiveness of healthy- and unhealthy-looking male faces. Within a general female preference for healthy-looking male faces, women whose facial attractiveness was judged high by others showed stronger preferences for healthy-looking male faces than women whose attractiveness was judged low. Moreover, these potentially adaptive preferences were disrupted by hormonal contraceptive use. Further analysis indicated that these individual differences in female preferences for healthy-looking male faces occur independently of previously reported individual differences in female preferences for masculine male faces. We conclude that evolutionary explanations of attractiveness can accommodate both general preferences for facial traits that may be cues to health and individual differences within these preferences.

Keywords: *facial attractiveness, individual differences, universal preferences*

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3:25PM

- Little, Anthony (University of St Andrews) **NI**

EVIDENCE AGAINST PERCEPTUAL BIAS VIEWS FOR SYMMETRY PREFERENCES IN HUMAN FACES

Symmetrical human faces are attractive. Two explanations have been proposed to account for these preferences: (1) the evolutionary advantage view, which posits that symmetry advertises mate-quality and (2) the perceptual bias view, which posits that symmetry preferences are a consequence of greater ease of processing symmetrical images in the visual system. I shall discuss recent data that is consistent with an evolutionary view but problematic for perceptual bias views. Studies have documented that symmetry preference differs when judging same- and opposite-sex faces. Symmetry is preferred more in opposite-sex, or mate-choice relevant, faces. A recent study has also found that symmetry preferences vary across observers according to their self-assessed mate-value. Both individual differences and a bias to prefer symmetry under conditions relevant to mate-choice are consistent with an evolved preference for symmetry for partner-choice but problematic for any posited universal perceptual bias. I also present new data showing that: (1) symmetry preferences are greater when face images are upright than when inverted, again evidence against a simple perceptual bias view suggesting symmetry preference should be constant across orientation about a vertical axis and (2) symmetry is preferred even in familiar faces, a finding that is unexpected by perceptual bias views positing that symmetry is only attractive because it represents a familiar prototype of that particular class of stimuli. This data favors the interpretation that a preference for symmetry in human faces is the result of evolutionary pressures on mate-

selection and not the result of a simple perceptual bias.

Keywords: *symmetry, attractiveness, perceptual bias*

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3:45PM

- Brase, Gary L. (University of Sunderland)

SEX-SPECIFIC SENSITIVITY TO CUES OF FUTURE PARENTAL INVESTMENT

Sex-specific sensitivity in humans to cues of future parental investment was documented in previous research (LaCerra, 1995), but these results are not easily accessible. The present research replicated this earlier finding, demonstrating that women –but not men—were sensitive to contextual cues of willingness on the part of opposite-sex models to invest in children. The current results utilized digital photograph manipulations to eliminate the need for repeated ratings of masked and unmasked stimuli, and used an internet population of participants to produce more generalizable results. In addition, the effect of sociosexual orientation on responses was evaluated.

Keywords: *parental investment, sex differences, attractiveness, internet*

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4:05PM

- Beaulieu, David (University of California - Santa Barbara)

AM I PRETTY?: TESTING THE DOMAIN-SPECIFICITY AS WELL AS THE ADAPTIVE SIGNIFICANCE OF SOCIAL COMPARISON WITHIN THE MATING DOMAIN

Undoubtedly, risks of pregnancy are greatest during the ovulatory phase of the menstrual cycle. During this period, poor mating decisions concerning sexual partners has greater potential for long-lasting consequences. Recent research suggests that females have unconscious psychological mechanisms that manage risks associated with increased fertility during ovulation. One valuable piece of information concerning mating decisions is the assessment of one's mate value (i.e. one's ability to attract valuable members of the opposite sex). One means by which individuals can assess their mate value is through social comparison (i.e. comparing oneself to others within our social environment). Social comparison associated with cues linked to one's mate value aids one in evaluating their mate value. Such mate value-linked cues include cues associated with health (i.e. being physically attractive) as well as cues related to the ability to sustain a long-lasting romantic partnership (i.e. being kind and understanding). Since mate value is a valuable piece of information concerning mating decisions, it was hypothesized that as a woman becomes increasing fertile across her menstrual cycle the assessment of her mate value should become more important. Specifically, I hypothesized that during the ovulatory phase characteristics related to a woman's mate value (e.g. being physical attractive; being kind and understanding) should become more important to her perceived social identity and she should assess herself on these characteristics more often via social comparison. Results illustrate the importance of taking the menstrual cycle into account when making predictions concerning social phenomenon.

Keywords: *Menstrual Cycle, Social Comparison, Mate Value*

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Cooperation and Game Theory I, Chair: J. Hibbing
Regency B, Thursday Afternoon

2:15PM

- Hibbing, John (University of Nebraska)
- Theiss-Morse, Elizabeth (University of Nebraska)

THE PERILS OF VOICE; THE JOYS OF INFLUENCE: INVOLVEMENT AND ITS CONSEQUENCES

Accepted wisdom among social psychologists and democratic reformers is that the greater the extent to which people are personally involved in decision making, the more likely they are to view the outcome as satisfying and the process as legitimate. Empirical tests of this hypothesis, however, are difficult to locate and evolutionary theory offers a different and more complicated set of expectations. If humans benefit from being respected parts of a viable social group, input (voice) that fails to translate into influence is a danger sign whereas voice that appears to have been influential—even if the final outcome is still not attractive—provides the validation people seek. In this paper, we report the results of original laboratory experiments using 200 non-student subjects. All reacted to identical outcomes (a decision-maker charged with dividing \$20 between the two of them keeps \$17 and gives just \$3 to the subject) rendered by eight different processes, four permitting the subjects a voice before the decision maker's allocation was made and four in which no voice was allowed. Consistent with evolutionary theory but contrary to most social and political theory (which tends to hold that voice has a positive effect under all circumstances), the results indicate voice that appears to have no influence makes people more frustrated than no voice at all. But voice that seems to have been heeded, however modestly (in this case by getting the decision maker to change the allocation from \$19-\$1 to \$17-\$3), makes people more satisfied with the outcome and the process. Thus, the proper conclusion is that people are not solely concerned with outcome and they are actually frustrated by unheeded voice. Increased satisfaction and legitimacy derives from the belief that we have had an influence. We believe this conclusion has important implications for a wide range of political, social, and occupational situations in which decisions are made and compliance is desired.

Keywords: *dictator game, legitimacy, voice, influence*

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2:35PM

- Hiraishi, Kai (The University of Tokyo)

DEFECTION TO ONESELF AND DEFECTION TO OTHERS: EXTENSION OF THE WASON SELECTION TASK WITH THE SHARING-RULE

Hiraishi (2002, HBES) extended the Wason selection task with a Sharing-rule, *if one is in-group, one gets the share*, by asking respondents which card(s) they would check when they could check only one, two, or three cards. It was shown that when respondents took the perspective of a potential recipient of the share, they put priority on checking the *in-group* card with a tag saying that the card carried information about oneself. Without the tag, however, the priority granted to the *in-group* card was diminished to a certain degree. This result suggests that respondents tried to detect defection to oneself while did not necessarily care about defection to others. In order to further confirm the notion, we conducted an experiment with three between-subjects conditions; control, sharing-familiar, and sharing-unfamiliar. The control condition had an indicative conditional rule. We had five cards; *oneself (in-group)*, *in-group*, *out-group*, *get-share*, *not-get-share*. The tendency to put priority on checking the *oneself* card was replicated in two Sharing-rule conditions as well as in the abstract condition. On the other hand, while the priority granted to the *in-group (not oneself)* card was high in the control condition, it was low in the Sharing-rule condition. These results suggest that 1) people generally tend to check information about oneself, 2) but such tendency can be discriminated from the tendency to check information about other in-group

members.

Keywords: *Wason selection task, in-group bias, cooperation, free-rider detection*

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2:55PM

- Wiessner, Polly (University of Utah)

THE PERILS AND PLEASURES OF PUNISHMENT AMONG FORAGERS

Recently an alternate model to account for certain forms of social cooperation has been proposed: strong reciprocity (Gintis 2000). In this model, members of a group benefit from mutual adherence to a social norm, and therefore individuals obey the norm and punish its violators, even when this behavior cannot be justified in terms of selfish preferences (Bowles and Gintis 2002, Fehr et al 1902). Strong reciprocity requires high levels of monitoring within the group and subsequent action to bring individual behavior in line with certain interests or norms through either reward or punishment. Though high levels of monitoring and “leveling” transgressors has been noted for forager societies, few systematic studies have been carried out to address critical questions about reward and punishment in egalitarian societies. This paper will draw on material in over 250 conversations among the Ju/’hoansi (!Kung) Bushmen to address the following questions: 1. What are the potential costs of punishment in an egalitarian society? 2. Is adherence to norms more frequently achieved through reward or punishment? 3. Who punishes whom for what? 4. What are different forms of punishment applied , how frequently, and under what circumstances ? 5. What is the outcome of punishment? 6. How does punishment vary according to political structures? For the last question, punishment among the Ju/’hoansi will be briefly compared to punishment among the Enga, a transegalitarian big-man society of Papua New Guinea.

Keywords: *strong reciprocity, social reward and punishment, Ju/’hoansi (!Kung Bushmen), norm conformity*

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3:25PM

- Ketelaar, Timmothy (NMSU)
- Bromgard, Gregg (NMSU)

EMOTIONAL SIGNALING IN SOCIAL DILEMMAS: EVIDENCE FROM THE PRISONER’S DILEMMA AND COORDINATION GAME

Do individuals who tend to cooperate in the Prisoner’s Dilemma display different emotional signals than individuals who tend to defect? In the current study participants were presented with a series of nine photographs of standard facial expressions of emotion (Ekman & Friesen, 1971; Ketner & Buswell, 1997) and were asked to indicate which emotion(s) they would display in each of the four possible outcomes of the Prisoner’s Dilemma (i.e., mutual cooperation, mutual defection, the sucker’s payoff and the temptation to defect). This same question was posed for each of the four outcomes of a much less conflictual two-person two-strategy game known as the Coordination game). The results showed that Happiness and Contempt displays were the most common emotions selected in both the Prisoner’s dilemma and Coordination game. These findings are discussed in terms of an on-going cross-cultural study of emotional signaling in China, Ecuador and the US.

Keywords: *emotion, game theory, prisoner's dilemma, coordination game*

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NMSU

3:45PM

- Zak, Paul (Claremont Graduate University)
- Kurzban, Robert (University of Pennsylvania)
- Matzner, William (Claremont Graduate University)

THE NEUROBIOLOGY OF TRUST

Animal models indicate that a suite of hormones, especially the neuroactive peptide oxytocin, are associated with pro-social behaviors. Based on this evidence, we sought to explore the physiological basis for interpersonal trust in humans in an experimental setting. We used a one-shot, anonymous "Trust Game" (Berg, Dickhaut & McCabe, 1995), which is played as follows. First, 1 player can pass up to \$10 provided by the experimenter to a second person. This amount is tripled, and any fraction of it can be returned. The amount sent is taken to be a measurement of trust, while the amount returned is an index of trustworthiness. To measure hormone levels, we drew blood from each participant immediately after he or she had made their decision. We found that oxytocin levels rose in direct proportion to the amount transferred to second-mover participants, and these participants return more to first-movers. That suggests that oxytocin responds to a signal of trust and facilitates trustworthiness. In contrast, oxytocin levels were unrelated to the amount first movers transferred, suggesting that oxytocin responds to the signal of trust rather than trust being related to basal oxytocin. Measurements of seven other hormones were unrelated to trust and trustworthiness. Lastly, oxytocin levels in second-movers were unrelated to any of the 172 survey questions administered to each participant during the experiment, with the exception of one question on positive affect, suggesting that oxytocin levels are primarily responding to the signal of trust, rather than being driven by exogenous factors.

Keywords: *trust, oxytocin, experimental economics*

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4:05PM

- Price, Michael (University of California, Santa Barbara) **NI**

DETECTING AND PUNISHING FREE RIDERS IN A COLLECTIVE ACTION

Male and female Ecuadorian Shuar subjects were presented with an experiment designed to measure their ability to detect and punish free riders in a collective action. The experiment involved a hypothetical collective action scenario in which participants were said to vary in both how much they benefited from, and contributed to, the collective action. These participants were of four kinds: (1) high-benefiting low-contributors (i.e., free riders); (2) high-benefiting high-contributors; (3) low-benefiting low-contributors; (4) low-benefiting high-contributors (i.e., altruists). Subjects were presented with various paired comparisons of the four kinds of participants (e.g. 'free rider' vs. 'altruist'), and asked which participant should be punished more. This experiment produced two interesting results. First, there were major sex differences in how subjects administered punishments: while males tended to punish the free rider, females tended to punish the altruist. Second, male subjects who had had a great deal of real-life experience in collective actions were significantly more likely to punish the free rider than were males who had had little such experience. These results may imply that the ability to detect and punish free riders is affected by sex differences and / or differential exposure to collective action problems.

Keywords: *collective action, punishment, cooperation, altruism*

Keynote

8:30PM

- Robert Boyd (UCLA)
- Peter J. Richerson (UC-Davis)

THE NATURE OF CULTURES

Humans learn from one another by imitation and teaching at extra-ordinary rates compared to other animals. The evolution of human capacities for culture and the impact of cultural evolution on human behavior vexed scientists for the whole of the 20th Century. We argue that accepting two fundamental principles is necessary to understand the role of culture in human behavior. First, contrary to many social scientists, culture is not superorganic; it is part of human biology. Our psychology has evolved to acquire and manage a large cultural repertoire. Innate mechanisms are deeply involved in these processes and, at the population level, create some of the strongest forces affecting cultural evolution. Second, contrary to some evolutionists, culture creates novel evolutionary outcomes because heritable cultural variation responds to natural selection. Genes and culture thus form a coevolving system in which innate aspects of our psychology are to some degree a result of selection on culture. Patterns of adaptation and maladaptation illustrate the action of the two principles.

Applied Evolutionary Psychology, Chair: R. Aunger
Heritage Room, Thursday Afternoon

2:15PM

- Jenkins, Mimi (London School of Hygiene and Tropical Medicine)
- Aunger, Robert (London School of Hygiene and Tropical Medicine)

*BAD SMELL AS A PROXY FOR DANGER AND THE IMPLICATIONS FOR GLOBAL IMPROVEMENTS IN
SANITATION*

Nearly half the world's population lacks sanitation, yet just building toilets does not ensure that people will use them. Public health officials in developing countries are beginning to recognize that more effective sanitation policies must be driven by consumer demand. But what makes a consumer more likely to accept improved sanitary facilities? Recent fieldwork in Benin and Ghana has found that an important reason for rejecting in-house sanitation is fear of smells. Often, households prefer continuing to use poorly managed public toilets or open defecating over the convenience of home toilets because they are sure to get away from the smell. In evaluations reported across the globe, smell is commonly stated as a primary dimension of satisfaction with a home toilet. Why should smell be so important? Disease-inducing or -carrying organisms thrive in bio-chemical environments that generate a variety of odor-producing molecules. We speculate that the ability to detect bad smells has been naturally selected as a good proxy for the presence of invisible dangers in the local environment and leads to their avoidance by promoting a disgust reaction. An evolutionary, consumer-based approach to public health policy-making thus suggests that odor control is a crucial feature of any sanitation improvement. Unfortunately, many toilets currently being supplied to the developing world fail the smell test. Flush toilets and water-borne sewerage solve the problem but are unaffordable. Achieving widespread adoption of on-site sanitation practice in developing countries is likely to require re-designed toilets that can cheaply and reliably control smell. Newly emerging urine-diverting toilets may offer this performance.

Keywords: *sanitation, motivation, disgust, disease*

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2:35PM

- Rabie, Tamer (London School of Hygiene and Tropical Medicine)
- Aunger, Robert (London School of Hygiene and Tropical Medicine)
- Curtis, Valerie (London School of Hygiene and Tropical Medicine)

THE EVOLUTIONARY PSYCHOLOGY OF DISGUST

A set of 15 visual stimuli designed to test the hypothesis that objects representing a risk of disease are viewed as disgusting were developed for use by the British Broadcasting Corporation (BBC). Over 25,000 valid responses to the test panel were obtained via the BBC website from around the world. In comparisons between similar objects (such as a caterpillar versus intestinal parasitic worm), the more dangerous stimulus in the pair consistently provoked a stronger disgust response. Stimuli unrelated to disease risk (such as play balls) were neutral. Females are more disgust sensitive than males, confirming earlier studies by Jonathan Haidt and colleagues. No differences were found in average disgust sensitivity between continents, consistent with the claim that cultural variation in core disgust is trivial. A characteristic life cycle could also be identified in disgust sensitivity. Preadolescents are relatively insensitive, but then the developing emotional reaction appears to over-generalize, rising to its highest level during adolescence; averages then moderate during adulthood as sensitivity mechanisms become more sophisticated. Health professionals are also less sensitive than those working in other occupations, due either to reaction fatigue or a modulated responsiveness to an environment presenting constant, multiple disease threats. We conclude that the various kinds of objects found to be disgusting are united in being a perceived disease risk, and that a cognitive mechanism has evolved to find such risky objects repellent. This evolutionary psychological perspective is a powerful, grounded theoretical basis for understanding disgust in humans, and unifies our understanding of previously diverse phenomena.

Keywords: *evolutionary psychology, disgust, disease, life history*

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London School of Hygiene and Tropical Medicine

2:55PM

- Scott, Beth (London School of Hygiene and Tropical Medicine)
- Curtis, Valerie (London School of Hygiene and Tropical Medicine)

USING EVOLUTIONARY PSYCHOLOGY TO INFORM HYGIENE PROMOTION IN GHANA AND INDIA (KERALA STATE)

Curtis and Aunger have described a model which uses evolutionary psychology to predict what mechanisms might drive hygiene behaviors. In this model they have argued that the citation of biomedical or health reasons represents a conscious attempt to rationalize and explain behaviors such as hand washing, but that the true drivers for hygiene behaviors probably lie in the subconscious and evolved in our animal past to allow us to maximise our chances of Darwinian success, that is to survive and reproduce.

Here we present analyses from formative research carried out in Ghana and Kerala State, India designed to elucidate those factors motivating hand washing with soap, especially after contact with stools. It is striking that while there are differences between the two contexts, there are also clear similarities and as predicted by the evolutionary psychology model of hygiene behaviors: disgust, nurture and status building all appear to play key roles in motivating hand washing with soap, as well as a wide range of more general hygiene behaviors. While biomedical reasons are commonly cited as motivators for hand washing in both data sets, they are rarely cited in isolation from other drivers, indicating the potential weakness of using traditional hygiene education alone to appeal to people to wash their hands. These analyses suggest that hygiene behaviors are not practiced with the sole aim of consciously preserving health, but also to maximise survival through social acceptance and the disgust instinct, and reproductive success through enhancing attractiveness and nurturing offspring.

Keywords: *hygiene, India, disgust, motivation*

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3:25PM

- Curtis, Valerie (London School of Hygiene and Tropical Medicine)
- Aunger, Robert (London School of Hygiene and Tropical Medicine)

A "DUAL NETWORK" MODEL FOR CHANGING HABITS

If the brain is a product of natural selection, then knowing its evolved structure and function should constitute a powerful basis not only for understanding behaviour, but for changing it. We therefore present a general model of habit formation and modification inspired by evolutionary psychology. This model argues that someone seeking to change behaviour can only do so by modifying the "information environment" of target individuals. Further, interventionists can usefully conceive of the environment as a maze (or network of linked object/events) through which the messages they produce must wend their way to reach a target individual. The communication events that constitute this causal chain can link people or artifacts (like computers) or both. Once the message reaches the target individual, it must negotiate another network--this one composed of linked neurons in the brain. From this perspective, a habit is a linked suite of neurons (or route through a brain module) that repeatedly processes stimuli from a particular domain of content and leads to a regularized behavioural response. This "dual network" model suggests some strategies will be more effective than others in negotiating environmental and neuronal networks to cause change in habitual behaviors. An important implication is that strategies designed to transform habitual behavior should not necessarily target "rational," conscious decision-making, but make use of the regular, evolved and ancient features of the human brain. The case of advertising campaigns directed at improving hygienic behavior is presented as a case study of this approach.

Keywords: *hygiene, evolutionary psychology, behaviour modification, applied*

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3:45PM

- Lipchin, Clive (University of Michigan) **NI**

MEN, WOMEN AND WATER: A CASE STUDY OF GENDER PERCEPTIONS ON WATER IN THE SOUTHERN ARAVA DESERT, ISRAEL

The way people perceive water as a resource is becoming recognized as a necessary step toward integrative water resource management. Determining how a resource is perceived is a multi-faceted task. A first step in teasing apart such complexity is the consideration that one's gender influences one's perceptions about the environment. Biological and social theories indicate that men are more inclined to discount the future than women and are more inclined to take risks than women in their respective roles of breadwinner and caregiver. From a biological standpoint these roles are manifested by men and women pursuing different reproductive strategies. From a social perspective these roles arise as a result of enforcement in society. This study examined how these roles influenced men and women's responses to a set of survey items about water. The study was carried out in communities in the southern Arava Desert, Israel where water scarcity is acute. The survey items reflected how men and women pursue their respective roles in pursuing long term versus short-term trade offs such as using available water supplies now or later and risk prone versus risk averse strategies such as water re-use from wastewater. Enforcement of these roles in society was according to whether a person lived in an urban setting (high enforcement) or a rural setting (low enforcement). The effects of socioeconomic factors (age, income and education) were also analyzed as predictors for responses to the statements. Results indicated that men and women did differ in their perceptions on water and that women were more inclined to adopt long term strategies that are risk averse versus men who favored shorter term, risk prone strategies. The effects of social enforcement (urban versus rural) and socioeconomic factors were not significant predictors for differences between the responses made by men and women. Rather, the data lent support to the biological theory of gender differences. The implication for policy management that is sensitive to gender differences is also discussed.

Keywords: *gender differences, water scarcity, environment*

4:05PM

- Mysterud, Iver (Department of Biology, Univ. of Oslo, P.O. Box 1050 Blindern, NO-0316 Oslo, Norway)
- Viljen Poleszynski, Dag (Bjerkelundveien 8b, NO-1358 Jar, Norway)
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- Bruset, Stig (Lierskogen legekantor, NO-3420 Lierskogen, Norway)

*TO EAT OR WHAT TO EAT, THAT'S THE QUESTION: A CRITIQUE OF THE OFFICIAL NORWEGIAN
DIETARY GUIDELINES*

An evolutionary perspective gives a useful comparison for how people's health was before the agricultural revolution started some 10,000 years B.C. As a contrast to modern people in industrial societies, non-industrialized people are generally not afflicted with many common "civilization diseases" like cancer, cardiovascular disease, type 2 diabetes, high blood pressure and osteoporosis. How come we seem less healthy than "primitive peoples", having access to more scientific data about how to avoid disease and remain healthy exist than any society before us, and as more scientists devoted to inform the public exist than ever before? We argue that the official guidelines are themselves part of the problem. They actually contribute to creating the very problems that they are intended to solve. Therefore, we focus on the official recommendations for healthy eating in Norway, as they are quite similar to the guidelines in most other Western countries, including the USA. Some of the problems with these guidelines are that they ignore 1) evolutionary arguments and research, 2) the historical experience of indigenous/traditional peoples, 3) the biochemical, metabolic and hormonal effects of foods, 4) the differing bioavailability of nutrients in various foods, and 5) the variability of individual needs in large groups with special requirements.

Keywords: *diet, evolution, official dietary guidelines, critique*

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Plenary (Auditorium, 211)

9:00PM

Eric Alden Smith (University of Washington)

*COMMUNICATION AND COLLECTIVE ACTION: WHAT THE SOCIAL SCIENCES CAN
TEACH EVOLUTIONISTS, AND VICE VERSA*

Human Behavioral Ecology II, Chair: F. Marlowe
Heritage Room, Friday Morning

10:15AM

- Blum, Elizabeth (University of Pittsburgh)

*DOES NATAL TERRITORY QUALITY PREDICT HUMAN DISPERSAL CHOICES? A TEST OF EMLÉN'S
MODEL OF FAMILY FORMATION*

In most species with parental care, offspring disperse from the natal territory either at sexual maturity or when they are competent to survive independently. In a relatively small number of species, dispersal does not coincide with these developmental markers. Instead, offspring remain on the natal territory, where they compete for resources and sometimes help raise other young. This presumably costly life history trait is undoubtedly influenced by ecological factors. In Emlén's (1995) definition, a "family" is characterized by delayed dispersal, that is, continued interaction with kin after maturity. Emlén suggests that natal territory quality (NTQ) may influence family formation by affecting the timing and circumstances of dispersal. Specifically, individuals from higher quality territories should be more discriminating in their dispersal choices, resulting in delayed dispersal relative to individuals from inferior territories. Indeed, much research in birds suggests that relevant dimensions of natal territory influence dispersal timing. Humans, too, exhibit a form of delayed dispersal. A behavioral ecological explanation for this could contribute to our understanding of human social systems and family stability. In order to test whether Emlén's model is empirically useful regarding human dispersal choices, this paper presents data on the relationship between human NTQ and dispersal. Using age-based cohorts from the Panel Study of Income Dynamics, I test the prediction that there is a positive relationship between human NTQ and age at dispersal. Measures of family economic resources (NTQ) and of timing of several life history events (dispersal) are analyzed using logistic regression and proportional hazards.

Keywords: delayed dispersal, human behavioral ecology, PSID, family formation

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10:35AM

- Kurland, Jeffrey A. (Department of Anthropology, Penn State)
- Sparks, Corey S. (Department of Anthropology, Penn State)

*IS THERE A PALEOLITHIC DEMOGRAPHY? IMPLICATIONS FOR EVOLUTIONARY PSYCHOLOGY AND
SOCIOBIOLOGY*

Biological anthropologists, evolutionary psychologists and sociobiologists postulate an environment of evolutionary adaptation to which the unique cognitive and affective modules of human psychology have been fashioned. Paraphrasing G. C. Williams, evolution is the differential vital statistics of individuals; no more, no less.

It would seem critical therefore to estimate the demography of our ancestors in order to understand their social world, yet we know little of the survival and fertility patterns of the Upper Paleolithic. In a first attempt to ascertain the evolutionary demography of the Upper Paleolithic, we use contemporary forager and paleodemographic samples to generate a range of Paleolithic demography. Age-specific rates of birth and death are used to generate the expected number of kin for a given ego. For example, over a range of demographic assumptions, the odds are 3:1 against a 20-year-old woman having her 40-year mother alive for help rearing her offspring. Indeed, individuals would have had to interact more regularly and more frequently with distant kin and non-relatives, both within and between social groups. This suggests weaker kin selection, but stronger mutualism and reciprocity, among our ancestors. This also may, in part, explain why contemporary human kinship is classificatory rather than genealogical. This research was partially supported by a grant from the Henry Luce Foundation to JAK, co-PI; Robert Marshall, PI, Department of Economics, The Pennsylvania State University.

Keywords: *demography, EEA, Paleolithic, sociality*

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10:55AM

- Marlowe, Frank (Harvard)

THE MATING EFFORT OF HADZA MEN

Mating effort (ME) is an important component of reproductive success but rarely measured since this is difficult to do, especially in humans. Here, I explore the concept of ME by making some predictions about men's ME and testing them among Hadza hunter-gatherers in Tanzania. When costs are held constant, men should increase their ME in response to increasing mating opportunities. However, the more time and effort a man spends on ME the less time and effort he has to spend on parenting effort (PE). Therefore, I predicted: 1) men would provide less PE when they had more potential mates in camp, and 2) men who had had more wives in their lifetime, controlled for man's age, would provide less PE. The time a man spends near his wife may reflect mate guarding or mate helping, either of which should count as ME. I therefore predicted: 3) men would spend more time near wives who had higher mate value (were younger), and 4) spend less time near wives who were not cycling (pregnant, nursing, or post-menopausal). Because more ME directed at one woman means less available to direct at other women, I predicted: 5) men would spend less time near their wives when they had more potential mates in camp, and 6) men would provide less direct care to their stepchildren (ME) when they had more potential mates in camp. Some, but not all, of these predictions were supported. The reasons why are explored.

Keywords: *Hadza, hunter-gatherers, mating effort, parenting effort*

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11:15AM

- Meehan, Courtney (Washington State University)

THE EFFECTS OF MATERNAL LOCALITY ON PARENTAL AND ALLOPARENTAL BEHAVIOR AMONG THE AKA FORAGERS OF CENTRAL AFRICA

Evolutionary researchers indicate that tradeoffs in inclusive fitness, reciprocal exchange, and learning to mother influence alloparental care. This paper examines intracultural variability in parental and non-parental care infants receive among Aka hunter-gatherers in the Central African Republic. The Aka exhibit high frequencies of alloparental care, but substantial variability exists in the frequency infants receive care from others. This paper

examines the role of residence of mother in shaping parental and non-parental care. Fifteen eight to twelve month old infants were observed during all daylight hours. While the overall frequency of care was similar across residence patterns, the variability is with who directs care to the infant and the frequency of care offered. Infants who reside in their mother's natal camp received significantly higher frequencies of care from juvenile and adult females. In patrilocal camps, where the frequency female care giving is low, paternal investment is significantly higher and mothers offer a slightly higher frequency of care as well.

Keywords: *Alloparenting, hunter-gatherers, infant care*

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11:35AM

- Cvorovic, Jelena (Arizona State University)

GYPSY REPRODUCTIVE STRATEGY

Based on original fieldwork in Serbia, this paper elucidates and contrasts the reproductive behavior of typically poor Gypsies with a group of much wealthier Gypsies living in a Serbian village. The examined traits include rates of fertility, mortality, age distribution, education and parental care. This paper explores the relationship between socioeconomic status, reproductive behavior and ethnicity.

Keywords: *K/r-selection, Gypsies, socioeconomic status*

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Depression and Emotions, Chair: E. Hagan Regency B, Friday Morning

10:15AM

- Campbell, Benjamin (Boston University)
- Plumb, Ellen (Bryn Mawr)

HOUSEHOLD TYPE AND PSYCHOLOGICAL STATUS OF ADOLESCENT BOYS IN RAKAI DISTRICT, UGANDA

Evolutionary theories of socialization predict that early childhood experience shapes the balance of internalizing and externalizing behavior among adolescent and adult behavior, with insecure attachment leading to increased rates of depression and harsh parenting leading to increased rates of aggression. We used this insight to explore the impact of social conditions on the behavior of adolescent boys in Rakai District, Uganda. Rates of depression, aggression and problem behavior were compared between orphans (n=42) and boys from intact (n=18) households in a sample of boys aged 9-18. Depression was determined using the childhood depression scale. Aggression was determined using the Olweus anger scale; problem behavior was based on questions about a set of anti-social activities. In addition, in-depth interviews and focus groups confirmed the cross-cultural validity of concepts of anger and depression. Results show that contrary to expectation, boys from intact rather than non-intact households reported higher rates of severe depression. In addition, boys from intact households reported higher rates of physical aggression and problem behavior. Severe depression was not associated with loss of parents or any other predictor, which may in part reflect the average age at parental loss (8.7years). Multivariate analysis revealed that physical aggression was positively related to reports of physical punishment and negatively to church attendance. These preliminary results indicate that physical punishment is associated with externalizing behavior among adolescent boys in Rakai District, Uganda and suggest that evolutionary approaches to

aggression among boys would benefit from attention to cultural practices of punishment.

Keywords: *adolescence, aggression, depression, Africa*

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10:35AM

- Hagen, Edward H (Institute for Theoretical Biology)
- Barrett, H. Clark (University of California Los Angeles)

IS POSTPARTUM DEPRESSION AN ADAPTATION? EVIDENCE FROM SHUAR MOTHERS.

The standard medical model views investment in offspring as automatic; consequently, pregnancy and postpartum depression, which are characterized by a disinterest and reduction in investment in a new offspring, are viewed as 'mental illnesses'. Given the enormous costs of raising human infants, it is a virtual certainty that mothers evolved to evaluate social support, access to resources, and infant health before committing to a dozen or more years of investment in the new child. Scores of studies in industrialized societies have shown that that latter are excellent predictors of pregnancy and postpartum depression. Here we report results of the first study of pregnancy and postpartum depression in a small-scale, kin-based hunter-horticultural society. These results include prevalence of pregnancy and postpartum depression, indigenous explanations for pregnancy and postpartum depression, and the association between desire for the new offspring and pregnancy and postpartum depression.

Keywords: *postpartum depression, psychopathology, parental investment*

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Institute for Theoretical Biology

10:55AM

- Keller, Matthew (University of Michigan) **NI**

WHAT CAN QUANTITATIVE EVOLUTIONARY GENETICS TELL US ABOUT WHY MENTAL DISORDERS EXIST?

Mental disorders seem to pose somewhat of a conundrum for evolutionary psychologists. Why do mental disorders exist? There are probably three answers to this. First, some cases classified as "mental disorders" are actually adaptive reactions to extreme situations. Second, some other cases of mental disorders are caused by mismatches between the modern and ancestral environments. Last, some mental disorder cases are due to defective mechanisms that are (often) caused by variant genes. This genetic variance underlying mental disorders seems higher than we might expect natural selection to tolerate. However, a surprising observation in the last 20 years has been that, contrary to early theoretical expectations, even highly fitness relevant traits exhibit moderate to high (maladaptive) genetic variability. Thus, it is possible, if not likely, that a substantial proportion of the genetic variance underlying mental disorders is maladaptive, persisting *despite* selection against it. Modern evolutionary quantitative genetics supplies several possible reasons for why this genetic variance has persisted. In light of these principles, the existence of mental disorders seems less puzzling, and adaptive explanations for the genetic variance underlying mental disorders are less necessary.

Keywords: *mental disorders, quantitative genetics, heritability*

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11:15AM

- Nesse, Randolph (University of Michigan)
- Keller, Matthew (University of Michigan)

MOOD AND THE REGULATION OF GOAL PURSUIT

Organisms must have mechanisms to allocate effort away from enterprises that waste effort and towards those that payoff. Humans differ from most other animals in pursuing goals, especially social goals that require large investments of resources over months or years with uncertain payoff. Thus, people frequently find themselves in situations where they must decide whether to give up and disengage from goals in which they have already made large investments. This paper presents results from two studies of related phenomena. In the first, subjects completed a computerized virtual foraging task in which their staying time in patches could vary along with variations in the rate of depletion of resources in the patch to determine if persistence in one patch is related to mood or to persistence in the pursuit of other goals. Staying time in this task was more closely related to academic performance than it was to our measures of mood. In the second study, a community sample of 100 people were interviewed for 2 hours each to determine if they were pursuing a major unreachable life goal from which they could not disengage. The results showed that such situations were common and strongly associated with low mood in a way that could potentially help to explain differences in mood between groups of different SES, and in people in different life circumstances. These results provide the foundation for further cross-cultural studies to determine the role low mood plays in regulating the pursuit of goals in a more naturalistic environment.

Keywords: *mood, foraging, goals, depression*

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University of Michigan

11:35AM

- Poels, Karolien (Ghent University)
- Vyncke, Patrick (Ghent University)

THE CRUCIAL ROLE OF EMOTIONS IN ADVERTISING PROCESSING

In literature on how people process advertising emotions are often neglected. This contradicts findings within neuroscience and evolutionary psychology in which emotions are seen as necessary for human "rational" behaviour: emotions set out the context in which rational behaviour takes place. Consequently, without emotions no rational behaviour is possible. In this paper, we first give an overview of the most important models of advertising processing in which we take a closer look at the emotional component. We think emotions are essential in advertising processing, too. Secondly, we present our research on sex and gender differences in affective reactions to pictures. We created 30 sets of pictures each containing 1 female-oriented, 1 male-oriented and 2 neutral pictures (not specifically female or male oriented). Within 5 seconds the respondents (N=694) had to indicate the picture they preferred. Afterwards, we connected the results to both sex and gender. To divide the respondents into gender-groups they had to fill in the Bem Sex Role Inventory (BSRI). The results clearly reveal more sex than gender differences. Although men tend to be more "feminine" according to the BSRI, they still react consistent with their biological sex when it comes to affective reactions. These findings suggest that men and women possess specific emotional sensibilities. In the last part of this paper, we study the gender specific emotional sensibilities from an evolutionary psychological point of view and we discuss implications for advertisers who make use of gendered ads.

Keywords: *emotions, gender, advertising research*

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Language and Voice Pitch, Chair: F. Gil-White
Colonial, Friday Morning

10:15AM

- Bryant, Gregory (UC Santa Cruz)

DOES VOCAL BEHAVIOR COMMUNICATE STATUS INFORMATION?

Conversationalists coordinate many aspects of their behavior while engaged in discourse. Some of these coordinated movements may signal information regarding hierarchical status. Previous research has suggested that lower status individuals adjust (i.e., lower) the pitch of their voice while speaking to higher status individuals. Synchronizing and matching nonverbal aspects of communication increase relevance and thus ease cognitive processing. But these behaviors could also reflect adaptations for communicating status information, and may be rooted in older systems designed to signal information regarding strength and size as seen in many animal species. The current study examined how speakers adjust their voice dependent upon their partner in a conversation. Participants reliably altered prosodic features of their speech when switching conversational partners and these changes were systematically related to relative hierarchical status. A collaborative status information exchange system could facilitate cooperation and allow conspecifics to avoid needless costly contests.

Keywords: *prosody, language, status*

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10:35AM

- De Backer, Charlotte (Ghent University)

STONE AGED MINDS IN TABLOID SPACE

According to R. Dunbar's social brain hypothesis, the main function of language was, and still is, the exchange of social information (gossip) in order to facilitate bonding in larger social groups. Today, we not only exchange social information through interpersonal communication, but also through broader channels, like (mobile) phone e-mail, media or gossip magazines (tabloids). J. Barkow explained our interest in media gossip by pointing out that we have 'stone aged minds' that fool us into believing that the people who come into our lives daily (through television and other media) are people we actually know. To test whether tabloid topics are similar to conversational (gossip) topics, we analyzed 850 stories from Belgian tabloids. We set up a list of adaptive, universal behaviour patterns of which the spreading through gossip is valuable. All articles were coded by three independent coders in order to obtain objectivity. In our analysis we checked whether all articles could be classified in one or more of the behavioural patterns. We ranked the items to see which behavioural pattern appeared most frequently. Next we analyzed gender differences. Previous research on mating strategies revealed that information about women is most appreciated when it concerns physical appearance. The preferred information about men rather concerns status. We therefore coded the gender of the subjects and looked whether topics differed in articles on males, females or mixed groups. At last we also investigated if articles on celebrities differed in topics from articles on unknown people.

Keywords: *Gossip, Tabloids, Social Communication, Evolutionary Psychology*

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10:55AM

- Gil-White, Francisco (Psychology, University of Pennsylvania)

THE EVOLUTION OF PRESTIGE LEADS TO THE EVOLUTION OF REFERENCE (AND HENCE LANGUAGE)

This talk will defend that: 1) To evolve language first you must evolve arbitrary reference. Reference cannot emerge unless: 2a) there are cooperative dyads already trying to exchange information pre-linguistically (i.e. imitation plus pedagogy); and unless the ecology is structured in such a way that (2b.i) truly large rewards accrue to any dyad that manages to invent the arbitrary reference, thus motivating its invention; and (2b.2) once invented, the trick almost coercively spreads through social learning to the entire population, becoming stable (which is necessary to create a selection pressure for genes *for* the reference trick)

Solving the above problems without 'magical' assumptions appears difficult. But perhaps a solution is at hand. My hypothesis assumes a creature with a chimpanzee brain *except* for a capacity to imitate behavior through observation (without domain limitations - i.e. unlike songbirds). That is *all* I assume. The claim is: merely from this assumption it follows, in an unbroken series of sequentially entailing logical steps, that prestige (not dominance!) processes will result. Prestige solves all of the above problems, in one stroke, leading to the emergence of reference (and hence, ultimately, language).

At this stage the argument is non-mathematical. It is Baldwinian, as any theory of language evolution must be. It solves problems that earlier proposals cannot (even the ability to model minds does not have to be assumed in this account, because the ability to model minds will be selected for by prestige processes even if it does not exist before such processes appear).

Keywords: *Language, Imitation, Prestige, Cultural transmission*

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11:15AM

- Sokol, Rosemarie (Clark University)
- Webster, Karen (Clark University)
- Elfenbein, Dana (Clark University)
- Thompson, Nicholas (Clark University)
- Stevens, David (Clark University)

AN EVOLUTIONARY PSYCHOLOGICAL APPROACH TO PROSODY AND WHINING

Whining is a method children frequently and adults occasionally use to attract the attention of potential caregivers. That this behavior is stereotyped and that it produces such a strong response implies an adapted responsiveness in adults to the properties of whining. Our own preliminary observations suggest that whining may share the slowed production, high pitch, and exaggerated intonation contours that characterize vocalizations directed towards infants by parents, termed "motherese". This study attempts to identify the distinctive attention-getting properties of whining through a multi-dimensional scaling study of adult responses to adult whining and non-whining statements. The stimuli consisted of 6 utterances of the sentence "I want to go to Boston". This sentence was spoken as either a whine, a boast, an angry statement, a demand, a simple statement, or a question. 18 participants judged the similarity of random pairs of these utterances, and in a second session rated each statement on quality scales created from feedback from the participants. If, as we suppose, that whining is "motherese" directed back at mothers to solicit care giving, then whining is a form of evolutionary mimicry. We explore selection hypotheses to explain why such mimicry should have come to be effective in attracting the attention of caregivers.

Keywords: *whining, evolutionary psychology, prosody*

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11:35AM

- Falcon, Rachael (Clark University)
- Thompson, Nicholas (Clark University)
- Yee Lai Kelly Ku (Clark University)
- Elfenbein, Dana (Clark University)
- Webster, Karen (Clark University)
- Sokol, Rosemarie (Clark University)
- Stevens, David (Clark University)

ADULT PERCEPTION OF INFANT CRIES: SALIENT ACOUSTICAL FEATURES

For decades researchers have attempted to discover the communicative acoustic characteristics of infants' cries. Strong evidence for a communicative characteristic would consist of a set of relationships between the salient features of the cries and the caregivers' perceptions of them. The Respiratory Drama Hypothesis proposes that infants' cries are designed to communicate with caregivers by simulating cues of respiratory distress, such as abnormal pitch/duration ratios, coughing, choking, or gasping. Following this hypothesis, two studies using Multidimensional Scaling were conducted in which adult participants were presented with cry stimuli from varying situations (Study 1) and from a single situation (Study 2). Our results failed to support the Respiratory Drama Hypothesis. However, we did find other acoustic characteristics that seem to be communicative. Participants perceived particular acoustic characteristic of cries as representing age and urgency.

Keywords: *Infant, Crying, Multidimensional Scaling, Evolution*

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Mate Choice I, Chair: L. Cronk **Regency A, Friday Morning**

10:15AM

- Campbell, Lorne (University of Western Ontario)

HOW THE SELF-CONCEPT HAS BEEN SHAPED BY THE MATING PREFERENCES OF OTHERS

Men place greater importance on traits representing youth and beauty in potential mates, whereas women place more importance on traits indicating status and resources. Over evolutionary time, these differential preferences should have shaped the importance people place on different aspects of their self-concept. 5 studies tested the hypothesis that men should place greater importance on traits that reflect their status, whereas women should place more importance on traits that reflect their physical appeal. A self-report study (Study 1), and a modified Stroop Task (Study 2), showed that men more highly valued in themselves traits related to status, whereas women valued traits related to physical attractiveness. Study 3 and 4 asked men and women to imagine having a pleasant discussion with an opposite-sex individual that they wanted to ask on a date, and then being derogated by a same-sex competitor on their status or physical attractiveness. Men were more upset at the thought of being derogated on their status, whereas women were more upset at the thought of being derogated on their physical attractiveness. Participants in Study 5 believed they had the opportunity to win a lunch date with a member of the opposite sex. They answered questions about themselves that were asked by an opposite-sex research confederate, in the presence of a same-sex competitor (also a confederate), and were derogated on their status, physical attractiveness, or not at all, by the competitor during the interview. Results were identical to those obtained in studies 3 and 4. It is suggested that the self-concept has been shaped by the preferences of mates over evolutionary history.

Keywords: *self-concept, mate preferences, status, attractiveness*

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10:35AM

- Cornwell, R. Elisabeth (University of St. Andrews, School of Psychology)
- Pitman, Robert (University of St. Andrews, School of Biology)
- Whiten, Susie (University of St. Andrews, School of Medicine)
- Boothroyd, Lynda (University of St. Andrews, School of Psychology)
- Burt, D. Michael (University of St. Andrews, School of Psychology)
- Feinberg, David R. (University of St. Andrews, School of Psychology)
- Jones, Ben C. (University of St. Andrews, School of Psychology)
- Little, Anthony C. (University of St. Andrews, School of Psychology)
- Perrett, David I. (University of St. Andrews, School of Psychology)

PHEROMONES IN RELATIONSHIP CONTEXT: LINK BETWEEN VISUAL AND OLFACTORY CUES

Psychological mechanisms mediating human mating strategies have evolved in response to adaptive challenges, including those posed by fluctuating conditions. Whilst preferences may differ between individuals across conditions, at any one moment in time preferences for a particular characteristic in a partner might be expected to hold across multiple sensory modalities. In two studies we examine whether individual differences in preferences for masculine and feminine characteristics correlate across two different modalities, olfaction and vision. In study 1 subjects were asked to rate 2 male human pheromones (4,16-androstadien-3-one; 5 α -androst-16-en-3-one) and 1 female pheromone (1,3,5(10), 16-estratetraen-3-ol) in terms of pleasantness and to choose a preferred degree of masculine/feminine facial shapes for long- and short-term relationships. When judging for long-term relationships, women showed a positive correlation between preference for male pheromones and for masculine facial shapes, while men showed a positive correlation between a preference for the female pheromone and for increased feminine facial shape. Study 2 replicated the findings using an independent sample and subjects were asked to indicate preferences for the pheromones and face shapes based on long- or short-term relationships. In both studies women taking oral contraceptives did not show this relationship of olfactory and visual preferences indicating possible hormonal influences. This is the first study to link sex-specific preferences between putative human sex pheromones and sexually dimorphic facial characteristics and it provides evidence for the concordant nature of human mating signals.

Keywords: *pheromones, facial attractiveness, individual differences*

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10:55AM

- Cousins, Alita J. (University of New Mexico) **NI**

WOMEN'S RESISTANCE TO MATE GUARDING

Although mate guarding is considered to be an important aspect of intimate relationships, its impact on women has been virtually ignored. This study was motivated by the paucity of research on women's attitudes toward mate guarding by their partners. Under most circumstances, mate guarding is costly to women because it decreases women's freedom and independence, especially as it relates to their choice of extra-pair partners. Because of the negative nature of mate guarding for many women, especially those interested in EPCs, women were expected to resist mate guarding. The current study assessed women's reactions to mate guarding in dating couples (N = 102). To assess women's resistance to mate guarding, I developed a measure of women's resistance behaviors associated with mate guarding. Analyses indicated that the scale was valid. Women indicating higher levels of resistance toward mate guarding by their partner stated that they would have significantly more negative reactions to mate guarding. In addition, structural equation modeling revealed that women showing sexual interest in other men were more likely to resist male mate guarding attempts. Men with higher levels of relationship investment mate guarded their partners more than less investing men. SEM also revealed that when women expressed high levels of resistance behaviors, both men and women reported more

conflict in the relationship. This study supports the notion that many women resist mate guarding by their partners, and that there are individual differences in women's reactions to mate guarding.

Keywords: *mate guarding, female mate choice, relationship dynamics*

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11:15AM

- Cronk, Lee (Rutgers University)
- Dunham, Bria (Rutgers University)

ENGAGEMENT RINGS AS SIGNALS IN AMERICAN COURTSHIP

This study examines engagement rings as signals in American courtship. Engagement rings may serve as signals of resource control and of commitment to the relationship. We began with the hypothesis that, if rings are signs of commitment, ring cost would increase when other signs of commitment, such as a lengthy courtship, are weak or absent. To test this and other hypotheses, we sent questionnaires to one thousand newlyweds in Franklin County, Ohio. Preliminary results indicate that (1) in contrast to our original hypothesis, courtship length positively correlates with ring cost; (2) there is a strong positive correlation between male income and ring cost; and (3) younger brides are given rings that cost more as a proportion of male income than older brides. Engagement rings may augment existing signals of male commitment such as a lengthy courtship rather than compensating for the lack of such signals.

Keywords: *mating, courtship, engagement rings, signaling*

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11:35AM

- Dane, Laura (University of New Mexico)

RELATION BETWEEN INDIVIDUAL DIFFERENCES IN SEX-ROLES AND SEX DIFFERENCES IN MATE PREFERENCES

Much evolutionary psychology research supports the hypothesis that women evolved to prefer men who can provide them and their offspring with resources, and that men evolved to prefer women who display fertility cues such as youth and beauty. By contrast, some recent social psychology research appears to support the social-constructivist view that women's mate preferences vary across cultures in ways that reflect different levels of sexual equality and women's access to resources. I agree that individual differences in mate preferences may reflect sex-role egalitarianism within or across societies, but I hypothesized that male preferences may shift in parallel with female preferences, such that overall sex differences may persist in the relative importance of resources versus physical attractiveness. In my sample of 102 men and 118 women, individual scores on two sex-role measures (SRES and BEM) were correlated with subject preferences for 18 characteristics in a long-term mate. Results suggested that within each gender, some mate preferences did vary with sex-roles. However, as men's and women's attitudes towards sex-roles became more egalitarian, their mate preferences shifted in parallel, such that the sex differences in preferences for resources and physical attractiveness remained. Both men and women reduced their emphasis on resources, and did not change their emphasis on physical attractiveness. There were however, non-parallel shifts for other mate preference characteristics such as pleasing disposition. These results may provide further impetus for more integrated research on the environmental (e.g. economic and socio-cultural) inputs that influence the operation of evolved behavioral mechanisms.

Keywords: *mate preferences, sexual selection, sex-roles, individual differences*

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Current Developments in Sexual Orientation Research, Chair: J. Bailey
Main Auditorium, Friday Morning

10:15AM

- Bailey, J. Michael (Northwestern University)

GENDER NONCONFORMITY AND SEXUAL ORIENTATION

Stereotypes of homosexual people contain several aspects of sex atypical behavior and psychology that have been collectively named “gender nonconformity.” These include patterns of childhood behavior (i.e., femininity in males and masculinity in females); patterns of articulation and movement; patterns of occupational and recreational interests; and physical appearance. I will review studies from my lab that strongly confirm the validity of most stereotypes, on average.

Keywords: *sexual orientation, gender nonconformity, homosexuality*

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10:35AM

- Vasey, Paul (University of Lethbridge)

DOES HOMOSEXUAL BEHAVIOR IN JAPANESE MACAQUES REFLECT AN UNCONSTRAINED SEXUAL STRATEGY?

In a heterosexual context, each sex pursues different primary sexual strategies, and as such, these strategies are often compromised. In contrast, within a homosexual context, sexual activity is relatively unconstrained by the opposite-sex and thus, primary sexual strategies are more likely to be expressed. I tested this line of reasoning by examining patterns of sexual activity by male and female Japanese macaques within heterosexual and homosexual contexts. Japanese macaques represent an excellent animal model for testing these theoretical predictions because females, in some populations, routinely engage in both heterosexual and homosexual behaviors within the context of sexual relationships called “consortships.” Five aspects of sexual partner acquisition and maintenance were analyzed including: (1) sexual solicitations, (2) consortship formation, (3) mate competition, (4) harassment of consort couples, and (5) sexual coercion. Based on theoretical predictions, I reasoned that: (1) males would engage in these sexual activities more than females and (2) females would engage in these sexual activities more within a heterosexual context, than within a homosexual context. Both predictions held true for each of the five aspects of sexual partner acquisition and maintenance that were analyzed. The available data support the conclusion that female sexual activity in Japanese macaques is relatively constrained within a heterosexual context, and relatively unconstrained within a homosexual context. Additional analyses of affiliative behavior exhibited during homosexual consortships suggest that females acquire and maintain same-sex sexual partners through mutual consensus, more often than by employing promiscuous, competitive or coercive means.

Keywords: *sexual orientation, primates, partner acquisition, bisexuality*

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10:55AM

- Chivers, Meredith L. (Northwestern University)
- Rieger, Gerulf (Northwestern University)
- Latty, Elizabeth (Northwestern University)
- Bailey, J. Michael (Northwestern University)

A SEX DIFFERENCE IN THE SPECIFICITY OF SEXUAL AROUSAL

Sexual arousal is category-specific in men; heterosexual men are more aroused by female than by male sexual stimuli, while homosexual men show the opposite pattern. There is reason to believe that female sexual arousal is altogether differently organized. We assessed genital and subjective sexual arousal to male and female sexual stimuli in women, men, and postoperative male-to-female transsexuals. In contrast to men, women showed little category-specificity on either genital or subjective measures. Both heterosexual and homosexual women experienced strong genital arousal to both male and female sexual stimuli. Transsexuals showed a category-specific pattern, demonstrating that category specificity can be detected in the neovagina using a photoplethysmographic measure of female genital sexual arousal. In a second study, we showed that our female results are unlikely to be explained by ascertainment biases. These findings suggest that sexual arousal patterns play a fundamentally different role in male and female sexuality.

Keywords: *sexual orientation, sexual arousal, homosexuality, sex difference*

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11:15AM

- Rieger, Gerulf (Northwestern University)
- Chivers, Meredith L. (Northwestern University)
- Bailey, J. Michael (Northwestern University)

DO BISEXUAL MEN EXIST?

There has long been skepticism about the idea that men who claim to be bisexual are genuinely sexually aroused by both sexes. Alternatively, putatively bisexual men may have either homosexual or heterosexual arousal patterns but self-identify as bisexual for other reasons. Men's patterns of penile erection to male and female sexual stimuli provide a highly accurate window on sexual arousal... We investigated genital and self-reported subjective sexual arousal to male versus female sexual stimuli in 30 homosexual, 33 bisexual, and 38 heterosexual men. Patterns of genital arousal provided no support that the putatively bisexual men were distinctly bisexual. In contrast, their subjective sexual arousal did conform to a bisexual pattern. Male bisexuality appears primarily to represent a style of interpreting or reporting sexual arousal rather than an unusual pattern of physiological sexual arousal. Male sexual orientation appears to be largely dichotomous.

Keywords: *sexual orientation, sexual arousal, homosexuality, bisexuality*

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Plenary (Auditorium, 211)

1:00PM

- Steven Gaulin (University of Pittsburg)

OF RODENTS AND ROLES: FATAL FLAWS OF THE SOCIAL-ROLE MODEL OF SEX DIFFERENCES.

A persistent view in the social sciences is that psychological (behavioral, cognitive) sex differences are the result of arbitrary cultural norms and rearing practices. A relatively moderate version of this view, the social-roles model, was promulgated in a 2002 HBES plenary lecture by Alice Eagly. I will argue that even this position is rendered untenable by two independent lines of evidence. First, the traits of interest are developmentally linked to fundamental mechanisms of sexual differentiation and hence seem to be part of the evolved package of sex-specific adaptive machinery. Second, these sex differences are neither invariant nor arbitrarily distributed across taxa; instead their presence or absence conforms to adaptive expectations. This argument will be illustrated with data on a well-known cognitive sex difference--spatial ability--and, if time permits, will be supplemented with similar evidence on a behavioral one--aggression.

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Sexual Conflict, Chair: D. Buss
Main Auditorium, Friday Afternoon

2:15PM

- Buss, David M. (University of Texas)

SEXUAL CONFLICT

Sexual conflict permeates social relationships. Empirical evidence points to the “footprints” of dyadic coevolutionary arms races between the sexes, such as deceptive mating strategies in one sex and coevolved defenses against deception in the other. Mating strategies also may have evolved from triadic or multiparty antagonistic coevolution. Triadic coevolution creates multidimensional adaptive problems, producing strategies that simultaneously solve problems imposed by intrasexual competitors, existing mates, and prospective mates. Triadic conflicts occur across the entire temporal duration of mating--before mating has taken place, after mateship formation, and in the aftermath of a breakup. The hallmarks of triadic mating coevolution have been documented in non-human species. Among *Drosophila melanogaster*, for example, seminal proteins produced by one male combat a competitor's sperm and manipulate fecundity and female sexual appetite, but can be toxic to the female. This paper proposes that there are psychological and strategic analogues of manipulative seminal proteins in human mating. These include: (1) pre-mating strategies to induce bidding wars among two prospective mates; (2) infidelity strategies, such as sending surreptitious sexual signals to non-mates while deceiving the current mate; (3) mate poaching strategies, such as driving a wedge between existing mates to promote a breakup; (4) mate guarding strategies designed to inflict costs on a mate for signals of straying while driving off mate poachers; and (5) stalking strategies designed to prevent a partner from re-mating after a breakup. Discussion focuses on the role of perpetual dyadic and triadic antagonistic arms races in the evolution of sexual conflict.

Keywords: *mating, sexual conflict, coevolution*

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2:35PM

- Demarest, J. (Dept. of Psychology, Monmouth University)
- Shroyer, B.E. (Dept. of Psychology, Monmouth University)

STALKING AND SPYING: A MATE RETENTION TACTIC

Jealousy motivates people to use mate retention tactics when fidelity is threatened in the relationship. Tactics such as calling one's partner at unexpected times and spying on your mate operate to verify the person's whereabouts and helps reduce anxiety in suspicious partners. It was hypothesized that males would be more likely to spy on a mate if fidelity is threatened in a relationship, based on the finding that 90% of stalkers are males and 80% of the victims are females. In this study, 52 male and 43 female university students indicated the likelihood of using each of seven tactics for stalking and spying on their mate. Contrary to the hypothesis, the results showed that females were more likely to spy on their mate.

Eleven situations were also provided as cues of infidelity, and participants were asked to rate how likely they would stalk or spy on their mate for each reason. In almost every case, females were more likely to spy on their mate, but in only two cases was this difference significant. The discussion will focus on the adaptive significance of stalking as spying as mate retentions tactics.

Keywords: *Mating systems, Mate retention, Jealousy*

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2:55PM

- Malamuth, Neil (UCLA)

SEXUAL COERCION AND EVOLUTIONARY PSYCHOLOGY

I will integrate current knowledge regarding sexual coercion. First, I will discuss some proposed alternative evolutionary-based models including 1) rape as an adaptation, 2) rape as the manifestation of the intersection of psychological mechanisms underlying sexual desire and coercive tactics of influence, and 3) rape as a one of various manifestations of an alternative strategy such as psychopathy. Second, I will critically examine empirical predictions from the alternative models in light of research findings. Included are data regarding the characteristics of sexual coercers in criminal and non-criminal samples, victims' characteristics and the environmental/situational conditions affecting the frequency of sexual coercion. Finally, I will compare the utility of evolutionary-based to non-evolutionary informed models.

Keywords: *sexual coercion, rape, evolutionary vs. non-evolutionary models*

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3:25PM

- Michalski, Richard (Florida Atlantic University)
- Shackelford, Todd K. (Florida Atlantic University)
- Salmon, Catherine (University of Redlands)

UPSET IN RESPONSE TO A SIBLING'S PARTNER'S INFIDELITIES

Across cultures, time periods, and methodologies, men display greater upset in response to a long-term partner's

sexual infidelity, whereas women display greater upset in response to a partner's emotional infidelity. Evolutionary psychologists, who argued that the difference reflects sex-differentiated evolved psychological design, first hypothesized this sex difference. Socialization theorists, in contrast, have argued that the difference is attributable to sex-differentiated socialization practices. A. Fenigstein and R. Peltz (2002) collected data from parents of undergraduates about upset in response to a child's partner's infidelities and found that both sexes report greater upset about a son's partner's sexual infidelity and about a daughter's partner's emotional infidelity. We report an extension of these findings. Using data collected from undergraduate students who had at least one brother and one sister, we present support for the hypothesis that participants will be more upset by a brother's partner's sexual infidelity, than by her emotional infidelity. We also present support for the hypothesis that participants will be more upset by a sister's partner's emotional infidelity, than by his sexual infidelity. There was no effect of participant sex on upset over an in-law's infidelity. The results suggest that the key variable therefore was the sex of the sibling, or correspondingly, the sex of the in-law, as predicted from an evolutionary analysis of reproductive costs, and not the sex of the participant, as predicted from a socialization perspective. Discussion offers directions for future work on jealousy.

Keywords: *jealousy, infidelity, in-laws*

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3:45PM

- Pound, Nicholas (University of East Anglia) **PD**

A MAMMALIAN MODEL OF PRUDENT SPERM ALLOCATION

In species where there is post-copulatory competition between males in the form of sperm competition, theory predicts that males should be capable of prudent sperm allocation. Specifically, males should adjust the number of sperm they inseminate in response to variations in the risk and/or intensity of sperm competition. In recent years, experimental evidence has accumulated indicating that males of many non-mammalian species do adjust their ejaculate expenditure in an adaptive fashion. To date, however, in mammals the only within-subject demonstration of ejaculate adjustment by individual males has been Baker & Bellis' (1993) human study. In the present study, a novel mammalian model of prudent sperm allocation was developed to facilitate future investigations into the proximate physiological mechanisms involved in adaptive regulation of sperm delivery. Copulatory ejaculates were collected from twelve male rats (*Rattus norvegicus*) that each mated under two experimental conditions. In the monandrous condition, males spent 24 hours prior to copulation in a cage with a female, but separated from her by a perforated clear plastic screen. In the polyandrous condition, during the 24 hours preceding copulation each male was also accompanied in the cage by a "rival" male who then observed the copulation from behind the plastic screen. As predicted by sperm competition theory, males ejaculated significantly more sperm when copulating in the presence of a rival male. Moreover, the ejaculate adjustments made by individual males were consistent and predictable.

Keywords: *sperm competition, ejaculate expenditure, Rattus norvegicus*

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4:05PM

- Apicella, Coren (Harvard University)

PATERNITY AND PARENTAL INVESTMENT IN HUMAN MALES

Much research has focussed on the psychological mechanisms that work to reduce males' likelihood of being cuckolded with little attention given to the possibility of mechanisms that serve to reduce its impact. This is an

attempt to explain variation in male parental investment in terms of varying degrees of paternity confidence. Two possible cues to paternity were examined: 1) fathers' perception of the characteristics and traits possessed by the mother of their children (i.e. chastity and faithfulness) and 2) their perceived phenotypic resemblance to their offspring. Both independently predicted males' reported amount of parental investment. Future research should examine how males respond to changes in paternity in relation to the costs and benefits of pursuing a parenting vs. mating strategy.

Keywords: *Paternity, Investment, Cuckoldry, Resemblance*

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Olfaction, Chair: D.S. Wilson
Regency B, Friday Afternoon

2:15PM

- Schank, Jeffrey (University of California, Davis)

WHITHER HUMAN PHEROMONES?

If human pheromones exist, they are crucial for understanding the evolution of human mate choice, reproductive strategies, and perhaps human emotions. However, as I will show, the existence of human pheromones appears to conflict with the evolution of concealed ovulation and female mate choice. If there is strong evidence for human pheromones that increase sexual behavior or modulate human emotions that affect sexual behavior, then we may have to radically revise our thinking about the evolution of human mating strategies. A second possibility is that our evolutionary hypotheses are on the right track, but the evidence for human pheromones is deeply flawed. I show that there are four categories of errors characterizing human pheromone research: (1) errors of calculation: these include apparent miscalculation of statistical tests, which when calculated correctly reveal no significant results; (2) control condition errors: several studies report pheromonal effects when in fact the changes reported are in the control rather than the experimental conditions; (3) regression to the mean: in some studies, data are manipulated in such a way that regression to the mean is a likely explanation; and (4) publishing inconsistent results within and between studies: some studies fail to note inconsistent results both within and between studies. Typically, experiments are conducted to test theories. In the case of human pheromone research, however, evolutionary hypotheses have led us to systematic errors in empirical research.

Keywords: *Human Pheromones, evolution, mate choice*

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Department of Psychology

2:35PM

- Petrie, Marion (University of Newcastle)
- Roberts, Craig (University of Newcastle)
- Robinson, Lucy (University of Newcastle)
- Gosling, Morris (University of Newcastle)

OLFACTORY SELF-RECOGNITION REVISITED

Recent studies indicate that human olfactory capability is better than traditionally believed and that odor is used to select genetically dissimilar mates. The mechanism behind this may be a form of self-referent phenotype matching, which may require at least some degree of self-odor discrimination. While previous studies show that humans can recognize their own odor, these studies usually present only one alternative, same-sexed odor sample, and show that men are poor at performing this task relative to women. Here we test whether men can

discriminate their own odor from a larger sample of same-sexed odors (their own and 6 others) and whether their performance is influenced by the relative similarity in MHC genotype of the odor donors.

Keywords: *MHC, mate choice, odor*

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2:55PM

- Sergeant, Mark (Nottingham Trent University) NI

EVOLUTION AND OLFACTION; THE ROLE OF SEXUAL ORIENTATION IN BODY ODOUR

Within the behavioural sciences there has previously been a surprising lack of consideration given to how our sense of smell affects our social behaviour. Within recent years the work of individual researchers in the field has demonstrated that not only do humans have a finely tuned sense of smell, but that odors can play an important role in our social behaviour. This study has sought to extend our knowledge of how olfaction affects social behaviour by examining the effects that male sexual orientation can have upon male olfactory cues. Self-described heterosexual female participants (n=40) were presented with olfactory samples produced by self-described homosexual and heterosexual males, and ratings of these samples were recorded using validated measures. This study marks an extended replication of a previous pilot study that was presented at the 2002 meeting of HBES (Sergeant, 2002), with significantly improved sample size and methodological controls. This previous work indicated that female participants found the body odor of homosexual males to be significantly less intense and more pleasant than that of heterosexual males.

The results from this study are considered in light of recent evolutionary theory of human homosexual behaviour, such as Rahman & Wilson (in press) and Kirkpatrick (2000). Additionally the findings have bearing on recent research indicating that same-sex behaviour in non-human animals, and heterosexual behaviour in humans, is influenced by olfactory cues.

Keywords: *Homosexuality, Olfaction, Sexual behaviour*

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Evolution of Superorganisms, Chair: D.S. Wilson
Regency B, Friday Afternoon

3:25PM

- Corning, Peter (Institute for the Study of Complex Systems)

WHAT IS A SUPERORGANISM -- AND WHY DO THEY EXIST?

The venerable term “superorganism” has reemerged in evolutionary biology in recent years as a way of characterizing some of the key properties of social organization in the natural world. It is argued that the organismic analogy is justified by the existence of common functional characteristics at “higher levels” of biological organization, including especially functional differentiation, “integration” and collective action with respect to the pursuit of overarching, collective goals or objectives; there is a functional similarity between organisms and superorganisms. But more important, superorganisms may also represent a distinct unit of selection (and adaptive change) in the evolutionary process. In accordance with the so-called “Synergism Hypothesis,” the combined functional effects that are produced by social “wholes” are themselves a primary causal agency underlying the evolution of cooperation and complexity in nature. It is the functional synergies (the economic payoffs, broadly speaking) that are the drivers for evolutionary complexification. Several illustrations

will be provided, including bacterial colonies, social insects, symbiotic partnerships between species, and social mammals.

Keywords: *superorganisms, synergy, group selection, bioeconomics*

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3:45PM

- Richerson, Peter J. (University of California, Davis)

WHY HUMAN SUPERORGANISMS ARE CRUDE: THE EVOLUTION OF STRANGE AND MALADAPTIVE CULTURAL TRAITS

Human societies behave as crude superorganisms. Cultural evolutionary models provide tentative explanations for both the unusual cooperative behavior we exhibit and for the manifest imperfections of our superorganic adaptation. Cultural variation is a new and poorly organized system of inheritance. In addition, cultural systems of inheritance are adapted to use decision-making forces and horizontal and oblique transmission in attempts to acquire fitness-enhancing cultural variants. As a result, cultural variation is probably subject to stronger natural selection at both the group and the sub-individual level compared to genetic variation. The propensity to acquire variants by horizontal and oblique transmission is prone to contamination by not only naturally selected selfish memes and group selected institutions but also artificially selected cultural variants. Ad writers use clever psychological trickery to induce us to adopt products and practices that are in their interest but generally not ours. Ideologists induce us to cooperate in great group endeavors, such as building conquest empires. The social changes inherent in modernism have reduced the importance of vertical cultural transmission relative to oblique and horizontal transmission. As a result, both superorganic institutions (national patriotism) and selfish memes (television watching) have proliferated exceedingly. Only Anabaptist sects, by very careful management of their exposure to horizontal and oblique cultural transmission, manage to exploit modern economies to maximize genetic fitness, depending very much on tight, small-scale superorganic institutions.

Keywords: *superorganisms, natural selection, culture, memes*

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4:05PM

- Genet, Russell M. (The Orion Institute)

HUMAN AND LEAFCUTTER ANT SUPERORGANISMS, A COMPARISON OF TWO HIGHLY ORGANIZED AGRICULTURAL SPECIES

Human agriculture is transforming our planet. We humans, however, occasionally forget that we are not the planet's only agriculturists. For millions of years, the highly organized leaf cutter ants have been feeding leaf clippings to their domesticated fungi. Humans and leafcutters are both high-end feeders, and they employ other species in a sophisticated manner to tap the otherwise, for them, inedible bottom of the food chain. This allows both ants and humans (and their domesticates) to become significantly more numerous than they otherwise would have been. Leafcutter superorganisms—with colonies five million strong—evolved their successful, genetic-based, within-species division of labor over a period of some twenty million years, while humans—with cities also numbering in the millions—evolved their successful, primarily cultural-based, within-species division of labor in a mere ten thousand years. In terms of biomass, the leafcutters are the most successful New World

insect, but their slow genetic evolution allowed others species to evolve defenses and take advantages of new leafcutter-generated opportunities, holding the leafcutters in check. Humans have culturally evolved with such rapidity, however, that genetic life (agricultural and human pests and viruses aside) has been unable to develop an effective defenses against our human agricultural blitzkrieg, which now appears to be emerging as a planetary superorganism.

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Evolutionary Psychology, Chair: L. Cosmides
Regency B, Friday Afternoon

2:15PM

- Ellis, Bruce (University of Canterbury)
- Keenan, Thomas (University of Canterbury)

CHILDREN'S PERFORMANCE ON A FALSE BELIEF TASK IS IMPAIRED BY ACTIVATION OF AN EVOLUTIONARILY-CANALIZ

We examine whether children's performance on a false belief task is impaired by task content that activates an early-developing, prepotent motivational system: predator-avoidance. In two studies, children aged 3 to 5 years completed variants of a false belief task that involved predator-avoidance, playmate-avoidance, prey-seeking, and playmate-seeking, respectively. In both studies, the proportion of correct answers on the playmate-avoidance task was significantly greater than the proportion of correct answers on the analogous predator-avoidance task. This difference was not an artifact of children generally performing better on playmate stories than on predator-prey stories. These results are consistent with the hypothesis that activation of the predator-avoidance system generates prepotent response patterns that pre-empt full consideration of the mental states of the prey characters in false belief stories.

Keywords: *Theory of mind, predator-avoidance, cognitive development, false belief*

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2:35PM

- Evans, Dylan (University of Bath)
- Nettle, Daniel (The Open University)

MOTIVATIONAL BIASES AND DECISION MAKING: AN ADAPTIVE APPROACH

Humans have been shown to exhibit 'motivational biases' in their judgments about the likelihood of events involving the self. Typically these take the form of unwarranted optimism about the probability of desirable things happening or over-estimation of the self's effectiveness in controlling events. Such biases appear grossly irrational and have been explained in terms of self-presentation. However, we argue from first principles that where judgments about whether to undertake a task are made under uncertainty, and the benefits of success outweigh the costs of failure, biased reasoning could be directly adaptive. This argument is explored using an agent-based simulation in which organisms play for energy in an uncertain environment. We show that under certain sets of conditions, organisms with motivationally biased decision-making rules can outperform those lacking such biases.

Keywords: *evolutionary psychology, reasoning, heuristics*

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2:55PM

- Tooby, John (Center for Evolutionary Psychology, University of California, Santa Barbara)
- Cosmides, Leda (Center for Evolutionary Psychology, University of California, Santa Barbara)

ELEMENTS OF A DARWINIAN THEORY OF LAMARCKIAN INHERITANCE

Lamarckian inheritance systems can be selected for within a conventional Darwinian-Mendelian framework when the genes that specify such systems out compete alternatives that do not. Early experiments interpreted as disproving Lamarckian inheritance only falsified what were in fact models of indiscriminate and hence maladaptive general-purpose Lamarckian inheritance – systems whose emergence would have been prevented by natural selection anyway. Theoretical expectation can pinpoint a variety of fitness-promoting strategies that more specialized Lamarckian systems could exploit, if the realities of organic engineering permitted their existence. Predictions about the design features that well-engineered Lamarckian systems ought to have can be derived from the functions they could implement, rendering these hidden systems visible (if they exist). Adaptive Lamarckian systems could, for example, potentially integrate information along lineages about the temporal distribution of recurrent environmental regimes, allowing improved prediction about the environments offspring will face. This could be used, for example, to better match developmental trajectories to the demands offspring will confront, or to better parameterize adaptations for more likely futures. Promising areas of application include systems of personality variation, the cross-generational regulation of life-history variables, secular trends, and metabolic allocation. Empirically, such systems would create phenotypic patterns very similar to systems of quantitative genetic variation, providing competing explanations for phenomena like heritability in personality factors, intelligence, longevity, or height that are presently assumed to be genetic. The relative weighting of past generations in the system of Lamarckian inheritance for a given trait will determine whether the trait appears to be of high or low heritability.

Keywords: *life-history, Lamarckian, development, behavior genetics*

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3:25PM

- Vyncke, Patrick (Ghent University)
- Poels, Karolien (Ghent University)
- De Backer, Charlotte (Ghent University)

MASLOW REVISITED: TOWARDS A NEW MOTIVATION INVENTORY BASED ON EVOLUTIONARY PSYCHOLOGY

The concept of 'motivations' can be referred to as 'a very limited set of fundamental drives of human behaviour'. Thus defined, this set of motivations is supposed to be shared by all human beings worldwide. Within many scientific disciplines motivations have been studied (psychology, social sciences, marketing...). The most widespread motivation inventory was developed by Maslow (1970). Although this motivation inventory claims to be universal, it is not based on an evolutionary psychological theory of motivations, since it does not explain how these motivations have been genetically hard-wired into our minds because of their adaptive value in the environment of evolutionary adaptiveness (EEA). Grounded on basic principles from evolutionary psychology (Tooby & Cosmides, 1997; Buss, 1999) we tried to develop a new motivation inventory. Taking gene replication as a starting point, we arrived at a list of eight fundamental motivations: survival, mating, parental investment, pair bonding, kin investment, struggle for status, group bonding, and reciprocal investment. For each motivation we formulated some hypothesis based on evolutionary psychology and we tested them in a Flemish context. A total amount of 1004 respondents participated in our research. The results clearly confirm basic evolutionary psychological principles. However, for further development and testing of this motivation inventory large-scale cross-cultural research would be useful in order to prove the universal base of the motivations.

Keywords: *motivations, basic evolutionary psychology, large scale survey research*

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3:45PM

- Larimer, Christopher (University of Nebraska-Lincoln) **NI**

BEHAVIOR A FUNCTION OF PUBLICITY: ITS WHO KNOWS THAT MAKES A DIFFERENCE

Cooperative behavior in the absence of readily identifiable benefits has presented a formidable challenge for models of human behavior based in game theory and rational choice. Recent evidence from evolutionary psychology and experimental economics suggests the decision to divide a fixed amount of scarce resources fairly, rather than selfishly, stems from behavioral traits that evolved to facilitate social exchange among small, hunter-gatherer groups. In this paper I present evidence from a dictator game which suggests that when the degree to which decisions are known by others is manipulated, individual behavior differs significantly. These differences are significant not only between decisions perceived to be anonymous and decisions believed to be known by receivers, but also between decisions known to the experimenter and decisions known to receivers. In other words, it is not only that someone else knows your decision, but who knows that makes a difference. Thus, behavior is highly dependent upon the characteristics of individual interactions, specifically the degree to which decisions are known by others. This suggests that the decision to forgo immediate individual incentives stems from behavioral adaptations intended to perpetuate social behavior, not individual, rational calculations.

Keywords: *dictator game, reputation, cooperation*

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4:05PM

- Friedman, Barry (Lebanon Valley College)
- Duntley, Joshua (University of Texas at Austin)

CUES TO COMMITMENT

We put forward an evolutionary psychological model of commitment in heterosexual dating relationships. Tracking dating partners' commitment intentions was an important adaptive problem for our ancestors because the following decisions hinged on such information: (1) how much to invest in the partner, (2) how much to anticipate receiving from the partner, and (3) whether to invest in other potential partners. To help solve these problems, humans are hypothesized to possess psychological adaptations designed to perceive certain classes of information as being diagnostic of dating partners' commitment intentions. Study 1 (N = 129) identified a large and diverse set of naturally occurring specific cues to dating partners' commitment intentions. In Study 2 (N = 251), participants rated how diagnostic each cue was of an imagined dating partner's interest in developing a committed and exclusive long-term romantic relationship with them. Discussion will focus on cues the sexes found to be differentially diagnostic of dating partners' commitment intentions.

Keywords: *commitment, mating, sex differences, evolutionary psychology*

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Aggression, Homicide, and Suicide II, Chair: E. Cashdan
Heritage Room, Friday Afternoon

2:15PM

- Potts, Malcolm (University California, Berkeley)

WHY DID 9/11 HAVE SUCH AN IMPACT?

In relation to the US population and the size of the economy, the loss of life and property on 9/11 was small. The public impact in the US and around the world was huge and disproportional. There are many examples in history of violent but small scale attacks having a large political and emotional impact. If, as seems likely, human and hominid ancestors back to a common ancestor with chimpanzees, engaged in frequent coalitional aggression, then finding one of more corpses with signs of violent injury would be a sure sign of a raid by a rival troop or clan. Pan troglodytes show excitement and strange behaviors when confronted with a dead chimpanzee. This paper will speculate that during the course of hominid and human evolution this predisposition became increasingly focused and powerful. In the modern world it is probably an inappropriate response.

Keywords: *warfare, coalitional aggression, September 11, death*

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2:35PM

- Sifferd, Katrina (King's College London)

SHOULD COMMONSENSE PSYCHOLOGY BE ELIMINATED FROM CRIMINAL LAW?

Commonsense psychology (CSP) is the suite of adaptations that constitute the explanatory framework humans use to understand and predict behavior. The theory places mental states in a privileged role, where such states are seen as the 'source' of or causal link between behaviors. CSP is used to make attributions of culpability in criminal law. In a criminal trial, the prosecuting attorney presents behavioral evidence that might lead the judge or jury to find the defendant committed a further criminal act (*actus reus*). Evidence will also be presented that the defendant possessed the requisite mental state with respect to that act, such as 'purposely', 'knowingly', or 'recklessly' (*mens rea*). Thus the application of criminal penalties depends upon the commonsense psychology of those who return criminal verdicts. However, CSP is non-scientific method of understanding and predicting human behavior - CSP consists of specific adaptive 'rules of thumb' or heuristics operating 'ceteris paribus.' As such one would expect CSP to be sensitive to the way information is presented and subject to systematic biases.

This paper asks if the emergence of scientific theories of psychology and human behavior undermine the reliance of criminal law on CSP. Just as the scientific study of physics has turned out to be a much more accurate description of physical matter than folk physics, is there a scientific study of human behavior that should replace CSP in the criminal law? The somewhat surprising answer is 'no.' CSP is indispensable to criminal law: it can not be eliminated, although it may be (and should be) enhanced by scientific psychology.

Keywords: *commonsense psychology, criminal law, eliminativism*

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2:55PM

- Webster, Gregory (University of Colorado at Boulder) **NI**

SOCIOSEXUAL ATTITUDES AND BEHAVIORS AS DIFFERENTIAL PREDICTORS OF AGGRESSION

Sociosexuality describes individual differences in willingness to engage in short-term sexual relationships and was measured using Simpson and Gangestad's (1991) Sociosexual Orientation Inventory (SOI). The SOI contains two items that are self-reports of past sexual behavior, whereas the other five items generally relate to sexual attitudes. In a correlational study, 1,975 participants completed the SOI and the Aggression Questionnaire (AQ; Buss & Perry, 1992) as part of a mass testing session. The AQ contains four subscales: Anger, Hostility, and Verbal and Physical Aggression. Confirmatory factor analyses of the AQ and SOI items revealed four latent factors: Attitudinal and Behavioral Aggression (Anger-Hostility and Verbal-Physical Aggression subscales, respectively) and Attitudinal and Behavioral Sociosexuality (outlined above). Structural equation modeling revealed both Attitudinal factors to be strong, positive predictors of their respective Behavioral factors. SOI Attitude was a strong positive predictor of AQ Behavior, and this relationship was partially mediated by SOI Behavior, such that SOI Behavior was inversely associated with AQ Behavior. SOI Attitude was also moderately positively associated with AQ Attitude. Lastly, SOI Behavior was unrelated to AQ Attitude. In a separate laboratory aggression experiment, participants completed the SOI, wrote a brief essay about themselves, received one positive and one negative essay evaluation that ostensibly came from two other participants, and were given the opportunity to retaliate against each evaluator by preparing a sample of hot sauce for each to consume. Only SOI Attitude was a reliable positive predictor of hot sauce allocated to the negative evaluator, relative to the positive evaluator.

Keywords: *Aggression, Sexuality, Structural Equation Modeling*

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3:25PM

- Weekes-Shackelford, Viviana A. (Florida Atlantic University)
- Shackelford, Todd K.
- Fredericks, Irina

MOTIVATIONAL DIFFERENCES FOR FILICIDE BY STEPPARENTS AND GENETIC PARENTS

According to M. Daly and M. I. Wilson (1994), motivational differences generate differences in the methods by which stepparents and genetic parents kill a child. Using a national-level database of over 400,000 homicides, Weekes-Shackelford and Shackelford (2002) found that stepparents commit filicide at higher rates than do genetic parents. In addition, stepparents are more likely than genetic parents to commit filicide by beating and bludgeoning, arguably revealing stepparental feelings of bitterness and resentment. Using a smaller but more detailed homicide database (Chicago Homicide Database), I further explored motivational differences between stepparents and genetic parents. The CHD contains detailed information on roughly 23,000 homicides for the years 1965-1994. The CHD codes for over 200 types of weapons, whereas the database used in Weekes-Shackelford and Shackelford (2002) codes for just 16 types of weapons. Similarly, the CHD codes for the time of the incident and the time of death, whereas the database used in Weekes-Shackelford and Shackelford (2002) does not code for such variables. Using the CHD, I tested the hypotheses that (a) filicidal stepparents, relative to filicidal genetic parents, use weapons that are more suggestive of intense rage, and (b) that stepchildren will live longer than genetic children following the initial attack, because genetic parents are more likely to commit filicide in such a way as to minimize the suffering of the child. Discussion addresses limitations of this research, and presents future directions for research on motivational differences in filicidal stepparents and genetic parents.

Keywords: *filicide, stepparents, motivational differences*

3:45PM

- Cashdan, Elizabeth (University of Utah)
- Schug, Mariah (University of Utah)

SEXUALITY IS MORE IMPORTANT THAN RESOURCE SCARCITY IN PREDICTING COMPETITION AMONG WOMEN

Aggressive female-female competition has been described ethnographically in societies where resources are scarce and short-term sexual liaisons are common, but the relative role of resources and sexuality in promoting competition and aggression has not been studied. We report here on a study of urban American women who varied widely in income, age, and sexuality. While evolutionary arguments have stressed the role of resource scarcity in exacerbating aggressive competition, this study found little effect of resource scarcity (income and related SES variables) but a strong effect of sexuality. Specifically, sexually unrestricted women reported feeling more competitive than sexually restricted women, particularly over male sexual attention, physical attractiveness, financial resources, and prestige. They were also more likely to take action in the competitive interactions they described, and were more likely to use physical aggression when they did so. These results are consistent with findings from an earlier study of students, where unrestricted women who kept diaries of their competitive interactions reported more competitive interactions over men, particularly potential or actual boyfriends. The greater competitiveness and assertiveness of unrestricted women may reflect the greater threat they face from similarly unrestricted women eager to form short-term relationships with their male partners.

Keywords: *sexual restrictedness, female competition, aggression*

Elizabeth Cashdan

University of Utah

4:05PM

- Beasley, Shanna (Florida Atlantic University)
- Weekes-Shackelford, Viviana A. A. (Florida Atlantic University)
- Fernandez, Irina (Florida Atlantic University)
- Shackelford, Todd K. (Florida Atlantic University)

FILICIDE-SUICIDE BY STEPPARENTS AND GENETIC PARENTS

Filicide is the killing of a ward by a parent. Relative to other types of homicide, filicide is a rare event. Filicide followed by suicide is rarer still. The characteristics and circumstances surrounding filicide-suicide may nevertheless provide insight into evolved parental psychology. Some research suggests, for example, that filicidal genetic parents are more likely to commit suicide than are filicidal stepparents. Using a large city-level database that includes incident-level information on over 22,000 homicides, we test the hypothesis that filicidal genetic parents are more likely than filicidal stepparents to commit suicide. In a second study, we present qualitative analyses of all filicide-suicide cases reported over a 10-year period by a regional newspaper. These qualitative analyses corroborate the differential likelihood of filicide-suicide for genetic parents and stepparents, and suggest further avenues of research that can inform our understanding of evolved parental psychology.

Keywords: *Filicide, Filicide-Suicide, Parental Psychology*

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SATURDAY, JUNE 7

Plenary (Auditorium, 211)

9:00PM

Ernst Fehr (University of Zurich)

Cross-Cultural Research, Chair: C.R. Ember Heritage Room, Saturday Morning

10:15AM

- Ember, Carol R. (Human Relations Area Files at Yale University)
- Ember, Melvin (Human Relations Area Files at Yale University)

WHY IS FAT OR THIN DESIRABLE? A CROSS-CULTURAL STUDY

Plumpness in women is valued in most cultures. But why do some cultures, even pre-industrial ones (and not just the elites in Western cultures), value thinness? Previous theory and research suggest that valuation of fat depends on degree of food scarcity--the less scarcity, the less fatness would be valued. Using three different measures of resource scarcity, our cross-cultural results do not support this proposition. It is not that resource scarcity is irrelevant, but its effect appears to change depending on whether or not the society has food storage. Without food storage, more resource scarcity predicts less valuation of fat, not a positive valuation. With food storage, the more that food is stored, the more thinness is valued. Other factors possibly relating to valuation of fatness are also examined.

Keywords: *fatness, thinness, scarcity, cross-cultural*

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Human Relations Area Files at Yale University
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10:35AM

- Huber, Brad (College of Charleston)
- Linhartova, Vendula (College of Charleston)
- Cope, Dana (College of Charleston)

MEASURING PATERNAL CERTAINTY USING CROSS-CULTURAL DATA

This presentation discusses an effort to develop and test a new measure of paternal certainty using the HRAF Probability Sample. Coding criteria were employed independently by two observers to rate the level of paternal certainty in sixty cultures. Rating criteria included the frequency and severity of sanctions associated with premarital and extramarital sex. The percentage of agreement and coefficient of association methods were used to check the reliability of four paternal certainty sub-scales. Both analyses indicate that the inter-observer error of the rating system is low. A reliable measure of paternal certainty should be useful to scholars engaged in cross-cultural research. For example, we hope to test cross-cultural hypotheses predicted by kin selection theory. Kin selection theory predicts a society's level of paternal certainty is positively related to the amount of assistance a father's and mother's paternal relatives provide during the prenatal, birth and post-natal periods.

Keywords: *Paternal Certainty, Cross-Cultural Research, Childbirth, Kin Selection Theory*

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10:55AM

- Kress, Howard (University of Connecticut)
- Sosis, Richard (University of Connecticut)

SCARS FOR WAR: A CROSS-CULTURAL STUDY OF MALE INITIATION RITES AS COSTLY SIGNALS OF COMMITMENT FOR WARFARE

The reasons that young men throughout the world are required to go through painful initiation rituals have been debated since the inception of the field of anthropology. The costly signaling theory of religion suggests that the costliness of religious rituals serves to promote trust and cooperation among performers. We posit that male initiation rites are performed in order to facilitate the bonding of non-related men for military purposes. To test this hypothesis we collected data on the presence and type of initiation rite, levels of warfare, and the costliness of rituals adolescents must endure from over 100 societies in the Human Area Relations Files. Results indicate that controlling for a variety of factors, frequency of external warfare is a predictor of the presence and costliness of male initiation rites.

Keywords: *Costly signals, Initiation Rites, Warfare, Cross-cultural*

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11:15AM

- Parkhill, Michele (Wayne State University)
- Lucas, Todd (Wayne State University)
- Wendorf, Craig (University of Wisconsin, Stevens Point)
- Imamoglu, E. Olcay (Middle East Technical University)
- Shen, Jiliang (Beijing Normal University)

THE MEANING OF MARRIAGE: CROSS-CULTURAL INVARIANCE TESTING OF A MARITAL SATISFACTION MEASURE

Invariance testing is a relatively uncommon but essential statistical technique used to determine whether constructs of interest to researchers are defined similarly by different groups of individuals. While a small, yet increasing, amount of attention has been devoted to cross-cultural marriage research, little has been done to test the measurement invariance of various marital satisfaction instruments that are used (e.g. do husbands and wives from different cultures define Love in a similar manner?). In the present study, the measurement invariance of a comprehensive marital satisfaction measure was investigated. Over 2500 married couples from Britain, Turkey, China and the United States completed the MARQ, a comprehensive measure of numerous aspects of marriage (Russell & Wells, 1993). Using a recommended structural equation modeling procedure (Vandenberg & Lance, 2000), numerous measures of marital satisfaction defined by the MARQ failed to demonstrate cross-cultural invariance for both husbands and wives. In addition, the MARQ largely failed to demonstrate invariance between husbands and wives from the same culture. The present study substantially impacts the pursuit of cross-cultural marriage research in suggesting the need to recognize measurement invariance as a necessary criterion to establish before making cross-cultural comparisons of marital satisfaction. The present study further suggests the need to develop versatile cross-cultural measures of marital satisfaction in order to better inform the evolutionary conclusions that are drawn from their empirical application.

Keywords: *Invariance Testing, Marriage, Cross-cultural Research, Evolutionary Theory*

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11:35AM

- Schmitt, David P. (Bradley University)

SOCIOSEXUALITY FROM ARGENTINA TO ZIMBABWE: THE EFFECTS OF GENDER EQUITY, SEX RATIOS, AND ECOLOGICAL

As part of the International Sexuality Description Project (Schmitt et al., 2003), the Sociosexual Orientation Inventory (SOI) was translated from English into 25 additional languages and administered to a total sample of 14,059 people across 48 nations. Responses to the SOI were used to evaluate several theories concerning the systematic distribution of sociosexuality across cultures. Both operational sex ratios and reproductively demanding environments were related in evolutionary-predicted ways to national levels of sociosexuality. Sex differences in sociosexuality were found to be cross-culturally universal, confirming several evolutionary theories of human mating. Finally, sex differences in sociosexuality were significantly larger when reproductive environments were demanding, and appeared attenuated—though never eliminated—in cultures with more political and economic gender equality.

Keywords: *sociosexuality, mating strategies, culture, gender equity*

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Risk Taking and Lifespan, Chair: R. Nesse
Regency B, Saturday Morning

10:15AM

- Ermer, Elsa (University of California Santa Barbara)

SOCIAL STATUS AND THE TASTE FOR RISK

Social status has important effects on human behavior, yet this factor has been largely ignored in research on risky decision-making. An evolutionary perspective suggests that social status may affect risk preference, provided that decisions concern relevant status determinants, such as resources for human males. Prospect theory, risk-sensitive foraging theory, and dominance theory make different predictions about such effects. Across two experiments, on a decision problem about the loss of monetary resources, men favored the risky option only when they thought they would be viewed and evaluated by others of equal social status, supporting predictions from dominance theory. Furthermore, this pattern did not arise in structurally equivalent control problems or within female control groups. Subsequent experiments showed that this pattern was specific to monetary resource problems involving loss; problems involving gains did not produce the same effects. These findings emphasize the importance of both context and content in understanding human decision-making.

Keywords: *social status, risky decision-making, gains and losses*

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10:35AM

- Kruger, Daniel (University of Michigan)
- Nesse, Randolph (University of Michigan)

THE MALE:FEMALE MORTALITY RATIO ACROSS SOCIAL CONTEXTS

We have previously documented how sex differences shaped by natural selection interact with aspects of the current environment to result in mortality rates considerably higher for men than for women in the USA, especially in early adulthood and especially for external causes of death. In this presentation, we will depict patterns of excess male mortality in populations ranging from a hunter-gatherer tribe to post-industrial societies with presumed social gender equality. We will demonstrate that the M:FMR may be a valuable indicator of social conditions pertinent to an evolutionary perspective. In addition to exhibiting differences across nations and cultures, the M:FMR is affected by demographic factors within cultures, such as income, education, and marital status. Cultural disruptions and transformations that may intensify male-male competition also have an impact on the M:FMR, for example in the recent transition of Eastern European countries to a capitalist economy. These findings are consistent with hypotheses proposed by evolutionary researchers and our predictions derived from Life History Theory.

Keywords: *mortality, sexual selection, life history, risky behavior*

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10:55AM

- Mueller, Ulrich (Marburg University)

DO LATE CHILDREN INDEED ENHANCE FEMALE LONGEVITY? FINDINGS FROM THE EUROPEAN ROYALTY (1790-1939)

Several observational studies of human females reported a statistical association between late reproduction or, more specifically: a late onset of reproduction and longevity. Some authors (e.g. Mueller HG et al. 2002) interpret this association such that the event of a late child, or of a late first child, indeed may enhance mother's (and perhaps even father's) life span. To test this hypothesis and others, I used a data base includes all living births in the reigning dynasties in Europe (Bernadotte, Bourbon, Guelph/Hanover/Windsor, Habsburg, Hessen, Hohenlohe, Hohenzollern, Holstein-Gottorp-Romanov, Mecklenburg, Nassau, Oldenburg-Holstein, Radziwill, Reuss, Wettin, Wittelsbach, Wuerttemberg) between January 1, 1650 and December 31, 1939 (n=1648). I conclude that neither late first birth nor a late last birth is an event which enhances female life span. I also checked whether age difference at last birth predicted lifespan difference, with mean cohort lifespan and mean cohort fertility controlled. It did not. I also checked the statistical association between sister lifespan and first husband lifespan. In a world of wetnurses and separate nannies for each child, a woman shares her environment longer and more intensively than with a sister. Nevertheless, lifespan of sister, but not of husband predicted target subject's own lifespan. I conclude that it is a genetical basis of late menopause and – consequently – long lifespan, which produces the statistical association between a late birth and a long life for females, and not the event of a late birth per se.

Keywords: *life course, late reproduction, life span*

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Marburg University

11:15AM

- Pillsworth, Elizabeth G. (Center for Behavior, Evolution, and Culture & Department of Anthropology, UCLA)
- Fessler, Daniel M.T. (Center for Behavior, Evolution, and Culture & Department of Anthropology, UCLA)
- Flamson, Thomas (Center for Behavior, Evolution, and Culture & Department of Anthropology, UCLA)

EMOTIONAL AROUSAL AND RISK-TAKING: THE INTERACTION OF SEX AND EMOTION

Emotions are usefully viewed as discrete mechanisms which evolved to address specific fitness challenges. Fitness-maximizing decision making is contingent on the appropriate weighting of costs and benefits. Reasoning that emotions function in part by adjusting such weightings, we investigated the influence of anger and disgust on risk-taking. Although both are high-arousal, negative emotions, the function of each, and its utility to each of the sexes, may be quite different. Anger truncates transgressions and deters future aggression by decreasing the salience of the hazards of confronting others. Disgust protects the individual from contamination by increasing the salience of potential harm. Because adaptive problems differ by sex, these emotions would have had differing importance for males and females in the ancestral past. Intrasexual competition over access to mates and social standing, which may be aided by anger, would have been a significant factor in male fitness, while contamination avoidance may have been more important for females due to reproductive immunosuppression. 120 subjects completed a relived emotion task that elicited anger, disgust, or a neutral state, then chose between a guaranteed sum of money and a chance to win a greater sum of money. Results indicate that there is a significant interaction of sex and emotion on economic risk-taking, with only males making significantly riskier choices when experiencing anger, and only females making significantly less risky choices when experiencing disgust.

Keywords: *Emotions, Risk-Taking, Sex Differences*

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11:35AM

- Wilke, Andreas (MPI Human Development)
- Hutchinson, John M. C. (MPI Human Development)
- Todd, Peter M. (MPI Human Development)

HUMAN MATE PREFERENCE FOR RISKY BEHAVIOR

Human risk-taking behavior shows striking sex differences, suggesting the possibility of a sexually selected trait. We investigate this hypothesis, and in particular whether women find male risk-taking attractive. An important component of our approach was not to consider general risk-taking, but to use a *domain-specific risk scale* that assesses five distinct domains of risk (recreation, health, social, financial, ethical). Our first investigation asked women what types of risky behaviors they found attractive, asking also how likely they were to perform these behaviors themselves, how risky they perceived the behaviors, and what they viewed as their benefits. We also asked men what risky behaviors they thought that women would find attractive. Men were accurate in judging that women found risk taking in the recreational and social domains attractive but in the other three domains unattractive. We also compared the responses against such life-history variables as age and marital status. Our next step will be to interview couples. One hypothesis is that behaviors that individual women find most risky will be judged as particularly attractive, drawing them towards men that are indifferent to such risks; thus within a partnership there would be an inverse correlation between male and female perceptions of risky behavior. An alternative hypothesis is that men and women sharing common attitudes to risk are involved in the same activities and thus will be more likely to pair up, leading to a positive correlation (i.e. assortative mating). We report preliminary results.

Keywords: *mate choice, risk-taking, domain-specificity*

Testosterone Research, Chair: J. Manning
Georgian Room, Saturday Morning

10:15AM

- Burnham, Terence (Harvard Business School)
- Flynn Chapman, Judith (Harvard University, Department of Anthropology)
- Gray, Peter (Harvard University, Department of Anthropology)
- McIntyre, Matthew (Harvard University, Department of Anthropology)
- Lipson, Susan (Harvard University, Department of Anthropology)
- Ellison, Peter (Harvard University, Department of Anthropology)

MEN IN COMMITTED, ROMANTIC RELATIONSHIPS HAVE LOWER TESTOSTERONE

Variation in human male testosterone levels may reflect, and effect, differential behavioral allocation to mating and parenting effort. This proposition leads to the hypothesis that, among North American men, those involved in committed, romantic relationships will have lower testosterone levels than men not involved in such relationships. Our study is the first to examine whether being in such a relationship (rather than being married) is the meaningful predictor of male testosterone levels. To test this hypothesis, 122 Harvard Business School male students filled out a questionnaire and collected one saliva sample (from which testosterone level was measured). Results revealed that men in committed, romantic relationships had 21% lower testosterone levels than men not involved in such relationships ($p = 0.006$). Furthermore, the testosterone levels of married men and unmarried men who were involved in committed, romantic relationships did not differ, suggesting that, at least for this sample, male pair bonding status is the more significant predictor of testosterone levels than is marital status.

Keywords: *testosterone, pair bond, marriage, male reproductive effort*

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10:35AM

- Hooven, Carole (Harvard University)
- Chabris, Christopher (Harvard University)
- Ellison, Peter (Harvard University)
- Kosslyn, Stephen (Harvard University)

TESTOSTERONE AND MENTAL ROTATION PERFORMANCE IN MEN

Studies suggest that higher levels of testosterone (T) in males contribute to their advantage over females in tests of spatial ability. However, the mechanisms that underlie the effects of T on spatial ability are not understood. We investigated the relationship of salivary T in men to performance on a modified, computer-based version of the mental rotation task (MRT) developed by Shepard and Metzler. We studied whether T is associated specifically with the ability to mentally rotate objects or with other aspects of the task. We collected hormonal and cognitive data from 27 college-age men on two days of testing. Subjects evaluated whether two block objects presented at different orientations were the same or different. We recorded each subject's mean response time (RT) and accuracy and computed the slopes and intercepts of the functions relating performance to angular disparity. T level was positively correlated with accuracy and negatively correlated with RT; these effects arose

from correlations with the intercepts but not the slopes of the rotation functions. Furthermore, the accuracy/T correlations were significant only for trials in which the two objects in the pair were different. Thus, the results do not reflect properties of the mental operations that change the orientation of objects in images per se. These results suggest that the large sex difference in mental rotation performance is not due to sex differences in mental rotation per se. In this case, some prevalent hypotheses of the selection pressures leading to modern-day sex differences in this task should be reevaluated.

Keywords: *testosterone, mental rotation, sex differences, cognition*

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Harvard University

10:55AM

- Manning, John (University of Central Lancashire)
- Bundred, Peter (Department of Primary Care, University of Liverpool)
- Flanagan, Brian (Department of Immunology, University of Liverpool)

THE 2ND TO 4TH DIGIT RATIO AND THE ANDROGEN RECEPTOR GENE: IMPLICATIONS FOR HUMAN EVOLUTION

The 2nd to 4th digit ratio (2D:4D) shows sex differences such that on average males have lower values of 2D:4D (longer 4th digits relative to 2nd) than do females. It has been suggested that the sexual dimorphism in 2D:4D is fixed in utero and that 2D:4D is negatively related to prenatal testosterone and positively related to prenatal oestrogen (Manning et al, 1998). In support of this there are a growing number of sex dependent behaviors which appear to be associated with 2D:4D. However, there is as yet no direct evidence that 2D:4D is related to amounts of, or sensitivity to, sex steroids. Here we report that 2D:4D is correlated with a measure of sensitivity to testosterone i.e. the structure of the androgen receptor gene (AR). The X linked AR contains a domain that is highly polymorphic for repeats of the triplet CAG. Alleles of AR with high numbers of CAG repeats respond to testosterone with lower transactivational activity than do alleles with low numbers of triplets. We found that male 2D:4D in the right hand was positively associated with CAG number and that subjects with low right hand 2D:4D in relation to left hand 2D:4D ($D[r-l] = 2D:4D \text{ right} - 2D:4D \text{ left}$) had low numbers of CAG repeats. Our findings indicate that 2D:4D and $D[r-l]$ are phenotypic correlates of sensitivity to testosterone. We discuss the association between 2D:4D and AR and its relevance to the ontogeny of 2D:4D, and the implications of variation in 2D:4D and AR for human evolution.

Keywords: *2D:4D, androgen, receptor, evolution*

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11:15AM

- Roney, James (University of Chicago) **PD**

BEHAVIORAL AND HORMONAL RESPONSES OF MEN TO SOCIAL INTERACTIONS WITH WOMEN

This study tested for behavioral, psychological, and hormonal reactions of young men to brief social encounters with potential mating partners. Male college students were randomly assigned to engage in a short conversation with either a young man (male condition) or a young woman (female condition). Participants provided saliva samples before and after the conversation, completed a battery of psychological measures after the interaction, and had their behavior rated by their conversation partners. Salivary testosterone (T) increased significantly over

baseline levels in the female condition only, though differences between conditions were not significant. In addition, change in T was significantly correlated with the degree to which the female confederates thought the male participants were trying to impress them. These behavioral ratings, in turn, were correlated with the participants' ratings of the female confederates as potential romantic partners. Psychological measures did not differ between conditions, though a number of variables were correlated with measures of interest in the female confederates. Results were generally consistent with the hypothesis that human males may exhibit a behavioral and endocrine courtship response that is similar to that observed in males of many nonhuman vertebrate species.

Keywords: *Testosterone, Courtship, Mating, Attractiveness*

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11:35AM

- Schug, Mariah (University of Utah)

PRENATAL ANDROGENS AND ATHLETIC ABILITY

In recent years it has been suggested that the second to fourth digit ratio in humans may be an indicator of the level of prenatal androgens to which an individual was exposed. Manning and colleagues have shown that the most successful athletes have low ratios, indicating high levels of prenatal testosterone. The present study attempts to find out why, by measuring digit ratio, competitiveness (by questionnaire) and aggressiveness (by questionnaire) in athletes from various competitive sports. The sports vary in their aggressiveness, and the competitors in their success (as measured by the level at which they are competing). It is hypothesized that prenatal androgen enhances athletic success both by increasing competitiveness and by increasing aggressiveness.

Keywords: *prenatal androgens, athletic ability, competition, aggression*

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Paternal Uncertainty and Anticuckoldry Strategies, Chair: S. Platek
Main Auditorium, Saturday Morning

10:15AM

- Shackelford, Todd K. (Florida Atlantic University)
- Goetz, Aaron T. (Florida Atlantic University)
- Buss, David M. (University of Texas at Austin)
- Euler, Harald A. (University of Kassel)
- Hoier, Sabine (University of Kassel)

WHEN WE HURT THE ONES WE LOVE: PREDICTING VIOLENCE AGAINST WOMEN FROM MEN'S MATE RETENTION

Male sexual jealousy is a primary cause of violence in romantic relationships. Mate retention tactics are behavioral manifestations of jealousy designed to thwart a partner's infidelities or relationship defection. Although many mate retention tactics appear to be innocuous romantic gestures, some may be harbingers of violence. We investigated the relationships between male mate retention tactics and female-directed violence in romantic

relationships. In Study 1, 461 men reported their use of mate retention tactics and violence in romantic relationships. Because research has shown that men underreport the violence they inflict on their partners, whereas women report this violence with relative accuracy, Study 2 assessed 560 women's reports of their partners' behaviors. Finally, Study 3 collected data on 107 married couples, including wives' reports of their husbands' violence and husbands' reports of their own mate retention behaviors. As predicted, and across all three studies, men's use of mate retention tactics was related positively to female-directed violence. Also as predicted and across all three studies, the mate retention tactics of Vigilance, Concealment of Mate, Monopolization of Mate, and Punishment of Threat to Infidelity were among the best predictors of female-directed violence. Discussion addresses mate retention tactics as unique predictors of violence in romantic relationships and suggests directions for future work.

Keywords: *mate retention, jealousy, violence against women*

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10:35AM

- Burch, Rebecca L. (Colby College)
- Gallup, Jr., Gordon G. (State University of New York at Albany)

THE PENIS AS A SEMEN DISPLACEMENT DEVICE: ARTIFICIAL MODELS AND BEHAVIORAL DATA

Using artificial models we attempted to assess the possibility that certain features of the human penis evolved to displace semen left by other males in the female reproductive tract. A number of different prosthetic genitals were used to simulate sexual encounters. Displacement of artificial semen varied as a function of glans/coronal ridge morphology, semen viscosity, and depth of thrusting. Results obtained by modifying an artificial penis suggest that the coronal ridge is the principal morphological feature mediating semen displacement. Behavioral data from college students showed that males behave in ways that would increase displacement when they were separated from their partners or were suspicious of infidelity.

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Colby College
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10:55AM

- Goetz, Aaron (Florida Atlantic University)
- Shackelford, Todd K. (Florida Atlantic University)
- Weekes-Shackelford, Viviana A. A. (Florida Atlantic University)
- Euler, Harald A. (University of Kassel, Germany)
- Hoier, Sabine (University of Kassel, Germany)
- Schmitt, David P. P. (Bradley University)

MATE RETENTION, SEMEN DISPLACEMENT, AND HUMAN SPERM COMPETITION: TACTICS TO PREVENT AND CORRECT FEMALE INFIDELITY

Sperm competition is the competition between the sperm of two or more males to fertilize a female's egg(s). In humans, female physical attractiveness and personality characteristics that attract rival males may increase the likelihood of female sexual infidelity and, therefore, place her partner at a high recurrent risk of sperm competition. We examined how males under a high recurrent risk of sperm competition might solve the adaptive problems of preventing and correcting a female partner's sexual infidelity. Using a self-report survey, 463 males in committed, sexual relationships rated their partner's physical attractiveness and personality characteristics, and reported their use of tactics designed to prevent partner infidelity (mate retention tactics) and their use of specific copulatory behaviors arguably designed to remove or displace the semen of rival males (semen-displacing behaviors). As

hypothesized, males mated to females who place them at a high recurrent risk of sperm competition were more likely to use mate retention tactics and to perform semen-displacing behaviors. Results suggest that preventative and corrective tactics are complementary tactics designed to solve the adaptive problem of sperm competition. Limitations of this study and directions for future work are discussed.

Keywords: *Human sperm competition, mate retention, semen displacement*

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11:15AM

- Platek, Steven (Drexel University) **PD**

- *PATERNAL UNCERTAINTY, THE BRAIN, AND CHILDRENS FACES: NEURAL CORRELATES OF CHILD FACIAL RESEMBLANCE*

Resemblance affects the way males react to children's faces. However, the effect of resemblance on male investment decisions appears to be unconscious. Using functional magnetic resonance imaging I show that the male, but not the female, brain responds differentially to children's faces that are morphed with their own face. These results support the hypothesis that the male brain possesses specific neurocognitive substrates responsible for responding to resemblance expressed in children's faces.

Keywords: *paternal resemblance, paternal uncertainty, neurocognition, facial resemblance*

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Life History Strategy as an Individual Difference Factor, Chair: A.J. Figueredo
Regency A, Saturday Morning

10:15AM

- Figueredo, Aurelio Jose (Department of Psychology, University of Arizona)
- Vasquez, Geneva (Department of Psychology, University of Arizona)
- Sefcek, Jon (Department of Psychology, University of Arizona)
- Hagenah, Barbara (Department of Psychology, University of Arizona)
- Kirsner, Beth (Department of Psychology, University of Arizona)
- Jacobs, W Jake (Department of Psychology, University of Arizona)

THE K-FACTOR: INDIVIDUAL DIFFERENCES IN LIFE HISTORY STRATEGY

Until quite recently, variations in life history strategy have been studied exclusively at the level of different species. Within the last decade or so, this domain of investigation has been extended to possible systematic differences in life history strategy among human individuals, social classes, and racial groupings. Most recently, some evolutionary theories of human development and related behavioral genetic work has strongly implied that there is substantial individual variation in life history strategy within groups. Nevertheless, the analyses of these correlational patterns have mostly been restricted to univariate analyses in the service of testing specific causal hypotheses, and have not fully described or explicated the wider pattern of intercorrelations implied by these theories. This paper presents a latent variable model that seeks to identify a single common factor, denoted as K, that is theorized to underlie a variety of otherwise disparate life history parameters, including mating effort, romantic partner attachment, machiavellianism, generalized aggressiveness, and risk propensity. We believe that

this K-factor is an individual difference variable of major importance to human development and has been hitherto underappreciated, possibly due to the historical lack of an overarching theory that would predict its existence. Correlations with more traditional personality factors will also be explored, sampled from the NEO, Eysenck, and Zuckerman personality inventories.

Keywords: *Life History Strategy, Individual Differences, Personality, Reproductive Strategy*

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Department of Psychology
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10:35AM

- Tal, Ilanit (Department of Psychology, University of Arizona)
- Hines, Dawn (Department of Psychology, University of Arizona)
- Figueredo, Aurelio Jose (Department of Psychology, University of Arizona)
- Frias-Armenta, Martha (Departamento de Derecho, University of Sonora)
- Corral-Verdugo, Victor (Facultad de Psicologia, University of Sonora)

REPRODUCTIVE LIFE HISTORY STRATEGY AND ENVIRONMENTAL CONSERVATION

Water conservation is globally important, especially in areas of Mexico where scarcity in certain areas has become more prevalent. Although water conservation is generally held in high value among residents of these areas, conservation behaviors do not coincide with these values. Most models that explain conservation behavior treat populations as equal and claim that varying levels of certain personality traits, experiences, and beliefs will predict the level of conservation behavior any individual practices. However, it may be that strategic trade-offs and practical considerations may be weighed differently depending upon the ultimate motivation of the individual. Whereas conservation psychology has done little to understand the underlying motivations that may explain human nature's tendency to conserve or destroy the environment in which humans live, evolutionary psychology has laid the foundation to begin formulating and testing theories which will help us better understand why some people are receptive to the current conservation efforts and others are not. Our model proposes that it is a human's reproductive life-history strategy that may predict conservation behavior. To test our model, we plan to correlate water usage observations from homes in a water-scarce Mexican city with the individuals in the homes' life history strategy. Life history strategy (the K-factor) was measured by the following variables: family social support, friends social support, parental investment experienced as a child from the mother, parental investment experienced as a child from the father, long term planning propensity, "General Theory of Crime" criminality, and mating effort.

Keywords: *Life History Strategy, Conservation Psychology, Water Conservation, Reproductive Strategy*

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Department of Psychology, University of Arizona

10:55AM

- Walsh, Michele (Tobacco Education and Prevention Program Evaluation Unit, University of Arizona)
- Figueredo, Aurelio Jose (Department of Psychology, University of Arizona)

SEXUAL RESTRICTEDNESS IN ADOLESCENCE

One hypothesized aspect of the K-factor is a tendency towards sexual restrictedness. That is, highly K-selected individuals are likely to ascribe to attitudes and beliefs that support remaining sexually abstinent and therefore are more likely to delay sexual behaviors and to engage in less risky sexual behaviors once sexual activity is initiated. This paper examines the baseline sexual attitudes, beliefs and behaviors of over 13,000 adolescents, 12-19 years old, from schools and detention centers, who participated in a sexual education program promoting abstinence

until marriage. These data indicated that there is a general factor, hypothesized to be a dimension of the K-factor, that underlies a variety of self-reported sexual beliefs and attitudes. The lower order factors most highly correlated with the K-factor include expressed intentions to abstain from sex, endorsed value reasons to refrain from sex, positive attitudes towards teenage abstinence, and lack of endorsement of positive aspects of sex. Other factors correlated with the K-factor include perceived refusal skills regarding sex, endorsed health reasons to abstain from sex and religiosity. The number of parents in the home was significantly related to the K-factor, even when controlling for age, with youth from two-parent homes more likely to be highly K-selected than those from one-parent homes. The level of K-factor was inversely related to sexual behavior, even when statistically controlling for age.

Keywords: Life History Strategy, Sexual Restrictedness, Abstinence, Reproductive Strategy

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Tobacco Education and Prevention Program Evaluation Unit
University of Arizona

11:55AM

- Murphy, Ryan (Department of Management & Policy, University of Arizona)
- Paddock, E Layne (Department of Management & Policy, University of Arizona)
- Kirsner, Beth (Department of Psychology, University of Arizona)
- Figueredo, Aurelio Jose (Department of Psychology, University of Arizona)

TO COOPERATE OR TO DEFECT?: A LIFE HISTORY THEORY EXPLANATION OF INDIVIDUAL DIFFERENCES IN SOCIAL DILEMMA GAMES

Cooperation is in stark contrast to the dictates of economic rational choice theory, the focus of a class of interactions called social dilemmas. In a social dilemma, multiple people each make a decision to cooperate with or defect (not cooperate) from a group. Individuals receive higher payoffs for defecting than for cooperating, regardless of group members' actions; however, individuals are better off if all cooperate than if all defect. One possible evolutionary explanation for the differences observed between players' cooperation behaviors is that players have different fundamental strategic orientations; that they fall on different ends of the r/K type continuum. For the present research we employ a novel social dilemma called the Real Time Trust Game (RTTG). Briefly, RTTG is a 3-person game where on each of 60 rounds, a mutually anonymous triad observes a common pool of money increase in value over time from \$.05 to \$25. The first player in the triad to stop the game receives the value of the pot at that moment, whereas the other two players each receive 10% of the pot's value; players are paid real money for a select number of trials. The same participants were administered a battery of scales to assess their K-factor scores. It was hypothesized that more highly K-selected subjects who maintain long-term thinking will be more likely to cooperate as this behavior may lead to greater mutual earnings than would short term exploitation. Participant scores on indicators of the K-factor and RTTG "cooperativeness" were moderately correlated.

Keywords: Life History Strategy, Cooperation, Defection, Reproductive Strategy

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Plenary (Auditorium, 211)

9:00PM

- Paul Rozin (University of Pennsylvania)

Kin Recognition, Chair: G. Weisfeld
Heritage Room, Saturday Afternoon

2:15PM

- Cavaliere, Mary Beth (Central Michigan University)
- Colarelli, Stephen (Central Michigan University)
- Connor, Jeffrey (Central Michigan University)

HELPING BEHAVIOR AND PERCEPTIONS OF PHYSICAL SIMILARITY BETWEEN HUMAN SIBLINGS OF VARYING GENETIC RELATEDNESS

Hamilton's rule predicts that full-sibs should help one another more than half-sibs, who should help one another more than step-sibs. However, because humans may use visual cues to infer relatedness, physical similarity may influence the association between relatedness and helping behavior. Accordingly, we examined the influence of both genetic relatedness and physical similarity on helping behavior among siblings. Individual siblings from 170 sibling pairs (103 full-sibs, 40 half-sibs, 27 step-sibs) completed questionnaires on sibling conflict and rated physical similarity to their siblings. In addition, independent observers rated photographs of the sibling pairs for physical similarity. Sibling ratings of perceived physical similarity correlated positively with genetic relatedness but independent ratings of physical similarity did not. Relatedness, as expected, correlated positively with helping behavior. Siblings' ratings of physical similarity also correlated positively with helping behavior but similarity ratings by independent observers did not. These results suggest that beliefs about relatedness may have a stronger influence on the perception of physical similarity among siblings than actual physical similarity, and – in a more speculative vein – beliefs about relatedness may influence helping behavior more than actual relatedness. A plausible explanation is that inaccurate (positively biased) perceptions of physical similarity (and possibly relatedness) among siblings increase the likelihood of receiving investment from both true and putative siblings, which in turn increases fitness.

Keywords: *Altruism, Siblings, Physical similarity, Kin recognition*

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Central Michigan University

2:35PM

- DeBruine, Lisa M. (McMaster University)

FACIAL RESEMBLANCE INCREASES ATTRACTIVENESS

People playing a two-person monetary investment game over the internet while viewing a picture of the "second player" were more likely to trust this player if the picture was digitally morphed to resemble the first player (DeBruine, 2002). This is candidate evidence of human kin recognition by phenotype matching. The proximate mechanism for this effect may include a greater perception of attractiveness for self-resembling individuals. In an experimental study using computer morphing techniques, I found that self-resembling faces are judged as more attractive by the individuals they resemble than by other individuals. In addition, differences in attractiveness judgments depend on the sex of the judge and the sex of the face being judged: identically produced facial resemblance increases the attractiveness judgments of same-sex morphed faces more than other-sex faces for both male and female subjects. These results will be discussed in light of current findings and theory with regard to kin recognition mechanisms, optimal outbreeding, and face recognition mechanisms.

Keywords: *kin recognition, phenotype matching, facial attractiveness, optimal outbreeding*

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2:55PM

- Lieberman, Debra (Department of Psychology, UCSB)
- Cosmides, Leda (Department of Psychology, UCSB)
- Tooby, John (Department of Anthropology, UCSB)

INVESTIGATING THE CUES USED TO DETECT GENETIC RELATEDNESS THROUGH PATTERNS OF ALTRUISM

In 1964, the British biologist W.D. Hamilton described how adaptations for altruism could evolve by natural selection. His theory, inclusive fitness theory, depends on the reproductive benefits accrued by the recipient of an altruistic deed, the costs incurred by the altruist, and the probability these two individuals share the same allele identical through common descent. This latter variable, degree of relatedness (r), is a critical parameter defining the range of altruistic behaviors (as measured by their cost/benefit ratios) that would have been selected for over our species evolutionary history. But, how do we calculate r ? What kinds of information serve as input for a system designed to compute relatedness? Though there have been a handful of studies documenting a propensity to allocate assistance to another based on their degree of relatedness, these studies presume the prior detection of an individual as a certain type of genetic relative. The purpose of this paper is to provide a theoretical framework within which kin detection systems in humans can be investigated and to provide empirical findings that take the first strides in uncovering the parameters mediating sibling detection. Data will be discussed from a study that investigated the cues used to assess sibship by matching variation in developmental parameters such as coresidence to variation in sibling-directed altruism. Results indicate that length of coresidence with a sibling positively correlates with altruistic tendencies directed toward that sibling. In addition to coresidence, other important variables influencing altruistic behaviors will be discussed.

Keywords: *Kin detection, Altruism, Inclusive fitness*

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3:25PM

- Rushton, Philippe (University of Western Ontario)

MATE CHOICE IN IDENTICAL VS. FRATERNAL TWINS: A TEST OF SELF-REFERENT PHENOTYPE MATCHING

Studies of assortative mating in a variety of species in the laboratory as well as in nature suggest an optimal level of outbreeding is often ideal. Too close inbreeding increases the chances that harmful alleles will combine. Conversely, mating with individuals very genetically different can break up gene combinations that produce favorable traits. One means of pursuing optimal outbreeding is to look for physical features that are similar to self, mom, or dad, a strategy termed self-referent phenotype matching, which typically depends on a mix of inherited and learned constraints (Hauber & Sherman, 2001, Trends in Neurosciences).

The present study explores the genetic and environmental contributions to human mate selection using a classical twin design. Three hundred and twenty two pairs of adult twins from the University of London Twin Register, and 323 of their spouses, completed personality, attitude, and demographic questionnaires. The 174 pairs of monozygotic (MZ) twins were more similar ($r = 0.54$) across all variables than were 148 pairs of dizygotic (DZ) twins ($r = 0.37$), suggesting an average heritability of 34%. The spouses of MZ twin pairs were more similar

to each other ($r = 0.24$) than were the spouses of DZ twin pairs ($r = 0.15$), who in turn were more similar than spouses randomly paired with twins from the same sample ($r = 0.01$). These results support the self-referent phenotype matching mechanism and suggest the human preference for similarity in mates is partly heritable (18%).

Keywords: *mate choice, assortative mating, twins, phenotype matching*

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3:45PM

- Weisfeld, Glenn (Wayne State University)
- Czilli, Tiffany (Wayne State University)

REACTIONS TO FAMILY MEMBERS' BODY ODORS: POSSIBLE MEDIATION OF THE WESTERMARCK EFFECT

Proximity early in life may instill inbreeding aversion in mammals, including simians and humans. Our data suggest that olfaction may help mediate this imprinting phenomenon. Studying intact families in Ontario, we found that mothers and fathers could distinguish their child from a control child by olfaction. Mothers preferred the control child's odor to their own child's. Fathers, by contrast, showed an aversion for the odor of a daughter, compared with a control, but not a son. Children ages 6 to 8 did not recognize their mother's odor, but children 9 to 15 did. Breastfed sons recognized the mother but not bottle-fed sons or daughters, or breastfed daughters. Children showed no aversion to the mother's odor compared with the control's. Children recognized the father's odor, and older children had an aversion to it. Children recognized their opposite-sex siblings but not their same-sex siblings. Children had an aversion for the odor of their opposite-sex siblings but not same-sex. In summary, the only first-degree relationships that exhibited mutual aversion were father-daughter and brother-sister—those relationships with the greatest risk of incest. This and other research indicates that complex developmental and gender factors affect olfactory recognition of and emotional reaction to kin.

Keywords: *olfaction, kin recognition, inbreeding, incest*

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4:05PM

- Speelman, Tom (University of Ghent)

EVALUATING EVOLUTIONARY EXPLANATIONS OF ETHNOCENTRISM AND RACISM

Recent work in the philosophy of science offers a framework with scientific criteria and desiderata that can be used to evaluate competing theories within the same research program. Using this framework, I want to look at two different evolutionary approaches to ethnocentrism and racism. I will compare J.P. Rushton's genetic similarity theory, which claims that people are able to detect degrees of genetic similarity in others resulting in ethnocentric and racist attitudes, with the theory proposed by R. Kurzban, L. Cosmides, and J. Tooby. These authors claim that encoding by race is a byproduct of our cognitive machinery, and that it evolved to detect coalitional alliances. The merits of both theories will be assessed and the results presented.

Keywords: *philosophy of science, racism, ethnocentrism, theory evaluation*

Mate Choice II, Chair: TBA
Regency A, Saturday Afternoon

2:15PM

- Friedman, Barry (Lebanon Valley College)
- Duntley, Joshua (University of Texas at Austin)

CUES TO COMMITMENT

We put forward an evolutionary psychological model of commitment in heterosexual dating relationships. Tracking dating partners' commitment intentions was an important adaptive problem for our ancestors because the following decisions hinged on such information: (1) how much to invest in the partner, (2) how much to anticipate receiving from the partner, and (3) whether to invest in other potential partners. To help solve these problems, humans are hypothesized to possess psychological adaptations designed to perceive certain classes of information as being diagnostic of dating partners' commitment intentions. Study 1 (N = 129) identified a large and diverse set of naturally occurring specific cues to dating partners' commitment intentions. In Study 2 (N = 251), participants rated how diagnostic each cue was of an imagined dating partner's interest in developing a committed and exclusive long-term romantic relationship with them. Discussion will focus on cues the sexes found to be differentially diagnostic of dating partners' commitment intentions.

Keywords: *commitment, mating, sex differences, evolutionary psychology*

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2:35PM

- Fisher, Maryanne (York University) **NI**

ATTRACTIVENESS, ESTROGEN, AND FEMALE INTRASEXUAL COMPETITION

When males of high genetic quality are considered a resource, evolutionary theory predicts that female intrasexual competition will occur. Since attractiveness is considered as one of the primary selection criteria used by men when selecting mates, it is likely that women will compete in the arena of attractiveness. Furthermore, as a factor influencing the mate selection process, competition should be mediated by hormones related to fertility. One documented competitive strategy that women use is derogation—any act intended to decrease a rival's perceived value. Using the framework of intrasexual competition, and specifically the use of derogation, I investigated the influence of estrogen on women's ratings of female facial attractiveness. During periods of high fertility, competition, and hence derogation, should increase as evidenced by lower ratings of female facial attractiveness. Results indicate that women significantly rate female faces less attractive when experiencing high levels of estrogen. In contrast, male faces were significantly rated as more attractive when experiencing high levels of estrogen. Contraceptive use mitigated both effects. The results are discussed in terms of female intrasexual competition.

Keywords: *attractiveness, competition, fertility, mate selection*

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2:55PM

- Frederick, David (UCLA)
- Haselton, Martie G.
- Buchanan, Gregory M.
- Gallup, Jr., Gordon G.

MALE MUSCULARITY AS A GOOD-GENES INDICATOR: EVIDENCE FROM WOMEN'S PREFERENCES FOR SHORT-TERM AND LONG-TERM MATES

Prior research suggests that bilateral symmetry and facial masculinity may be indicators of good genes. According to the good-genes hypothesis, men possessing these indicators should be preferred by women as sires of offspring. Such men should also be able to pursue a short-term mating strategy involving multiple sexual partners and low per-partner parental investment. Consistent with this hypothesis, prior research demonstrated that these features are preferred more by women when they are ovulating. Men possessing these features are also perceived as dominant, sexually attractive, and not particularly faithful to their mates—perceptions suggesting greater effort devoted to mating as opposed to parenting by such men. We propose that male muscularity may also serve as an indicator of good genes. We tested this hypothesis by examining the perceived social profile of men with different body types. Women (N=140) viewed photographs of men with differing levels of muscularity and rated their impressions of the men along several dimensions. Results showed that women preferred muscular males as short-term partners, judging muscularity to be associated with sexual attractiveness, social influence, and certain positive personality traits. Women preferred less muscular men as long-term partners and perceived them to be faithful mates. Replication of this study with hand-drawn silhouettes produced similar results. Tests for changes in these preferences over the course of the menstrual cycle are currently underway. In sum, the results to date provide preliminary evidence for male muscularity as a good-genes indicator.

Keywords: *Mate preferences, Muscularity, Good Genes, Attractiveness*

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3:25PM

- Scheyd, Glenn (University of New Mexico)

INDIVIDUAL DIFFERENCES IN ATTRACTION: FACULTATIVE PREFERENCES?

I argue that many instances of assortative mating on particular traits are by-products of matching on overall quality or fitness. Fitness-matching itself is an evolutionarily stable strategy, at least in the context of long-term pair bonds. Given that it is not open to invasion by the strategy of mating with someone of superior quality, it behooves the individual to form a more efficient search strategy. One possible adaptive “strategy” is to calibrate the typicality of one’s attraction to the opposite sex, such that individuals of lower mate value are less in agreement with their competitors over the relative desirability levels of potential mates than are higher mate value individuals. I present data from two studies that provide some evidence for such an adaptive calibration. In Study 1, which included male participants only, a significant positive correlation was found between the number of sexual partners a man has had in the past year and the typicality of his judgments of women’s physical attractiveness. In Study 2, which included both sexes, a marginally significant correlation was found between one’s physical attractiveness (as rated by all opposite-sex participants) and the typicality of his or her judgments of opposite-sex physical attractiveness. A follow-up test revealed that this correlation was significant for males only (although, importantly, the sex difference in correlations was non-significant).

Keywords: *individual differences, mate search strategies, assortative mating*

Glenn Scheyd

University of New Mexico

3:45PM

- Pawlowski, Boguslaw (Dept. of Anthropology, University of Wroclaw, (Poland))

PREFERENCE FOR SEXUAL DIMORPHISM IN HEIGHT AS A STRATEGY FOR INCREASING THE POOL OF POTENTIAL PARTNERS IN HUMANS

Human mate preferences are known to be related to a number of morphological traits. Those relating to female waist-to-hip ratio or Body Mass Index (BMI) and to male height appear to be distinctive mate-choice criteria and are known to be related to reproductive success. In addition to absolute height, a possibly important mate-choice criterion may also be relative height, i.e. the extent of sexual dimorphism in stature (SDS = male height/female height) between oneself and a potential partner. To show whether preference for SDS depends on a subject height, I used an anonymous questionnaire which included both personal questions and frontal-view outlines of 6 male/female pairs with different degrees of SDS (A=1.19, B=1.14, C=1.09, D=1.04, E=1.0, F=0.96). Both males and females adjusted their preferences for SDS in relation to their own height so as to increase the potential pool of partners (taller men and shorter women preferred higher SDS). I postulate the presence of a psychological mechanism for SDS preference which tries to strike a balance between: (a) increasing one's chances of getting a partner by preferring members of the opposite sex whose height comes closest to the population mean of that sex and (b) finding a partner whose difference in stature from oneself approximates to the mean population SDS. This mechanism would lead to stabilizing selection on intrapopulation SDS and would explain why assortative mating for height is not linear at the extremes of height. The results also indicate that both sexes are responsible for the selection process.

Keywords: *sexual dimorphism in height, pool of potential partners, human preferences, stabilizing selection*

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4:05PM

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- Barrett, Louise (School of Biological Sciences, University of Liverpool, Liverpool, UK)
- Manning, John (Department of Psychology, University of Central Lancashire, Preston, UK)
- Henzi, Peter (School of Biological Sciences, University of Liverpool, Liverpool and School of Psychology, Bolton Institute, Bolton, UK)

FEMALE HEIGHT AND REPRODUCTIVE SUCCESS: THE LONG AND SHORT OF IT.

The advantages of height for men have been widely documented; on average, height is a positive attribute for males with taller men enjoying a range of advantages compared to shorter men. Until recently, relatively less has been known of the relationship between height and reproductive success in women. Here we confirm and extend a recent finding that extreme height in females (at both ends of the distribution) is negatively associated with reproductive success. Within our sample of British women, we found that women who are taller than average had significantly fewer reproductive events compared to women of both average and below-average height, and that this relationship persisted once we had controlled for marital status. We go on to consider factors that account for the lower reproductive success of taller women.

Keywords: *height, reproductive success, assortative mating*

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Sexual Selection and the Menstrual Cycle, Chair: M.G. Haselton and S.W. Gangestad
Main Auditorium, Saturday Afternoon

2:15PM

- Haselton, Martie G. (University of California, Los Angeles, Center for Behavior, Evolution, and Culture)
- Buss, David M. (University of Texas, Austin)
- Gangestad, Steven W. (University of New Mexico)

OVULATION-CONTINGENT SHIFTS IN FEMALE DESIRE AND PARTNER JEALOUSY

Women's obligatory parental investment created strong selection for a discriminating sexual psychology. Partner choice is especially critical during the narrow window of fertility within the menstrual cycle. Ovulating women may increase their preference for men displaying indicators of good genes, even at the cost of jeopardizing their primary mateship. Given its high costs, however, we predicted that women would pursue an extra-pair conceptive strategy only if their primary partner is relatively low on indicators of gene quality. Forty-two women not using hormonal contraceptives provided daily reports of sexual interests and feelings. Extra-pair flirtation and desires were higher near ovulation. As predicted, this effect was moderated by women's assessments of their partner's quality on hypothesized good-genes indicators (e.g., sexual and physical attractiveness) relative to their assessments of their partner's long-term mate value (e.g., future resource provisioning). Specifically, women with partners lower on good-genes qualities experienced a greater increase in extra-pair desires at midcycle than did women with higher gene-quality partners. Near ovulation, women also reported higher sexual proprietariness and monopolization of time by partners. This effect was contingent on cycle phase primarily for less attractive women; more attractive women experienced high mate retention efforts from their partners across fertile and non-fertile cycle phases. Near ovulation, both mated and unmated women reported feeling more physically attractive and having greater interest in attending social gatherings where they might meet men. Overall, results support the hypothesis that human mating adaptations show ovulation-contingent shifts in desires and behaviors that are sensitive to varying adaptive payoffs.

Keywords: *Menstrual Cycle, Jealousy, Attractiveness, Good Genes*

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2:35PM

- Gangestad, Steven W. (University of New Mexico)
- Thornhill, Randy (University of New Mexico)
- Garver-Apgar, Christine E. (University of New Mexico)

CHANGES IN WOMEN'S SEXUAL INTERESTS ACROSS THE OVULATORY CYCLE: THE MODERATING EFFECTS OF MATES' SYMMETRY

Previous research has demonstrated that: (1) Women are particularly attracted to the scent of symmetrical men, more masculine faces, and behavioral displays of social presence and direct intrasexual competitiveness when fertile, particularly when evaluating men as short-term (sex) partners; (2) women report greater attraction to extra-pair males when fertile. The favored explanation for these findings is adaptation for extra-pair mating. If ancestral women could have garnered genetic benefits for offspring through extra-pair mating at a potential cost of losing in-pair partners, selection may have shaped sexual attraction to fitness indicators (e.g., the scent of symmetry, facial masculinity, social presence) to be conditional upon women's fertility status: greatest when women are fertile and diminished during non-fertile phases, particularly when women evaluate men as short-term partners. This explanation leads to an additional prediction. If a woman's in-pair mate possesses indicators of genetic

benefits, she should show less enhanced interest in extra-pair men when fertile, as she stands to gain fewer genetic benefits for offspring through extra-pair mating. Women paired with men who, relatively speaking, lack indicators of genetic benefits should show larger effects of fertility status on extra-pair sexual interest. We report the results of research that examined the effects of in-pair men's symmetry on their female mates' extra-pair and in-pair sexual interests. As predicted, in-pair men's symmetry moderates the effect of fertility status on the pattern of women's sexual interests. These findings indicate that the conditional effect of fertility status on women's sexuality is itself conditional on mates' attributes.

Keywords: *sexual selection, menstrual cycle, sexual attraction, fluctuating asymmetry*

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2:55PM

- Miller, Geoffrey (University of New Mexico)

A GREAT SENSE OF HUMOR IS A GOOD GENES INDICATOR: OVULATORY CYCLE EFFECTS ON THE SEXUAL ATTRACTIVENESS OF MALE HUMOR ABILITY

A great sense of humor (GSOH) is sexually attractive, so may have evolved as a mental "fitness indicator" – a sexually selected display of intelligence, creativity, and genetic quality. To test this hypothesis, 130 young women (none on hormonal contraception) read vignettes about potential male mates with different SOH levels (great, average, or bad), then rated each male's short-term and long-term sexual attractiveness, plus their inferred values on 27 physical and psychological traits. Each woman's expected fertility (likelihood of conception given copulation) on the date of the experiment was calculated from self-reported menstrual cycle information. As predicted, fertility did not affect the long-term attractiveness of GSOH men ($r = -.108$, n.s.), but it increased both their raw short-term attractiveness ($r = +.164$, $p = .069$, marginal), and their short-term minus long-term attractiveness ($r = +.213$, $p = .016$). Factor analysis of the 27 trait attributions revealed 3 main factors: a social/monetary success factor uninfluenced by fertility, a sexy/risky "bad boy" factor attractive for short-term mating that correlated positively with fertility ($r = +.506$, $p < .001$), and a 'great personality' factor attractive for long-term mating that correlated negatively with fertility ($r = -.518$, $p < .001$). Fertility also predicted women's wariness of sexual coercion, but had no influence on women's self-rated mate value or sense of humor, sociosexuality, satisfaction with current relationships, or hereditarian beliefs. Thus, women's mate preferences apparently respond to GSOH as a good-genes indicator that becomes more attractive for short-term mating when women are highly fertile at mid-cycle.

Keywords: *fitness indicators, menstrual/ovulatory cycle, sense of humor, mate choice*

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3:25PM

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- Gangestad, Steven W. (Department of Psychology, University of New Mexico)
- Simpson, Jeffrey A. (Department of Psychology, Texas A&M University)

SEXUAL COERCION AND WOMEN'S EVOLVED COUNTER-STRATEGIES: ENHANCED SENSITIVITY TO CUES OF SEXUAL COERCIVENESS ACROSS THE MENSTRUAL CYCLE

Circumvention of female choice by male sexual coercion is costly to females in many species (including humans) and was likely a recurrent problem in women's evolutionary history. Consequently, women may have evolved

counter-strategies designed to decrease risk and costs associated with sexual coercion. Ancestrally, women would have suffered higher consequences as a result of being sexually victimized when they were nearing ovulation due to the increased risk of conception; i.e., conceiving the offspring of an unchosen man with potentially low fitness and low paternal commitment. Thus, one might expect women's evolved counter-strategies to be contingent on menstrual cycle status. Previous research has demonstrated that: (1) women report engaging in less risky behaviors when nearing ovulation; (2) women's hand-grip strength increases after reading a sexual assault scenario, but only when women are nearing ovulation. We report two additional types of evidence that anti-coercion strategies vary across the menstrual cycle. Women viewed videotaped interviews of men and rated each man's propensity to be sexually coercive. As predicted, fertile women rated men as more sexually coercive overall, indicating that women may lower their threshold for detecting cues of sexual coerciveness when nearing ovulation. Moreover, women gave more prototypical ratings of sexual coerciveness (measured by aggregating sexual coerciveness ratings across women) when nearing ovulation than when not, suggesting an enhanced sensitivity to cues of sexual coerciveness mid-cycle.

Keywords: *sexual coercion, sexual selection, menstrual cycle*

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3:45PM

- Fessler, Daniel (UCLA)

HUNGRY FOR LOVE: UNDERSTANDING THE PERIOVULATORY NADIR IN HUMAN FEEDING BEHAVIOR

A comprehensive review of studies of dietary behavior across the menstrual cycle suggests a drop in caloric intake around the time of ovulation. This pattern resembles those which occur in many other mammals. The periovulatory nadir at first appears puzzling, as it is not explicable in terms of changes in the energy budget. Rather, a decrease in the set point for satiation occurs during the fertile period of the female cycle. This phenomenon, regulated by the same proximate factors as those mediating sexual proceptivity, is best understood as an adaptation that serves to reduce the motivational salience of goals which compete with those directly or indirectly pertaining to mating. This explanation is congruent with evidence of a) periovulatory reductions in other ingestive behaviors, and b) periovulatory increases in motor activity and the psychological concomitants thereof.

Keywords: *diet, menstrual cycle, periovulatory nadir, time allocation*

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4:05PM

- Thornhill, Randy (Dept. of Biology, University of New Mexico)
- Gangestad, Steven W. (Dept. of Psychology, University of New Mexico)

THE EVOLUTION OF WOMAN'S CONCEALED FERTILITY, EXTENDED SEXUALITY, AND PERMANENT ORNAMENTATION

Theory and comparative data across species indicate that fertility itself (high conception probability) never is directly selected to be signaled by females because sexual selection on males guarantees that males will evolve to find fertile females using incidental cues of change in reproductive status (as in the silk moth and vervet monkey). Thus female hominids did not lose estrus in the usual sense of estrus being a signal of cycle-related fertility. Selection concealed women's fertility by disguising by-products of peak fertility that males were selected

to detect. The female reproductive success, in human evolutionary history, resulting from securing a sire of high genetic quality by extra-pair copulation generated direct, effective selection for fertility disguise. The resulting adaptation contextually disguises fertility and sexual interest in extra-pair mates through emotional adaptations designed to withhold information. Female eroticism at peak fertility is emotion designed to be manifested very selectively, i.e., toward men with high genetic quality when benefits exceed costs, and otherwise to be hidden from others, and is probably homologous with heat or estrus shown by females in other mammal species. The numerous other hypotheses for the evolution of concealed fertility in women in the literature appear to be false given a) female adaptation to signal fertility doesn't evolve and b) recent data on women's sexuality and men's mate guarding across the cycle. Recent research also allows understanding women's sexually-selected, extended sexuality and estrogen-facilitated bodily and facial ornamentation and the relationship of these adaptations with the adaptation of concealed fertility.

Keywords: *Concealed ovulation, ornaments, extended sexuality, extra-pair copulation*

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Cooperation and Game Theory II, Chair: G. Roberts
Regency B, Saturday Afternoon

2:15PM

- Allen-Arave, Wesley (University of New Mexico)

IS ALTRUISM COMPETITIVE OR GUARDED? EVIDENCE FROM EMERGENCY INTERVENTION STUDIES

Several theorists have proposed that indiscriminate generous acts may garner favorable attention for altruists who signal their quality as either: 1) a beneficent partner for cooperative endeavors or 2) someone who commands social prestige. Many of these theories posit that "competitive altruism" can result with individuals competing to gain reputations for generosity or social prestige. However, a reputation for indiscriminate altruism may also attract unwanted attention from "free riders" who would freely exploit the kindness of altruists. Since completely indiscriminate altruists have no defense against "free riders" they will surely not benefit from social interactions with them. For this reason, individuals may be more "guarded" in their acts of altruism than "competitive altruism" or strategic handicap models would predict. According to this "guarded altruism" view, individuals will often signal their kindness to valued associates and friends, but will rarely compete actively with others to make wide broadcasts of their kindness. Indeed, results from emergency intervention studies in psychology indicate that rather than being eager to advertise their quality as a helper, individuals are often apprehensive to help in front of an audience. This well known "bystander effect" and other results from emergency intervention studies are more congruent with a view that altruism is "guarded" than with a view that altruism is "competitive".

Keywords: *altruism, indirect reciprocity, strategic handicap, bystander effect*

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2:35PM

- Aktipis, C. Athena (University of Pennsylvania)

COOPERATIVE AGENTS WITH CONTINGENT MOVEMENT RULES RESIST INVASION BY TIT-FOR-TAT AND PAVLOV

Over evolutionary history, humans and many other animals have evolved cognitive and behavioral mechanisms in order to navigate in social environments. However, evolutionary psychologists do not yet know exactly which

strategies humans and other animals use to avoid interactions with exploitative individuals. It is also unclear exactly how individuals evolved to be cooperative when cooperation is costly. Several different strategies have been suggested (tit-for-tat, memory of interactions, reputation effects, subjective commitments) but this is only a small subset of the possible strategies that might have favored the evolution of cooperation. Before assuming that cooperation evolved in humans because of sophisticated information processing abilities, one should consider the possibility that less complex strategies could have favored the evolution of cooperation. This series of agent-based computer simulations shows that a behavioral rule that is even simpler than Tit-for-Tat and PAVLOV can outperform Tit-for-Tat, PAVLOV and defecting strategies. In the first simulation, cooperative agents with contingent movement rules (to move after their partner defected) achieved a higher frequency than indiscriminate defectors and defectors that used contingent movement rules to minimize interactions with other defectors. The second, third and fourth simulations showed that this same contingent movement strategy can outperform both Tit-for-Tat and PAVLOV. The fifth simulation demonstrated that the cooperative contingent movement strategy is resistant to invasion by Tit-for-Tat and PAVLOV. This contingent movement strategy was successful, despite its simplicity, because it exploited various aspects of the physical and social environment. Limitations of the strategy and the experimental model are discussed.

Keywords: *cooperation, simple strategy, movement, agent-based*

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2:55PM

- Mashima, Rie (Hokkaido University)
- Takahashi, Nobuyuki (Hokkaido University)

THE EMERGENCE OF INDIRECT RECIPROCITY: IS THE STANDING STRATEGY THE ANSWER?

Although altruism based on direct reciprocity has been theoretically and empirically illustrated in both the biological and the social sciences, the occurrence of altruism without direct reciprocity has been a puzzle. Recently, however, significant advances have been made in research in biology on this issue. Nowak and Sigmund (1998a, b) proposed that what they refer to as the image scoring strategy makes indirect reciprocity possible. Criticizing their works, Leimar and Hammerstein (2001) and Panchanathan and Boyd (2002) proposed the standing strategy as the solution. After critically examining the work of Nowak and Sigmund (1998a, b), this paper points out several limitations in their research. In addition, careful attempts to replicate the findings of Leimar and Hammerstein (2001) and Panchanathan and Boyd (2002) reveal that the standing strategy is not the solution, either. Instead, based on a series of evolutionary simulation, this paper proposes a new strategy we refer to as the "strict discriminator," as the solution. Although this strategy's criterion for giving is stricter than the image scoring strategy and the standing strategy, all three strategies that attempt to shed light on the occurrence of altruism without direct reciprocity (image scoring strategy, standing strategy, and the strategy we call the strict discriminator) are similar in the sense that only discriminating altruism can hold (Hardin, 1981). They are also similar to the strategies that have been proposed in the studies of generalized exchange in the social sciences.

Keywords: *Indirect reciprocity, Generalized exchange, Cooperation, Evolutionary simulation*

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Hokkaido University

3:25PM

- Roberts, Gilbert (University of Newcastle)
- Atkinson, Nick (University of Newcastle)

COOPERATION THROUGH INTERDEPENDENCE

Existing theories of cooperation can explain helping among relatives or reciprocating pairs, but it is increasingly being recognized that many behaviors cannot be explained in these terms. Here we show how cooperation is readily established in groups without reciprocity or kinship. We consider a simple two-stage scenario in which individuals first have an option to help others at the expense of their own fitness, and are then subjected to a mortality process in which their chances of survival increase with group size. The scenario is designed to represent situations where individuals have an option to share food with group mates, and then have a better chance of surviving inter-group conflicts in larger group sizes. We find that although altruism cannot be favored when we consider the helping stage alone, it is readily established when we add in the second, group-size dependent process. We explain this in terms of a 'boomerang effect' whereby helping others benefits the altruist secondarily. This can be formalized in terms of the 'stake' of one individual in another, where the stake is a measure of the extent to which the altruist's own fitness increases with that of its beneficiary. We suggest that such interdependence between individuals may be a widespread and important factor promoting cooperative behaviour.

Keywords: *cooperation, altruism, modeling*

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3:45PM

- Barclay, Pat (McMaster University) **NI**

TRUSTWORTHINESS AND COMPETITIVE ALTRUISM CAN ALSO SOLVE THE "TRAGEDY OF THE COMMONS"

Humans are often altruistic towards groups even when there is no chance for direct reciprocity or incentive for others to reciprocate. Several researchers have suggested that altruistic individuals may benefit from being altruistic because they acquire a good reputation. Recent experiments in indirect reciprocity have shown that when people stand to benefit from having a good reputation, they are more altruistic towards groups and charities (Milinski, Semmann & Krambeck, 2002a,b). In this study, I added to those experiments by showing that individuals are more altruistic when it might make others trust them more. Participants in a cooperative group game contribute more to their group when they expect to play a dyadic trust game afterwards, and participants do tend to trust altruistic individuals more than non-altruistic individuals. Furthermore, altruism towards the group was maintained best when participants had to choose only one other person to trust. This suggests that people attempting to obtain the best reputation via competitive altruism can maintain cooperation better than people who would not benefit from competing for the best reputation.

Keywords: *competitive altruism, cooperation, reputation, trust*

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Plenary (Auditorium, 211)

9:00PM

- Jeffrey French (University of Nebraska-Omaha)

Biparental Offspring Care in Marmosets: Endocrinology and Energetics

For most mammals, including primates, mothers provide the greatest amount of care for offspring, and in many species females are exclusive caregivers. As a consequence, most of our knowledge regarding the dynamics of caregiving, its ultimate function, and the underlying mechanisms regulating this care, is based on the mother-offspring dyad. In biparental species, care is provided by two individuals, and in cooperatively breeding species, care is provided by multiple caregivers. Marmoset monkeys are cooperative breeders with biparental care, and we have approached the study of offspring care in marmosets from both proximate and ultimate perspectives. Our findings show that while both males and female contribute approximately equally to energetically demanding tasks, such as infant transport and provisioning of resources, the timing of this effort between the sexes differs dramatically. Females are primary caregivers early in infant life, while males exert their greatest effort in offspring care later in infant development. While mothers provide all of the nutrition for infants early in life via milk, fathers are the primary source for resources as infants transition from milk to solid food. Common underlying endocrine changes are correlated with these behavioral transitions in males and females. Testosterone (T) is high in males before and after their period of maximal involvement with infants, but during the phase of intense infant care, T levels are reduced to 60% of baseline levels. In females, T is low during the period of intense infant care, but rises coincident with decreasing maternal interest in infant care. The endocrine and behavioral changes are associated with female reproductive energetics, and appear to be designed to maintain high investment in current offspring (via male care) and facilitate investment in future offspring (fetal growth mediated by maternal resources).

Literature and Culture, Chair: C.T. Palmer
Regency A, Sunday Morning

10:15AM

- Vandermassen, Griet (Ghent University)

EVALUATING SOME FEMINIST ACCOUNTS OF GENDER

Many feminists are suspicious of a biological or evolutionary approach of gender. They argue that the answers to the question of gender identity are always as political as they are scientific. In this paper I will analyze the work of three feminist authors, addressing their views of human nature: biologist Anne Fausto-Sterling (*Myths of Gender*, 1992; *Sexing the Body*, 2000), science writer Natalie Angier (*Woman: An Intimate Geography*, 1999), and psychologist Lynne Segal (*Why Feminism?*, 2000). To what extent do these authors show an adequate understanding of evolutionary biology? Do they impose the same standards of evidence on social-constructivist theories of gender as they do on biologically inspired theories and research? To what extent can their respective theoretical frameworks be reconciled with a Darwinian point of view? I argue that, in order to bridge the gap between feminism(s) and evolutionary psychology, research into the precise interaction between ultimate and proximate levels of explanation is urgently needed.

Keywords: *feminism, gender, evolutionary psychology, philosophy of science*

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10:35AM

- Kruger, Daniel (University of Michigan)
- Fisher, Maryanne (York University)
- Jobling, Ian

DADS AND CADS: ALTERNATIVE MATING STRATEGIES AND PREFERENCES FOR LITERARY CHARACTERS

This project contributes to Darwinian literary criticism, an emerging theoretical approach with the promise of promoting consilience among the sciences and the humanities. Recent studies have indicated that humans have evolved to pursue both long-term and short-term mating strategies, and also that women have different criteria for choosing long-term and short-term mates. For long-term relationships, women seek partners with the ability and willingness to sustain long-term relationships requiring paternal investment. For short-term relationships, women choose partners with features indicating high genetic quality. The proper hero and dark hero in British Romantic literature of the late 18th and early 19th centuries respectively represent long-term and short-term male mating strategies. In hypothetical scenarios, females preferred proper heroes for long-term relationships. The shorter the relationship under consideration, the stronger tendencies if women were to choose dark heroes as partners. The strongest preference was seen for whom participants would prefer as a prospective son in law; they overwhelmingly chose the dad.

Keywords: *Darwinian literary criticism, mating strategy, life history, sexual selection*

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10:55AM

- Zunshine, Lisa (University of Kentucky, Lexington)

THEORY OF MIND AND FICTION (OR, CAN COGNITIVE SCIENCE TELL US WHY WE ARE AFRAID OF VIRGINIA WOOLF?)

My presentation demonstrates that cognitive research into ToM can furnish us with a series of surprising insights into our interaction with literary texts. Using as a case study Virginia Woolf's 1925 novel *Mrs. Dalloway*, I show how a series of recent experiments testing our ability to process multiple levels of embedded intentionality (as discussed by Robin Dunbar) can help us to account, at least partially, for the trepidation that Woolf's prose tends to provoke in some of her readers. I further argue that although the investigation of our mind-reading ability is very much a project-in-progress, enough carefully documented research is already available to literary scholars to begin asking such questions as, how does the literary narrative exploit or even train our capacity for mind-reading? How does it test its limits? How do different cultural-historical milieus encourage different literary explorations of this capacity? How do different genres? Speculative and tentative as the answers to these questions could only be at this point, they mark the possibility of a genuine interaction between cognitive psychology and literary studies, with both fields having much to offer to each other.

Keywords: *Theory of Mind, embedded intentionality, Virginia Woolf, modernism*

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11:15AM

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THE EVOLUTIONARY NATURE OF COMANCHE INDIAN HORSE PASTORALISM

Although observers have identified numerous universal traits among pastoralist peoples, there has been very little consensus over what constitutes the fundamental elements of this behavior. Some characteristics, such as living in environmentally marginal zones, herding livestock, dependence on livestock production, nomad-ism, and bellicosity, have been noted as particular traits of pastoralists. However, all of these can also apply to other types of societies as well. If these characteristics can be identified in various types of human societies through-out history and around the world, then what exactly constitutes pastoralism? Even though pastoralists share just as many differences as similarities, there are a few characteristics that all pastoral peoples have in common. This paper discusses the four necessary and sufficient conditions that are required in determining whether or not a society is engaged in pastoralism. The bequeath-al of animals from an individual of one generation to another of a later generation makes pastoralism a heritable trait subject to natural selection. Because domesticated animals are replicable and inheritable, the occurrence of this behavior among humans is influenced by the effect it has on individuals' success in leaving descendants. The continuance of pastoralism around the world attests to its success as an adaptation that helps individual humans thrive in various environments and to successfully reproduce. The discussion of the evolutionary nature of pastoralism focuses on the existence of this behavior among Comanche Indians of the southern Great Plains during the eighteenth and nineteenth centuries. Comanches acquired the Old World pastoralist tradition as a result of their kinship and social relationships with people living in the Spanish province of New Mexico. As Comanches recognized the benefits of Spanish horse pastoralism it became adopted as an inheritable cultural tradition. That Comanches acquired the pastoralist tradition ultimately attests to this behavior's positive effect on the ability of people to successfully endure and reproduce.

Keywords: *pastoralism, Comanche Indians, culture, tradition*

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11:35AM

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TOTEMISM: DESCENDANT-LEAVING STRATEGY OF THE AUSTRALIAN ABORIGINES

Totemism, the religion of the Australian Aborigines, has been at the center of attempts by social scientists (e.g., Durkheim and Freud) to explain religion for over a century. Evolutionary psychologists attempting to explain religion also need to account for this form of religion. This will require addressing several aspects of totemism that represent challenges to the view that religious behavior is simply the result of psychological mechanisms that cause an individual to hold religious beliefs. First, far from springing from an individual's psychological mechanisms, the religious behavior comprising Australian totemism is profoundly traditional, having been copied for hundreds of generations: regardless of their personal inclinations, individuals are socially obligated to participate. Second, the assumption that practitioners of totemism believe their religious claims (e.g., that they are true members of their totemic species) is not scientifically acceptable. As an alternative, we present a model of totemism (and religion in general) that focuses on the identifiable, social effects of religious behavior, particularly on the relationships among distant kinsmen.

Keywords: *religion, kinship, traditions, altruism*

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Attractiveness II, Chairs: D. Singh and J. Chen
Heritage Room, Sunday Morning

10:15AM

- Roberts, Craig (University of Newcastle)
- Petrie, Marion (University of Newcastle)
- Gosling, Morris (University of Newcastle)
- Perrett, David (University of St Andrews)
- Little, Anthony (University of St Andrews)
- Jones, Ben (University of St Andrews)
- Penton-Voak, Ian (University of Stirling)
- Carter, Vaughan (UK National Blood Service)

HUMAN FACIAL ATTRACTIVENESS AND THE MHC

Females gain fitness benefits by choosing between males with traits indicating “good genes”, but we know very little about the nature of these genes. However, it has recently been suggested that genetic quality, in this sense, may often be defined as heterozygosity at certain loci. Here we investigate whether heterozygosity at key human leukocyte antigen (HLA) loci is associated with greater facial attractiveness. We show that faces of men who are heterozygous at all three loci are judged more attractive by women than faces of men who are homozygous at one or more of these loci. HLA genes code for proteins involved in immune response in humans. Consistent with this function, faces of HLA-heterozygotes are also perceived to be healthier. In the absence of any other cues, patches of skin from the cheeks of heterozygotes are judged healthier than skin of homozygotes and these ratings correlate with attractiveness judgments for the whole face. These judgments are independent of the degree of HLA-similarity between the men and the female raters. Our results are the first to link genes and facial attractiveness directly, and suggest a new mechanism to explain common consensus concerning individual attractiveness.

Keywords: *MHC, attractiveness, mate choice, good genes*

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10:35AM

- Rohde, Percy (University of Kassel, Germany) **NI**

ATTRACTIVENESS, MATING SUCCESS, AND ABORTION DECISION

In evolutionary studies of behavior, mating success, age at reproduction, and number of offspring produced are frequently used proxies for genetic fitness. For many species, it has been predicted and found that physical attractiveness is positively related to mating success and to the number of offspring produced. These correlations may, however, be disrupted, for example in populations of modern humans where individuals practice effective contraception and can freely and safely decide to abort a pregnancy. For most childless women, abortion is a means to postpone parenthood. In this study I investigated how attractiveness and mating success relate to abortion decision making. I asked a sample of childless female and male students what they would do if they or their partner became pregnant today. Among other variables, measures of physical attractiveness and mating success were recorded. I predicted and found that in both women and men physical attractiveness was positively related to measures of promiscuity, but that attractiveness (both sexes) and mating success (more so in women) were positively related to the tendency to abort an imagined pregnancy. In women attractiveness was negatively related to the number of children desired. I argue that attractiveness and promiscuity as traits that, in the evolutionary past, would have enhanced would have been of reproductive advantage, make the mating phase

particularly enjoyable to individuals who rank high on these traits. As a result, attractiveness and promiscuity negatively affect an individual's willingness to change from the mating phase into the parental phase.

Keywords: *attractiveness, mating success, abortion*

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10:55AM

- Singh, Devendra (University of Texas)
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ANATOMICAL LOCATION OF BODY FAT INFLUENCES JUDGEMENTS OF FEMALE ATTRACTIVENESS

Recent research showing that people judge a woman with low WHR as attractive and healthy has been criticized by arguing that figures presenting low WHR also have low body weight as measured by the Body Mass Index (BMI, weight divided by height in meters squared). Specifically, it is proposed that the figures of women with low WHR appear to have a low BMI, whereas figures with high WHR have high BMI. BMI does not take into account the anatomical location of the fat. It implies that increase or decrease in BMI by changing the size of any body part should affect the judgments of attractiveness and health. Women with low BMI should be judged more attractive than women with high BMI. Anatomical location is crucial as the thickness of the waist is affected by age and hormone condition. Therefore, if selection shaped the judgment of attractiveness, the anatomical location of body fat should be important. To test this idea, four figures were created. Figures were created with differing WHR and BMI's. Figures with lower WHR had higher BMI's and figures with higher WHR had lower BMI's. Then subjects were asked to estimate the age of the figures and attractiveness (0-least attractive to 5-most attractive). In spite of larger arms and thighs (higher BMI), subjects judged the figure with the 0.7 WHR to be most attractive and healthy. Therefore it is the anatomical location rather than BMI that is determinate of female attractiveness.

Keywords: *BMI, WHR, Attractiveness*

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11:15AM

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CONTEXT-SPECIFIC MODULATION OF TEMPORAL DISCOUNT RATES

Animals are expected to discount the future more or less steeply in response to cues of the utility of current versus future consumption. Future discounting is likely to vary in relation to sex, age, cues of survival prospects, and cues of social status or competitive position. Men are expected to discount the future more steeply than women, both because men are less likely to live to see the future, and because immediate, even total, resource expenditure was more likely to pay off for a man (as mating effort) than for a woman in ancestral environments.

In an experimental study, individual discount rates were computed from paired monetary choices before and after the subjects rated a set of photographs on their appeal. It was hypothesized that men would discount the future more steeply after viewing pictures of attractive persons of the opposite sex. For men, but not women, the discount parameter was significantly higher after viewing attractive faces than unattractive faces. Discounting did not change in either sex after viewing pictures of more or less appealing cars.

Keywords: *temporal discounting, sexual selection, sex differences, attractiveness*

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11:35AM

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MASCULINIZATION AND SELF-PERCEIVED ATTRACTIVENESS PREDICT PROMISCUITY IN WOMEN

Women vary with respect to monogamous / polyandrous inclinations, as indexed by the Sociosexual Orientation Inventory (SOI). Possible sources of SOI variation include variation in perceptions relating to the utility of different mating tactics and in one's degree of masculinity / femininity, among other things. In a university sample, two measures of masculinization, namely scores on the Vandenberg Mental Rotation test and the 2D:4D digit ratio, were correlated with SOI scores, and an index of self-perceived attractiveness provided additional, independent prediction of SOI variance. These results will be discussed in terms of their implications for whether SOI variation is "strategic" or a functionless byproduct of other processes.

Keywords: *Strategic plurality, Sexuality, Attractiveness, Masculinization*

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Cooperation and Game Theory III, J. Patton
Regency B, Sunday Morning

10:15AM

- Kameda, Tatsuya (Hokkaido University)
- Tsukasaki, Takafumi (Hokkaido University)

ADAPTIVE GROUP DECISION MAKING AND CULTURAL GROUP SELECTION: ROBUST BEAUTY OF THE MAJORITY RULE

Group decision making is a commonly-used cultural device in many societies including tribal as well as industrialized societies. One major adaptive consequence of group decision making is a reduction in within-groups fitness variation while preserving variation between groups, facilitating the operation of cultural group selection. This paper explores adaptive efficiencies of various group decision rules under uncertainty, by a series of computer simulations. Implementing a Brunswikian adaptive environment in the computer where the state of the environment is known only imperfectly through stochastic cues, we seek fast and frugal group decision heuristic that works well under uncertainty. We argue that simple majority rule may qualify as such a fast and frugal heuristic, overcoming the possibility of mob rule for a wide range of parameters.

Keywords: *Cultural group selection, group decision making, uncertainty, evolutionary game*

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10:25AM

- Patton, John (Washington State University)

COALITIONAL DIFFERENCES IN EXPERIMENTAL ECONOMIC GAME PERFORMANCE IN THE ECUADORIAN AMAZON.

This paper reports differences in game performance between two groups of ethnic Achuar living in the Ecuadorian Amazon. In this paper I argue that intra-ethnic differences in game performance are more likely influenced by strategic decision making than by social norms. Ultimatum, Dictator, and Trust games were played in two separate communities in the summer of 2002. The two communities are located in adjacent river valleys about a day's hike apart. The Achuar in these two communities have sporadic contact and some intermarriage, but differ in coalitional contexts. One community (Pindu Yacu) is small and homogeneously Achuar with a high degree of shared kinship; the other is a larger community (Conambo) shared with ethnic Quichua. This paper focuses on the ultimatum game in which individuals in Pindu Yacu make more generous offers than do Achuar living in Conambo. Differences in game play are explored with reference to differences in social network structures and stability. Further evidence that the differences in performance are due to differences in perceptions of differences in coalitional context is found by comparing differences in ultimatum game offers in Conambo to game offers recorded in the same community four years prior (1998). Achuar offers in Conambo have become less generous. This drop in offers corresponds to a drop in coalitional power and a rise in inter-coalitional conflict within Conambo.

Keywords: *Coalitions, Experimental Economic Games, Amazon*

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10:55AM

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INDIRECT RECIPROCITY IN THE SELECTIVE-PLAY ENVIRONMENT

Research on explaining indirect reciprocity has just begun using the random matching giving game paradigm (Nowak and Sigmund 1998a, b). Currently, the most promising solution is the "strict discriminator" strategy, which gives only to the recipients who gave to a "good recipient" (Mashima and Takahashi 2003). This paper points out two limitations in the previous study, however. First, the victory of the strict discriminator strategy was achieved in the presence of only ALL-C and ALL-D. Thus, we do not know whether the strict discriminator strategy can win when some other strategies are also present. Second, the random matching paradigm in which a pair of a donor and a recipient is chosen randomly from a population is somewhat counterintuitive: if a donor knows every other individual's reputation score, why not choose a desirable person as a recipient from a population? Such an environment is referred to as the "selective-play" paradigm in social sciences (Takahashi, 2000; Yamagishi and Hayashi 1996). In order to address these issues, we conduct a new series of simulations. The results show that the strict discriminator strategy cannot always make indirect reciprocity possible in the random matching environment when strategies other than ALL-C and ALL-D are also present. In the selective-play environment, however, both the strict discriminator strategy and the "extra standing" strategy (to give to a recipient who gave to a "good" individual or who did not give to a "bad" individual) can make indirect reciprocity possible in most cases.

Keywords: *Indirect reciprocity, Generalized exchange, Cooperation, Evolutionary simulation*

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11:15AM

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KEEPING UP APPEARANCES: RATIONALISM, ALTRUISM AND INFORMATION ASYMMETRY

The over-cooperation of humans is an enduring puzzle for social science. Though often assumed to be self-interested, humans are frequently observed acting for the benefit of others even at apparent cost to themselves. What explains this altruistic streak in human decision making? I use dictator and ultimatum games to test the hypothesis that selfish and altruistic choices are driven by a sensitivity to perceived (not necessarily actual) fairness. In the experiments, allocators are asked to divide “tickets” between themselves and a recipient, and then informed that the tickets have differential values. In some scenarios a ticket’s redemption value is twice as much for an allocator than for a recipient. In other scenarios the values are reversed. In all cases only the allocator knows of the differential values. I find that allocators are perfectly willing to take advantage of inside information for their own benefit—they will play others for suckers as long as they can maintain the perception of a fair split. More interestingly, I also find allocators are willing to incur costs and disproportionately benefit the recipient in order to keep up the appearance of a fair split. These findings suggest altruism and rational self-interest are simply different sides of the same evolutionary coin. They also suggest that we can take advantage of evolutionary theory to better understand how the specifics of the decision making environment determine whether we maximize our interests or sacrifice them.

Keywords: *altruism, rational choice*

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11:35AM

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EFFECTIVE PRECAUTION RULES AND THE HAZARD MANAGEMENT ALGORITHM

Hazardous situations vary along several dimensions which affect the degree of danger or harm they involve. Two of these dimensions are the effectiveness of the precautionary rule, that is, the likelihood that it will prevent or reduce a hazard; and the magnitude or severity of the hazardous situation. The effect of these two factors on precautionary reasoning was explored using the Wason Selection Task. Participants were randomly assigned to a high or low effectiveness condition. They then answered four different WST’s which varied the degree of severity of the hazardous situation. Results showed that while the severity of the hazardous situation has no effect on performance, the effectiveness of the precaution rule does. Specifically, precaution rules with low effectiveness produce a distinct pattern of answers, which is predicted by Hazard Management Theory (Cosmides and Tooby, 1997). These results support the idea that the inferences produced by hazard management algorithms are automatic and have ecological rationality, thus supporting the idea that precautionary reasoning is carried out by a cognitive adaptation.

Keywords: *hazard management theory, precaution rules, Wason Selection Task*

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Trivers-Willard and Child Health, Chair: M.Flinn
Main Auditorium, Sunday Morning

10:15AM

- Hopcroft, Rosemary (UNC-Charlotte)

TESTING TRIVERS-WILLARD: PARENTAL STATUS AND DIFFERENTIAL INVESTMENT IN SONS AND DAUGHTERS

The Trivers-Willard hypothesis when applied to humans suggests that 1) high status families will allocate more resources to boys, while low status families will allocate more resources to girls and 2) higher status individuals will have more boys than lower status individuals. Here, I test the resource allocation version of Trivers-Willard with cumulative GSS data, using years of education attained as a behavioral, if indirect measure of parental investment; and father's occupational status as a measure of familial status. Results support the Trivers-Willard hypothesis. All else being equal, sons of high status fathers attain more education than daughters, and the daughters of low status fathers attain more education than sons. Also consistent is the finding that among African-Americans, daughters of high status fathers attain more education than sons. I further test the sex ratio version of Trivers-Willard and find evidence that higher status men have more sons.

Keywords: *Trivers-Willard, status, educational attainment, sex ratio*

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10:35AM

- Quinlan, Robert (Ball State University)
- Leone, David V. (U. of Missouri)
- Gangestad, Steven W. (U. of New Mexico)
- Quinlan, Marsha B. (Ball State U.)
- England, Barry G. (U. of Michigan)
- Thornhill, Randy (U. of New Mexico)
- Flinn, Mark V. (U. of Missouri)

TRADEOFFS BETWEEN INDIRECT PARENTAL INVESTMENT AND DIRECT CHILDCARE: LONG-TERM EFFECTS OF HOUSEHOLD PRODUCTION AND BREASTFEEDING DURATION ON CHILDREN'S CORTISOL LEVELS, FLUCTUATING ASYMMETRY AND GROWTH.

Parental investment (PI) among humans is a complex behavior involving types of resources that may differentially affect child development. Recent evolutionary models of PI suggest a tradeoff between indirect investment (wealth, education etc.) and direct childcare. Child development may be relatively insensitive to indirect PI, because in the course of human evolution there were few avenues for indirect investment. If human parenting behavior evolved to foster offspring social competency, then children may be particularly attuned to qualities of direct parental care. Here we examine direct care (breastfeeding duration), indicators of indirect PI (household wealth) and their association with children's long-term well-being in a rural Caribbean village. The aim is to isolate independent effects of breastfeeding and household production on children's growth, developmental stability, and psychosocial stress. Longitudinal data are for 110 children between 6 and 18 years of age in the Commonwealth of Dominica. Multivariate analyses indicate that duration of breastfeeding is negatively associated with children's fluctuating asymmetry and psychosocial stress (salivary cortisol level). Wealth, mother's pair-bond status and coresidence with adult female kin were not associated with developmental stability or stress levels independent of the duration of breastfeeding. Long-term growth was not significantly associated with breastfeeding, wealth or household composition; however, wealth and breastfeeding duration were positively associated with children's body fat. These results and other studies in this community suggest that parental attention focused on economic

production in lieu of direct childcare may entail fitness costs.

Keywords: *parental investment, child development, psychosocial stress, breastfeeding*

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10:55AM

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THE EVOLUTIONARY ECOLOGY OF CLASS DIFFERENCES IN URBAN SOUTH INDIA: STRATEGIES IN RELATION TO PARENTAL INVESTMENT AND MARRIAGE PRACTICES

Parental Investment in urban South Asia centers around two main objectives: 1) investment in the embodied capital of one's children, and 2) investment in arranging their marriages to suitable brides and grooms. In addition, the marriage practices in urban South India have recently undergone several significant changes. Marriages have become increasingly expensive and greater occasions for social competition and display of wealth, and marriage practices have become increasingly similar between different caste and class groups.

Members of different social classes occupy distinctive socio-ecological niches in the South Indian social system. Each group not only has average differences in terms of occupation, education, income, age of marriage, and women's labor force participation, but also has a unique history of cultural practices which has undergone an equally unique pattern of change in recent decades.

In this paper I present the results of a field study conducted in Bangalore, India, with the goal of comparing the investment strategies of five occupation-based social classes in relation to: 1) their educational investment in sons and daughters, 2) their investment in the marriage costs of sons and daughters, and 3) the ways in which educational investment and marriage practices in each group have shifted over the last 30 years.

Keywords: *behavioral ecology, parental investment, marriage, India*

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11:15AM

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READING PALMS: A BIOCULTURAL ANALYSIS OF STATUS AND CHILD HEALTH AS INDICATED BY FLUCTUATING ASYMMETRY

This study explores potential relationships between parental status and child phenotypic quality, as indicated by body mass indexes (BMI) and fluctuating asymmetry (FA) among a small-scale tribal population of Achuar and Quichua speakers living in the Ecuadorian Amazon. Other studies have correlated status, especially male status, with differential reproduction and ability to provision offspring. Furthermore, it has been asserted that because of access to more abundant and advantageous resources, higher status individuals may enjoy greater insulation from life's physical, nutritional, and psychological stressors than those lower ranked. Thus, it was hypothesized that in the test population, children parented by higher status individuals would exhibit greater body mass by age and sex, and display less fluctuating asymmetry (FA), an amalgamated indicator of developmental stability composed of intrinsic (genetic) and extrinsic (environmental) factors. The null hypotheses were supported, that is, in the sampled population, variation in BMI and FA are not significantly correlated with parental status.

Keywords: *body mass index (BMI), fluctuating asymmetry (FA), status, hunter-gatherers*

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11:35PM

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HUNTING AND THEORY OF MIND

Although the proper domain of theory of mind is often assumed to be human social interactions, mind reading skills may also have evolved in part because of their usefulness for predator evasion and prey capture. Here I report the preliminary results of a study of theory of mind use by Shuar hunters in the Ecuadorian Amazon. The results suggest that several types of mental state inference are particularly important in hunting, and that hunters rely on “personality”-like composites of individual prey taxa to predict behavior.

Keywords: *Predators, Prey, Theory of Mind, Mind reading*

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