

WELCOME TO HBES 2009

Dear Colleagues,

Welcome to the 21st Annual Meeting of the Human Behavior and Evolution Society, and to California State University at Fullerton (CSUF). We are honored to host this year's meeting which falls on the 200th anniversary of Darwin's birth and the 150th anniversary of the publication of *The Origin of Species*. To mark this occasion, James Moore will be speaking on *Darwin's Sacred Cause and the Problem of Slavery* at this year's banquet. We are excited about this year's lineup of keynote and plenary speakers and the quality of the over 300 papers and posters that will be presented. On behalf of the host committee and CSUF, I thank you for attending and hope you enjoy the presentations and this opportunity to socialize and exchange ideas with your colleagues.

John Q. Patton

Conference Organizer

John Patton

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QUICK SCHEDULE

Wednesday, May 27

1:00-9:00pm	Registration	Chapman Atrium
7:00-9:00pm	Welcome Reception	Portola Pavilion C

Thursday, May 28

9:00-9:15am	Coffee	Chapman Atrium
9:00-5:00pm	Registration	Chapman Atrium
9:15-9:30am	Welcome & Announcements	Portola Pavilion A & B
9:30-10:30am	Morning Plenary by Joseph Henrich	Portola Pavilion A & B
10:30-10:50am	Break	
10:50-12:30pm	Morning Sessions (A1-A4)	Titan Theater, Gabrielino, Ontiveros, & Alvarado
12:30-1:40pm	Lunch Break	
12:30-1:40pm	HBES Executive Council Meeting	Alvarado
1:40-2:40pm	Afternoon Plenary by Hanna Kokko	Portola Pavilion A & B
2:40-3:00pm	Break	
3:00-4:20pm	Afternoon Sessions (B1-B4)	Titan Theater, Gabrielino, Ontiveros, & Alvarado
4:20-4:40pm	Break	
4:40-6:00pm	Evening Sessions (C1-C4)	Titan Theater, Gabrielino, Ontiveros, & Alvarado
6:00-6:20pm	Break	
6:20-7:40pm	Keynote by Stephen Stearns	Portola Pavilion A, B, & C

Friday, May 29

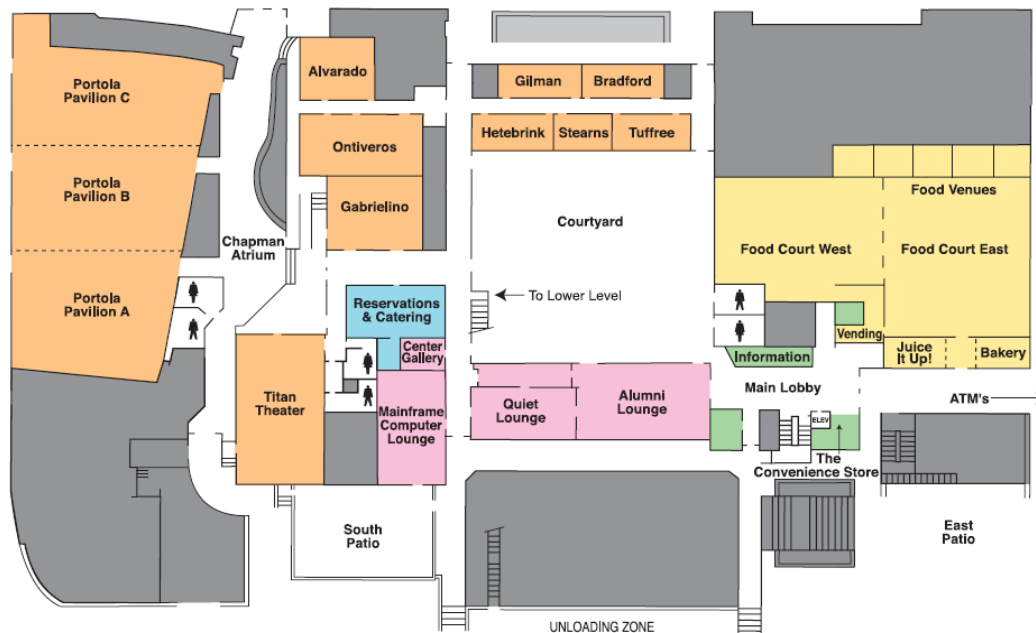
8:00-8:30am	Coffee	Chapman Atrium
8:00-5:00pm	Registration	Chapman Atrium
8:30-9:30am	Morning Plenary by Hillard Kaplan	Portola Pavilion A & B
9:30-9:50am	Break	
9:50-11:30am	Morning Sessions (D1-D4)	Titan Theater, Gabrielino, Ontiveros, & Alvarado
11:30-12:40pm	Lunch Break	
11:30-12:40pm	HBES Publications Committee Meeting	Alvarado
12:40-1:40pm	Afternoon Plenary by Caleb Finch	Portola Pavilion A & B
1:40-2:00pm	Break	
2:00-3:40pm	Afternoon Sessions (E1-E4)	Titan Theater, Gabrielino, Ontiveros, & Alvarado
3:40-4:00pm	Break	
4:00-5:20pm	Evening Sessions (F1-F4)	Titan Theater, Gabrielino, Ontiveros, & Alvarado
4:00-7:00pm	Poster Session	TSU Courtyard
7:00-9:30pm	BBQ	Fullerton Arboretum

Saturday, May 30

9:00-9:30am	Coffee	Chapman Atrium
9:00-5:00pm	Registration	Chapman Atrium
9:30-10:30am	Morning Plenary by Robert Kurzban	Portola Pavilion A & B
10:30-10:50am	Break	
10:50-12:30pm	Morning Sessions (G1-G4)	Titan Theater, Gabrielino, Ontiveros, & Alvarado
12:30-1:40pm	Lunch Break	
12:30-1:40pm	Open Member Meeting	Titan Theater
1:40-2:40pm	Afternoon Plenary by Virpi Lummaa	Portola Pavilion A & B
2:40-3:00pm	Break	
3:00-4:40pm	Afternoon Sessions (H1-H3)	Titan Theater, Gabrielino, Ontiveros, & Alvarado
4:40-5:00pm	Break	
5:00-6:40pm	Evening Sessions (I1-I4)	Titan Theater, Gabrielino, Ontiveros, & Alvarado
6:40-7:00pm	Break	
7:00-9:00pm	Banquet & Banquet Address by James Moore	Portola Pavilion A, B, & C

Sunday, May 31

9:00-9:30am	Coffee	Chapman Atrium
9:00-12:00pm	Registration	Chapman Atrium
9:30-10:30am	Morning Sessions (J1-J4)	Titan Theater, Gabrielino, Ontiveros, & Alvarado
10:30-10:40am	Break	
10:40-12:00pm	Late Morning Sessions (K1-K3)	Titan Theater, Gabrielino, Ontiveros, & Alvarado



PROGRAM OF EVENTS

Wednesday, May 27

1:00-9:00pm	Registration	Chapman Atrium
7:00-9:00pm	Welcome Reception	Portola Pavilion C

Thursday, May 28

9:00-9:15am	Coffee	Chapman Atrium
9:15-9:30am	Welcome & Announcements	P. Pavilion A & B
9:30-10:30am	Morning Plenary by Joseph Henrich <i>Culture and the Evolution of Human Sociality</i>	P. Pavilion A & B
10:30-10:50am	Break	

Thursday Morning Sessions

Session A-1: **Warfare and Intergroup Conflict** Titan Theater
 Chair: Joshua D. Duntley

Th 10:50	<i>The psychology of warfare</i>	Joshua D. Duntley, David M. Buss
Th 11:10	<i>Infectious disease causes global variation in the frequency of intrastate armed conflict and civil war</i>	Kenneth Letendre, Corey L. Fincher, Randy Thornhill
Th 11:30	<i>Demographic and individual factors as causes of suicide terrorism</i>	Kyle Gibson
Th 11:50	<i>The origin of human warfare: Experimental results to link processing war scenes to mating primes</i>	Lei Chang, Huijing Lu, Tong Li, Hongli Li
Th 12:10	<i>Sexual selection and the psychological architecture of race bias</i>	C. David Navarrete

Session A-2: **Cooperation** Gabrielino
 Chair: Joseph H. Manson

Th 10:50	<i>Does conversational conduct among strangers predict expectations of defection in a one-shot prisoner's dilemma game?</i>	J.H. Manson, M.M. Gervais, M.A. Kline, R.L. George
Th 11:10	<i>The evolution of human cooperation: Ecological and intra-cultural variation in normative behavior</i>	Shakti Lamba
Th 11:30	<i>The paradox of cooperation benefits</i>	Karoly Takacs, Andras Nemeth
Th 11:50	<i>Facial expressions of emotion as signals of cooperation</i>	Joanna Schug, Toshio Yamagishi, David Matsumoto, Yataka Horita, Kemberlee Bonnet
Th 12:10	<i>Is group selection viable for highly mobile organisms? Rethinking the assumptions of standard group selection models</i>	C. Athena Aktipis

Session A-3: **Life History 1**
Chair: Bruce J. Ellis

Ontiveros

Th 10:50	<i>Fundamental dimensions of environmental risk: The impact of harsh versus unpredictable environments on the evolution and development of life history strategies</i> Bruce J. Ellis, Aurelio Jose Figueredo, Barbara H. Brumbach, Gabriel L. Schlomer
Th 11:10	<i>Growth and nutritional status in an indigenous lowland Ecuadorian population</i> L.S. Sugiyama, J.J. Snodgrass, A.D. Blackwell, F.C. Madimemos, T.J. Cepon, T.R. Gandolfo, M.A. Liebert
Th 11:30	<i>Are quantity-quality tradeoffs reflected in the immune function of human children? An analysis of immune function, illness frequency, and family composition in a Shuar village</i> Aaron D. Blackwell, J. Josh Snodgrass, Felicia C. Madimemos, Tara J Cepon, Tiffany R. Gandolfo, Lawrence S. Sugiyama
Th 11:50	<i>Differential maternal somatic investment in response to local environmental variation in a modern population</i> Daniel J. Kruger, Melissa A. Munsell

Session A-4: **Facial Masculinity**
Chair: Benedict C. Jones

Alvarado

Th 10:50	<i>Facial cues of dominance modulate reflexive gaze-cuing in human observers</i> Benedict C. Jones, Lisa M. DeBruine, Julie C Main, Anthony C Little, Lisa L.M. Welling, David R Feinberg
Th 11:10	<i>Women's preferences for masculinity in male faces are predicted by pathogen disgust, but not moral or sexual disgust</i> Lisa M. DeBruine, Benedict C. Jones, Joshua M. Tybur, Debra Lieberman, Vladas Griskevicius
Th 11:30	<i>The masculine face: Facial characteristics that increase a male's mate value</i> Jack Demarest, Arci Guzman
Th 11:50	<i>Mothers and mate choice: Facial Preferences in a cross-cultural sample</i> Isabel Scott, William Jankowiak, Viren Swami, Zejun Huang, Yangke Zhao, Ian Penton-Voak
Th 12:10	<i>Waist-hip ratio predicts women's preferences for masculine male faces, but not perceptions of men's trustworthiness</i> Finlay G. Smith, Benedict C. Jones, Lisa M. DeBruine, Lisa L.W. Welling, Jovana Vukovic, Julie C. Main, Anthony C. Little

12:30-1:40pm Lunch Break

12:30-1:40pm HBES Executive Council Meeting

Alvarado

1:40-2:40pm Afternoon Plenary by **Hanna Kokko**
Which Sex Does What, and Why?

P. Pavilion A & B

2:40-3:00pm Break

Thursday Afternoon Sessions

Session B-1: **Foraging**
Chair: Andreas Wilke

Titan Theater

Th 3:00	<i>Cognitive adaptations for resource search: Explaining hot hands and fallacious gamblers</i> Andreas Wilke, H. Clark Barrett, Peter M. Todd
Th 3:20	<i>Physiology of foraging choice: Blood glucose and future discounting</i> X.T. Wang, Robert D. Dvorak
Th 3:40	<i>Optimal foraging in semantic memory</i> Peter M. Todd, Thomas H. Hills, Michael N. Jones, Andreas Wilke
Th 4:00	<i>You can't always get what you want: The motivational effect of need on risky decision-making</i> Sandeep Mishra, Martie L. Lalumiere

Session B-2: **Women's Mate Preferences 1: Muscularity, Strength, & Dominance** Gabrielino
 Chair: David A. Frederick

Th 3:00	<i>Preferences for muscularity in 26 countries across 10 world regions: Results from the International Body Project I</i> David A. Frederick, Viren Swami, the 56 Members of the International Body Project
Th 3:20	<i>Women's preferences for dominant and physically formidable men in long-term relationships</i> Jeffrey K. Synder, Carlos D. Navarrete, Daniel M.T. Fessler
Th 3:40	<i>Men's physical strength is associated with women's perceptions of their dancing ability</i> Bernard Fink, Nadine Hugill, Nick Neave, Hanna Seydell
Th 4:00	<i>Social dominance and forceful submission sexual fantasies: An indicator of feminine pathology or feminine power?</i> Patricia H. Hawley

Session B-3: **Disgust and Disease Avoidance** Ontiveros
 Chair: Joshua Tybur

Th 3:00	<i>Politics and disgust make not-so-strange bedfellows</i> Joshua Tybur
Th 3:20	<i>Correlates of progesterone on measures of disease avoidance: Support for the compensatory prophylaxis hypothesis</i> Diana Santos Fleischman, Daniel M.T. Fessler
Th 3:40	<i>The twin effects of exposure on attraction and disease avoidance</i> Alison Aylward, Debra Lieberman, Robert Oum

Session B-4: **Developmental Instability and Individual Differences** Alvarado
 Chair: Leslie A. Merriman

Th 3:00	<i>Health, fitness, and personality correlates of minor physical anomalies, makers of developmental disruption in utero</i> Leslie A. Merriman, Melissa Emery Thompson, Martin N. Muller, Steven W. Gangestad
Th 3:20	<i>Utilizing current genetic methods to understand the evolution of individual differences and mental disorders</i> Daniel P. Howrigan, Matthew Simonson, Matthew C. Keller
Th 3:40	<i>Schizophrenia and autism both have their origin during very early pregnancy</i> Annemie Ploeger, Fritson Galis

4:20-4:40pm Break

Thursday Evening Sessions

Session C-1: **Symposium: Nature of Reciprocity: Psychological Adaptations for Cooperation Reflect Ancestral Regularities** Titan Theater
 Chair: Andrew Delton

Th 4:40	<i>I will only know that our interaction was one-shot if I kill you: A cue theoretic approach to the architecture of cooperation</i> John Tooby, Max Krasnow, Andrew Delton, Leda Cosmides
Th 5:00	<i>Regularities of the ancestral world exploitable for cooperation: Why I always remember a face</i> Max Krasnow, Andrew W. Delton, John Tooby, Leda Cosmides
Th 5:20	<i>Combining ancestral cue structure with direct reciprocity explains one-shot cooperation</i> Andrew W. Delton, Max Krasnow, John Tooby, Leda Cosmides
Th 5:40	<i>The role of welfare tradeoff ratios in reciprocity</i> Julian Lim, Daniel Sznycer, Andrew W. Delton, Theresa E. Robertson, John Tooby, Leda Cosmides

Session C-2: **Women's Mate Preferences 2: Facial Attractiveness**
Chair: Ian S. Penton-Voak

Gabrielino

Th 4:40	<i>Women's preferences for male faces reflect cues to successful resource allocation</i> I.S. Penton-Voak, I. Scott, A.P. Clark, N. Pound
Th 5:00	<i>Circum-menopausal effects on women's judgments of facial attractiveness</i> Jovana Vukovic, Benedict C. Jones, Lisa M. DeBruine, Anthony C. Little, David R. Feinberg, Lisa L.M. Welling
Th 5:20	<i>Putting your best face forward: Subtle facial signals produced by exposure to potential mates</i> Zachary L. Simmons, Aaron W. Lukaszewski, James R. Roney
Th 5:40	<i>Trade-offs between markers of absolute and relative quality in human facial preferences</i> Tamsin K. Saxton, Anthony C. Little, Hannah M. Rowland, Ting Gao, S. Craig Roberts

Session C-3: **Parity, Pregnancy, and Postpartum Adaptations**
Chair: William D. Lassek

Ontiveros

Th 4:40	<i>The optimal BMI for human mothers varies with parity</i> William D. Lassek, Steven J.C. Gaulin
Th 5:00	<i>Pregnant women show a threat-detection advantage</i> Marla V. Anderson, M.D. Rutherford
Th 5:20	<i>Birthweight and paternal involvement predict early reproduction in women</i> Daniel Nettle, David A. Coal, Thomas E. Dickins
Th 5:40	<i>New evidence for lactation aggression in humans</i> Jennifer Hahn-Holbrook, Julianne Holt-Lunstad, Colin Holbrook

Session C-4: **Digit Ratio**
Chair: Marcelo Vinhal Nepomuceno

Alvarado

Th 4:40	<i>Finger length ratio and attitudes towards several product categories</i> Marcelo Vinhal Nepomuceno, Gad Saad, Eric Stenstrom, Zack Mendenhall
Th 5:00	<i>Prenatal androgens and domain-specific risk: digit ratio predicts financial, recreational, social, and ethical risk-taking propensity</i> Eric Stenstrom, Gad Saad, Marcelo Nepomuceno, Zack Mendenhall
Th 5:20	<i>2D:4D ratio, aggression, leadership, and reproductive success in Hadza men</i> Marina Butovskaya, Valentina Burkova, Dmitry Karelin
Th 5:40	<i>Gender and age differences in aggression, 2D:4D ratio, and body measurements in Datoga</i> Valentina Burkova, Marina Butovskaya

6:00-6:20pm

Break

6:20-7:40pm

Keynote by **Stephen Stearns**

P. Pavilion A, B, & C

Are We Stuck in a Major Transition and Feeling the Pain?

Friday, May 29

8:00-8:30am	Coffee	Chapman Atrium
8:30-9:30am	Morning Plenary by Hillard Kaplan <i>Learning, Menopause and the 70-Year Lifespan</i>	P. Pavilion A & B
9:30-9:50am	Break	

Friday Morning Sessions

Session D-1: **Symposium: Evolutionary Economics: Insights into Motivation, Satisfaction, and Consumer Behavior** Titan Theater
Chair: Kristina M. Durante

F 9:50	<i>Deep rationality and behavioral economics</i>	Douglas T. Kenrick, Yexin Jessica Li, Jill Sundie
F 10:10	<i>It's a wonderful life — for some: An examination of goals and satisfaction by domains</i>	Norman P. Li, Christie N. Scollon, William Tov
F 10:30	<i>Going green to be seen: Status, reputation, and conspicuous conservation</i>	Vladas Griskevicius, Joshua Tybur, Bram Van den Bergh
F 10:50	<i>Risk, rivalry, and the pursuit of attractiveness: Evidence for contextually dependent risk suppression in women</i>	Sarah E. Hill, Kristina M. Durante
F 11:10	<i>Fashion, rivals, and love: The effects of intrasexual competition and fertility on women's consumer behavior</i>	Kristina M. Durante, Sarah E. Hill, Carin Perilloux, Norman P. Li

Session D-2: **Altruism** Gabrielino
Chair: Craig T. Palmer

F 9:50	<i>How the consequences of Trivers (1974) lead to revisions of Hamilton (1964) and a new evolutionary explanation of altruism</i>	Craig T. Palmer, Kathryn Coe, Amber L. Palmer, Carl DeVito
F 10:10	<i>The selfish hero? A study of the individual benefits of self-sacrificial behavior by members of small groups</i>	Francis T. McAndrew
F 10:30	<i>Partner in life or one-night stand? How reproductive strategies might have shaped the evolution of altruism</i>	Julia Pradel, Lars Penke, Detlef Fetchenhauer
F 10:50	<i>Trust and detection of trustworthiness</i>	Mizuho Shinada, Toshio Yamagishi
F 11:10	<i>Punishers play chicken</i>	Alejandro Rosas

Session D-3: **Cultural Transmission** Ontiveros
Chair: Daniel M.T. Fessler

F 9:50	<i>The spirits are not your friends: The predominance of beliefs concerning hazards</i>	Daniel M.T. Fessler, Anne C. Pisor, Carlos David Navarrete
F 10:10	<i>Culture in transmission: A quantitative account of daily learning among Aka forest forager children from middle to late childhood</i>	Adam Howell Boyette
F 10:30	<i>Prestige biased cultural learning among children</i>	Maciek Chudek, Susan Birch, Joseph Henrich
F 10:50	<i>An investigation of the relationship between innovation and cultural diversity</i>	Anne Kandler, Kevin N. Laland
F 11:10	<i>Environmental and social conditions promoting human innovation</i>	Ulf Toelch, Matthew M. Bruce, Gerardus J.M. Lucas, Marius T.H. Meeus, Simon M. Reader

Session D-4: **Sexual Strategies**
Chair: Jenee James Jackson

Alvarado

F 9:50	<i>Development of reproductive strategies: Infusing the Belsky, Steinberg, and Draper model with sexual selection</i> Jenee James Jackson, Bruce J. Ellis, Gabriel L. Schlomer, Judy Garber
F 10:10	<i>Religiosity as a context dependent mating strategy: Sexual competitors increase belief in God</i> Yexin Jessica Li, Adam B. Cohen, Douglas T. Kenrick
F 10:30	<i>When the sexes conflict: Women's attractiveness and sociosexuality</i> Mercedes M. Ward, Emily A. Stone, John A. Gauthier, Elizabeth Cashdan
F 10:50	<i>Testing the power and evolutionary theories of rape with cross-cultural and cross-national data</i> Stephen K. Sanderson
F 11:10	<i>Sexual double standards: The evolution of moral hypocrisy</i> David M. Buss

11:30-12:40pm	Lunch Break	
11:30-12:40pm	HBES Publications Committee Meeting	Alvarado
12:40-1:40pm	Afternoon Plenary by Caleb E. Finch <i>Disease, Diet and Inflammation in the Evolution of Human Lifespan</i>	P. Pavilion A & B
1:40-2:00pm	Break	

Friday Afternoon Sessions

Session E-1: **Symposium: Life History Strategy and Intrasexual Relations** Titan Theater
Chair: Aurelio José Figueredo

F 2:00	<i>Fecundity, offspring longevity, and assortative mating: Parametric tradeoffs in sexual and life history strategy</i> Pedro S. A. Wolf, Aurelio José Figueredo
F 2:20	<i>Comparing assortative mating and life history strategy as predictors of relationship satisfaction longitudinally</i> Sally Olderbak, Aurelio José Figueredo
F 2:40	<i>Life history strategy predicts monitoring and interference in romantic relationships</i> Candace J. Black, Zachary J. Hohman
F 3:00	<i>Life history strategy, executive functioning, and negative androcentrism</i> Paul Gladden, Aurelio José Figueredo, D.J. Andrzejczak, Dan Jones, Vanessa Smith-Castro
F 3:20	<i>Life history strategy, executive functions, and intimate partner violence</i> Aurelio José Figueredo, Paul Gladden, Connie J. A. Beck, Marcela Sotomayor

Session E-2: **Mate Choice I**
Chair: Jeremy M. Koster

Gabrielino

F 2:00	<i>Mate choice among the Mayangna and Miskito of Nicaragua: A cultural consensus analysis approach</i> Jeremy M. Koster, Melissa M. Sloan
F 2:20	<i>Meet the parents: An evolutionary perspective on the introduction of parents and mates</i> Catherine Salmon, Maryanne Fisher
F 2:40	<i>Driving hard bargains: Biological markets influence human mate choice</i> Thomas V. Pollet, Daniel Nettle
F 3:00	<i>Humans show mate copying after observing real mate choices</i> Skyler Place, Peter Todd, Lars Penke
F 3:20	<i>Trait-based versus individual-based mate choice copying in humans</i> Robert I. Bowers, Peter Todd, Skyler S. Place, Lars Penke

Session E-3: **Social Contracts, Cheater-detection, and Morality**
 Chair: Toko Kiyonari

Ontiveros

F 2:00	<i>Can people discriminate cheaters from cooperators when they have incentives to manipulate their impressions?</i> Toko Kiyonari, Joanna Schug, Mizuho Shinada, Taiki Takahashi, Toshio Yamagishi
F 2:20	<i>Wason selection task performance in schizophrenia and autism</i> R.J. Sullivan, M. Solomon, M. Minzenberg, J. Yoon, J.D. Ragland, S. Ursu, E. Ermer, C. Carter
F 2:40	<i>Social reasoning in psychopathy</i> Elsa Ermer, Kent A. Kiehl
F 3:00	<i>The omission effect and the design of moral psychology</i> Peter DeScioli, Rebecca Bruening, Robert Kurzban
F 3:20	<i>The omission effect in a reverse dictator game</i> John Christner, Peter DeScioli, Robert Kurzban

Session E-4: **Menstrual Cycle**
 Chair: Steven W. Gangestad

Alvarado

F 2:00	<i>Men's facial masculinity, but not their intelligence, predicts changes in their female partners' sexual interests across the ovulatory cycle</i> Steven W. Gangestad, Randy Thornhill, Christine E. Garver-Apgar
F 2:20	<i>Kin affiliation across the menstrual cycle: Evidence for incest avoidance near ovulation</i> Elizabeth G. Pillsworth, Martie G. Haselton, Debra Lieberman
F 2:40	<i>Menstrual cycle phase influences both subjective and objective reward value of male faces: An event related fMRI study</i> Katherine M. Reding, Steven M. Platek
F 3:00	<i>Menstrual cycle alters preference for facial movement</i> Edward R. Morrison, Andrew P. Clark, Lisa Gralewski, Neill Campbell, Ian S. Penton-Voak

3:40-4:00pm Break

Friday Evening Sessions

Session F-1: **Pathogens and Parasites**
 Chair: Chris Eppig

Titan Theater

F 4:00	<i>Parasitic infection and the worldwide distribution of cognitive ability</i> Chris Eppig, Corey Fincher, Randy Thornhill
F 4:20	<i>Drug use as potential protection against pathogens: Tobacco consumption vs. helminth load in Aka foragers</i> E.H. Hagen, C. Roulette, B.S. Hewlette, R.J. Sullivan
F 4:40	<i>Parasite transmission mode and cross-cultural variation in human values</i> Randy Thornhill, Corey Fincher
F 5:00	<i>What's so wrong about gettin' lovin' from a cousin? Factors predicting consanguineous marriage among indigenous populations</i> Ashley Hoben, Abraham P. Buunk

Session F-2: **Homosexuality**
Chair: Andreas de Block

Gabrielino

F 4:00	<i>The rise of modern homosexuality: An exercise in evolutionary historiography</i> Andreas de Block, Lesley Newson
F 4:20	<i>Sexual orientation lies smoothly on a continuum: New data and evolutionary implications</i> Robert Epstein
F 4:40	<i>Explaining change and diversity in beliefs about homosexuality</i> Lesley Newson, Andreas de Block, Peter Richerson
F 5:00	<i>Does mother always know best? Maternal depletion and the origin of homosexuality</i> Eldin Jasarevic, Curtis Atkisson, Mary K. Shenk

Session F-3: **Reputation and Altruism**
Chair: Pat Barclay

Ontiveros

F 4:00	<i>Balancing reputational costs and benefits: An evolutionary model of “bystander effects”</i> Pat Barclay
F 4:20	<i>Peers are watching you: Eyes promote altruism toward in-group members</i> Nobuhiro Mifune, Hirofumi Hashimoto, Toshio Yamagishi
F 4:40	<i>Is reputation the proximate motivation underlying pro-social behavior?</i> Karthik Panchanathan, Willem Frankenhuis, Joan Silk
F 5:00	<i>“Warning-type” punishers are preferred by altruists while they are avoided by free-riders</i> Yuko Morimoto, Satoshi Nakashima, Motoki Watabe, Takashi Kusumi

Session F-4: **Selection Via Intrasexual Competition or Intersexual Selection?**
Chair: David Puts

Alvarado

F 4:00	<i>Beauty and the beast: Mechanisms of sexual selection in humans</i> David Puts
F 4:20	<i>Selection on masculine facial features: male-male competition or female choice?</i> Emily A. Stone
F 4:40	<i>Tall and handsome, but mostly rich... Male stature is associated with direct fitness benefits</i> G. Stulp, T.V. Pollet, S. Verhulst, A.P. Buunk
F 5:00	<i>Redness enhances perceived aggression, dominance, and attractiveness in men’s faces</i> Ian D. Stephen, Francesca H. Oldham, David I. Perrett, Robert A. Barton

4:00-7:00pm Poster Session
7:00-9:30pm BBQ

TSU Courtyard
Fullerton Arboretum

Saturday, May 30

9:00-9:30am	Coffee	Chapman Atrium
9:30-10:30am	Morning Plenary by Robert Kurzban & Peter DeScioli <i>Adaptationist Morality</i>	P. Pavilion A & B
10:30-10:50am	Break	

Saturday Morning Sessions

Session G-1: **Symposium: Darwin's Dangerous Critics: Evolutionary Biology and Identity Politics in the Internet Age** Titan Theater
Chair: Alice Dreger

St 10:50	<i>Darwin's dangerous critics: Evolutionary biology and identity politics in the internet age</i>	Alice Dreger
St 11:30	<i>Respondents</i>	Napoleon Chagnon, Michael Bailey, Randy Thornhill, Craig Palmer
St 12:10	<i>Evolution is not relevant to sex differences in humans because I want it that way! Evidence for the politicalization of human evolutionary psychology</i>	Glenn Geher, Daniel Gambacorta

Session G-2: **Learning, Memory, and Perception** Gabrielino
Chair: Russell E. Jackson

St 10:50	<i>Evolved navigation theory and perception of risky horizontal surfaces</i>	Russell E. Jackson
St 11:10	<i>Perceptual accuracy and learning within the context of evolved navigation theory</i>	T.C. Cook, Russell E. Jackson
St 11:30	<i>Remembering the past to plan for the future</i>	Theresa Robertson
St 11:50	<i>Vividness and salience from a functionalist perspective</i>	D. Vaughn Becker

Session G-3: **Infidelity, Jealousy, and Sperm Competition** Ontiveros
Chair: Justin R. Garcia

St 10:50	<i>Uncommitted sexual behavior and dopamine receptor gene variation</i>	Justin R. Garcia, James MacKillop, Edward L. Aller, Ann M. Merriwether, David Sloan Wilson, J. Koji Lum
St 11:10	<i>Who's next? Spatial distance and the suspicion of sexual and emotional infidelity</i>	Achim Schützwohl
St 11:30	<i>Are sex differences in jealousy really universal? Data from Tjimba forager-pastoralists</i>	Robert MacKinnon
St 11:50	<i>Men's sexual arousal to sperm competition</i>	Joseph A. Camilleri, Vernon L. Quinsey
St 12:10	<i>Male genital mutilation in pre-industrial societies: A costly behavior maintained by sexual conflict, not by sexually transmitted diseases</i>	Christopher G. Wilson

Session G-4: **Friendships and Social Networks**
Chair: Stacey Rucas

Alvarado

St 10:50	<i>Do friends enhance fitness: Reproductive outcomes of social networking among Tsimane women</i> Stacey Rucas, Michael Gurven, Hillard Kaplan, Jeff Winking
St 11:10	<i>Jealousy and the treat of being replaced: Friendship and the banker's paradox</i> Brandy N. Burkett, Leda Cosmides, John Tooby
St 11:30	<i>Attractiveness and rivalry in women's friendships with women</i> April Bleske-Rechek, Melissa Lighthall
St 11:50	<i>Encrypted humor and social networks in rural Brazil</i> Thomas Flamson, H. Clark Barrett
St 12:10	<i>Signaling status through food sharing in Lamalera, Indonesia</i> David A. Nolin

12:30-1:40pm	Lunch Break	
12:30-1:40pm	Open Member Meeting	Titan Theater
1:40-2:40pm	Afternoon Plenary by Virpi Lummaa <i>Long-lived Ladies and Grumpy Grandfathers: Measuring Evolutionary Fitness in Humans</i>	P. Pavilion A & B
2:40-3:00pm	Break	

Saturday Afternoon Sessions

Session H-1: **Workshop on NSF-Funded National Consortium in Evolutionary Studies (EvoS)**
Chair: David Sloan Wilson

Titan Theater

St 3:00	<i>The EvoS Consortium: Expanding evolutionary training in higher education</i> David Sloan Wilson
St 3:20	<i>'Evolution for everyone': A course that brings Darwin's theory to the masses</i> Daniel O'Brien, David Sloan Wilson
St 3:40	<i>A case study of EvoS replication: EvoS New Paltz</i> Glenn Geher
St 4:00	<i>evostudies.org: The website of the EvoS Consortium and journal</i> Rosemarie Sokol Chang
St 4:20	<i>Questions for the panelists</i> David Sloan Wilson, Daniel O'Brien, Glenn Geher, Rosemarie Sokol Chang

Session H-2: **Cultural Evolution**
Chair: Michelle Kline

Gabrielino

St 3:00	<i>How treadmills and drift create cultural loss in Oceania</i> Michelle Kline, Robert Boyd
St 3:20	<i>Late Pleistocene demography and the appearance of modern human behavior</i> Adam Powell, Stephen Shennan, Mark G. Thomas
St 3:40	<i>Do people really conform? A naturalistic study and a mathematical model</i> Julie Coultas, Kimmo Eriksson
St 4:00	<i>The role of specialization in cultural cumulation</i> Micael Ehn

Session H-3: **Mate Preferences**
Chair: Rebecca Sear

Ontiveros

St 3:00	<i>How universal are human mate preferences? Size doesn't matter when Hadza foragers are choosing a mate</i> Rebecca Sear, Frank W. Marlow
St 3:20	<i>Kind toward whom? Mate preferences for personality traits depend on the targets of behavioral acts</i> Aaron W. Lukaszewski, James R. Roney
St 3:40	<i>The evolution of humor: Intelligence, fitness indicators, and mating success</i> Gil Greengross
St 4:00	<i>Calculating beauty: Adding up attractiveness from faces, voices, and video</i> Anthony C. Little, Stephen Graham, S. Craig Roberts, David R. Feinberg, Tamsin K. Saxton, Benedict C. Jones, Lisa M. DeBruine
St 4:20	<i>T-shirts and genes: The role of MHC in human kin recognition and mating preferences</i> Ilanit Tal, Amanda Watson, Debra Lieberman

4:40-5:00pm Break

Saturday Evening Sessions

Session I-1: **Life History 2**
Chair: Siobhan Mattison

Titan Theater

St 5:00	<i>Child productive work and urban fertility: An embodied capital approach to the quality-quantity tradeoff among Indo-Fijians</i> Siobhan Mattison, Dawn Neill
St 5:20	<i>Contributions and wellbeing among older Tsimane</i> Eric Schniter, Michael Gurven
St 5:40	<i>Perceived mortality risk and reproductive behavior over time in a sample of young adults in the United States</i> Jeff Davis
St 6:00	<i>Effects of early and adult environment on survival in humans</i> Ian J. Rickard, Matthew R. Robinson, Virpi Lummaa

Session I-2: **Conflict and Dominance**
Chair: Aaron Sell

Gabrielino

St 5:00	<i>Mapping the "grammar" of anger-based arguments</i> Aaron Sell, Leda Cosmides, John Tooby
St 5:20	<i>Patterns of male dyadic conflict with respect to kinship, cooperative networks, and social status in a small-scale human society</i> Chris von Rueden, Paul L. Hooper, Dan Cummings, Michael Gurven, Hillard Kaplan
St 5:40	<i>Paleolithic politics in Victorian novels</i> Joseph Carroll, Jonathan Gottschall, John A. Johnson, Daniel J. Kruger
St 6:00	<i>Sibling rivalry as a product of resource competition and dilution in rural Dominica</i> Michelle R. Dillon
St 6:20	<i>What we say conveys more than how we say it: Vocalics in interview data</i> Bria Dunham, Lee Cronk, Shannon Steadman

Session I-3: **Mate Choice II**
Chair: Alexandre Courtiol

Ontiveros

St 5:00	<i>Preferences for height and mate choice: A conflict between the sexes</i> Alexandre Courtiol, Jean Baptiste Ferdy, Julien Claude, Sandrine Picq, Bernard Godelle, Michel Raymond
St 5:20	<i>Intralocus sexual conflict in humans: Evidence from siblings and implications for mate choice</i> Christine E. Garver-Apgar, Melissa A. Heap, Joshua M. Tybur, Melissa Franklin
St 5:40	<i>Cross-cultural perceptions of proceptive behavior</i> Andrew P. Clark, Ian S. Penton-Voak, Yangke Zhao, Zejun Huang, Isabel Scott
St 6:00	<i>Facial adiposity, a valid cue to health?</i> Vinet Coetzee
St 6:20	<i>Faking it: Does faked voice pitch affect attractiveness?</i> David R. Feinberg, Paul Fraccaro, Jillian J.M. O'Connor, Daniel E. Re, Lisa M. DeBruine, Benedict C. Jones

Session I-4: **Kinship, Caregiving, and Familial Sentiment**
Chair: Peter B. Gray

Alvarado

St 5:00	<i>Testing the hormonal correlates of grandmothing in Jamaica</i> Peter B. Gray, Maureen Samms-Vaughan
St 5:20	<i>Democratization and consanguinity: An underappreciated yet significant relationship</i> Michael A. Woodley
St 5:40	<i>A twin-family study of social closeness and perceived similarity</i> Nancy L. Segal, William D. Marelich
St 6:00	<i>The effect of mother-daughter bonding on pregnancy behavior</i> Brooke Scelza

6:40-7:00pm

Break

7:00-9:00pm

Banquet & Banquet Address by **James Moore**
Darwin's Sacred Cause and the Problem of Slavery
(Banquet Address open to the public @ 8:00pm)

P. Pavilion A, B, & C

Sunday, May 31

9:00-9:30am

Coffee

Chapman Atrium

Sunday Morning Sessions

Session J-1: **Theory of Mind**
Chair: Annie E. Wertz

Titan Theater

Sn 9:30	<i>Representing multiple mental states: Investigating 'theory of mind' in a more ecologically valid context</i> Annie E. Wertz
Sn 9:50	<i>What can children's narratives tell us about theory of mind?</i> Michelle Scalise Sugiyama, Lawrence S. Sugiyama
Sn 10:10	<i>Dogs track knowledge states in humans</i> Siamak T. Naficy H. Clark Barrett

Session J-2: **Testosterone**
 Chair: Leander van der Meij

Gabrielino

Sn 9:30	<i>Testosterone changes provoked by competition: The importance of the opponent</i> Leander van der Meij, Abraham P. Buunk, Alicia Salvador
Sn 9:50	<i>Edocrine responses of men to social interactions with women</i> James R. Roney, Aaron W. Lukaszewski, Zachary L. Simmons
Sn 10:10	<i>Puberty, testosterone, and aggression among Zimbabwe schoolboys</i> Benjamin Campbell, Michael Mbizvo

Session J-3: **Coalitional Psychology**
 Chair: Aldo Cimino

Ontiveros

Sn 9:30	<i>On the perception of newcomers: Towards an evolved psychology of intergenerational coalitions</i> Aldo Cimino, Andrew Delton
Sn 9:50	<i>Evidence of alliance psychology in preschoolers: Children represent that the enemy of my friend is also my enemy</i> David Pietraszewski
Sn 10:10	<i>Rethinking feelings in terror management theory and coalitional psychology: "Worldview defense" as misattributed affect</i> Colin Holbrook, Paulo Sousa, Jennifer Hahn-Holbrook

Session J-4: **Group-living**
 Chair: Cristina Moya

Alvarado

Sn 9:30	<i>Development of inferences based on ethnic and occupational categories</i> Cristina Moya, Clark Barrett, Rob Boyd
Sn 9:50	<i>Membership inheritance in permanent groups</i> Frans Roes
Sn 10:10	<i>Reciprocity, not kinship explains labor exchange in a Dominican village</i> Shane J. Macfarlan

10:30-10:40am Break

Sunday Late Morning Sessions

Session K-1: **Social Emotions**
 Chair: Daniel Brian Krupp

Titan Theater

Sn 10:40	<i>Spite and the evolution of ethnocentrism</i> Daniel Brian Krupp
Sn 11:00	<i>The evolved function of social anxiety: Are moderate levels adaptive?</i> Nicole R. Buttermore, Randolph M. Nesse
Sn 11:20	<i>Distinguishing emotions and attitudes in evolutionary psychology: The case of contempt</i> Matthew Gervais, Daniel M.T. Fessler
Sn 11:40	<i>The regulatory theory of shame</i> Daniel Sznycer, John Tooby, Leda Cosmides

Session K-2: **Cognition and Modularity**
 Chair: Drew H. Bailey

Gabrielino

Sn 10:40	<i>Hominid brain evolution: Testing climactic, ecological, and social competition models</i> Drew H. Bailey
Sn 11:00	<i>Reason and the passions are not opposed: They are domain-specific</i> Laurence Fiddick, Sean Lee, Ryo Oda, Gary Brase, Ryo Tamura, Kai Hiraishi
Sn 11:20	<i>When well-designed adaptations produce poor performance: How different types of participant payments alter task performance</i> Gary L. Brase
Sn 11:40	<i>To be or to become: An evolutionary model of ontogenetic specialization</i> Willem E. Frankenhuis, Karthik Panchanathan

Session K-3: **Paternal Investment: Predictors and Consequences of**
 Chair: Miranda Chi Kuan Mak

Ontiveros

Sn 10:40	<i>Father-child resemblance belief and paternal investment as functions of living with paternal grandparents</i> Miranda Chi Kuan Mak, Lei Chang, Huijing Lu, Shasha Sui
Sn 11:00	<i>Women with children sired by a previous partner and risk of non-lethal and lethal intimate partner abuse</i> Emily J. Miner, Todd K. Shackelford, Valerie G. Starratt
Sn 11:20	<i>The consequences of paternal investment for child status: A test case from South India</i> Mary Shenk, Brooke Scelza

Keynote, Plenary, and Banquet Address Abstracts

Keynote Address

Thursday, 6:20pm

Portola Pavilion A, B, & C

Are We Stuck in a Major Transition and Feeling the Pain?

Stephen Stearns

Edward P. Bass Professor of Ecology and Evolutionary Biology
Yale University

This talk poses an evolutionary hypothesis about the nature of the human condition: that we are stalled part way through a major evolutionary transition from individuals to groups, a transition that may never be completed but that has already shaped our history, politics, psychology, and social life. The conditions causing the transition to stall include the decreasing congruence of group boundaries with kinship boundaries, growth in group size, increasing interdependence of groups, membership of individuals in several types of groups, divided loyalties of individuals among groups, and the emergence of institutions as novel entities uncoupled from the individuals who temporarily belong to them. Those conditions combine to decrease the ability of cultural group selection to effect genetic change in group-oriented traits. The theory supporting this hypothesis deals with major transitions, hierarchical selection, conflicts and conflict resolution, and gene-culture co-evolution. The evidence is diverse. It comes from biological anthropology, behavioral economics, evolutionary psychology, and history. It suggests research programs in anthropology, psychology, history, economics, and political science.

Plenary Addresses

Thursday, 9:30am

Portola Pavilion A & B

Culture and the Evolution of Human Sociality

Joseph Henrich

Canada Research Chair in Culture, Cognition, and Evolution, Departments of Psychology and Economics
University of British Columbia

Research over the last thirty years increasingly indicates that the interaction of genes and culture over human evolutionary history has influenced our social psychology in important ways. Drawing on evolutionary modeling, cross-cultural and cross-species experiments, laboratory studies of social learning, and quantitative ethnographic studies of social life in small-scale societies, I argue that humans possess (1) two different status psychologies, only one of which is homologous with dominance in non-human primates, and (2) a norms psychology, which arose in response to cultural evolution's tendency to create self-re-enforcing behavioral equilibria and to favor equilibria with higher average payoffs. These two lines of coevolutionary theory allow us to tackle otherwise puzzling aspects of human status, large-scale cooperation, prosociality, and norm sanctioning, as well as giving us a purchase to grapple with the broadest patterns in human history.

Thursday, 1:40pm

Portola Pavilion A & B

Which Sex Does What, and Why?

Hanna Kokko

Professor of Animal Ecology
University of Helsinki

Humans are very atypical mammals and in certain respects resemble birds. In 90% of mammal species there is no male care, while in 90% of bird species both sexes care for the young. Since a seminal contribution by Trivers (1972) we have known that differences in parental investment between the sexes are a key factor in sexual selection. It is, however, underappreciated how convoluted the evolution of this difference is. Firstly, as already pointed out by Dawkins and Carlisle (1976), one must avoid the "Concorde fallacy" when predicting that the sex that has invested more so far is selected to keep investing more. Secondly, the field is littered with other predictions that appear intuitive but are, in fact, not sound. The simple biological fact that each offspring (in diploid species) has one genetic parent on each sex produces frequency-dependent selection on care that strongly resembles frequency-dependent selection on the primary sex ratio. I will explore why this frequency-dependence does not produce the same strategy in all species, and why certain species (say, humans) might become atypical representatives of their taxon. I will conclude that more precise data on the adult sex ratio in different human societies would be useful.

Friday, 8:30am

Portola Pavilion A & B

Learning, Menopause and the 70-Year Lifespan

Hillard Kaplan

Professor of Anthropology
University of New Mexico

The talk will present a general theory of growth and aging, and then extends it to examine the life history implications of the skills-based foraging niche, characteristic of the human evolutionary past. The theory proposes that the role of knowledge, skill acquisition and transfers in determining economic productivity and resource distribution is the distinctive feature of the traditional human ecology that is responsible for the evolution of prolonged development, menopause and a 70 year lifespan. The theory also proposes that *male* reproductive cessation and post-reproductive investment in descendants is a fundamental characteristic of humans living in traditional foraging and simple horticultural economies. The talk will present evidence relevant to the theory. The data show that after ceasing to reproduce, both men and women provide net economic transfers to children and grandchildren. Given this pattern of economic productivity, delays in menopause would produce net economic deficits within families. The data also show that reproductive decline in human females is more rigid than in chimpanzees, and most human males undergo reproductive cessation at the same time as their wives. In addition, the modal age at death for adults in traditional societies is approximately 70 years of age. By this age, people have no dependent children, and a declining number of grandchildren to support.

Friday, 12:40pm

Portola Pavilion A & B

Disease, Diet and Inflammation in the Evolution of Human Lifespan

Caleb Finch

ARCO Professor of Gerontology, Davis School of Gerontology; Professor of Anthropology, Molecular Biology, Neurobiology, and Psychology
University of Southern California

The human lifespan has evolved in two major phases. Since divergence from shared a shared ancestor, the basal life expectancy doubled from the great ape norm of 15-20 years. During these 6 million years, human ancestors also shifted from plant-based diets to meat-eating with much higher intake of animal fats. This is paradoxical because cholesterol-rich diets accelerate most diseases of aging. Moreover, uncooked meat contains many pathogens that promote chronic inflammation, a core process in many diseases of aging. Meat-adaptive genes are hypothesized to enable the dietary-health transitions. The recent doubling of the lifespan since 1800 is associated with a reduced infectious environment, which is hypothesized to have lowered the inflammatory load and slowed some aging processes.

Saturday, 9:30pm

Portola Pavilion A & B

Adaptationist Morality

Robert Kurzban¹ and Peter DeScioli²

¹ Associate Professor of Psychology, University of Pennsylvania

² Postdoctoral Research Associate of the Economic Science Institute, Chapman University

Current evolutionary theories of morality maintain that the adaptations that underlie moral judgment and behavior function to deliver benefits (or prevent harm) to others. In particular, it has been argued that the theories of kin selection and reciprocal altruism are focal to explaining moral cognition. These processes predict the existence of mechanisms designed to deliver benefits to others. If moral cognition is indeed designed to deliver benefits, then conscience systems – the mechanisms that cause compliance to moral rules – and condemnation systems – the mechanisms that evaluate acts as wrong and generate the belief that such acts should be punished – should reflect this putative function. This prediction does not, however, accord well with data on moral judgment. Instead of seeing moral cognition as designed to deliver benefits – but doing so poorly – we believe that alternative functions of moral cognition should be entertained, starting with possible functions of the systems that underlie moral condemnation.

 Saturday, 1:40pm

Portola Pavilion A & B

Long-lived Ladies and Grumpy Grandfathers: Measuring Evolutionary Fitness in Humans
Virpi Lummaa

 Royal Society Senior Research Fellow, Department of Animal and Plant Sciences
 University of Sheffield

Documenting evolutionary processes is often difficult in human behavioral ecology, given the hurdles in measuring the two requirements for evolution by natural selection: heritable trait variation and differential reproduction and survival associated with traits. First, selection can vary with age, and determining such age-related changes is particularly important in long-lived species with extended post-reproductive period. Second, selection can also vary across environments, and both the early and adult environments can have long-term consequences for individual success. Finally, trait heritabilities themselves can vary both across different ages and environments, and traits can be positively or negatively correlated, negative correlations indicating difficulties in maximizing both traits simultaneously. I have investigated these questions in particular to unravel why women experience menopause and prolonged post-reproductive lifespan and, perplexingly, why male lifespan is comparable to that of their sterile partner. I use detailed pedigree records of historical Finnish families, combining information on individual longevity and reproductive success with variation in social, demographic, nutritional and climatic conditions to document varying selection pressures. This talk will highlight the usefulness of adopting an integrative approach and the need to combine data on long-term measures of fitness with information on the underlying genetic variation and trade-offs across different ages and environments to understand human life-history evolution.

Banquet Address

Thursday, 8:00pm

Portola Pavilion A, B, & C

Darwin's Sacred Cause and the Problem of Slavery
James Moore

 Professor of the History of Science, Technology & Medicine
 The Open University

Why did Charles Darwin, a rich and impeccably upright gentleman, go out of his way to develop privately a subversive image of human evolution in 1837-39? Why did he pursue the subject with tenacity for three decades before publishing the *Descent of Man*? Underpinning his work on human origins was a belief in racial brotherhood rooted in the greatest moral movement of his age, for the abolition of slavery. For abolitionists, the human races were members of one family, with a common ancestry. Darwin extended the common descent image to the rest of life, making not just the races, but all races kin. Slavery, however, did not evolve out of existence naturally; it had to be destroyed. Intractable slavery collided with Darwin's post-Christian progressivism in the American Civil War. The triumph of the abolitionists' 'sacred cause' enabled him to carry 'the grand idea of God hating sin and loving righteousness' into the *Descent of Man*, where the driving of formerly enslaved races out of existence is naturalized as a by-product of human progress.

Session and Symposium Abstracts

Thursday, May 28

Thursday Morning Sessions

Session A-1: **Warfare and Intergroup Conflict**

Titan Theater

Th 10:50am

The psychology of warfare

Joshua D. Duntley, David Buss

We propose a co-evolutionary theory of the psychology of warfare. Its core premises are: (1) The primary fitness benefits that favored an evolved warfare psychology include acquisition of new mates, resources, territory, and importantly, eliminating key competitors for those resources; (2) The fitness benefits of waging war were greater for men than for women, shaping warfare mechanisms in men that women lack; (3) Selection favored psychological design features that increase the probability of success in warfare, including the facilitation of coalitional solidarity, strategies for increasing coalitional size, preferring physically formidable and brave coalition partners, punishing cowardice with reputational damage, and motivational mechanisms to induce attack; (4) The fitness costs of being a victim of coalitional aggression strongly favored the evolution of anti-homicide defenses; (5) The design features of these defenses include adaptive overestimates of the likelihood of enemy attack, cultivating a reputation as non-exploitable, and a psychology of vengeance to deter rival groups from future attack; (6) Co-evolved defenses, in turn, selected for new and refined warfare adaptations, including deception about aggressive intentions and conducting surprise attacks. We conducted three studies (combined N=290) to evaluate these and other hypotheses. Our results provide support for the existence of specialized adaptations in men for initiating coalitional aggression and adaptations in both sexes to defend against the costs of being attacked by an enemy group. Discussion focuses on the importance of within-species antagonistic coevolution in shaping adaptations for warfare and anti-homicide warfare defenses.

Th 11:10am

Infectious disease causes global variation in the frequency of intrastate armed conflict and civil war

Kenneth Letendre, Corey L. Fincher, Randy Thornhill

Geographic and cross-national variation in the frequency of intrastate armed conflict and civil war is a subject of great interest. Previous theory on this variation has focused on the influence on human behavior of climate, resource competition, national wealth, and cultural characteristics. We present a model that unites previous work on the correlates of intrastate conflict by linking frequency of the outbreak of this conflict, including civil war, to the intensity of infectious disease across countries of the world. High intensity of infectious disease leads to the emergence of xenophobic and ethnocentric cultural norms. These cultures suffer greater poverty and deprivation due to the morbidity and mortality caused by disease, and as a result of decreased investment in public health and welfare. Resource competition among xenophobic and ethnocentric groups within a nation leads to increased frequency of civil war. We present support for a direct effect of infectious disease on intrastate armed conflict with regression analyses, and support for an indirect effect of infectious disease on the incidence of civil war via its negative effect on national wealth. We discuss implications for international warfare and global patterns of imperialism.

Th 11:30am***Demographic and individual factors as causes of suicide terrorism*****Kyle Gibson**

Suicide attacks are a dramatic tactic of modern terrorism. From a strategic standpoint, they are highly effective in that they represent the minority of terrorist attacks, but inflict the majority of terrorism-related casualties. They are a cheap and effective means of waging war in asymmetrical campaigns. Yet we know relatively little about the characteristics of populations that produce suicide terrorists or lead individuals to volunteer to kill themselves in these spectacular acts of violence. Here, I systematically address several possibilities, ranging from poverty to polygyny. I compiled a cross-national database of nearly 200 countries and regions. For each, I gathered information on a number of demographic, economic, political, cultural, and social variables including operational sex ratio, religion, gross domestic product, democracy index score, GINI Index score, adult mortality rate, polygyny rate, and so on. I then analyzed reports on hundreds of suicide attacks to find the age, sex, and nationality of the assailants. In conjunction, these two datasets show that many popularly assumed “causes” of suicide attacks, like poverty, do not predict whether countries produce suicide terrorists; while others factors, like high operational sex ratio and the presence polygyny, predict it very well. To properly address, and eventually halt, suicide attacks, the public and their representatives must understand the roots of the phenomenon. The results of the present effort show that although religious, cultural, and social factors contribute to the use of suicide terrorism, applied evolutionary theory suggests biological and demographic factors also play a role.

Th 11:50am***The origin of human warfare: Experimental results to link processing war scenes to mating primes*****Lei Chang, Huijing Lu, Tong Li, Hongli Li**

Across cultures and throughout history and prehistory, men but not women engage in wars and unmarried young men more than married or older men are likely to go to wars. When a behavior represents such sex dimorphism and other reproductive differences, sexual selection is likely at work. In this study, we present two experiments to demonstrate the link between mating primes and response time in processing war information. The first experiment was based on a sample 31 male, Chinese, non-psychology undergraduate students. The primes were attractive female faces versus older female faces. The target consisted of a simple task involving processing war versus farm scenes. The results showed that, under the attractive female face condition, response time in processing war scenes was significantly faster than processing farming scenes, whereas, under the older women condition, there was no response time difference between processing war and farm pictures. Processing war scenes was overall slower than processing farm scenes. The second experiment was based on a different sample of 23 male, Chinese, non-psychology undergraduate students. The priming was female leg versus Chinese national flag and the target was a simple word recognition task involving war related words versus farm related words. Similar designs were used. Priming effect similar to that of the first experiment was obtained. These and other results will be discussed within the framework of sexual and natural selection.

Th 12:10pm***Sexual selection and the psychological architecture of race bias*****C. David Navarrete**

Intergroup conflict perpetrated by male aggressors has been a persistent feature of human societies for centuries, and may have been common enough over evolutionary time to have allowed selection to shape the neural circuitry underlying the psychology of prejudice. Because intergroup aggression poses separate adaptive challenges with different response suites for men and women, the workings of psychological adaptations designed to cope with such threats may differ as well. To the extent that racial categories are mentally represented as groups, modern race and gender bias should be understandable within this general framework. Results from several studies are consistent with this perspective, and show that (a) race bias is primarily directed at men of the racial out-group, (b) men are more likely to be prejudiced than women, (c) women become more prejudiced as a function of fertility across the menstrual cycle, and (c) race bias is modulated by individual differences in traits relevant to threat responses that differ in their adaptive utility between the sexes—namely, aggression and social dominance orientation among men and fear of sexual coercion among women. These results are consistent with the notion that the psychology of intergroup bias is generated by different psychological systems between men and women. Implications for political psychology are discussed.

Session A-2: **Cooperation**

Gabrielino

Th 10:50am***Does conversational conduct among strangers predict expectations of defection in a one-shot prisoner's dilemma game?*****J.H. Manson, M.M. Gervais, M.A. Kline, R.L. George**

Several studies have shown that, following brief interactions among strangers, subjects perform better than chance at predicting whether their co-subjects will defect in a one-shot PDG. Theoretical work suggests that adherence to “arbitrary” norms serves a signaling function that allows individuals to assort along cultural lines so as to maximize coordination and cooperative efficiency. One set of norms, documented by Conversation Analysis (CA), concerns the details of face-to-face interaction, such as avoiding conversational overlaps (“interruptions”). We (1) videotaped 10-min conversations among 25 same-sex triads of previously unacquainted university students who were naïve to the impending game and then (2) separated the Ss and directed each of them to (a) play a one-shot PDG with each of their co-participants and to predict one another’s play decisions and (b) complete the Levenson Self-Report Psychopathy Scale (LSRP) and answer some demographic questions. From each conversation, a mean of 3.93 min was transcribed using CA methods. Subjects chose to cooperate in 67.7% of decisions. Combining both sexes, subjects performed no better than chance at predicting one another’s game play decisions. Subjects that scored above the median on the primary psychopathy scale of the LSRP were marginally more likely to defect than those that scored lower. Additional analyses address whether Ss were more likely to be predicted to defect if they were responsible for more conversational gaps or unwarranted overlaps. We discuss the implications of these results for understanding the widely documented phenomenon of accurate judgments based on “thin slices” of the behavioral stream.

Th 11:10am***The evolution of human cooperation: Ecological and intra-cultural variation in normative behavior*****Shakti Lamba**

A major evolutionary puzzle in human behavioural studies is the existence of widespread co-operation between unrelated individuals, particularly in instances of one-shot, anonymous interactions. A cross-cultural games project (Henrich et al, 2004), demonstrated significant differences in normative behaviour between cultural groups. Variation in normative behaviour within cultural groups remains largely unexplained. My research focuses on the demographic and ecological variation within and between populations of a single cultural group in order to disentangle the effects of properties of (i) individuals and (ii) groups, on cooperative behaviour, while controlling for cultural differences. This will help clarify which theoretical models of the evolution of cooperation best fit real populations and whether model assumptions about operant behavioural strategies and selection forces (individual and/or group) are supported. My study populations are villages of the same cultural group – the Pahari Korwa, a central Indian, horticultural society. I will present results from a field study conducted in India between January and June, 2008. I used economic games to measure pro-social behaviour among a sample of adults in different village populations and studied its relationship to: (i) population size (ii) rates of migration (iii) household distribution (iv) market access and (v) properties of individuals such as age, income, number of kin in the village and network size.

Th 11:30am***The paradox of cooperation benefits*****Karoly Takacs, Andras Nemeth**

It seems natural that when benefits of altruism or of cooperation are increasing, the share of altruists or of cooperators (if there are any) in the population also increases. Besides, it is well documented that in case of positive assortment that is when cooperative types meet each other more often than expected based on population averages (for instance, in spatially structured populations), there is an improvement in the conditions for the evolution of cooperation compared to random interactions or complete mixing. This study demonstrates, however, that while under most conditions, increase in the benefits of cooperation also increase the share of cooperators assuming positive assortment, under a specified range of payoff values a reverse relation holds. The conditions for this paradox relation are determined for two-person social dilemmas: for the Prisoner's Dilemma, for the Hawks and Doves game, and for the Stag Hunt game, assuming global selection and positive assortment. Our results are supplemented by a simulation study that demonstrates the existence of the paradox of cooperation benefits also in more complex situations.

Th 11:50am***Facial expressions of emotion as signals of cooperation*****Joanna Schug, Toshio Yamagishi, David Matsumoto, Yataka Horita, Kemberlee Bonnet**

Previous studies have suggested that facial expressions of emotion may be used to identify cooperators. In particular, pro-social individuals have been found to display higher levels of genuine positive emotion compared with pro-selfs (Brown et al., 2003; Oda et al., in press; Shelley & Kuhlman, 2007; Mehu, Grammer & Dunbar, 2007). In this study, we investigated the relationship between emotional expression and cooperation by examining the facial expressions of individuals as they responded to unfair offers in an ultimatum game. Twenty male participants participated in an ultimatum game, playing two rounds as responder and one round as the proposer. Emotional expressions were analyzed using the Emotion Facial Action Coding System (Matsumoto, Ekman & Fridlund, 1991), an abbreviated version of the Facial Action Coding System (Ekman & Friesen, 1978). The results indicated that, consistent with previous studies, cooperative individuals were more likely to display higher levels of positive emotion. Importantly however, cooperative individuals also expressed higher levels of negative emotions such as disgust, sadness, and contempt than did uncooperative participants. These results suggest that, rather than simply displaying higher levels of positive emotion alone, cooperative individuals may be more likely to openly express all emotions regardless of their valence. We speculate that the honest display of emotion is more costly for egoists than for cooperators, and thus emotional expressivity may be a more reliable signal of altruism than the display of positive emotion alone.

Th 12:10pm***Is group selection viable for highly mobile organisms? Rethinking the assumptions of standard group selection models*****C. Athena Aktipis**

Models such as Maynard Smith's Haystack model have shown that high rates of movement (i.e., migration, mixing, dispersal) undermine the evolution of cooperation. However, these models generally assume that movement is unconditional. The present model replaces the assumption of unconditional movement with conditional movement; individuals stay in groups that provide higher returns (by virtue of having more cooperators), and 'Walk Away' from groups providing low returns. Implementing this conditional movement rule generates a number of findings including: 1) when individuals have high thresholds, corresponding to low tolerance for defectors, this lead to selection for cooperation, 2) high thresholds lead to high rates of movement initially and lower rates of movement after selection for cooperators, and 3) population structure becomes more stable after selection increases the proportion of cooperators in the population. These findings challenge the standard view derived from Maynard Smith's Haystack model and others that high rates of movement undermine selection for cooperation. In contrast, the current model demonstrates that high rates of conditional movement can be associated with stronger selection for cooperation. These results show that high rates of migration observed in nature are not prohibitive for the evolution of cooperation, as standard group selection models have assumed.

Session A-3: **Life History 1**

Ontiveros

Th 10:50am***Fundamental dimensions of environmental risk: The impact of harsh versus unpredictable environments on the evolution and development of life history strategies*****Bruce J. Ellis, Aurelio Jose Figueredo, Barbara H. Brumbach, Gabriel L. Schlomer**

The current paper synthesizes theory and data from the field of life history (LH) evolution to advance a new developmental theory of variation in human LH strategies. The theory posits that clusters of correlated LH traits (e.g., timing of puberty, age at sexual debut and first birth, parental investment strategies) lie on a slow-to-fast continuum; that harshness (externally caused levels of morbidity-mortality) and unpredictability (spatial-temporal variation in harshness) are the most fundamental environmental influences on the evolution and development of LH strategies; and that these influences depend on population densities and related levels of intraspecific competition and resource scarcity, on age-schedules of mortality, on the sensitivity of morbidity-mortality to the organism's resource-allocation decisions, and on the extent to which environmental fluctuations affect individuals versus populations over short versus long timescales. These interrelated factors operate at evolutionary and developmental levels and should be distinguished because they exert distinctive effects on LH traits and are hierarchically operative in terms of primacy of influence. Although converging lines of evidence support core assumptions of the theory, many questions remain unanswered. This review demonstrates the value of applying a multi-level evolutionary-developmental approach to the analysis of a central feature of human phenotypic variation: LH strategy.

Th 11:10am***Growth and nutritional status in an indigenous lowland Ecuadorian population*****L.S. Sugiyama, J.J. Snodgrass, A.D. Blackwell, F.C. Madimenos, T.J. Cepon, T.R. Gandolfo, M.A. Liebert**

Economic development has been linked to increases in a variety of negative health outcomes and to changes in patterns of growth. Studies have revealed that these health and life history shifts are not uniform across populations, yet this topic has attracted surprisingly little attention. Research is needed to clarify how factors such as the timing and intensity of market integration, cultural practices, and biological differences shape growth and health across populations. The Shuar are an indigenous Amazonian group that presently live across a wide range of circumstances from traditional forager-horticulturalists to professionals in urbanized communities. Our past work has shown that many Shuar children have height-for-age z-scores indicative of stunting, and that the extent of poor growth is considerably higher than among closely related groups, such as the Shiwiar and Achuar. In the present study, we investigate growth and nutritional status among Shuar children in a rural community in the southeastern Amazonian region of Ecuador with the following objectives: 1) to compare growth and nutritional status among the Shuar to international standards; 2) to assess lifestyle and dietary correlates of growth and nutritional status; and 3) to examine relationships among lifestyle, growth, and hemoglobin concentration. We collected genealogical, anthropometric data and obtained hemoglobin concentrations for 149 Shuar children and adolescents (1-18 years old; 87 females, 62 males), as well as information on lifestyle, medical history, and diet. Our results document substantial variation in growth indicators and hemoglobin concentration by lifestyle and medical history, and reveal overall stunting prevalence of nearly 70%. Lifestyle factors have different effects on hemoglobin levels of boys and girls, suggesting possible differences in PI.

Th 11:30am***Are quantity-quality tradeoffs reflected in the immune function of human children? An analysis of immune function, illness frequency, and family composition in a Shuar village*****Aaron D. Blackwell, J. Josh Snodgrass, Felicia C. Madimenos, Tara J Cepon, Tiffany R. Gandolfo, Lawrence S. Sugiyama**

According to life history theory, parents face a tradeoff between investing in many lower quality offspring or funneling resources into fewer, high quality offspring. To date, studies of quantity-quality tradeoffs in humans have looked at only a few proxy measures of quality, such as the effect of fewer household producers per dependents on children's growth (e.g. Hagen/ et al./, 2006; Larrea & Kawachi, 2005). However, tradeoffs should also be apparent in other measures of offspring quality, such as immune function. The immune system is multi-faceted and tradeoffs exist between non-specific defenses such as inflammation, cell-mediated defenses such as cytotoxic T-cells, and humoral defenses based on the circulation of antibodies (McDade, 2003; Sheldon & Verhulst, 1996). Each type of defense has its own costs and benefits. Like growth and reproduction, immune system tradeoffs are expected to vary based on available resources and local ecology. This study examines the effects of quantity-quality tradeoffs on immune function in a Shuar village of sixty families. We collected anthropometrics, medical histories, dietary interviews, household information, hemoglobin levels, and dried blood spots from 149 children age 1 to 18 (87 female, 62 males). Medical records were tallied to determine frequency of illness and dried blood spots were analyzed using ELISAs for C-reactive protein, Immunoglobulin E, and Epstein-Barr Virus antibodies. Using multiple regressions and structural equation modeling we test for trade-offs between growth and the three branches of immune function as a function of sibship size and birth order, controlling for total family resources.

Th 11:50am

Differential maternal somatic investment in response to local environmental variation in a modern population

Daniel J. Kruger, Melissa A. Munsell

Life History Theory (LHT) is a powerful framework for understanding variation in life strategies as functional adaptation to environmental conditions. LHT describes the allocation of effort or investment towards specific aspects of survival and reproduction across the lifespan. We propose that the degree of maternal somatic investment in gestating offspring may be contingent on local environmental conditions. Conditions that suggest high extrinsic mortality rates and unpredictability of future outcomes may be associated with relatively faster life history strategies, including shifts in the balance of investment between offspring quantity and quality. The human built environment is increasingly recognized as an important influence on health, and the physical deterioration of the local built environment may affect mechanisms that evaluate environmental conditions and regulating investment trade-offs. Here we examined the relationship between neighborhood structural deterioration and maternal somatic investment in Flint, Michigan. We used Geographical Information Systems software to calculate the proportion of dilapidated structures, premature births, and low birth weight births in .5 mile square areas. We extracted the variance accounted for by maternal education, paternal education, and private insurance status at the individual level before calculating neighborhood proportions. There was a significant inverse relationship between structural deterioration and maternal somatic investment, as indicated by the concentration of premature and low birth weight births. These adverse birth outcomes may partially result from mechanisms that facilitated reproductive success in ancestral environments by evaluating environmental conditions and regulating investment trade-offs. We will also discuss other contextual influences on human maternal somatic investment.

Session A-4: **Facial Masculinity**

Alvarado

Th 10:50am

Facial cues of dominance modulate reflexive gaze-cuing in human observers

Benedict C. Jones, Lisa M. DeBruine, Julie C Main, Anthony C Little, Lisa L.M. Welling, David R Feinberg

The ability to follow others' gaze is essential for fluent social interaction, playing a crucial role in social learning, collaboration, understanding others' intentions, and threat assessment. While cognitive models typically propose that the extent to which we follow others' gaze is unaffected by non-gaze cues (e.g., facial expressions or explicit social knowledge), recent research has challenged this widely held view. In particular, a recent study demonstrating that macaques follow the gaze direction of dominant conspecifics more than that of subordinate conspecifics suggests that cues of dominance can modulate gaze-cuing in at least one primate species. Using a simple spatial cuing task, we show a similar effect of facial cues associated with dominance on gaze-cuing in human observers: at short viewing times, observers demonstrated a greater cuing effect for gaze cues from masculinized (i.e., dominant) faces than from feminized (i.e., subordinate) faces. Importantly, this effect of facial dominance on gaze-cuing decreased as viewing time was increased, indicating that the effect of dominance on gaze-cuing is driven by involuntary responses. Our findings suggest that the mechanisms that underpin gaze-following evolved to be sensitive to cues of others' dominance, potentially because such differential gaze-cuing promoted desirable outcomes from encounters with dominant individuals.

Th 11:10am

Women's preferences for masculinity in male faces are predicted by pathogen disgust, but not moral or sexual disgust

Lisa M. DeBruine, Benedict C. Jones, Joshua M. Tybur, Debra Lieberman, Vidas Griskevicius

Because women's preferences for male masculinity reflect tradeoffs between indirect benefits of greater genetic health and direct costs of lower paternal investment, variables that affect the importance of these costs and benefits also affect masculinity preferences. Concern about disease and pathogens may be one such variable. Here we show that disgust sensitivity in the pathogen domain is positively correlated with facial masculinity preferences, but disgust sensitivity in the moral and sexual domains are not. Our findings present novel evidence that systematic variation in women's preferences for masculine men reflects factors that influence how women resolve the tradeoff between the indirect benefits and the direct costs associated with choosing a masculine partner.

Th 11:30am***The masculine face: Facial characteristics that increase a male's mate value*****Jack Demarest, Arci Guzman**

The purpose of this investigation was to determine how male facial characteristics affect judgments of mate value (i.e., attractive or favorable ratings by females). Previous studies have shown that masculine or neonate facial characteristics of males (i.e., eye size, jaw shape) influence a woman's choice during mate selection (Cunningham, Barbee, & Pike, 1990). Research has also shown that female sociosexual orientation (i.e., attitudes about casual sex) and ovulation status (i.e., reproductive status) influence a woman's mate selection criteria (Simpson & Gangestad, 1992; Penton-Voak & Perrett, 2000). These variables were included in this study. The faces utilized in this study were grayscale drawings created using computer software. They varied in three ways, (a) eye size, (b) jaw shape, and (c) facial hair. It was hypothesized that (1) females who were ovulating would be more likely to choose masculine-type faces (e.g., narrower eyes and square-lined jaw) than neonate faces (e.g., big eyes and round jaw). This trend (2) was also expected for females who were unrestricted sexually compared to more sexually restricted females. Lastly, (3) it was predicted that ovulating females would also choose male faces having greater facial hair, while the opposite trend was expected for non-ovulating females. The data obtained from female college students (N = 77) revealed that a male's mate value was greatest for a neonatal jaw structure (round jaw), narrow eye structure, or a hybrid combination of both neonate and masculine features. A full beard was not preferred, although the preference was for some facial hair. Contrary to prior studies, neither SOI nor ovulation status produced a main effect on female mate choice, although female SOI and ovulation status often interacted with eye structure, jaw structure, and facial hair.

Th 11:50am***Mothers and mate choice: Facial Preferences in a cross-cultural sample*****Isabel Scott, William Jankowiak, Viren Swami, Zejun Huang, Yangke Zhao, Ian Penton-Voak**

Facial dimorphism may be an honest signal of quality. However, both theory and evidence suggest that high quality mates, and especially masculine males, are a "risky" choice of partner. Thus, while people should on average prefer dimorphism in a partner, their preferences should vary according to their own mate value, as well as the amount of investment offered and required. To test this hypothesis, we measured perceptions of facial dimorphism in five populations from three countries (UK, China and Malaysia). Results showed that males preferred feminine faces for both long and short term relationships, while women preferred masculine faces in the short term and average faces in the long term. In all samples, both sexes thought that dimorphic faces were healthy and fertile, that feminine faces were "nice" and masculine faces "nasty". Good health among subjects predicted stronger preferences for facial dimorphism. In addition, there was an effect of maternal investment and support. Living with one's mother until relatively late, living close to her in adulthood, and positive regard for the relationship, all promoted preferences for dimorphism. Mothers exerted a stronger influence on daughters than on sons, especially with respect to support offered in adulthood. These results suggest that mothers may influence their children's mate choice, by investing in them as children (increasing their offspring's mate quality), and/or by offering them support and assistance in adulthood (offsetting the risks associated with choosing high quality mates).

Th 12:10pm***Waist-hip ratio predicts women's preferences for masculine male faces, but not perceptions of men's trustworthiness*****Finlay G. Smith, Benedict C. Jones, Lisa M. DeBruine, Lisa L.W. Welling, Jovana Vukovic, Julie C. Main, Anthony C. Little**

Previous studies have shown that attractive women demonstrate stronger preferences for masculine men than relatively unattractive women do. Such condition-dependent preferences may occur because attractive women can more easily offset the costs associated with choosing a masculine partner, such as lack of commitment and less interest in parenting. Alternatively, if attractive women are treated better than relatively unattractive women by masculine men, attractive women may perceive masculine men to have more positive personality traits than relatively unattractive women do. Here, we tested for relationships among two indices of women's attractiveness: body mass index (BMI) and waist-hip ratio (WHR); their preferences for masculinized versus feminized male faces; and the extent to which they perceived feminized male faces to be more trustworthy than masculinized male faces. Consistent with previous studies, women with a low (i.e. attractive) WHR had stronger preferences for masculine male faces than women with a relatively high (i.e. unattractive WHR) did. This relationship remained significant when controlling for possible effects of BMI and neither WHR nor BMI predicted perceptions of trustworthiness. These findings present converging evidence for condition-dependent mate preferences in women and suggest that such preferences do not reflect individual differences in the extent to which pro-social traits are ascribed to feminine versus masculine men.

Thursday Afternoon Sessions

Session B-1: **Foraging**

Titan Theater

Th 3:00pm***Cognitive adaptations for resource search: Explaining hot hands and fallacious gamblers*****Andreas Wilke, H. Clark Barrett, Peter M. Todd**

Wilke & Barrett (2009) proposed that the “hot hand” phenomenon, expecting that streaks will continue, is not a reasoning fallacy as commonly suggested, but rather reflects an evolved psychological assumption that items in the world come in clumps. In two computerized experiments, American undergraduates and Shuar hunter-horticulturalists predicted hits and misses in foraging for fruits, coin tosses, and several other kinds of resources whose distributions were generated randomly. The results suggested that a hot hand expectation of clumps is our evolved psychological default, though this can be reduced (though not eliminated) by experience with genuinely independent random phenomena like coin tosses. In this talk, we report results from further experiments in which we investigated the proximate mechanisms that people use when reasoning about depletable resources. Wilke & Barrett (2009) suggested that searching for a sequence of depletable resources may lead to the converse of hot hand beliefs, namely the “gambler’s fallacy”, in which streaks of hits in time and space lead to reduced probability of nearby hits. In a sequential foraging game, subjects had to imagine either walking along a forest path full of fruit trees or had to sample from a bag of fruits. In both conditions, each fruit was either ripe or unripe, and subjects had to predict whether the next resource they would encounter is ripe or unripe. By analyzing the extent to which past hits lead to reduced prediction of future hits, we can determine the degree of adherence to gambler’s fallacy versus hot hand beliefs.

Th 3:20pm***Physiology of foraging choice: Blood glucose and future discounting*****X.T. Wang, Robert D. Dvorak**

Foraging as an evolutionary task domain should have shaped choice behavior to be sensitive to both external and internal cues of survival and reproductive risk. According to an energy budget rule of foraging theory, organisms regulate their degree of risk taking according to their dynamic body energy condition. However, little is known about how internal cues of energy budget such as fluctuating blood glucose levels affect choice behavior. The current study explored metabolic mechanisms of future discounting, a choice phenomenon where people value present goods over future goods. Using blood glucose as an index of body energy budget, optimal discounting should regulate behavioral resource allocation as a continuous function of body caloric requirement. That is, people should be more energy conserving and value future returns more (discount future less) when blood glucose levels are high, and vice versa. We identified this novel link between glucose levels and future discounting in an experiment where human participants made intertemporal choices between a smaller and sooner reward and a larger and later option, with possible actual monetary consequences. In contrast to the group of zero-sugar drink, the sugar-drink group showed a reduced future discount rate after drink, when controlling for sex, age, body mass index, and the taste rating of the drink. The blood glucose levels not only varied as a result of caloric intake but also regulated the rate of future discounting according to body energy budget. The study expanded foraging theory analysis from a choice between concurrent options to intertemporal choice.

Th 3:40pm

Optimal foraging in semantic memory

Peter M. Todd, Thomas H. Hills, Michael N. Jones, Andreas Wilke

Foragers seeking resources in patches must decide when to leave a diminishing exploited patch and find a new one. When resources are food items distributed in space, Charnov's (1976) Marginal Value Theorem describes optimal patterns of animal foraging. What happens with resources are items in memory? Given that distance metrics can be defined over internal representations of memory items, we explore the possibility that humans may forage in memory in a similar fashion to the way that animals forage in space. We investigated how people retrieve items from memory patches using the category fluency task: Participants were asked to retrieve the names of as many types of animals from memory as they could in three minutes. Clusters or patches of these items, along with their semantic similarity and frequency, were found with an automatic Wikipedia corpus analysis using the BEAGLE semantic memory model (Jones & Mewhort, 2007), and via hand-coded category membership from Troyer et al. (1997). Participants did not seem to use static patch boundaries, such as 'pets', to search memory, but instead used fluid patch boundaries that were updated with each new item retrieved. We found that participants leave patches in memory when the marginal (i.e., current) rate of finding items is near the average rate for the entire task, as predicted by the Marginal Value Theorem. We discuss what this suggests for possible common evolved mechanisms underlying search in space and in mind.

Th 4:00pm

You can't always get what you want: The motivational effect of need on risky decision-making

Sandeep Mishra, Martie L. Lalumiere

Risky behavior in humans is typically considered irrational, reckless, and maladaptive. Risk-sensitivity theory, however, suggests that risky behavior may be adaptive in some circumstances: Decision-makers should prefer high risk options in situations of high need, when safer, lower risk options are unlikely to meet those needs. This pattern of decision-making has been well established in the non-human animal literature, but little investigation has been conducted on humans. We demonstrate in an experimental study that young men and women (n=115) behave as predicted by risk-sensitivity theory, shifting from risk-aversion to risk-proneness in situations of high need. This shift occurred whether decisions were made from description, or from experience. Neither sex differences nor individual differences in personality and general risk propensity played a significant role in decision-making under need. Implications for real-world risky decision-making (including phenomena such as crime) are discussed in the context of ecological rationality.

Session B-2: Women's Mate Preferences 1: Muscularity, Strength, & Dominance Gabrielino

Th 3:00pm

Preferences for muscularity in 26 countries across 10 world regions: Results from the International Body Project I

David A. Frederick, Viren Swami, the 56 Members of the International Body Project

Evolutionary scientists propose that exaggerated secondary sexual characteristics are cues of good condition and genes that increase offspring viability or reproductive success. It is hypothesized that women find these traits physically appealing. For example, studies in the U.S. reveal that muscular men are rated more attractive and report more sex partners than less muscular men (Frederick & Haselton, 2007). Very little is known, however, about the extent to which muscularity is valued across cultures. We organized the International Body Project to identify preferences for muscularity and whether these preferences are linked to increased Westernization. Collaborators from 41 sites in 26 countries across 10 world regions collected data from over 7,000 participants. The dataset included college samples (N = 19) and community samples (N = 22) who rated silhouettes of men varying in muscularity and body fat. Two of the community samples were from particularly understudied locales (Sabah, Malaysia, and KwaZulu-Natal, South Africa). In all but 2 of the 41 sites, women reported that the most attractive level of muscularity was greater than the muscularity of the typical man. There was significant variation across cultures, however, in perceptions of the average and most attractive level of muscularity. Preferences for male body fat were less consistent, with thinner men valued in some cultures and heavier men in others. The results were generally consistent with the proposal that muscularity is a component of attractiveness. The variability in preferences suggests that cultural and ecological factors shift the degree to which muscularity is valued.

Th 3:20pm***Women's preferences for dominant and physically formidable men in long-term relationships*****Jeffrey K. Synder, Carlos D. Navarrete, Daniel M.T. Fessler**

Some women select domineering men as long-term intimate partners – sometimes at high cost to themselves. Although conventional views frame these women's behavior as pathological, there are sound theoretical reasons to think otherwise. In violent environments, domineering and coercive strategies enhance male competitive success. Women are likely sensitive to levels of danger in the local environment, and hence may select domineering men when the benefits of the protection and provisioning that such men can provide outweigh the costs that they may inflict on their partners. Accordingly, women may prefer formidable, domineering, and aggressive men when the local environment is marked by high levels of conflict, with such preferences mediated by women's perceptions of their own vulnerability to extra-pair aggression. Preliminary evidence suggests that the latter association exists and that this effect is independent of race, income, and education level.

Th 3:40pm***Men's physical strength is associated with women's perceptions of their dancing ability*****Bernard Fink, Nadine Hugill, Nick Neave, Hanna Seydell**

Prenatal and/or pubertal testosterone (T) directly influences male physical characteristics and behaviours that facilitate the achievement and maintenance of status and resources. In numerous animal species there is evidence that females have evolved preferences for signals of a male's status as such signals may indicate male quality (in terms of health and reproductive success). In humans, it is known that women judge sex-typical (T-linked) physical characteristics of the face and body of men higher on attractiveness, masculinity, and dominance. Moreover, recent research indicates that women are also able to evaluate certain male facial characteristics that signal physical strength. Here we show that women's perception of the attractiveness and assertiveness of men's dancing, correlates with male handgrip strength (as a measure of muscular strength) after controlling for body weight. We conclude that men's dances – in addition to faces and bodies - may be another proxy for male competitiveness, and could thus be used by women to evaluate male quality.

Th 4:00pm***Social dominance and forceful submission sexual fantasies: An indicator of feminine pathology or feminine power?*****Patricia H. Hawley**

Romance literature for women exceeded \$1.3 billion in sales in 2006 and enjoyed a 26.4% market share of all books sold. Market forces illuminate human motivation and the "romance" literature should elucidate female sexuality. What does it mean that a prevailing theme involves explicit submission to a powerful man? The present study addresses forceful submission fantasies in men and women. Although traditional approaches explicitly pathologize women's force fantasies (e.g., sex guilt; but strangely, not men's), the present study seeks to explore the associations of such fantasy to female power. By adopting an evolutionary meta-theoretical perspective (and a resource control theoretic perspective; Hawley, 1999), we hypothesize that agentic, dominant women prefer forceful submission fantasies (more than subordinate women) as an indicator for their preference for dominant men. Additionally, we suggest that dominant women ascribe different meaning to the fantasy object. Nearly 900 college students read a novel-inspired vignette, rated it for appeal, and assessed it for personal meaning. Hypotheses were largely supported. Not only did dominant women find forceful submission more appealing than subordinate women, they also framed the interaction as ardent pursuit by a virile and successful man who wields power over others, and is driven by uncontrollable urges consequent to her allure. Moreover, he is a protective ally and capable/willing of paternal investment. Subordinate women deemphasize power and self-enhancement in favor of softer romantic attributes. Sex guilt played no role. Implications for evolutionary approaches to individual differences in mate preferences are discussed.

Session B-3: **Disgust and Disease Avoidance**

Ontiveros

Th 3:00pm***Politics and disgust make not-so-strange bedfellows*****Joshua Tybur**

Research concerning political ideology has recently experienced a resurgence (Jost, Nosek, & Gosling, 2008), with researchers better understanding how ideology relates to gender, how it develops across the lifespan, and how it relates to a variety of dispositional personality traits. In concert with theoretical developments explaining the ontogeny and function of ideology, this burgeoning area of research has placed ideology within a coherent nomological network. The current research capitalizes on recent advances in the understanding and measurement of disgust sensitivity (Tybur, Lieberman, & Griskevicius, in press) to further understand the nature of ideology, and to test recently articulated evolutionary hypotheses of the nature of ideology. Disgust can be categorized along domains of pathogen disgust, sexual disgust, and moral disgust, each of which is conceptually related to distinct factors hypothesized to relate to ideology (e.g., pathogen stress). In the current study, relationships between conservatism, disgust toward political issues, and sensitivity to pathogen, sexual, and moral disgust were tested. Bivariate correlations indicated that sensitivity to sexual and moral disgust – but not pathogen disgust – were related to conservatism. Multiple regression analyses indicated that only sensitivity to sexual disgust was uniquely related to conservatism. However, disgust toward certain political issues (e.g., abortion) was related to sensitivity to moral disgust – but only for conservatives – whereas disgust toward other political issues (e.g., tax cuts for the wealthy) was related to moral disgust only for liberals. Implications for multiple models of ideology are discussed.

Th 3:20pm***Correlates of progesterone on measures of disease avoidance: Support for the compensatory prophylaxis hypothesis*****Diana Santos Fleischman, Daniel M.T. Fessler**

Progesterone is a hormone that fluctuates throughout a woman's menstrual cycle and undergoes drastic changes throughout the lifespan. Progesterone causes immunomodulation, the downregulation of certain components of immune response during the first trimester of pregnancy and during the luteal phase of the menstrual cycle. Immunomodulation prevents the maternal immune system from attacking the half-foreign blastocyst facilitating implantation and later development. However, tolerance of the conceptus comes at the cost of increased vulnerability to infection. The compensatory prophylaxis hypothesis (Fessler 2001; Fessler and Navarrete 2003) holds that aspects of psychology sensitive to changes in immune function enhance avoidance of potential contaminants during periods of reproductive immunomodulation so as to decrease the likelihood of infection. Because such immunomodulation is triggered by progesterone, this hormone is predicted to correspondingly enhance behavioral prophylaxis and the reactions that underlie it. We investigated these predictions by measuring salivary progesterone in a nonclinical sample of women who were naturally cycling, using hormonal contraceptives or pregnant. We found that obsessive compulsive disorder symptomology, disgust sensitivity, behaviors related to use of public restrooms and bias against homosexuals all showed significant change as a function of progesterone. Results in pregnant women and women taking hormonal contraceptives will also be discussed.

Th 3:40pm***The twin effects of exposure on attraction and disease avoidance*****Alison Aylward, Debra Lieberman, Robert Oum**

Research findings show that repeated exposure to particular stimuli enhances positive evaluations -- the mere exposure effect. Although this effect is stable across many different types of neutral stimuli, studies that use more complex social stimuli have generated contradictory results. Here we apply an evolutionary framework to investigate the effects of repeated exposure in social contexts and to make specific predictions about how exposure might affect different types of judgments. Focusing on kin, we build on recent work showing that repeated exposure during childhood serves as a kinship cue and predicts increased sexual aversions during adulthood. So if repeated exposure decreases positive evaluations in the sexual realm, how does exposure affect evaluations in other interpersonal realms? Interpersonal disgust, disgust that functions to prevent contagion of disease-causing organisms, should also be affected by one's history of interactions with another. The threat of catching new, more harmful diseases comes more from strangers than from individuals with whom one has had extensive prior contact. For this reason, we predicted that prolonged exposure during childhood should correlate with *reduced* disgust towards behaviors making pathogen transmission more likely. Collecting data from 70 subjects, we found that whereas duration of childhood exposure predicted increased levels of sexual disgust, childhood exposure predicted decreased levels of pathogen related disgust. Further, these effects were significant only for younger siblings, individuals who rely on prolonged exposure as a kinship cue to detect probable older siblings. In sum, repeated exposure, rather than being a general effect, differentially impacts judgments across contexts and across different social targets.

Session B-4: **Developmental Instability and Individual Differences**

Alvarado

Th 3:00pm***Health, fitness, and personality correlates of minor physical anomalies, makers of developmental disruption in utero*****Leslie A. Merriman, Melissa Emery Thompson, Martin N. Muller, Steven W. Gangestad**

Developmental instability, the imprecise expression of a developmental plan, is an important component of developmental health and possibly of fitness, condition, or quality. The most common measure of it is fluctuating asymmetry (FA), deviation from perfect symmetry of bilateral morphological features that are, on average in the population, symmetrical. FA is thought to reflect effects of developmental disruption that accumulate during ontogeny. Another set of possible indicators of developmental instability are phenodeviants, deviations from morphological norms. In humans, minor physical anomalies (MPAs) are a set of features (e.g., low-set ears, steeped palate, single palmar crease, large gap between the first two toes), thought to be outcomes of developmental disruption during early-to-mid gestation. They are named for being the minor physical anomalies associated with Down's syndrome, but are associated with certain neurodevelopmental disorders (e.g., schizophrenia) as well. Within non-clinical populations, substantial variation exists but little work has examined covariation between MPAs and other outcomes. We related FA and MPAs to a variety of physical, health-related, and psychological traits in a sample of college men. FA and MPAs covaried moderately. MPAs were particularly strong predictors of reports of health and fitness, as well certain personality traits. Additional evidence suggests that MPAs may reflect outcomes of maternal-fetal conflicts and/or discriminative investment in offspring, though additional work is needed to more fully assess these possibilities. More generally, measurement of MPAs in future investigations may permit tests of specific evolution-inspired hypotheses.

Th 3:20pm***Utilizing current genetic methods to understand the evolution of individual differences and mental disorders*****Daniel P. Howrigan, Matthew Simonson, Matthew C. Keller**

The field of human genetics has undergone considerable advances in the past decade, with each new advance allowing researchers to get a more comprehensive picture of the genetic architecture underlying human differences. Currently, this genetic data can inform our understanding of human evolution and genetic variation. This presentation summarizes the main points forwarded in an upcoming book chapter for *Evolution of Personality and Individual Differences*, and discusses ways genetic data can test evolutionary hypotheses. We begin with a brief overview of evolutionary genetics, and what genetic signatures we would expect to see under balancing selection, neutral drift, mutation-selection balance, and directional selection, mentioning relevant research in each area. We then go over some current molecular genetic methods in human research, explaining the nature of single nucleotide polymorphisms (SNP's), copy number variation, and extended homozygosity at the genomic level, mentioning the main trends of genetic association studies and ongoing statistical issues with large genome-wide data. Finally, we discuss some of our current work on the role of copy number variation and extended homozygosity on IQ and Schizophrenia.

Th 3:40pm***Schizophrenia and autism both have their origin during very early pregnancy*****Annemie Ploeger, Fritson Galis**

Both people with schizophrenia and autism have significantly more physical anomalies compared to unaffected controls. These physical anomalies include brain pathologies, minor anomalies such as ear or toe deviations, and major structural anomalies such as DiGeorge or Down syndrome. Do these established research findings teach us something about the origin of these mental disorders? Examination of these physical anomalies reveals that most of them get established during a very early stage of gestation called early organogenesis, in humans from day 20 to day 40 after fertilization. This stage is evolutionary conserved, i.e., embryos of many animals look remarkably similar. During this stage, a single mutation affects many different traits, often resulting in a miscarriage, or a severely disabled newborn. We hypothesize that both schizophrenia and autism, and perhaps other mental disorders, result from mutations or environmental disturbances during early organogenesis. We provide evidence for this hypothesis with an integrative literature overview that includes studies on the prenatal and neural development of mental disorders, insights from evolutionary developmental biology and genetics, and recent findings in animal studies. We discuss the implications of the findings in the light of research on the heritability and evolution of mental disorders, the timing of disturbances during embryological development, and the recent literature on genomic imprinting and mental disorders.

Thursday Evening Sessions

Session C-1: **Symposium: Nature of Reciprocity: Psychological Adaptations for Cooperation Reflect Ancestral Regularities**

Titan Theater

Th 4:40pm

I will only know that our interaction was one-shot if I kill you: A cue theoretic approach to the architecture of cooperation

John Tooby, Max Krasnow, Andrew Delton, Leda Cosmides

Economists, behavioral scientists, and theoretical biologists have generated a rich set of theories designed to predict how humans should make decisions in cooperative contexts. Experimentalists have produced a contrasting literature documenting how humans actually make decisions. Unfortunately, these two literatures are at sharp variance with each other: Experimental work on human cooperation appears to show that humans violate the standards of rationality, whether considering classical economic rationality or evolutionary game theoretic rationality. Here we show how an ecological rationality approach involving the cue structure of the ancestral world can make sense of well-known experimental findings, in a way that parallels the demonstration that kin-oriented behavior in humans tracks not degrees of relatedness but specific cues to relatedness. By focusing on the nature of the cues that evolved decision rules should have been selected to track (e.g., cues to the probability an encounter will be repeated), and the necessary structure of the ancestral world within which selection operated, this approach shows that agents typically should evolve to be more cooperative than is “rational”; that agents can be selected to embody a cooperative strategy designed to cooperate even when it “believes” an interaction is one-shot; and that agents should evolve to respond to cues that standard theories normally consider irrelevant to cooperation, such as sex and age. Similar analyses underlie the experimental demonstration that the costs one’s exchange partners incur, as well as the benefits they deliver, are cues that are tracked and do matter in reciprocity.

Th 5:00pm

Regularities of the ancestral world exploitable for cooperation: Why I always remember a face

Max Krasnow, Andrew W. Delton, John Tooby, Leda Cosmides

Every evolutionary theory of organismal design faces a common problem: Assumptions about ancestral ecologies are necessary to motivate and constrain theories, but incorrect assumptions can easily lead to incorrect conclusions. Many have argued that reconstructions of the past—especially the social past—are too uncertain to generate useful knowledge. While this may be true in some cases, there are nonetheless a number of facts about the past that can be known with near certainty. For example, we posit that the ancestral world existed in at least two dimensions and was larger than our ancestors could traverse within a single day. In several simulations, we show how an organism could exploit these and similar regularities to find beneficial cooperative interactions. We argue that a psychology designed to exploit these regularities can account for some of the empirical findings from behavioral economics that researchers find puzzling.

Th 5:20pm

Combining ancestral cue structure with direct reciprocity explains one-shot cooperation

Andrew W. Delton, Max Krasnow, John Tooby, Leda Cosmides

People routinely cooperate with individuals they have never met before and may never see again. Why? Many theories propose that this is a by-product of selection for direct reciprocity, kin selection, or selection for maintaining a favorable reputation. According to other theories, however, additional selection pressures are required. This latter approach is motivated by findings that cooperation persists in anonymous, one-shot experimental settings despite the (apparent) removal of any cues relevant to the three selection pressures listed above. To account for these results, a variety of cultural or genetic group selection models have been proposed. However, by conducting a series of simulations, we show here that such a move is unnecessary: Our results reveal that once the probabilistic nature of ancestral cue structure is taken into account, selection for direct reciprocity creates agents willing to engage in one-shot cooperation. This occurs as a necessary by-product of machinery designed to capture the gains in trade made possible by repeated, mutually beneficial exchanges. Thus, the existence of human cooperation in one-shot experimental settings deductively follows from the premises of standard theories of selection.

Th 5:40pm

The role of welfare tradeoff ratios in reciprocity

Julian Lim, Daniel Sznycer, Andrew W. Delton, Theresa E. Robertson, John Tooby, Leda Cosmides

Human cooperation (e.g., food sharing) often represents social valuation: willingness to trade off personal welfare to increase the welfare of another. We propose that this is instantiated psychologically as welfare tradeoff ratios or WTRs, internal magnitudes that regulate social allocations. But how should WTRs be calibrated? Because greater valuation of the self by another indicates that the other is valuable to the self, the mind is expected to (1) estimate the other's WTR for the self and then (2) calibrate its own WTR based on that estimate. To test these predictions, we experimentally paired subjects with (sham) partners who revealed (through a series of monetary tradeoff decisions) either a high or low WTR towards the subject; importantly, the benefits received by subjects were held constant. Results showed that subjects based their welfare tradeoff decisions not only on the benefits received (as might be predicted from other psychological models of cooperation), but also on the costs incurred by their partners (consistent with the logic of WTRs). Subjects paired with a high-WTR partner increased their own WTRs, whereas those paired with a low-WTR partner lowered their WTRs. Subjects' emotional responses tracked their partner's WTRs in theoretically predicted ways: anger towards the low-WTR partner and gratitude to the high-WTR partner. These results are consistent with the existence of psychological adaptations for regulating welfare tradeoff ratios in one's own mind and in the minds of others.

Session C-2: **Women's Mate Preferences 2: Facial Attractiveness**

Gabrielino

Th 4:40pm

Women's preferences for male faces reflect cues to successful resource allocation

I.S. Penton-Voak, I. Scott, A.P. Clark, N. Pound

Immunocompetence handicap hypotheses of sexual signalling predict that females will prefer dimorphic males, but with human subjects support for this prediction has been equivocal. This may be explicable by considering the allocation of resources between signalling and condition maintenance. Masculinity in males may on average signal quality, but individuals who over allocate resources to trait size may also display cues to poor condition as a result of the immunosuppressive effects of androgens, and be considered unattractive. In two photosets, masculinity (measured and rated) and perceived health of male faces was assessed. We generated two factors from these measures: quality, loading positively for both health and masculinity, and overspend, loading positively for masculinity but negatively for health. An independent sample then rated masculinised and feminised versions of each face for attractiveness. In both samples, masculinity was preferred only when it co-occurred with perceived health. Furthermore, overspend was the best predictor of whether a face looked better masculinised, suggesting that women are sensitive to both trait size and independent cues to men's ability to bear the costs of the signal.

Th 5:00pm

Circum-menopausal effects on women's judgments of facial attractiveness

Jovana Vukovic, Benedict C. Jones, Lisa M. DeBruine, Anthony C. Little, David R. Feinberg, Lisa L.M. Welling

The marked change in a woman's hormonal profile that happens at menopause affects many aspects of behaviour. We investigated circum-menopausal women's preferences for femininity in the faces of young adult men and women. Post-menopausal women demonstrated stronger preferences for femininity in same-sex faces than pre-menopausal women did. This effect was independent of possible effects of participant's age and suggests that dislike of feminine (i.e. attractive) same-sex competitors decreases as fertility decreases. No significant difference between pre- and post-menopausal women was observed for men's faces, potentially because circum-menopausal women do not necessarily view young adult men as potential mates. To our knowledge, this is the first study to demonstrate circum-menopausal changes in women's face preferences.

Th 5:20pm***Putting your best face forward: Subtle facial signals produced by exposure to potential mates*****Zachary L. Simmons, Aaron W. Lukaszewski, James R. Roney**

A growing body of evidence suggests that males possess a highly specific set of courtship adaptations designed to signal the possession of qualities thought to be important in female mate choice. These adaptations would be expected to be deployed in response to potential mating opportunities, namely exposure to attractive (and seemingly interested) females. The current study focuses specifically on facial expressions that might form one component of these signals. Males were randomly assigned to either a courtship prime or neutral condition and were subsequently photographed while displaying a neutral expression. Even with expression thus constrained, males exposed to the courtship prime were rated as more attractive as potential long-term mates than those in the neutral condition. Further analyses suggest that these men were rated higher on dimensions relevant to parental investment, but lower on those relevant to dominance and formidability. These results suggest a pathway by which some cues relevant for mate evaluation might be malleably signaled through very subtle facial expressions, as there were no expected differences in physiognomy between the men in the two conditions. The reductions in formidability associated with these signals suggest there is a potential cost to engagement, and therefore that they should be expected to be used only when significant benefits can be realized.

Th 5:40pm***Trade-offs between markers of absolute and relative quality in human facial preferences*****Tamsin K. Saxton, Anthony C. Little, Hannah M. Rowland, Ting Gao, S. Craig Roberts**

Individuals are attuned to cues of quality in potential mates. Mate quality is assessed on both an absolute scale, independent of the observer ('good genes') and on a relative scale, dependent upon attributes of the observer ('compatible genes'). Much research has focused on how individuals respond to either absolute or relative quality in mate choice, but how these dimensions are weighted during mate choice decisions is poorly understood and has recently attracted much theoretical interest. Here we examine the interplay between women's facial preferences for a measure of absolute quality (sexual dimorphism) and one of relative quality (self-resemblance). Sixty women rated the attractiveness of male faces that had been simultaneously manipulated along the dimensions of masculinity and self-resemblance in short-term and long-term relationship contexts. Sexual dimorphism had a greater positive effect on ratings than self-similarity, and masculinity and self-similarity had positive combinative effects on ratings of attractiveness in the context of short-term relationships. Women's co-expressed preferences for masculine faces combined with their lesser preference for subtly self-similar faces may reflect selection of good genes, promote optimal outbreeding, and give rise to directional selection even in the presence of a general self-similarity preference.

Session C-3: Parity, Pregnancy, and Postpartum Adaptations

Ontiveros

Th 4:40pm***The optimal BMI for human mothers varies with parity*****William D. Lassek, Steven J.C. Gaulin**

The combination of pelvic changes to accommodate bipedalism and large-brained neonates has had a profound impact on human female life history. Across 69 populations, female BMI at the end of puberty averages 20.9 \pm 1.4, and the mode is also 21 in young nulliparous American women. In contrast, the mean, median, and modal BMI of samples of all adult females across 192 countries is 25. Are there selective forces shaping BMI that differ for nulliparous and parous women? Obstructed labor due to cephalopelvic disproportion (CPD) would have been fatal for mothers during human evolution, but parity enlarges pelvic structures and thus greatly reduces the incidence of subsequent CPD. For example, in American women, the incidence of CPD is 4 times higher for nulliparas (6.7%) than parous mothers (1.7%) despite lower birth weights, and CPD rises steeply in nulliparas as birth weight increases. Increasing maternal BMI after a first birth leads to increased insulin resistance causing a proportionate increase in birth weights and concomitant decrease in low-birth-weight infants, and these higher birth weights are linked to increased infant survival and health. Thus, young primiparas benefit from lower BMI's, insulin resistance, and birth weights despite some survival costs to their first-borns, while higher BMI's and birth weights are favored in parous females whose birth canals can better accommodate larger neonates. This explains why human females with adequate nutrition gain weight after a first birth, and also suggests a reason why men might prefer young women with low BMI's.

Th 5:00pm***Pregnant women show a threat-detection advantage*****Marla V. Anderson, M.D. Rutherford**

Research adopting an evolutionary perspective has brought attention to evolved protective mechanisms exhibited by pregnant women. Nausea and vomiting in pregnancy (NVP), traditionally viewed as a maladaptive ailment, is now recognized as serving a protective function in keeping dangerous teratogens from affecting the developing fetus. Pregnancy-specific adaptations are to be expected: Pregnant women are not only housing an increasingly valuable investment, they are also increasingly vulnerable. Pregnancy impacts almost all bodily systems, generating dramatic changes to body mass and shape that result in decreased cardiovascular ability and mobility. The current study seeks to expand the field of research exploring adaptations of pregnancy that serve a protective function. Here, we test the hypothesis that pregnant women are more efficient than non-pregnant women at detecting threatening versus non-threatening stimuli. In a visual search task results showed that pregnant women were more efficient at detecting spiders amongst a non-threatening background of flowers and butterflies than non-pregnant women.

Th 5:20pm***Birthweight and paternal involvement predict early reproduction in women*****Daniel Nettle, David A. Coal, Thomas E. Dickins**

There is considerable interest in the mechanisms maintaining early reproduction in the most socioeconomically disadvantaged groups in developed countries. Previous research has suggested that differential exposure to early-life factors such as low birthweight and lack of paternal involvement during childhood may be relevant. We used longitudinal data on the female cohort members from the UK National Child Development Study (n=3014-5230 depending upon variables analysed) to investigate predictors of early reproduction. Our main outcome measures were having a child by age 20, and stating at age 16 an intended age of reproduction of 20 years or lower. Low paternal involvement during childhood was associated with increased likelihood of early reproduction (O.R. 1.79-2.25) and increased likelihood of early intended reproduction (O.R. 1.38-2.50). Low birthweight for gestational age also increased the odds of early reproduction (O.R. for each s.d. of birthweight 0.88) and early intended reproduction (O.R. for each additional s.d. of birthweight 0.81). Intended early reproduction strongly predicted actual early reproduction (O.R. 5.39, 95% CI 3.71-7.83). Birthweight and paternal involvement mediated the relationships between family socio-economic position and early reproduction. The results suggest that early-life factors such as low birthweight for gestational age, and low paternal involvement during childhood, affect women's reproductive development, leading to earlier target and achieved ages for reproduction. Differential exposure to these factors is part of the reason that early fertility persists in socioeconomically disadvantaged groups.

Th 5:40pm***New evidence for lactation aggression in humans*****Jennifer Hahn-Holbrook, Julianne Holt-Lunstad, Colin Holbrook**

Lactation aggression is common in mammals and theorized to have evolved to help mothers protect their offspring. Although heavily studied in other mammals, lactation aggression remains virtually unexplored in humans. The current study compared breastfeeding, bottle-feeding, and never-pregnant women's willingness to deliver annoying sound bursts to an aggressive confederate, both before and after an infant feeding session. We found that breastfeeding mothers were significantly more likely to deliver louder and longer sound bursts than bottle-feeding mothers, although breastfeeding mothers were not more aggressive than female controls. Interestingly, breastfeeders reported liking the confederate significantly more than female controls, despite having delivered comparable sound bursts. Elapsed time since infant feeding had no effect on aggression. These results are discussed with respect to the hormonal mediators of breastfeeding, with emphasis on the seemingly conflicting findings that oxytocin can increase both aggressive and pro-social behaviour. In addition, possible selective pressures unique to early motherhood, such as infanticide deterrence and lactation amenorrhea, are considered. Results from salivary oxytocin samples and impedance cartography taken before and after the infant feeding sessions are pending.

Session C-4: **Digit Ratio**

Alvarado

Th 4:40pm***Finger length ratio and attitudes towards several product categories*****Marcelo Vinhal Nepomuceno, Gad Saad, Eric Stenstrom, Zack Mendenhall**

The second-to-fourth finger length ratio (2D:4D), a sexually dimorphic trait, is affected by androgen exposure in utero. It has been linked to a wide range of human phenomena including economic outcomes, personality, sexuality, athletic and musical abilities, health status, and occupational interests to name but a few examples. Surprisingly, it has yet to be investigated in the consumption context. Using a sample of 555 university students, we examined if finger length ratio was negatively correlated with products with a male penchant and positively correlated with products preferred by females. Participants responded to several items, which assessed their attitude towards several product categories namely: cosmetics, electronics, pornography, clothing, movies genres (drama, action, science fiction, romance, animation and war), sports (hockey, boxing, synchronized swimming and gymnastics) and genres of video-games (First-person Shooter, Real-time Strategy, Party-game, Platformer and Life Simulator). Two key findings were obtained. First, the length of the index finger relative to the sum of the lengths of all four fingers (2rel) was generally a better predictor of product attitudes than 2D:4D, given that it yielded a greater number of significant effects. Second, we found significant ($p < .05$) or marginally significant ($p < .10$) correlations, in the predicted directions, between 2rel and attitudes towards four out of the nine product categories preferred by males and towards five out of the ten product categories preferred by females. The remaining product categories were not significantly correlated to 2rel. This constitutes the first study to demonstrate a link between a morphological trait and attitudes toward specific products.

Th 5:00pm***Prenatal androgens and domain-specific risk: digit ratio predicts financial, recreational, social, and ethical risk-taking propensity*****Eric Stenstrom, Gad Saad, Marcelo Nepomuceno, Zack Mendenhall**

Prenatal androgens have important effects on an individual's brain organization and future behavior. The second-to-fourth digit length ratio (2D:4D), a purported marker of prenatal androgen exposure, has been associated to a plethora of sexually differentiated abilities and dispositions. Of relevance to the current work, recent evidence suggests a link between 2D:4D and risk preferences in the realm of financial trading. We examine the relationship between digit ratios and risk-taking behaviors across five domains: social, recreational, financial, ethical, and health. We propose that lower, more masculine digit ratios are predictive of riskier behaviors across domains. In an ethnically homogeneous sample of Caucasian men and women ($N = 250$), significant correlations were found between 2-rel (the length of the second finger relative to the sum of the lengths of all four fingers) and risk-taking in four of the five domains. Specifically, low 2-rel Caucasians displayed a greater propensity to engage in financially, recreationally, socially, and ethically risky behaviors. No significant correlation was found between digit ratios and health-related risk-taking. In the ethnically heterogeneous sample ($N = 438$), 2-rel was a significant predictor of only two of five risk-taking domains (financial and social). In addition, men were found to engage in riskier behaviors than women in all five domains, thereby supporting the sex specificity of risk across the five contexts. Our findings suggest that future digit ratio research should account for ethnic heterogeneity. Furthermore, our study adds to the growing body of evidence linking digit ratios to decision making.

Th 5:20pm***2D:4D ratio, aggression, leadership, and reproductive success in Hadza men*****Marina Butovskaya, Valentina Burkova, Dmitry Karelin**

The data were collected between August – November in 2006-2008 during our field study in Mangola, Northern Tanzania. The sample consisted of 122 adult Hadza males (98 non-leaders and 24 leaders), living in traditional bush camps and practicing regular hunting. For all males the demographic data about age, marriage status, number of children born and survived till the age of 5 years were collected. All males completed the Swahili version of the Buss-Perry Aggression Questionnaire during personal interviews. The anthropological measurements were collected, including BMI, body circumferences and manual strength. 2nd and 4th digits finger lengths were measured directly from the hand using steel Vernier caliper measuring to 0.01 mm (Manning et al. 1998). It was found that 2D:4D ratio was positively correlated with the total number of children born, as well as survived to particular male and negatively with self-ratings on verbal aggression scale (controlling for age and leadership), and negatively with manual strength. The Linear Regression analysis revealed the high significant correlation between the 2D:4D ratio and individual's age in the leader's sample and the absence of such correlation for the rest of Hadza males. It was demonstrated that leaders fathered significantly more children than non-leaders and have more offspring surviving till the age of 5 years. These data are discussed in the light of the parental investment theory and leaders reproductive success in hunter-gatherers. The study was supported by Russian Foundation for Humanities, grant # 08-01-00015a, and RFBR, grant # 07-06-00078a, and approved by COSTECH, 2006 - 2008.

Th 5:40pm***Gender and age differences in aggression, 2D:4D ratio, and body measurements in Datoga*****Valentina Burkova, Marina Butovskaya**

Datoga are traditional semi-nomadic pastoralists of Northern Tanzania. The data were collected in 2006-2008 in Mangola, lake Eyasi region. The sample consisted of 232 adult Datoga (107 males and 125 females), living traditional way of life, with the age range between 16 and 80. All participants were interviewed about their age, marriage status, number of children, and completed the Swahili versions of the Buss-Perry Aggression Questionnaire and Dominance Questionnaire during personal interviews. The anthropological measurements were collected, including BMI, body circumferences and manual strength. 2nd and 4th digits finger lengths were measured directly from the hand using steel Vernier caliper measuring to 0.01 mm (Manning et al. 1998). The 2D:4D ratio was significantly smaller for males than females in Datoga. Waist-to-hip ratio (WHR) was negatively correlated with 2D:4D ratio. We found no correlation between finger length ratio and any form of aggression. Hostility and dominance showed significant sexual dimorphism in younger cohort (before 30 years old), while physical, verbal aggression and anger did not. No gender differences in aggressive behavior were found for other age cohorts. Our study revealed significant sexual dimorphism in WHR, BMI (body mass index), systolic blood pressure, fatness, manual strength. Besides, we found significant gender and age differences between the number of children survived till the age of 5 years and 2D:4D ratio in Datoga males: in the younger males the number of children was negatively correlated with 2D:4D ratio, while in older males this correlation was positive. These data will be discussed as an example of different Evolutionary Stable Strategies for obtaining the higher reproductive success in Datoga males. The study was supported by Russian Foundation for Humanities, grant # 08-01-00015a, and RFBR, grant # 07-06-00078a, and approved by COSTECH, 2006 - 2008.

Friday, May 29

Friday Morning Sessions

Session D-1: **Symposium: Evolutionary Economics: Insights into Motivation, Satisfaction, and Consumer Behavior**

Titan Theater

F 9:50am

Deep rationality and behavioral economics

Douglas T. Kenrick, Yexin Jessica Li, Jill Sundie

What is a “rational” decision? Economists have traditionally viewed rationality as maximizing expected satisfaction. This view has been useful in modeling basic microeconomic concepts, but falls short in accounting for many everyday human decisions. It leaves unanswered why some things reliably make people more satisfied than others, and why people frequently act to make others happy at a cost to themselves. Behavioral economists have studied the biases in decision-making, but have thus far tended to catalog errors without developing a comprehensive functional model of when such errors do and do not occur. From an evolutionary perspective, people may be presumed to make decisions according to a set of principles that may not appear to make sense at the superficial level, but that demonstrate rationality at a deeper evolutionary level. That is, people use adaptive domain-specific decision-rules that, on average, would have resulted in fitness benefits. Using this framework, we re-examine several economic principles. We suggest that traditional psychological functions governing risk aversion, discounting of future benefits, and budget allocations to multiple goods, for example, vary in predictable ways as a function of the underlying motive of the decision-maker and individual differences linked to evolved life-history strategies. We present data from two studies supporting the heuristic potential of this approach for behavioral economics.

F 10:10am

It's a wonderful life — for some: An examination of goals and satisfaction by domains

Norman P. Li, Christie N. Scollon, William Tov

The current research adopts a microeconomic budget allocation method (Li, Bailey, Kenrick, & Linsenmeier, 2002) to investigate what people value in their life. We were particularly interested in uncovering differences between people who are high and those who are low on life satisfaction. With budgets of “life dollars”, we measured people’s goals and the extent to which they were reaching them in various social domains and tested the following possibilities: a) dissatisfied people are simply not able to reach their goals, which are generally similar to those set by satisfied people, b) dissatisfied people are not able to reach their goals because the goals are generally higher than those set by satisfied people, c) dissatisfied people have different life priorities than those who are satisfied. Findings, along with the benefits of a domain-specific view and a budget allocation method, are discussed.

F 10:30am

Going green to be seen: Status, reputation, and conspicuous conservation

Vladas Griskevicius, Joshua Tybur, Bram Van den Bergh

What motivates consumers to be pro-social and go green? Evolutionary biologists have observed that altruism might function as a “costly signal” associated with status. Four experiments examined how status motives influenced pro-social green product choices. Activating status motives led people to choose green products over more luxurious non-green products. Supporting the theory that altruism signals one's willingness and ability to incur costs for others' benefit, status motives increased desire for green products when shopping in public (but not private), and when green products cost more (but not less) than non-green products. In addition to demonstrating experimentally the links between altruism, reputation, and status, the findings suggest that status competition can promote positive outcomes such as green consumption.

F 10:50am***Risk, rivalry, and the pursuit of attractiveness: Evidence for contextually dependent risk suppression in women*****Sarah E. Hill, Kristina M. Durante**

Risky behaviors exhibited by women in the name of rendering themselves more attractive than their mating rivals may reflect functional suppression of the risks associated with these behaviors. That is, women's decisions to engage in behaviors such as visiting tanning beds or taking dangerous diet pills may reflect a context-dependent shift in risk estimates that function to prevent a woman from being outcompeted on the mating market. If so, they should vary strategically with the manipulation of cues associated with the presence of highly attractive same-sex competitors. We present evidence from two studies demonstrating that exposure to pictures of attractive same-sex others believed to be mating competitors suppresses women's estimates of the risks associated with potentially dangerous attractiveness enhancement behaviors. These findings are consistent with the view that specific types of risk-taking may reflect the functional execution of cognitive structures selected for their ability to solve adaptive problems inherent in mate competition.

F 11:10am***Fashion, rivals, and love: The effects of intrasexual competition and fertility on women's consumer behavior*****Kristina M. Durante, Sarah E. Hill, Carin Perilloux, Norman P. Li**

Recent research on consumer behavior has found that men participate in conspicuous consumption, displays of wealth, and monetary discounting in certain adaptive contexts (Griskevicius et al., 2007; Wilson & Daly, 2004). Less, however, is known about the contexts under which women alter their purchasing behavior. A simulated, online shopping program was designed to track women's spending patterns (at varying budgets) on clothing, undergarments, shoes, jewelry, and other fashion accessories – items that likely enhance a woman's ability to attract a high quality mate and effectively compete with same-sex rivals. In three studies, we explored factors that influence women's consumer behavior. Women reported to the lab at two points within the menstrual cycle – high-fertility (confirmed using hormone tests) and low-fertility. Near ovulation, women's spending patterns shifted toward sexy and revealing items. This change in spending was most pronounced when attractive, local same-sex rivals were thought to be present.

Session D-2: **Altruism**

Gabrielino

F 9:50am***How the consequences of Trivers (1974) lead to revisions of Hamilton (1964) and a new evolutionary explanation of altruism*****Craig T. Palmer, Kathryn Coe, Amber L. Palmer, Carl DeVito**

Two traits distinguish Homo sapiens from other species: 1) a high degree of traditional cultural behavior (i.e., behavior transmitted from parents to offspring), and 2) kinship altruism far beyond the degree of relatedness (.125 or first cousins) that is typically assumed to be the distance after which kin selection is ineffective. Based on the concept of “ancestor-descendant conflict,” this paper presents a mathematical model for a new theoretical explanation of the relationship between these two characteristics. The concept of “ancestor-descendant conflict” is a multi-generational diachronic extension of Trivers' concept of “parent-offspring conflict.” The multigenerational consequences of traditional parent-offspring conflict may explain why human kinship altruism extends to far more distant cousins than is predicted by kin selection. The concept of ancestor-descendant conflict leads to an extension and revision of Hamilton's rule “ $C < Br$ ” and constitutes an evolutionary explanation of human altruism that supplements the concepts of kin selection, reciprocal altruism and multilevel selection.

F 10:10am***The selfish hero? A study of the individual benefits of self-sacrificial behavior by members of small groups*****Francis T. McAndrew**

It has been proposed that costly acts of altruism are conspicuous displays of resources or character traits that enhance status and position the altruist for future reciprocation of favors and resources. This prediction was tested in a study involving 48 undergraduate students. Twenty-four same-sex, three-person groups consisting of an experimental confederate and two naive subjects participated in a “group decision making” study in which the success of the group depended upon the willingness of one of its members (the confederate) to endure pain and inconvenience. If the group successfully completed a series of tasks, it could divide \$45.00 among its three members. The results confirmed that engaging in self-sacrificial, costly behavior for the good of a group can be a profitable long-term strategy. The ordeal that individuals playing the role of the altruist had to endure was judged to be more difficult and costly than the experience of other group members, but in the end the altruists were rewarded with more money and higher status.

F 10:30am***Partner in life or one-night stand? How reproductive strategies might have shaped the evolution of altruism*****Julia Pradel, Lars Penke, Detlef Fetchenhauer**

Moral virtues have been an inspiring phenomenon for various researchers including those who investigate their relevance as mate choice criteria, and those who try to explain their evolutionary roots. Usually, the two lines of research rarely interact with each other as can be seen from the fact that within textbooks they tend to form isolated chapters. This work aims at integrating the two research lines by arguing that theories of mate selection might help solving the puzzle of the evolution of altruism. To specify, we assume that different levels of altruism evolved as a result of inter-individual variations in the propensity to engage in either short-term mating or long-term mating. Explicitly, we hypothesize that unattractive individuals show altruism to compensate for deficits in genetic quality and to win at least one long-term mate. Based on this idea, we tested whether individuals in fact look out for different levels of altruism depending on how long they intend a relationship to last. 170 raters watched short video-clips of target persons with varying physical attractiveness and received additional information on the targets’ level of altruism. In a between-subjects-design, raters indicated their desire to win the targets as either (a) short-term mates or (b) long-term mates. While altruism was a significant predictor for long-term desire, it was irrelevant for rating short-term mates. The results suggest that although altruism is costly, at least for some individuals it might be a wretched necessity to obtain access to mates and to reproduce.

F 10:50am***Trust and detection of trustworthiness*****Mizuho Shinada, Toshio Yamagishi**

General trust is the “default” expectation of other’s trustworthiness. From the adaptive perspective, high-trusters have an advantage over low-trusters in building new relationships, but they face the risk of being exploited by interaction partners. One path to building high trust is through the detection of other’s trustworthiness; if high-trusters detect other’s trustworthiness, they can avoid exploitation. This is the same logic as the coevolution between altruism and altruism-detection (Frank et al., 1993). Recent studies have reported that people can detect altruists from non-altruists in zero-acquaintance situations (Brown et al., 2003; Oda et al., in press; Verplaetse et al., 2005), but no study has shown that altruists can detect the other’s altruism more accurately than non-altruists. We conducted an experiment to examine whether high-trusters can detect others’ trustworthiness (i.e., allocation in Trust Game) more accurately than low-trusters using only non-verbal cues. Participants (perceivers, n=99) watched 5-sec video-clips. The videos were filmed while the other participants (targets, n=102) played a Trust Game. Before the experiment, we measured the perceiver’s trust level using a questionnaire. We found positive correlations between the perceiver’s trust level, “trustworthy bias” (i.e., the frequency that perceivers judged targets as trustworthy), and age: high-trusters and elderly perceivers tended to expect that most people were trustworthy. Furthermore, the perceiver’s trust level was positively correlated with the detection accuracy of trustworthiness when we controlled for the perceiver’s age: high-trusters were able to detect the trustworthiness of others with more accuracy than low-trusters.

F 11:10am***Punishers play chicken*****Alejandro Rosas**

Though altruistic punishment explains the success of large-scale human cooperation, its ability to invade when rare remains a puzzle. I argue that punishment can invade when rare and avoid the second-order free-rider problem if punishers are conceived of as playing an n-person Chicken game with forgivers. Envisage ancestral humans relying for survival on the production of public goods. Players divide between C (cooperators) and D (defectors) in the n-person PD. A small proportion of C is sustained initially in equilibrium with D by heavy group competition and enforcement through direct and indirect reciprocity in dyadic encounters. To increase the levels of cooperation, cooperators face the option to discipline defectors through costly punishment. Two new strategies - 'punish D' or 'forgive D' - are played, in two different games. Cooperators play a dyadic game with defectors; and an n-person dilemma among themselves. In the dyadic game, some cooperators decide to punish and defectors decide whether to change strategy (turn into C) or not. I establish the conditions for 'change strategy' to invade 'defector'. But for 'change strategy' to invade, punishment must be able to invade the population of cooperators, so I establish the conditions for punishment to invade. Because punishers obtain a net profit against defectors, the structure of their game with forgivers is an n-person Chicken, with $T > R > S > P$ representing the preferences over outcomes. With this game structure punishment can invade. I then estimate the group size that will favor the invasion of punishment.

Session D-3: Cultural Transmission

Ontiveros

F 9:50am***The spirits are not your friends: The predominance of beliefs concerning hazards*****Daniel M.T. Fessler, Anne C. Pisor, Carlos David Navarrete**

Because the ability to effectively acquire and use cultural information will have been a determinant of fitness in ancestral human populations, we can expect the mind to contain specialized mechanisms for the acquisition of such information. Attention and memory are limited, hence these mechanisms can be expected to be biased toward acquisition of information of greatest probable value. Because questions of resource acquisition are moot if survival is imperiled, all else being equal, information concerning hazards should have greater salience for culture-acquisition mechanisms than information concerning benefits. Likewise, the credulity with which information is met should in part be a function of the costs of individual learning; because the costs of learning about hazards are generally greater than the costs of learning about benefits, information about hazards should elicit greater credulity than information about benefits. Information about hazards should thus be more readily acquired, and more extensively retained and transmitted, than information about benefits. Acting in parallel, these features of the mind constitute Sperberian attractors such that, iterated over many instances of transmission, culture should bear their imprint. We examined i) a sample of the world's supernatural beliefs extracted from the Human Relations Area Files, and ii) a sample of contemporary urban legends collected from the Internet; in both, beliefs are more likely to contain information about hazards than information about benefits.

F 10:10am***Culture in transmission: A quantitative account of daily learning among Aka forest forager children from middle to late childhood*****Adam Howell Boyette**

A complete theory of cultural transmission will require empirical data on social learning among forager children. The process of cultural transmission is developmental, linked to socio-cognitive skills. Pace of development and the socio-ecological contexts in which children are raised influence how and what is learned during childhood. Foragers are thought to share a socio-ecological context similar to the one in which humans evolved. An account of forager children's activities throughout middle to late childhood is a first step in assembling this part of the puzzle of human cultural evolution. As such a step I collected time allocation data from Aka foragers in middle childhood through adolescence, considered an important period for social learning from a cognitive-developmental and ethnographic perspective. Here I present results of tests of the following hypotheses: observation should be common and explicit instruction rare based on previous ethnographic accounts; amount of time spent in observation should decrease with age as children acquire skills and cultural norms; observation during play should be greater than during work for younger kids, the opposite for older children; solitary play should decrease with age, and social play should increase concurrently before decreasing in place of work if social play has a crucial role in cultural norm inculcation across this age range. Age trends are modeled using linear regression. The implications of this research for the study of cultural transmission will be discussed, and future directions

for method and theory addressed.

F 10:30am

Prestige biased cultural learning among children

Maciek Chudek, Susan Birch, Joseph Henrich

Coevolutionary models describe the processes by which we developed a capacity for cultural learning and the learning biases these engendered. Recent evidence of selective imitation by young children constitutes a strong test of these models and their predictions. We review the existing research and describe our novel study of one the most robust of these evolutionary predictions: prestige-bias, a preference for learning from whomever others are attending to. We found that young children (mean = 50.5, SD=5.7 months, n=23) are about 1.5 times more likely imitate the preferences and behaviour of prestigious adult models. This preferential imitation generalises across behavioural domains, specifically from artefact use to food preferences, though not to novel label learning. This effect is strongest in the same domain in which a model's "prestige" was established, where prestigious individuals are 12 times more likely to be imitated.

F 10:50am

An investigation of the relationship between innovation and cultural diversity

Anne Kandler, Kevin N. Laland

In spite of extensive theoretical investigation into cultural evolution, the relationship between the rate of behavioural innovation and the level of cultural diversity remains comparatively unexplored. Here we use reaction-diffusion models to investigate how both independent invention and the modification and refinement of established innovations impact on cultural dynamics and diversity. We go on to investigate these relationships in the presence of biases in cultural learning. We find that the introduction of new variants typically increases cultural diversity substantially in the short term, but may actually decrease long-term diversity. While equilibrium levels of cultural diversity typically increase with innovation rate, this increase can be surprisingly modest, particularly when innovation occurs through refinements of earlier variants, or when conformist social learning is operating. Independent invention generally supports higher levels of cultural diversity than refinement. Repeated patterns of innovation through refinement generate characteristic oscillating trends in diversity, with increasing trends towards greater average diversity observed for medium but not low innovation rates. Conformity weakens the relationship between greater innovation and diversity. The level of cultural diversity, and pattern of temporal dynamics, potentially provide clues as to underlying process, which can be used to interpret empirical data. We propose that the detection of these characteristic patterns of diversity change in the archaeological record may potentially allow researchers to draw inferences about both the rate of innovation and the extent to which innovations are refinements. We go on to show that external factors as environmental heterogeneity or habitat shape can alter the relationship significantly.

F 11:10aam

Environmental and social conditions promoting human innovation

Ulf Toelch, Matthew M. Bruce, Gerardus J.M. Lucas, Marius T.H. Meeus, Simon M. Reader

A prominent feature of human behavior is the ability to deviate from established patterns and search for novel strategies, that is the ability to innovate. While novel behavior patterns can result in advantages, such as increased efficiency in exploiting a resource, innovation also carries costs. Time and energy have to be invested in researching a novel strategy where it is unclear whether this novel strategy will yield the desired outcome. Evolution is likely to have shaped cognitive strategies so that risky innovation is only undertaken under certain conditions. Here we present a series of experiments in which participants (N=180) were free to explore and exploit an unknown three dimensional computer game environment, their aim being to discover behavior patterns that provided positive pay-offs. We manipulated group performance and starting conditions to test for their possible influences on exploration, discovery, and exploitation of innovations. We found that (1) starting conditions influenced exploration, consistent with the proverb 'necessity is the mother of invention', and (2) that increased group performance increased the efficiency with which participants exploited previously discovered innovations. We will discuss these findings within an integrated framework of evolutionary psychology and economic theory of the diffusion of innovations.

Session D-4: **Sexual Strategies**

Alvarado

F 9:50am***Development of reproductive strategies: Infusing the Belsky, Steinberg, and Draper model with sexual selection***
Jenee James Jackson, Bruce J. Ellis, Gabriel L. Schlomer, Judy Garber

The Belsky, Steinberg, and Draper (BSD; 1991) model has garnered much empirical support, especially for the critical evolutionary prediction that early psychosocial stress should affect pubertal timing. However, the theory is not without limitations and several unresolved issues remain. One limitation is that the empirical research stemming from the BSD model provides a comprehensive account of female variation, but is lacking in its ability to explain male variation. This discrepancy could arise from inadequate specification of the different roles that men and women assume in reproduction. According to parental investment and sexual selection theory, males and females must solve unique problems when negotiating life history trade-offs. Females are biologically obligated to invest more in reproduction and thus are ultimately constrained by the resources that they can extract from the environment, their relatives, and their mates in order to successfully produce and rear offspring. As such, they should be especially attuned to the nature of the local ecology and psychosocial stressors within the home. Males, on the other hand, are ultimately constrained by their ability to attract females, and should be especially attuned to their ability to successfully engage in intrasexual competition. The current study examines the role of early psychosocial stress within the home, as specified by BSD, and competency within the peer group, as highlighted by a sexual selection perspective, on attachment orientation and sexual behavior. We predicted that female sexual behavior would be most strongly linked to psychosocial stress within the home, whereas male sexual behavior would be most closely associated with social/sexual competency among peers. We present the results of a multisample path analysis, which provides preliminary support for our model of sex-differentiated developmental pathways.

F 10:10am***Religiosity as a context dependent mating strategy: Sexual competitors increase belief in God***
Yexin Jessica Li, Adam B. Cohen, Douglas T. Kenrick

In 3 experiments, we examined religiosity as a malleable strategy tuned to local social ecology. In experiment 1, we randomly assigned 267 participants to view dating profiles or either attractive same sex or attractive opposite sex individuals. Then we measured their belief in God, rated importance of religion in general, and importance of religion to themselves. Both sexes were more religious after looking at members of their same sex vs. members of the other sex. Because of the lack of a pure control, it was unclear whether people become more religious after viewing the same sex, or less religious after viewing the opposite sex. A second study, involving 1504 students, also included a control group that saw no dating profiles. Compared to controls, members of both sexes became more religious when exposed to attractive members of their own sex. There was no significant change in religiosity for men who saw profiles of attractive women or women who saw profiles of attractive men. However, we did not know whether increases in religiosity arise from seeing attractive competitors, or any same-sex individuals in the dating market. So, in experiment 3, we manipulated whether participants saw unattractive same sex dating profiles from the University of Toronto, or pictures of couches (the control condition). Participants did not become more religious after viewing unattractive members of the same sex who are not potential dating competitors. The results of these three experiments suggest that intrasexual competition is responsible for the observed changes in religiosity.

F 10:30am***When the sexes conflict: Women's attractiveness and sociosexuality*****Mercedes M. Ward, Emily A. Stone, John A. Gauthier, Elizabeth Cashdan**

Women are generally viewed as the sex with greater bargaining power, and a common corollary is that women's sexual behaviors are determined by women's sociosexual attitudes. However, recent research points to the utility of examining separately behavioral and attitudinal components of sociosexuality. Indeed, sexual conflict theory suggests that such a distinction is necessary for an understanding of real-world patterns of human mating. For example, due to assortative mating, attractive women tend to partner with attractive men but attractive men are more likely than unattractive men to pursue a pure mating strategy (rather than an investing or mixed strategy). For an attractive woman, then, securing faithfulness from an equally attractive man may be difficult, and as a result, her sexual history may be more extensive than she wishes. We hypothesized that sociosexual attitudes would be a weaker predictor of sociosexual behaviors among attractive women than among less attractive women. We recruited female participants from the Salt Lake City area, and we assessed each participant's attractiveness in several ways: self-perceived, other-perceived (by male participants rating facial photographs), waist-to-hip ratio, body-mass index, and age. We used a survey instrument to collect information about women's sociosexual orientation and sexual and dating history. Preliminary analyses show support for our hypothesis.

F 10:50am***Testing the power and evolutionary theories of rape with cross-cultural and cross-national data*****Stephen K. Sanderson**

Two major contending theories of rape are the feminist or power theory and the evolutionary theory. The former holds that rape is primarily about men's attempts to exert power over women, whereas the latter contends that rape is a conditional reproductive strategy used by marginalized men in order to mate. The power theory, though overwhelmingly dominant in the social sciences, has never been properly tested. On the other hand, the evolutionary theory has been subjected to a number of empirical tests that provide support for it. This study tests both theories using cross-cultural and cross-national data. Results provide no support for the power theory. Higher rape rates are associated with less rather than more male domination, and changes in rape rates between 1964 and 2001 do not correspond to greater gender equality, as predicted by the power theory. By contrast, rape is associated with polygynous marriage, the capture of women from neighboring villages or tribes, and rates of murder, assault, and robbery. These results suggest that rape is part of a behavioral complex rooted in severe male-male competition over women, as the evolutionary theory predicts.

F 11:10am***Sexual double standards: The evolution of moral hypocrisy*****David M. Buss**

The "sexual double standard" usually refers to differing reputational consequences of women versus men for engaging in specific forms of sexual conduct, such as having sex with multiple partners or committing sexual infidelity. An evolutionary psychological analysis suggests that there exist multiple sexual double standards. One involves moral judgments about the sexual conduct of men versus women, although this is unlikely to be domain-general. Rather, domain-specific sexual double standards include judgments about the sexual conduct of (1) oneself versus one's romantic partner; (2) oneself versus same-sex rivals; (3) one's mate versus sexually available others of the opposite sex; and (4) kin and allies versus non-kin and enemies. I propose that several distinct psychological adaptations are required to explain multiple sexual double standards. These include intrasexual competition adaptations designed to inflict costs on sexual rivals; mate copying and mate preference adaptations in women that render sexually successful men attractive; mate value assessment adaptations in men that render sexually promiscuous women less valuable as long-term mates, but not as short-term mates; adaptations to enforce partner fidelity; and other adaptations to facilitate the success of one's own sexual strategies at the expense of mates and competitors. Tests from a study of 15 cultures ($N = 2,471$) of the reputational consequences of different sexual actions support aspects of this evolutionary framework. Discussion focuses on "the most fundamental double standard," which is not men versus women, but rather each individual as a reproductive competitor, to some extent, with everyone else.

Friday Afternoon Sessions

Session E-1: Symposium: Life History Strategy and Intrasexual Relations

Titan Theater

F 2:00pm*Fecundity, offspring longevity, and assortative mating: Parametric tradeoffs in sexual and life history strategy***Pedro S. A. Wolf, Aurelio José Figueredo**

Sexual reproduction likely evolved as a strategy that capitalizes on genetic diversity in response to unstable environmental features. These benefits, however, come with costs related to the fact that every offspring only carries 50% of the parent's genome by direct descent. These costs differentially impact the reproductive success of the parents as a function of their reproductive rates. We propose a mathematical theory, which refines reproductive life history theory to include the optimization of the costs and benefits of sexual reproduction through adjusting mate choice preferences and differential reproductive rates. Individuals who practice assortative mating on genetically polymorphic traits increase the genetic relatedness between parent and offspring and this increase in genetic relatedness increases the number of genes identical to theirs in subsequent generations. Therefore, without increasing reproductive rates, individuals evolved to have a slow life history can increase their genetic representation in subsequent generations without increasing their reproductive rates.

F 2:20pm*Comparing assortative mating and life history strategy as predictors of relationship satisfaction longitudinally***Sally Olderbak, Aurelio José Figueredo**

Two alternative hypotheses were tested longitudinally predicting relationship satisfaction in 198 heterosexual romantic relationships. The first was that the degree of assortative mating of each couple on Life History (LH) strategy would predict romantic relationship satisfaction. The second was that their absolute levels (within-couple mean LH strategy) would predict relationship satisfaction. Tested separately, both factors predicted relationship satisfaction initially and over a one year period. However, as predicted by Wolf and Figueredo (2009), the two alternative predictors were highly correlated. Tested within the same model, the couple's mean LH strategy was the single best predictor of relationship satisfaction. The assortative mating of the couple was predicted by their mean LH strategy, indicating that couples with a slower LH strategy were more assortatively mated, and there was no direct influence of assortative mating on relationship satisfaction, suggesting that the association between assortative mating and relationship satisfaction is caused by LH strategy.

F 2:40pm*Life history strategy predicts monitoring and interference in romantic relationships***Candace J. Black, Zachary J. Hohman**

Life History (LH) theory predicts highly heritable differential reproductive strategies, including higher levels of parental and nepotistic effort. According to kin selection theory, individuals will take action to ensure that their relatives choose strategies that enhance their reproductive success. Discouraging poor mate choice among kin may therefore be an adaptive element of slow LH strategy. We asked individuals about actions their parents took in monitoring and interfering with their romantic relationships and regressed this score on self-reported LH strategy, Sex of Respondent, and the interaction between them. Multiple regression results showed a positive main effect of slow LH strategy, a positive main effect of Sex, and a negative interaction between them. This indicated that slow LH strategy predicted more monitoring and interference with the romantic relationships of male than female offspring, but that there was more monitoring and interference with those of female than male offspring, regardless of LH strategy.

F 3:00pm***Life history strategy, executive functioning, and negative androcentrism*****Paul Gladden, Aurelio José Figueredo, D.J. Andrzejczak, Dan Jones, Vanessa Smith-Castro**

Previous findings suggest that slow Life History (LH) strategy is associated with increased levels of Executive Functioning (EF), decreased levels of negative ethnocentrism, and decreased levels of sexually coercive behaviors. We predicted that slow LH strategy should therefore predict decreased levels of negative androcentrism (bias against women). A sample of undergraduate students responded to a battery of questionnaires measuring their LH Strategy, Sociosexual Orientation, Mating Effort, Executive Functioning (inhibition, shifting, updating), Emotional Intelligence, and various convergent measures of Bias Against Women (Negative Androcentrism). Fast LH Strategy was associated with decreased EF and increased negative androcentrism, with EF significantly mediating the relationship between LH and negative androcentrism. These results suggest that slow LH and higher EF may inhibit bias against women in the same way that it inhibits bias against other ethnic groups. Further, this suggests that EF and antisocial attitudes may also mediate the association between LH and sexual coercion.

F 3:20pm***Life history strategy, executive functions, and intimate partner violence*****Aurelio José Figueredo, Paul Gladden, Connie J. A. Beck, Marcela Sotomayor**

A structural equations model was tested on questionnaire data from 120 University of Arizona undergraduate students in Tucson, Arizona, on Intimate Partner Violence (IPV) and a variety of theoretically-specified predictors. These included the Arizona Life History Battery (ALHB), the Brief Ratings Inventory of Executive Functions (BRIEF-A), the Multidimensional Sociosexual Orientation Inventory (MSOI), the Culture of Honor Revenge Scale (COH-RS), the Levenson Self-Report Primary and Secondary Psychopathy Scale (LSRP), the Reactive-Proactive Aggression Questionnaire (RPQ), and the Mate Value Inventory (MVI). IPV was measured using the Conflict Tactics Scales - 2 (CTS2) and the Relationship Behavior Rating Scale - Revised (RBRS-R). Various indirect effects of slow Life History (LH) strategy on IPV were mediated through higher Executive Functions, lower Short-Term Mating propensity, lower Revenge ideology, lower Psychopathic and Aggressive Attitudes, and higher Mate Value. A cross-cultural replication was also performed on a sample of University of Sonora undergraduate students in Hermosillo, Sonora.

Session E-2: Mate Choice I

Gabrielino

F 2:00pm***Mate choice among the Mayangna and Miskito of Nicaragua: A cultural consensus analysis approach*****Jeremy M. Koster, Melissa M. Sloan**

We report on the use of photo rankings and the cultural consensus model to investigate mate choice preferences in a remote community of indigenous Nicaraguan horticulturalists. Photographs were taken of all male household heads. Informants then used these photographs to rank the men according to wealth and hunting ability. Informants were also asked to rank their desirability as husbands while imagining that they were giving advice to unmarried female relatives about the kind of spouse they should seek. Consensus analysis indicates that there is high agreement on the rankings of both wealth and hunting ability, with average competencies of 0.82 for each dataset. Although the rankings of desirability as husbands exhibit relatively weaker agreement, there is still a consensus pattern in the rankings, and the average competency is 0.64. Using the average rankings from the desirability analysis as the outcome variable, we find that desirability is significantly correlated with wealth, as predicted by evolutionary theory. Controlling for the effect of wealth on the rankings, we also find that hunting ability is significantly correlated with desirability. Finally, we propose a method for examining kin-related biases in the rankings. This study demonstrates the value of consensus analysis for research on mate choice and signaling theory. Also, given previous evidence that hunters rarely donate meat for public consumption, the strong consensus on hunting ability in this study suggests that hunters do not necessarily have to rely on costly signaling to convey reliable information about their proficiency and skills.

F 2:20pm***Meet the parents: An evolutionary perspective on the introduction of parents and mates*****Catherine Salmon, Maryanne Fisher**

A sample of undergraduate students from the University of Redlands in Southern California and from St Mary's University in Halifax, Nova Scotia completed a questionnaire surveying attitudes and behaviors surrounding the meeting of a partner's parents or introducing one's own partner to parents. We were interested in the reasons articulated for such encounters and the ideal timing of such meetings. There exists very little research on the reasons that people want their mates to meet their parents. The most easily available explanations deal with social factors. For example, if parents are central figures to one's life, then one should want a potential mate to meet these important figures. This explanation is not satisfying, on its own. From an evolutionary perspective, for example, one might want to meet their mate's parents to ascertain how their mate might age, and hence, have an indication of their health, attractiveness, fertility, personality, loyalty to family, and so on. The results of our study detail an evolutionary perspective on meeting the parents and bringing one's mate home.

F 2:40pm***Driving hard bargains: Biological markets influence human mate choice*****Thomas V. Pollet, Daniel Nettle**

Predictions from biological market theory (Noë & Hammerstein, 1994/1995) on human behaviour have remained largely untested. One of the predictions derived from biological market theory is that an oversupply of males should allow females to become 'choosier' and refuse mates which would be acceptable when the sex ratio in the population is balanced. Here we test this specific prediction in two samples using Generalized Linear Mixed Models. Firstly, we show in a large historic US sample ($n > 20,000$ men) that when there is an oversupply in men, as measured by operational sex ratio at state level, male socio-economic status becomes significantly more important for successfully attracting a wife. Secondly, in a large sample from Uganda ($n > 1,100,000$ men), we show that as the district's operational sex ratio becomes more and more male-biased, landownership becomes increasingly important for successfully attracting a second wife. In addition, if local inequality in terms of landownership is large, those men who own land are significantly more likely than landless men to become polygynous, compared to when local inequality is small. Thus, if a relevant trait becomes locally scarce on the market, men carrying this trait are vastly more likely to obtain a (second) mate. We will also present some work in progress where we model Rwandese women's decision to marry monogamously or polygynously from a biological market perspective ($n > 90,000$ women). The results are discussed with reference to the literature on biological markets, operational sex ratios, and human mate selection.

F 3:00pm***Humans show mate copying after observing real mate choices*****Skyler Place, Peter Todd, Lars Penke**

When searching for a mate, one must gather information to determine the mate value of potential partners. By focusing on individuals that have been previously chosen by others, one's selection of mates can be influenced by another's successful search – a phenomenon known as mate copying. We show evidence of mate copying in humans with a novel methodology that closely mimics behavioral studies with non-human animals and goes beyond the use of staged still-picture stimuli in previous human mate copying studies. After viewing instances of real mating interest in video recordings of speed-dates, both male and female participants demonstrate mate copying effects for short-term and long-term relationship interest when they perceived the dates as successful. We also found that attractiveness can mediate whom an individual will choose to copy. These findings bridge the gap between animal and human mate copying research and highlight a new methodology to further the study of this phenomenon.

F 3:20pm

Trait-based versus individual-based mate choice copying in humans

Robert I. Bowers, Peter Todd, Skyler S. Place, Lars Penke

Individual mate choice decisions are generally assumed to be made independently of each other. However, females of several species have been shown to copy the sexual preferences of other conspecific females. Such mate choice copying, a form of nonindependent mate choice in which decisions are informed by available social information, can have systematic effects on sexual selection. The impact of mate choice copying depends on whether the increased preference is specific to the individual observed, or generalizes to other potential mates with similar characteristics. Using videos of speed-dating couples as stimuli, our laboratory has shown that a person who is seen in a positive interaction with a member of the opposite sex is, more often than not, thereafter rated more appealing as a potential mate by other observers, evidencing mate choice copying. Here we discuss the extent to which this effect generalizes to other potential mates with shared characteristics, or is restricted to an increased attractiveness of the individuals seen in the interactions—that is, whether humans show trait-based or just individual-based mate choice copying.

Session E-3: Social Contracts, Cheater-detection, and Morality

Ontiveros

F 2:00pm

Can people discriminate cheaters from cooperators when they have incentives to manipulate their impressions?

Toko Kiyonari, Joanna Schug, Mizuho Shinada, Taiki Takahashi, Toshio Yamagishi

Researchers hypothesize that humans have evolved sensitivity to cues exhibited by cheaters and cooperators (e.g., Cosmides & Tooby, 1992). There is some evidence suggesting that people can visually discriminate defectors from cooperators (e.g., Brown et al., 2003; Verplaetse et al., 2007). Except for Frank's (1988) study, however, these results were obtained in situations in which defectors had no incentives to deceive others. In this study we examine if naive observers can distinguish defectors from cooperators even when defectors may be motivated to present themselves positively. 150 participants played a "semi sequential" PD game, half as first-players and half as second-players. First-players decided to cooperate or defect, and second-players made the same decision without knowing the first-player's choice. The first-player was given a chance to present a video message to the second-player before the latter made their decision. After the PD game, players played a separate one-shot, semi-sequential Stag Hunt (SH) game, a coordination game (e.g., Skyrms, 2004) where cooperation is the best choice insofar as the other also cooperates. In this game, the first-player was not given a chance to send a video message. Our preliminary results suggest that the actual behavior of the first-player did not affect the second-player's prediction: they were unable to discriminate defectors from cooperators. However, additional analysis suggested that second-players were able to detect "hard-core defectors" who defected in both PD and SH games. More data will be reported at the conference.

F 2:20pm

Wason selection task performance in schizophrenia and autism

R.J. Sullivan, M. Solomon, M. Minzenberg, J. Yoon, J.D. Ragland, S. Ursu, E. Ermer, C. Carter

An influential interpretation of the conditional nature of Wason Selection Task performance [WST] performance is that it reflects content-dependent cognitive processes sensitive to violations of social rules. WST performance has been assessed in individuals with frontal lesions and schizophrenia, but not in individuals with autism spectrum disorder (ASD). Social deficits are prominent in both ASD and schizophrenia and the conditional sensitivity of WST performance makes it an ideal test of continuity, or lack thereof, of social cognitive performance in ASD, schizophrenia and typical development. Data gathering is proceeding in three groups: adult ASD participants, participants with schizophrenia diagnoses, and typically-developing controls. Participants are responding to five WST social-contract, five precautionary, and five descriptive problems. Preliminary results indicate that WST social-contract performance is relatively impaired in participants with ASD when compared to participants with schizophrenia and typical development, and that social-contract performance and General IQ are correlated in participants with ASD, but not in schizophrenia and typical development. We will interpret our results and discuss whether social cognition is content dependent and differently impaired in ASD relative to other mental disorders characterized by social deficits. We will discuss whether ASD participants are using generalized cognitive resources to solve the WST problems reflected in an apparent relationship between IQ and WST performance. In contrast to the patterns emerging in the ASD data, we will consider whether content-dependent cognitive processes sensitive to social-rule violations are intact in schizophrenia and typical development, and are independent of IQ.

F 2:40pm***Social reasoning in psychopathy*****Elsa Ermer, Kent A. Kiehl**

Psychopathy is a serious personality disorder with interpersonal, affective, and behavioral components. Psychopaths show a profound lack of morality and behavioral controls in the presence of intact general intellectual functioning. Two hallmarks of psychopathy are the persistent violation of social contracts (i.e., cheating) and chronic, impulsive risk-taking. These behaviors present a puzzle: can psychopaths understand and reason about what counts as cheating or risky behavior in a particular situation? Is their reasoning intact, but the outputs are not implemented in decision making and/or other behavioral systems? To begin to address these questions, we tested incarcerated psychopaths' and non-psychopaths' reasoning about social exchange, precautionary, and social descriptive rules using the Wason selection task. Compared to non-psychopaths, psychopaths showed significant impairment on social exchange and precautionary rules, but not descriptive rules. Incarcerated non-psychopaths' performance on social exchange and precautionary rules was comparable to performance in undergraduates. IQ and reaction time data suggest that these results cannot be accounted for by intelligence or motivational differences. These results suggest that examination of evolutionarily-identified reasoning processes can be a fruitful research approach for identifying which specific mechanisms are impaired in psychopathy.

F 3:00pm***The omission effect and the design of moral psychology*****Peter DeScioli, Rebecca Bruening, Robert Kurzban**

Moral judgment involves much more than computations of the expected consequences of behavior. The complexity of moral cognition is illustrated by the frequently-replicated finding that violations by omission are judged less morally wrong than violations by commission, holding intentions constant. Here we test a novel hypothesis: Omissions are judged less harshly because they produce little material evidence of wrongdoing. Evidence is crucial because moral accusations are potentially very costly unless supported by others. In our experiments, the omission effect was eliminated when physical evidence showed that an omission was chosen. Perpetrators who "opted out" by pressing a button that would clearly have no causal effects on the victim, rather than rescuing them, were judged as harshly as perpetrators who directly caused death. These results show that to reduce condemnation, omissions must not only be non-causal, they must also leave little or no material evidence that a choice was made.

F 3:20pm***The omission effect in a reverse dictator game*****John Christner, Peter DeScioli, Robert Kurzban**

The omission effect refers to people's judgments that moral violations are less wrong when they result from omission compared with resulting from commission, holding constant consequences and intent. The effect has been observed both in individuals' first-person omission decisions and their third-person judgments of others' omissions, but the explanation for these patterns remains unclear. Here we consider the relationship between first-person and third-person omission judgments, asking whether third person judgments might explain first-person decisions. In variants of the Dictator Game, participants were presented with decisions in which they could 1) benefit their counterpart, 2) act selfishly, yielding their counterpart very little, or 3) fail to act, yielding their counterpart nothing while earning themselves marginally less money than the selfish action. We predicted that people would forgo money by omitting selfishly, rather than acting selfishly, and that this tendency would be accentuated when third-party punishment was possible. Finally, we predicted that such strategic omissions would indeed be punished less than selfish actions, even when omissions led to inferior outcomes. We present the results of a series of studies using methods from experimental economics to investigate these predictions.

Session E-4: **Menstrual Cycle**

Alvarado

F 2:00pm***Men's facial masculinity, but not their intelligence, predicts changes in their female partners' sexual interests across the ovulatory cycle*****Steven W. Gangestad, Randy Thornhill, Christine E. Garver-Apgar**

A substantial body of work demonstrates that women's mate preferences change across the ovulatory cycle. When fertile in their cycles, women are especially attracted to masculine features (e.g., faces, voices, bodies), socially dominant behavior, and male scents associated with body symmetry and social dominance. Women may also find intelligent men particularly attractive when fertile, though most available findings do not support this claim. Related research shows that, on average, romantically-involved women report stronger sexual attraction to men other than their pair-bond partners, but not partners, when fertile, and especially when their partners lack features fertile women prefer (e.g., symmetry). In the current study, we examined whether women's patterns of sexual interests across the cycle are similarly moderated by partners' facial masculinity, facial attractiveness, and intelligence. Results revealed predicted effects of male partners' facial masculinity and attractiveness, but no hint of any effect of partners' intelligence. To explain the lack of effect of men's intelligence, we propose a new conceptualization of the role of intelligence in the human mating system.

F 2:20pm***Kin affiliation across the menstrual cycle: Evidence for incest avoidance near ovulation*****Elizabeth G. Pillsworth, Martie G. Haselton, Debra Lieberman**

In many nonhuman mammals, females avoid inbreeding by reducing affiliation with male kin during the fertile period of the ovulatory cycle. Using women's cellular phone records—an objective source of evidence of women's motivation to affiliate with others—this study examined whether the same pattern would be found in humans. We predicted that women would initiate fewer calls and participate in shorter bouts of communication with fathers and brothers during the ovulatory phase of the cycle, when conception is most likely to occur, relative to nonfertile phases of the cycle. We obtained complete, month-long records of 39 normally-cycling women's incoming and outgoing cell phone calls. Using a multilevel mixed-effects Poisson model, we examined the nested relationships of fertility and caller relationship within individual women's communication patterns. Fertility interacted with sex of kin to predict both the number of calls women make to a parent ($z = -2.48, p < .05$) and the amount of time they spent on calls they initiated to a parent ($z = -7.01, p < .001$). The pattern showed that women initiated communication less with a parent at high fertility only if that parent was their father. There was no main effect of sex of parent on either of these variables, indicating that, overall, women in this study communicate equally with their mothers and fathers. Fertility also had no effect on the number of calls made by parents to daughters, but did affect the amount of time women stayed on the phone when their parents called them ($z = -4.60, p < .001$). This is the first evidence of adaptation in human females to avoid affiliation with male kin when fertility is at its highest.

F 2:40pm***Menstrual cycle phase influences both subjective and objective reward value of male faces: An event related fMRI study*****Katherine M. Reding, Steven M. Platek**

Women exhibit a preference shift toward masculine and symmetrical faces during the follicular phase and toward feminine and self-resembling faces during the luteal phase of the menstrual cycle. This effect is pronounced when current or projected (long-term/short-term) relationship status is taken into account. Recent fMRI research has focused on the neural correlates of preferences for male faces and the affect of hormonal shifts. In an effort to better understand the proximate mechanisms of cyclic face preferences we investigated the changes in neural activity during subjective attractiveness judgments and objective reward evaluations when viewing faces that varied in masculinity, symmetry, femininity, and self-resemblance. Our results demonstrated that regions associated with attractiveness judgments and reward evaluation of all four face types increased in activity in the follicular phase. When the objective reward value of each face type was considered separately we identified a fluctuating pattern of neural activation which increased when processing self-resembling faces during the luteal phase. No alteration was shown for masculine, feminine, or symmetrical faces, suggesting that the menstrual cycle has a biased effect on altering the reward value of self-resembling faces when fertility risk is low. Preference shifts discovered in current behavioral research may be the result of proximate mechanisms which increase the reward value of self-resembling faces when kinship affiliations are most likely to affect reproductive success and those that heighten neural activation in regions associated with mate-choice decision making and reward receptivity when the benefits of seeking out and identifying high quality mates is greater.

F 3:00pm

Menstrual cycle alters preference for facial movement

Edward R. Morrison, Andrew P. Clark, Lisa Gralewski, Neill Campbell, Ian S. Penton-Voak

Women's preferences for facial structure vary over the menstrual cycle. Little is known, however, as to how preferences for behaviour may be influenced by hormonal factors. Here, we demonstrate that social properties of facial motion influence attractiveness judgments in the absence of other cues, and that women's preferences for these displays vary over the menstrual cycle, as has been demonstrated for structural traits of faces. We produced shape-standardized facial models that were animated with male movement and assessed for proceptivity (flirtatiousness). In fertile phases of the menstrual cycle, women showed stronger preferences for proceptive movement, but not for absolute movement. These data show that women a) recognize specific mating-relevant social cues in male facial movement and b) are differentially influenced by these cues at different phases of the menstrual cycle. This preference for proceptivity may promote the adaptive allocation of mating effort towards men who are, in turn, likely to respond positively.

Friday Evening Sessions

Session F-1: **Pathogens and Parasites**

Titan Theater

F 4:00pm

Parasitic infection and the worldwide distribution of cognitive ability

Chris Eppig, Corey Fincher, Randy Thornhill

Parasitic infection may affect normal ontogenetic resource allocation in the body in four ways: (1) Some parasitic organisms feed directly off of the body's tissues, which must be replaced at energetic expense, (2) some parasites inhabit the intestinal tract or cause diarrhoea, limiting the body's access to its own intake of nutrients, (3) viruses use the body's cellular machinery to reproduce themselves, at the energetic expense of the host, and (4) the body must activate its immune system to fight off the infection, at energetic expense. The brain is disproportionately metabolically expensive, both to build and to run, especially during early childhood. Any other demands on the body's energetic budget will adversely effect the allocation of this budget towards brain growth and other development. For this reason, we propose that parasitic infection is a major cause of the worldwide distribution of cognitive ability. We found that, on the cross-national level, parasitic infection and average IQ correlate at $r = -.82$ ($p < .0001$, $n = 182$). These findings are robust when analyzed by continent, and when the effects of education and other factors are removed. This framework also sheds light on the relationships between intelligence and body symmetry, allergies, asthma, height, and attractiveness.

F 4:20pm

Drug use as potential protection against pathogens: Tobacco consumption vs. helminth load in Aka foragers

E.H. Hagen, C. Roulette, B.S. Hewlette, R.J. Sullivan

Current neurobiological theory of drug use is based on the observation that all addictive drugs induce changes in activity of dopaminergic circuitry, interfering with reward processing, thus enhancing drug seeking and consumption. Current theory of drug origins, in contrast, views almost all major drugs of abuse, including nicotine, cocaine and opiates, as plant neurotoxins that evolved to punish and deter herbivores. According to this latter view, plants should not have evolved compounds that reward or reinforce plant consumption. Mammals, in turn, should not have evolved reinforcement mechanisms easily triggered by toxic substances. Situated in an ecological context, drug reward is a paradox. We report results of a study among Aka foragers of the Central African Republic that tested one potential resolution of the paradox, namely that humans, like other animals, might have evolved to counter-exploit plant neurotoxins. The Aka have high levels of helminth infection yet little access to Western anti-worm medicines, and so might be motivated (consciously or unconsciously) to increase consumption of certain readily available substances. The plant defensive chemical nicotine, in particular, is an effective anthelmintic. Commercial cigarettes and locally grown tobacco are widely used at the study site. We recruited 40 adult Aka men and women into a cross-sectional study of smoking behavior vs. levels of intestinal helminths. Each participant was interviewed about tobacco use and provided saliva and stool samples to assess exposure to nicotine and levels of intestinal helminths, respectively. As predicted, mean levels of intestinal helminths among smokers were significantly lower than among non-smokers.

F 4:40pm

Parasite transmission mode and cross-cultural variation in human values

Randy Thornhill, Corey Fincher

The parasite-stress theory of human values and associated cognition and behavior has been supported by several recent cross-national studies. The value systems of ethnocentrism, xenophobia, neophobia, philopatry and extended family nepotism appear to serve an anti-pathogen defense function. Under high parasite prevalence these values are observed whereas low parasite stress evokes their antipodes of nuclear family nepotism, xenophilia, neophilia, and dispersal. For example, parasite stress across many countries of the world positively predicts collectivism (negatively individualism), restricted sexual behavior and gender inequality and negatively predicts democratization (reviewed in Thornhill et al. 2009 *Biological Reviews* 84: 113-131). Parasite stress in these cases was measured without reference to differences in transmission mode between parasites. People contract zoonotic parasites from non-human animals but non-zoonotic parasites from people. Non-zoonotic parasites, because of their inter-human transmission, are most central to the parasite-stress theory's mechanism of how parasites in the local ecology ontogenetically build values of people. Zoonotic and non-zoonotic disease loads for almost all the world's autonomous states were tabulated. As expected from the parasite-stress theory, human values and political systems across the world are primarily predicted by non-zoonotic diseases, not by zoonotics.

F 5:00pm

What's so wrong about gettin' lovin' from a cousin? Factors predicting consanguineous marriage among indigenous populations

Ashley Hoben, Abraham P. Buunk

Choice of marriage partners among humans is a topic of interest across many disciplines. One type of marriage partner that tends to be ignored in the literature is consanguineous partners. Consanguineous marriages continue to occur at an extremely high rate in various parts of the world, with certain areas as high as 50%, while in other areas of the world this practice is nonexistent and forbidden. This variation may reflect functional responses to different ecological or family pressures. With data from hunting and gathering societies, we examined geographic isolation and local pathogen prevalence as possible predictors of the variance in occurrence of consanguineous marriages. Geographic isolation and pathogen prevalence were both significant predictors of whether or not a group practices consanguineous marriage. Previous studies have demonstrated that in areas with high pathogen prevalence, individuals tend to be more xenophobic; thus, consanguineous marriage may be an extreme form of avoidance of marriages with outgroup members in some societies. These points will be discussed, along with ideas for future exploratory investigations.

Session F-2: **Homosexuality**

Gabriellino

F 4:00pm

The rise of modern homosexuality: An exercise in evolutionary historiography

Andreas de Block, Lesley Newson

Sexual relationships between men are of all times. But a number of sex historians have argued that the early beginning of the 18th century witnessed a dramatic change in the homosexual scenery. In the early 1700's, urban subcultures of homosexual men emerged in north western Europe. The homosexual subcultures were associated with changes both in homosexual behaviour and in thinking about same-sex sexuality: (1) modern homosexual relations tend to be more symmetrical and less age-based, (2) the state took over the role of family in defining homosexual behaviour, (3) a homosexual identity emerged, and (4) modern homosexuals were much more exclusively homosexual than pre-modern homosexuals. Historians and sociologists differ in opinion about why modern homosexuality emerged, but all unanimously reject evolutionary theory as a tool for overcoming the dissent. However, the explanatory and modelling principles of evolutionary theory can be used for historical studies of homosexuality. Urbanization and industrialization created an environment that influenced conditional sexual strategies, including homosexual strategies. For instance, the new ecological context necessitated stronger symmetric alliances between non-kin. Furthermore, this context also urged the social and political elite to control sexual behavior in unprecedented ways. Together with new types of social transmission, also resulting from urbanization and economic development, this resulted in modern homosexuality. Although some sex historians already hinted at these factors, our evolutionary approach has a distinct surplus value for the traditional historiography of homosexuality, be it alone because it makes clear that the emergence of this type of homosexuality is probably not a historically unique phenomenon.

F 4:20pm***Sexual orientation lies smoothly on a continuum: New data and evolutionary implications*****Robert Epstein**

In a study with nearly 18,000 subjects obtained over the Internet in several countries, Kinsey's hypothesis that sexual orientation lies on a continuum from heterosexual to homosexual was confirmed. Using a new 18-question inventory that posed questions about attraction, behavior, and fantasies, Mean Sexual Orientation (MSO) scores were distributed relatively smoothly on a 14-point scale (the Sexual Orientation Continuum, or SOC). The continuum was constructed in a way that preserves information about same-sex and opposite-sex attractions as if they are on separate scales. Self-identifications of subjects as "gay," "straight," "bisexual," and "other" corresponded to broad, skewed distributions on the continuum, suggesting that such terms are misleading for many people. The new inventory also allowed the measure of Sexual Orientation Range (SOR)—roughly, how much flexibility someone has in expressing sexual orientation. SOR was found to differ from one person to another and to vary smoothly from a high to a low value across the subject population. Significant differences in MSO (but not SOR) were found for different ethnic groups. MSO and SOR scores were higher for females than males. The shape of the distribution of scores for subjects in the United States was similar to the shape of the aggregate distribution of scores for subjects in more than 40 countries outside the United States. The study suggests that less than 10 percent of the population has the exclusive kinds of attractions suggested by the terms "straight" and "gay." Implications for evolutionary theory are discussed.

F 4:40pm***Explaining change and diversity in beliefs about homosexuality*****Lesley Newson, Andreas de Block, Peter Richerson**

In Western cultures it is now common for people to have identities and be categorized by others on the basis of "sexual orientation". But this idea was adopted relatively recently in the West and has not been readily adopted by people in non-Western cultures. We have proposed an explanation for cultural differences in beliefs about a number of aspects of behavior including homosexuality (Newson & Richerson, 2009). The structure of communities changes when societies develop economically and this sharply reduces that proportion of social interaction that occurs between kin relative to non-kin. This change is likely to initiate a cultural evolutionary process affecting norms related to reproduction. Information exchanged between non-kin is less encouraging of fitness-maximizing behavior so social pressure to pursue reproductive success is reduced in non-kin-based communities. This will allow norms to increasingly diverge from those which maximize fitness. As the cultural change proceeds, it is increasingly seen to be appropriate for individuals to make choices on the basis of personal preferences rather than a desire for children and a feeling of duty to kin. I will report the results of a test of this prediction which use data from cross-national surveys. Country-level factors are strong predictors of an individual's attitude to homosexuality and the pattern of differences between countries is consistent with the suggestion that populations are at different points on a cultural evolutionary trajectory.

F 5:00pm***Does mother always know best? Maternal depletion and the origin of homosexuality*****Eldin Jasarevic, Curtis Atkisson, Mary K. Shenk**

Demographic observations from traditional and modern societies indicate several intriguing patterns: (i) later born sons have lower reproductive success, (ii) later born sons tend to be of lower weight, (iii) later born sons tend to have shorter gestation periods, and (iv) the presence of multiple older brothers, but not sisters, increases the probability of homosexuality in later-born sons. These patterns suggest a relationship between birth order, maternal condition and male homosexuality. Furthermore, a robust corpus of evidence suggests that male homosexuality has a strong biological basis and that social factors have little influence on its etiology. Researchers report genetic, morphological, neuroanatomical, physiological, cognitive, and behavioral differences between heterosexual and homosexual males. In light of these results, we propose that along with genetic factors, maternal depletion associated with high fertility and male biased parity, environmental stressors and high physical workloads during pregnancy increase the probability of prenatal programming of male homosexuality. Multiple male children drive maternal depletion and limit the resources a mother can allocate to later born sons during prenatal and postnatal development. Decreased resource allocation during critical periods of prenatal development retains demasculinized brain regions in homosexual males, and alters long-term behavior and neuroendocrine activity. Regarding the evolution of homosexuality, we argue that maternal depletion may arise from sibling competition, in which early born siblings employ strategies to acquire limited maternal resources that cannot be redistributed to later-born siblings. In such a case, we propose a maternal resource allocation strategy that could result in a homosexual son.

Session F-3: **Reputation and Altruism**

Ontiveros

F 4:00pm***Balancing reputational costs and benefits: An evolutionary model of “bystander effects”*****Pat Barclay**

Reputation-based theories of cooperation generally predict that generosity will increase with larger audiences. However, this clashes with numerous studies in social psychology demonstrating “bystander effects” – the tendency for individuals to be less likely to help as the number of bystanders increases. Here I present a general mathematical model of reputational benefits and costs for helping and not-helping which was inspired by this apparent contradiction. Individuals may help to gain reputational benefits (e.g. reciprocity, signaling), avoid reputational costs for not helping, or because they have some stake (e.g. kinship) in a recipient’s well-being. When the personal costs of helping outweigh the reputational benefits, individuals would prefer that others provide the costly help to the recipient, but might help if no one else will. As such, the likelihood of any individual helping decreases as the number of potential helpers increases or as others become more likely to help. The model shows how helping will vary according the different reputational and non-reputational costs and benefits experienced by different people, and when opportunities to help will be sought or actively avoided. Furthermore, it can be generalized to include within-group competition against those who do not pay the costs of helping. As such, it provides a useful model for combining different ultimate causes of generosity and for predicting the occurrence of generosity.

F 4:20pm***Peers are watching you: Eyes promote altruism toward in-group members*****Nobuhiro Mifune, Hirofumi Hashimoto, Toshio Yamagishi**

According to Haley and Fessler (2005) people tend to be altruistic facing eye-like paintings due to the concern of incurring negative reputation. We applied this logic to in-group favoritism in a dictator game with minimal groups. Yamagishi and Mifune (2008) demonstrated that dictators allocate resources more fairly to minimal in-group recipients than out-group recipients only when both parties knew each other's group membership. This in-group favoritism disappeared in the private knowledge condition, when the dictator knew that the recipient did not know the dictator's group membership, because the dictators' concern of incurring negative reputation is not relevant in this situation. In other words, in-group favoritism occurs because of reputational concern. As such, we expected that even in the private knowledge condition in-group favoritism would occur when participants faced eye-like paintings which elicit reputational concern. Results from two studies using the dictator game supported our prediction, as eyes promoted altruism toward an in-group recipient but not an out-group recipient. We maintain that people hold reputational concerns which promote altruism toward in-group members exclusively because these concerns are adapted to indirect reciprocity occurring within groups.

F 4:40pm***Is reputation the proximate motivation underlying pro-social behavior?*****Karthik Panchanathan, Willem Frankenhuis, Joan Silk**

People consistently exhibit preferences for outcomes that benefit others, and are (sometimes) willing to incur costs to achieve these pro-social outcomes, even in anonymous, one-shot settings. In the Dictator Game, for example, dictators often transfer half their endowment to recipients. Although well-documented in the laboratory and in cross-cultural field settings, researchers disagree about the proximate motivations underlying the behavior. Some argue that prosocial behavior is motivated by a concern for the welfare of others. Others argue that prosocial behavior is motivated by a desire to be perceived as altruistic by others, and that reputation concern is evoked in experimental settings by subtle cues that others are watching. The reputation hypothesis seems to conflict with the well-documented “Bystander Effect,” in which the likelihood of any one individual offering help decreases as the number of potential helpers increases. If helping behavior is motivated by reputation concern, the presence of onlookers should increase the likelihood of giving help, not decrease it. To investigate this contradiction, we modified the standard Dictator Game, varying the number of dictators transferring to a single recipient. In the first experiment, dictators made simultaneous transfers to recipients. To eliminate the possibility that dictators were influenced by fairness concerns with other dictators, we conducted a second study in which dictators made offers in response to offers made by other dictators. Both of these experiments were administered in the laboratory with monetary stakes and online with hypothetical stakes.

F 5:00pm

“Warning-type” punishers are preferred by altruists while they are avoided by free-riders

Yuko Morimoto, Satoshi Nakashima, Motoki Watabe, Takashi Kusumi

It has been suggested that a punisher acquire good reputation and are preferred by others (Barclay, 2006, Kurzban et al., 2007). According to Morimoto et al. (2008), there are two types of punishment to free-riders: justifiable punishment, Warning, and unjustifiable one, Vengeance. In order to test whether or not reputation on these two types of punishments are different from one another, we conducted a vignette-type questionnaire survey in study 1. It was found that Warning-type punishers are evaluated as fair and trustworthy, meanwhile Vengeance-type punishers are evaluated as unfair and untrustworthy. Participants in study 1, however, answered that they would like to befriend neither Warning-type nor Vengeance-type punishers, indicating that they do not prefer punishers even though the punishment is Warning-type. In study 2, we separated the participants into two groups by using Dictator Game: altruists and free-riders. We predicted that free-riders tend to avoid both types of punishers because they are most likely to be punished by them, while altruists tend to avoid Vengeance-type punishers and prefer Warning-type punishers. As predicted, altruists prefer Warning-type punishers and avoid Vengeance-type punishers; free-riders prefer neither of them. On the other hand, both altruists and free-riders evaluate two types of punishers differently: Warning-type punishers are fair, meanwhile Vengeance-type are not. In sum, altruists differently evaluate two types of punishers and give good reputation to and prefer only justifiable punishers, while free-riders also evaluate them differently but simply dislike both of them.

Session F-4: Selection Via Intrasexual Competition or Intersexual Selection?

Alvarado

F 4:00pm

Beauty and the beast: Mechanisms of sexual selection in humans

David Puts

Literature in evolutionary psychology suggests that mate choice has been the primary mechanism of sexual selection in humans, but this conclusion conforms neither to theoretical predictions nor available evidence. Contests override other mechanisms of sexual selection; that is, when individuals can exclude their competitors by force or threat of force, mate choice, sperm competition, and other mechanisms are impossible. Mates are easier to monopolize in two-dimensional mating environments, such as the terrestrial environment inhabited by humans, than in three-dimensional environments, such as air, water, and trees. Thus, two-dimensional mating environments may tend to favor the evolution of contests. Moreover, men's traits appear better designed for contest competition than for other sexual selection mechanisms; size, muscularity, strength, aggression, and the manufacture and use of weapons probably helped ancestral males win contests directly, and deep voices and facial hair signal dominance more effectively and they increase attractiveness. However, female mate choice and sperm competition also likely shaped men's traits. Male mate choice was probably more important to women's evolution, largely due to the inability of ancestral females to constrain the choices of larger and more aggressive males. Neotenous female features and body fat deposition on the breasts and hips appear to have evolved to extract greater male investment.

F 4:20pm

Selection on masculine facial features: Male-male competition or female choice?

Emily A. Stone

Masculine facial features inconsistently signal attractiveness, but consistently signal dominance, to women. Thus, this study investigated the hypothesis that these features were sexually selected for use in male-male competition, rather than by female choice alone, as previous research has investigated. I obtained digital facial photographs of men with varying morphological masculinity, calculated an index of masculinity from the photos, and recruited men and women from a university and surrounding community to rate the photographs on both attractiveness and dominance. Signals used in female choice should attract mates, whereas those used in male-male competition should intimidate rivals. Preliminary results support the hypothesis that masculine features more strongly affect men's dominance attributions than women's attractiveness ratings. Reframing the question to ask when women should prefer traits associated with male-male competition places the facial masculinity literature within a broader biological literature regarding traits of “dual utility” (meaning, of use to men as well as women) and thus makes specific predictions about variation in the attractiveness of masculinity within and between human populations. The discussion will present potential avenues for future research into the interaction between male-male competition and female choice in humans.

F 4:40pm***Tall and handsome, but mostly rich... Male stature is associated with direct fitness benefits*****G. Stulp, T.V. Pollet, S. Verhulst, A.P. Buunk**

Tall men attain higher levels of education and income than shorter men. Furthermore, tall men are perceived as more sexually attractive and have higher reproductive success. However, why taller men are perceived as more attractive and attain more reproductive success is still largely unknown. Tall men might be attractive because of the indirect benefits (e.g. 'good genes') or direct benefits (e.g. material resources) associated with height. We used the Wisconsin Longitudinal Study, a longitudinal study of men and women who graduated from Wisconsin high schools in 1957, to examine the relation between male stature and reproductive success (N=4,991 men). By Structural Equation Modeling, an analytical tool for modeling the relationships among multiple independent and dependent constructs simultaneously, we determined the relationships between height, education, income, and reproductive success (number of children). Our model confirmed the previously reported positive associations between height, education and income. The model also confirmed the negative association between education and reproductive success, and the positive association between income and reproductive success. Controlling for income (+) and education (-), height had no significant direct effect on reproductive success. The positive effect of height on reproductive success was fully mediated by income. These results suggest that taller men are attractive (at least partly) because of the direct fitness benefits associated with male stature: money.

F 5:00pm***Redness enhances perceived aggression, dominance, and attractiveness in men's faces*****Ian D. Stephen, Francesca H. Oldham, David I. Perrett, Robert A. Barton**

Redness is associated with social dominance and mate selection, and is associated with increased testosterone levels in a number of non-human primate, bird and fish species. In humans, red clothing gives a competitive advantage in sporting competition. Here we allow female participants to manipulate the redness of skin to optimise the perceived aggression, dominance and attractiveness of photographs of men's faces. Participants increase redness to optimise aggressive, dominant and attractive appearance of faces. Aggressive trials receive most redness, with dominance receiving less and attractiveness still less. This shows that redness is perceived as aggressive and dominant. While redness also increases the attractiveness of faces, the association with aggression may limit the attractiveness of redness.

Saturday, May 30

Saturday Morning Sessions

Session G-1: **Symposium: Darwin's Dangerous Critics: Evolutionary Biology and Identity Politics in the Internet Age**

Titan Theater

St 10:50am

Darwin's dangerous critics: Evolutionary biology and identity politics in the internet age

Alice Dreger

A number of scientists working in evolutionary anthropology, biology, and psychology have found themselves the targets of extraordinary campaigns to paint them as dangerous and immoral. Criticisms of their work have not been limited to the academic sphere, but have spilled out into the media and the Internet, sometimes with the participation of academics who have positioned themselves as defenders of marginalized people. In this presentation, Alice Dreger will present findings from her Guggenheim Fellowship book project on science and identity politics in the Internet Age. Dreger, a feminist historian and philosopher of science, spent over a decade working as a leader in an identity-based political movement, the intersex rights movement. Drawing on her academic and activist backgrounds, Dreger will present hair-raising summaries of what has happened to several prominent scientists, including: Napoleon Chagnon (who came to be charged with genocide and paying some subjects to murder others); J. Michael Bailey (who was accused of abusing human subjects and having sex with a transsexual research subject); Charles Roselli (supposedly guilty of eugenics aimed at gay and lesbian people); and Randy Thornhill and Craig Palmer (whose alleged "promotion" of rape led to death threats made against them). Dreger will parse out motivations for and patterns in these extraordinary attacks and explore successful and unsuccessful survival strategies. She will also provide historical context to these events and explicitly encourage "dangerous" research, in the spirit of Darwin and Galileo. Chagnon, Bailey, Thornhill, and Palmer will then respond to Dreger's presentation with their own insights as scientist-survivors.

St 11:30am

Respondents

Napoleon Chagnon, Michael Bailey, Randy Thornhill, Craig Palmer

St 12:10pm

Evolution is not relevant to sex differences in humans because I want it that way! Evidence for the politicalization of human evolutionary psychology

Glenn Geher, Daniel Gambacorta

This research explored political motivations underlying resistance to evolutionary psychology. Data were collected from 268 adults who varied in terms of academic and parental status. Dependent variables represented whether participants believe that several attributes are primarily the result of biological evolution versus socialization. Variables addressed attitudes about: (a) sex differences in adults, (b) sex differences in children, (c) sex differences in chickens, (d) human universals, and (e) differences between dogs and cats. Using a likert-scale, participants were asked to rate the degree to which they believed items were due to "nature" versus "nurture." For instance, one of the items from the cat/dog subscale was "Dogs are more pack-oriented than cats." Independent variables included political orientation, parental status, and academic status. Political liberalism corresponded to endorsing "nurture" as influential - but only for the two human sex difference variables. Academic status was independently predictive of the belief that sex differences are the result of "nurture." This effect was exacerbated for academics who came from sociology or women's studies backgrounds. The effect of academic status also predicted seeing behavioral differences between roosters and hens as caused by "nurture." Further, parents were more likely than non-parents to endorse "nature" for the sex-difference variables. Beliefs about differences between cats and dogs and beliefs about causes of human universals (that are not tied to sex differences) were not related to these independent variables, suggesting that the political resistance to evolutionary psychology is specifically targeted at work on sex differences.

Session G-2: **Learning, Memory, and Perception**

Gabrielino

St 10:50am***Evolved navigation theory and perception of risky horizontal surfaces*****Russell E. Jackson**

Distance perception research has long demonstrated vertical overestimation. Recent work under Evolved Navigation Theory (ENT) has outlined that much of everyday vertical overestimation may reflect navigational costs in the environments in which human ancestors evolved. Major components of navigation costs are the risks and consequences of falling. Distance overestimation mechanisms proposed under ENT have led to the discovery of novel, large magnitude illusions in everyday visual perception of environmentally vertical surfaces. However, previous research, including that under ENT, has not yet identified meaningful departures from accuracy in horizontal distance estimation. The current study addressed this issue by investigating distance estimation of horizontal surfaces with falling costs. I predicted under ENT a specific function of overestimation across several surfaces. Data supported these predictions in each case. Participants overestimated horizontal distances by the degree to which the navigation of those surfaces posed falling risks. A utility of ENT has been in specifying likely mechanisms and selection pressures in human navigation. The current study demonstrates the value of this approach in areas not previously investigated under ENT by identifying effects not previously known in human visual perception.

St 11:10am***Perceptual accuracy and learning within the context of evolved navigation theory*****T.C. Cook, Russell E. Jackson**

A growing body of research has demonstrated that perceptual systems may increase reproductive fitness, even while decreasing objective accuracy in perception. Research into learning often assumes an operational definition of “learning” as a familiarity response to perceived stimuli that reflects perceptual change toward objective accuracy. Evolved Navigation Theory (ENT) suggests that perceptual changes due to learning may push perception of environmental surfaces toward objective accuracy only to the extent that such a change reflects the changing costs of navigating the specific surface. To test these predictions from ENT, we collected data for two experiments in which participants with different levels of familiarity in navigating a surface estimated its distance. In the first experiment, participants completely unfamiliar with a descent surface estimated its distance. In the second experiment, we asked participants highly familiar with perceiving and navigating that same surface to estimate its distance and answer questions pertaining to their perception of the subjective size of the surface. We will review these data and discuss their implications within the framework of ENT. These findings have important applications to any human navigation in which accuracy of vertical perception is at issue, including climbing, piloting, and even driving.

St 11:30am***Remembering the past to plan for the future*****Theresa Robertson**

Memory systems evolve because they allow organisms to store information that can guide later behavior. Logically, then, one of the functions of human episodic memory is to store information about the past in the service of planning for the personal future. Because a biological system should have especially high performance when engaged in a task that it was designed to perform, we predicted that future-oriented planning would result in especially good memory compared to other memory tasks. We tested recall performance of a word list using four encoding tasks with similar content, but different perspectives—e.g., future and past. Consistent with our hypothesis, future-oriented encoding produced superior recall. More generally, this research encapsulates an important lesson from adaptationist approaches to psychology: by asking function questions—what is memory designed to do?—one is quickly lead to identify and answer interesting structural questions—what makes memory work well?

St 11:50am***Vividness and salience from a functionalist perspective*****D. Vaughn Becker**

Vividness is typically seen as something inherent to the thing itself (e.g. the yellow and black stripes of a hornet), while salience involves a relationship between the thing and its surroundings, quite dependent on its context and/or the goals of the perceiver (e.g. the salience of food to a hungry man). But these may merely be two ends of a continuum of evolved mechanisms for enhancing fitness-relevant contrasts. Vividness is an enhancement that is relatively consistent across persons and situations, reflecting the longstanding relevance of a stimulus-type to the fundamental goals of the organism (e.g. the avoidance of injury). Indeed, certain contrasts in the environment have played this role with such regularity that their detection and amplification has become structurally instantiated in the perceptual machinery itself—to the point that things like “sharpness”, “fire” and “looming” seem to force themselves upon consciousness. A similar urgency is possible in attention and memory, albeit for different stimuli. I will use several empirical examples from my research to argue that the stage at which a thing is vivid reflects the immediacy of its functional consequences. Furthermore, as different goals and motivations are aroused, this can cause additional amplification (or dampening) of goal-relevant stimuli, making them more salient in ways that also reflect functional consequences. I will conclude by discussing specific experimental examples from my lab, in which priming fundamental motives like self-protection and mating renders goal-relevant stimuli more salient at each level of information processing, even in the face of robust vividness effects.

Session G-3: Infidelity, Jealousy, and Sperm Competition

Ontiveros

St 10:50am***Uncommitted sexual behavior and dopamine receptor gene variation*****Justin R. Garcia, James MacKillop, Edward L. Aller, Ann M. Merriwether, David Sloan Wilson, J. Koji Lum**

There is enormous variability in human sexual behavior, particularly in the realm of promiscuity and infidelity. Yet little is known about the physiological and genetic bases of individual variation in sexual behavior. Variable number tandem repeats (VNTR) in the human dopamine D4 receptor gene (DRD4) varies considerably within and among populations and DRD4 VNTR genotype variation has been correlated with an array of sensation-seeking behavioral phenotypes and may be responsible for variation in sexual behavior. Here we show that among a sample of 181 university students, individuals with at least one 7-repeat allele (7R+) report greater rates of promiscuous sexual behavior (i.e., having had a “one-night stand”) ($p < 0.05$) and report a more than 2-fold increase in instances of sexual infidelity ($p = 0.01$). Conceptualizing these findings in terms of r/K selection theory suggests a mechanism for selective pressure for and against the 7R+ genotype that may explain the considerable global allelic variation for this polymorphism. These findings further elucidate the role of infidelity in human evolution, and highlight a distinct proximate mechanism. Further, these finding may suggest that at least some degree of infidelity and promiscuous sex is influenced by motivation for new stimuli, potentially challenging current views of human mating strategies.

St 11:10am***Who's next? Spatial distance and the suspicion of sexual and emotional infidelity*****Achim Schützwohl**

The present study investigates the spatial distance between the persons involved in the "eternal jealousy triangle" as a proximate contextual factor regulating the intensity of the jealous feeling. Introducing scenarios providing a valid description of a real-life situation, depending on condition the male and female participants were initially led to suspect either a partner's sexual or emotional infidelity. Subsequently, the participants indicated their feelings elicited by several spatial arrangements involving one's partner, a potential rival and the own person which systematically varied the distances such that two persons were close together but distant from the third person. These spatial arrangements allowed testing the following predictions: (1) The jealousy mechanism responds with only mild negative feelings at most when the own person and the partner are close together while the potential rival is distant. (2) The negative feelings increase when the own person and the potential rival are close but the partner is distant. (3) The most uncomfortable feelings result when the partner and the rival are close together but distant from the own person. (4) Based on evolutionary psychological considerations, men should consistently report stronger negative feelings than women when suspecting the partner's sexual infidelity. Conversely, women should report stronger negative feelings than men when suspecting the partner's emotional infidelity. The results confirmed predictions 1 and 4. Reversing predictions 2 and 3, the close rival consistently elicited the most uncomfortable feelings. Implications and limitations of the present study are discussed and suggestions for future research are provided.

St 11:30am***Are sex differences in jealousy really universal? Data from Tjimba forager-pastoralists*****Robert MacKinnon**

Jealousy research on people in industrial societies has repeatedly demonstrated a sex difference in response to imagined infidelity: women are much more likely than men to choose a partner's emotional infidelity as more upsetting than their sexual infidelity. This sex difference is sometimes presented as a human universal, which has evolved because the reproductive consequences of infidelity and partner loss differ between the sexes. This study attempted to replicate the methods of previous studies to investigate jealousy among the Tjimba, a small-scale forager-pastoralist group in Namibia. Men and women responded similarly, and very few Tjimba of either sex were more upset by emotional than sexual infidelity. While these results weaken support for this particular universal, they actually strengthen the underlying theoretical arguments usually offered to explain it, by linking parental investment, sexual selection, and infidelity threats to facultative mating strategies. Given that infidelity is common, paternal investment is low, and important material resources are inherited matrilineally among the Tjimba, it is not surprising to find both sexes are less upset by emotional infidelity than sexual infidelity: under these circumstances it is likely that neither sex has as much to lose by the threats posed by the former relative to those posed by the latter.

St 11:50am***Men's sexual arousal to sperm competition*****Joseph A. Camilleri, Vernon L. Quinsey**

The effect of signaling sperm competition on male sexual arousal was studied. We tested the influence of sperm competition on sexual arousal by manipulating the proportion of nude male to females viewed by men. Penile tumescence changes indicated that sexual arousal is positively related to the number of women and negatively related to the number of men in multi-person images. We also tested the influence of cuckoldry risk on sexual arousal by measuring penile tumescence in response to stories describing partner infidelity, and found that not only do men show as much arousal to infidelity as they do to consenting sex, men in relationships show greater arousal to infidelity.

St 12:10pm***Male genital mutilation in pre-industrial societies: A costly behavior maintained by sexual conflict, not by sexually transmitted diseases*****Christopher G. Wilson**

Nearly 25% of pre-industrial societies practice some form of costly male genital mutilation (MGM). I have previously suggested that ablation of sexually competitive tissue could reduce the capacity for extra-pair fertilizations, and that married men, especially in highly polygynous societies, could protect their paternity by enforcing MGM among adolescents through investment in sanctions and inducements. Here, I present new cross-cultural tests of this hypothesis in a standard sample of pre-industrial societies. Controlling for previously established correlates, I found a significantly lower incidence of MGM in societies with a high degree of intercommunity mobility, which is predicted because a man who emigrates no longer threatens the paternity of his natal elders, reducing their incentive to enforce MGM at adolescence. This finding contradicts an alternative hypothesis attributing the maintenance of MGM to the recognized prophylactic effect of circumcision against certain STDs, which incorrectly predicts increased MGM when adult mobility is high because infections are spread more effectively. I also found a lower rate of MGM among matrilocal societies, where men are particularly mobile. A comparison with male scarification demonstrates that this effect cannot be explained by instability in matrilocal societies of male rituals in general. These results further support the hypothesis that sexual conflict underlies MGM, and add to a growing understanding that the prophylactic effects of circumcision are not responsible for the distribution or selective maintenance of pre-industrial genital operations.

Session G-4: **Friendships and Social Networks**

Alvarado

St 10:50am***Do friends enhance fitness: Reproductive outcomes of social networking among Tsimane women*****Stacey Rucas, Michael Gurven, Hillard Kaplan, Jeff Winking**

This work explores the effect that friends and social status have on female reproductive quantity and quality of offspring among Tsimane women. Previous research indicates that social resources are at the root of significant interpersonal conflicts between women underlying their importance to inclusive fitness. Several studies among non-human primates support that social skills and networks correlate with various indices of inclusive fitness. Consequently, we tested for correlations between women's social network size, as measured by the number of friendly helpers women report having, and reproductive outcomes among n=92 adult women in four Tsimane communities. Regression analysis suggests a significant positive relationship between female network size and fertility rates. Data also indicates that social notoriety (status) within one's community is positively correlated to higher child survivorship. This data supports the hypothesis that social resources and social skills may confer natural selective advantages for women by increasing the quantity and survivorship of children.

St 11:10am***Jealousy and the treat of being replaced: Friendship and the banker's paradox*****Brandy N. Burkett, Leda Cosmides, John Tooby**

In our ancestral past, misfortunes such as illness, injury, and bad luck occurred frequently and posed selective consequences. Individuals became a bad credit risk. When most in need and for this reason, were less attractive as a potential recipient of assistance. Tooby and Cosmides (1996) suggest that forming friendships solves the adaptive problem of attracting assistance when one is in dire need. According to this view, another person encroaching upon the relationship signifies the potential diversion of resources gained in the relationship, which triggers an adaptive emotional response: jealousy. Thus, part of our psychology should be designed to deal with the threat of replaceability. The current study examines what variables predict jealousy in the context of friendship. Participants read scenarios involving interactions with themselves, their best friend, and an interloper. The scenarios manipulated the amount of mental coordination (i.e. shared wavelength, shared world view, private jokes) the friend shared with the participant versus the interloper. In addition, the scenarios manipulated how much time the friend spent with the participant versus the interloper. Participants' perceptions of feeling replaced (by the interloper) and losing time with their friend were significantly correlated with jealousy. However, the relationship between loss of time and jealousy was fully mediated by feeling replaced by the interloper regardless of the amount of mental coordination between the friend and the participant. These data suggest that in friendship, events that indicate one is being replaced are the specific trigger of the emotional response of jealousy.

St 11:30am***Attractiveness and rivalry in women's friendships with women*****April Bleske-Rechek, Melissa Lighthall**

Past research suggests that young women perceive their same-sex friends as both facilitating the pursuit of desirable mates and competing for access to desirable mates. We propose that similar – but not identical – levels of physical attractiveness between young adult female friends might be one explanation for the opposing forces in their friendships. Forty-six female friendship pairs completed questionnaires about themselves, their friend, and their friendship; in addition, each woman's picture was taken and rated by a set of nine naïve judges. Friends were similar in both self-rated and other-rated level of attractiveness. Within pair analyses revealed that women agreed on which friend was more attractive, and the less attractive members of each friendship pair (by pair consensus as well as outside judges' ratings) perceived more mating rivalry in their friendship than did the more attractive members of each friendship pair. We offer directions for research on women's friendships over the lifespan.

St 11:50am***Encrypted humor and social networks in rural Brazil*****Thomas Flamson, H. Clark Barrett**

The Encryption Theory of humor proposes that a necessary component of the structure of humorous production is the presence of multiple, divergent understandings of speaker meaning, some of which are dependent on shared access to implicit information on the parts of both speaker and audience. Only with access to this background knowledge can an audience member “decrypt” the implicit understandings, which also entails the inference that the speaker shares that access. This provides a channel for the honest signaling of personal features, which is proposed to have evolved to aid within-group assortment for long-term interaction partners such as friends or mates. This talk will present results of a field experiment conducted in rural Brazil, where participants were presented with high- and low-encryption versions of jokes after assessing their prior knowledge. These results, replicating previous findings using online surveys, suggest that both the background knowledge of the audience and the degree of encryption impact ratings of humor in ways predicted by the Encryption Theory. Further, participants had previously provided a ranking of their social closeness with all other participants, enabling testing of the degree of similarity in ratings of jokes by socially close and socially distant participants. These results suggest that similarity in sense of humor does reflect real-world patterns of social assortment.

St 12:10pm***Signaling status through food sharing in Lamalera, Indonesia*****David A. Nolin**

Costly signaling has been proposed as a possible mechanism promoting food-sharing behavior in subsistence economies. One prediction of this hypothesis is a positive correlation between status and giving. Using exponential random graph modeling (ERGM), this prediction is tested on a static network of between-household food-sharing relationships in the fishing and sea-hunting village of Lamalera, Indonesia. The results show that high-status households (households of important office or role-holders) both give to and receive from more other households than households of ordinary status. Most of this effect is due to two factors: the higher productivity of high-status households, and the propensity for households to reciprocate food-sharing relationships. After controlling for these two factors, high-status households continue to give food to more other households than do households of ordinary status. Households of two important roles types (boat masters and harpooners) receive food from fewer other households than do households of ordinary status, while other roles (master carpenters, village officers) receive no more than ordinary households. However, in the network as a whole status explains very little (< 2%) of the observed variance among households in number of food-sharing relationships. Other factors (distance, kinship, reciprocity) together explain a far larger (> 50%) proportion of the variance. While status-motivated sharing may be important for a few households, it does not explain most food-sharing behavior in Lamalera.

Saturday Afternoon Sessions

Session H-1: **Workshop on NSF-Funded National Consortium in Evolutionary Studies (EvoS)**

Titan Theater

Workshop Abstract: Core players in Evolutionary Studies (EvoS) will talk about the different aspects of this \$500,000 grant that is designed to encourage the expansion of interdisciplinary EvoS programs across the nation. Discussants will include Rosemarie Sokol Chang (Editor of *EvoS: The Journal*), Glenn Geher (Director of EvoS at SUNY New Paltz and grant PI), Patricia Hawley (Psychologist at Kansas and Director of Assessment for the grant), and David Sloan Wilson (Brainchild of EvoS, Director of EvoS at Binghamton, and grant PI). Issues to be discussed will include: (a) the educational success story of EvoS, (b) the website and open-source journal for EvoS designed for the grant (evostudies.org), and (c) the freely accessible measure of knowledge and beliefs about ideas related to evolution that is being developed as part of this grant. Ways that your school can get in on the NSF money and can start your own program will be addressed.

St 3:00***The EvoS Consortium: Expanding evolutionary training in higher education*****David Sloan Wilson**

Evolutionary theory is being applied to virtually all human-related subjects, but it is still taught primarily as a biological subject at virtually all colleges and universities. EvoS (for Evolutionary Studies, pronounced as one word) provides a comprehensive solution to this problem. The first two EvoS programs (at Binghamton University and SUNY New Paltz) have received NSF funding to organize a multi-institution consortium. Over thirty institutions have already become involved, spanning the range from major research universities to community colleges. This talk and workshop will describe the consortium and provide information for audience members to become involved in what promises to be a worldwide movement.

St 3:20 ‘Evolution for everyone’: A course that brings Darwin's theory to the masses**Daniel O’Brien, David Sloan Wilson**

A firm grasp of evolution is invaluable in understanding the biological world. This simple theory can and should be used to inform studies ranging from insect behavior to human institutions; however, not only does much of the American populace reject it, many thinkers within the scientific community resist its application to their own disciplines. In an attempt to usher in a new age of thought that embraces evolutionary theory, we have developed the course Evolution for Everyone. A general education course with an academically diverse student population, the curriculum delves into Darwin’s theory and some more specific models it has inspired (e.g. optimal foraging theory). These are used to illustrate not only classical biology but how the same ideas pertain to humans. As the course progresses, class meetings and assignments are bundled to explore specific topics (i.e. economics) through lecture, readings and experiments that are analyzed in class. This material is framed within the scientific method, each week elaborating another aspect or step therein. Armed with these new tools, the students are invited to engage directly with scientific inquiry, a process that culminates with a poster session in which they propose novel research. In addition to these products, alumni of the course demonstrate competence in basic statistics and report a more sophisticated opinion of evolution and its relevance to everyday life. The course represents not only a new approach to teaching evolution, but a new trend that provides students with the tools to educate themselves.

St 3:40 A case study of EvoS replication: EvoS New Paltz**Glenn Geher**

In Fall 2007, SUNY New Paltz officially launched its interdisciplinary evolutionary studies (EvoS) program, with an undergraduate 18-credit minor including courses offered in anthropology, biology, black studies, English, geology, history and psychology. With the EvoS seminar series course as the cornerstone of the program, EvoS has quickly become an important part of New Paltz's academic offerings. It is currently the fourth most-enrolled interdisciplinary minor on campus (of about 20) - and the numbers are still climbing. This talk will focus on (a) how starting such a program is logistically very feasible, (b) how EvoS incurs little in the way of fiscal costs, (c) how the academic benefits of the program are great, and (d) how there are many extra-curricular activities that EvoS brings to campus. Finally, this talk will address a core ingredient underlying EvoS' success: the fact that this program ties disciplines together by a shared set of basic principles (vis a vis evolutionary theory) as opposed to simply shared content.

St 4:00 *evostudies.org: The website of the EvoS Consortium and journal***Rosemarie Sokol Chang**

The EvoS Consortium consists of all EvoS programs nationwide. One tool at member institutions’ disposal is the EvoS Consortium website (<http://evostudies.org/index.html>). This site lists information for establishing and maintaining EvoS programs, offers space for informal communication among members, and acts as a repository of EvoS related materials (e.g. sample courses and syllabi). Another new feature of the EvoS Consortium is *EvoS: The Journal of the Evolutionary Studies Consortium* (<http://evostudies.org/journal.html>). *EvoS Journal* is a new open-access, peer-reviewed journal that will publish articles on the teaching of evolution in higher education, and articles based in evolutionary theory written by undergraduate students. In this talk, I will introduce the goals and features of the EvoS Consortium website, and give an overview of the *EvoS Journal*.

St 4:20 *Questions for the panelists***David Sloan Wilson, Daniel O’Brien, Glenn Geher, Rosemarie Sokol Chang**

Session H-2: **Cultural Evolution**

Gabrielino

St 3:00pm***How treadmills and drift create cultural loss in Oceania*****Michelle Kline, Robert Boyd**

Human cultural adaptations depend on the gradual accumulation of knowledge, skill, and increasingly specialized and sophisticated technology. Recent models of cultural evolution predict that large populations will have more diverse and complex toolkits than small populations. Here we discuss and empirically test two such models: (a) drift and (b) the treadmill mechanism. We show that, in Oceania, small island populations had less complicated marine foraging technology than larger island populations. These findings suggest that the particulars of human demography, as well as our unique cognitive capacities, may be necessary for much of human cultural adaptation.

St 3:20pm***Late Pleistocene demography and the appearance of modern human behavior*****Adam Powell, Stephen Shennan, Mark G. Thomas**

The origins of modern human behavior are associated with a package of increased symbolic and technological complexity in the archaeological record. In western Eurasia this transition, known as the Upper Palaeolithic, occurred ~45,000 years ago, but many of its features appear transiently in southern Africa ~45,000 years earlier. We show that demography is a major determinant in the maintenance of cultural complexity, and that variation in regional subpopulation density and migratory activity leads to stable spatial structuring of cultural skill accumulation. Using genetic estimates of regional population size over time we find that population densities in early Upper Palaeolithic Europe were similar to those in sub-Saharan Africa when behavioral modernity first appeared. We propose that demographic factors are sufficient to explain geographic variation in when modern behavior first appears without invoking structuring of cognitive capacity.

St 3:40pm***Do people really conform? A naturalistic study and a mathematical model*****Julie Coultas, Kimmo Eriksson**

Social psychologists (mistakenly) state that we know everything we need to know about conformity. However, there is a continuing fascination with this form of social influence, particularly within the field of cultural evolution where the 'conformist bias' is proposed as the mechanism that creates within group similarity. It has been proposed that humans have a frequency-dependent bias and will tend to copy the more common variant of behaviour than would be expected by chance alone. There is evidence, however, that this is not always the case. In fact, a social psychology model predicts that minority sources of influence will have relatively greater impact than majority sources. We set out to test these competing (conformist and non-conformist) hypotheses. In this talk I will describe a study where we approached people in shopping malls to take part in a study on opinions. Subterfuge was used so that the participants did not realise that they were being influenced. We obtained measures of what people would do under varying levels of social influence and also when no social influence was present. We use the data to compare the predictions made by the conformist transmission model (Boyd and Richerson, 1985) and Social Impact Theory. Our results are more in line with a non-conformist hypothesis and our mathematical model further supports these findings (Eriksson and Coultas, 2009). We suggest that within group similarity is not a general phenomenon and that people's intrinsic biases or 'habits' need to be taken into account.

St 4:00pm***The role of specialization in cultural cumulation*****Micael Ehn**

Specialization has been studied extensively within economy, biology and several other fields for a long time, but has, to our knowledge, not yet been considered in the study of cultural cumulation. Individuals strategies when learning, both individually and socially, are most likely very important for the result of cultural evolution. We explore the potential of specialization as a driver of cultural cumulation. We model culture as being divided into separate fields such as agriculture, house building, astronomy etc. Within each field, culture is assumed to evolve in steps on a "ladder": To be able to take a new step, i.e. learn a new cultural element in this field, the individual must already have learnt all the previous elements. The population consists of either specialists or generalists and culture is transferred between individuals either by direct social learning or through learning institutions. Our results show that things such as the structure of culture (cumulative or non cumulative), how culture is transmitted (direct social learning or through institutions) and individuals strategies when learning (specialist or generalist) have a large impact on the amount of culture cumulated. The model gives predictions about when we would expect the number of cultural elements in a population to grow rapidly and when to decline.

Session H-3: **Mate Preferences**

Ontiveros

St 3:00pm***How universal are human mate preferences? Size doesn't matter when Hadza foragers are choosing a mate*****Rebecca Sear, Frank W. Marlow**

It has been argued that size matters on the human mate market: both stated preferences and mating behaviour have been found to be non-random with respect to height and weight. But how universal are these preferences? Most of the human mate choice literature is based on post-industrial societies. Much less is known about mate choice in more traditional societies. Here we investigate mate choice by analysing whether there is any evidence for non-random mating with respect to size and strength in a forager community, the Hadza of Tanzania. We test whether couples assort for height, weight, BMI, percent fat and grip strength. We test whether there is a male-taller norm. Finally, we test for an association between anthropometric variables and number of marriages. Our results show no evidence for assortative mating for height, weight, BMI or percent fat; no evidence for a male-taller norm; and no evidence that number of marriages is associated with our size variables. Hadza couples may assort positively for grip strength, but grip strength does not affect the number of marriages. Overall we conclude that, in contrast to post-industrial societies, mating appears to be random with respect to size in the Hadza.

St 3:20pm***Kind toward whom? Mate preferences for personality traits depend on the targets of behavioral acts*****Aaron W. Lukaszewski, James R. Roney**

A wealth of data in the mate preference literature indicates that people prefer mates whose personalities are extremely kind and trustworthy, but relatively non-dominant. This conclusion, however, is based on research that leaves unclear whether these traits describe the behavior a partner directs toward oneself, toward other classes of people, or both. Because the fitness consequences of partners' behaviors likely differed depending on the classes of individuals toward whom behaviors were directed, we hypothesized that people would prefer mates who exhibit different personality profiles toward targets of different functional significance. Two experiments demonstrated that people prefer partners who are extremely kind and trustworthy when considering behaviors directed toward themselves or their friends/family, but shift their preferences to much lower levels of these traits when considering behaviors directed toward other classes of individuals. In addition, both sexes preferred partners who direct higher levels of dominance toward members of the partner's own sex than toward any other behavioral target category, with women preferring levels of dominance toward other men as high as – or higher than – levels of kindness and trustworthiness. Furthermore, when asked to rate trait terms for which the behavioral target was left unspecified, preferences were very similar to self-directed preferences, suggesting that previous trait-rating studies have primarily measured personality preferences for behaviors directed toward oneself, while neglecting preferences for partners' behaviors directed toward other classes of people. These data clarify the meaning of preferences reported in previous studies and demonstrate previously unknown adaptive patterns of target-specificity in human personality preferences.

St 3:40pm***The evolution of humor: Intelligence, fitness indicators, and mating success*****Gil Greengross**

There is growing evidence that sense of humor plays an important role in sexual selection, especially as a mental fitness indicator. According to this theory, a good sense of humor signals intelligence and translates into mating success. In this study, 400 students (200 males, 200 females) and 31 professional comedians (28 males, three females), were instructed to write funny captions for cartoons whose captions had been removed. Five judges rated the captions independently with high internal consistency. Results showed that, on average, comedians were funnier than students, and males were funnier than females. Humor production had stronger correlations with verbal intelligence as measured by the vocabulary subset of the Multidimensional Aptitude Battery (MAB), than with the Ravens' Advanced Progressive Matrices (RAPM) test. The correlation between humor production and each intelligence test was stronger for males. Individuals with good sense of humor were also more likely to enjoy mating success, suggesting that humor production is in fact a mental fitness indicator. Even though comedians scored higher on verbal intelligence, there was no relationship between verbal intelligence and humor production for comedians, suggesting that humor is not a mental fitness indicator for them. These findings shed further light on the nature of humor and its complexity.

St 4:00pm

Calculating beauty: Adding up attractiveness from faces, voices, and video

**Anthony C. Little, Stephen Graham, S. Craig Roberts, David R. Feinberg,
Tamsin K. Saxton, Benedict C. Jones, Lisa M. DeBruine**

Recent studies have investigated how well attractiveness judgements of static faces predict the attractiveness of moving faces. Some studies have found that attractiveness judgements of a static face are a poor predictor of a moving face's attractiveness, although one study has challenged this view. Here we present new data on this issue. We filmed 20 men and 20 women reading the same passage to a video camera and split information into four stimuli types: 1. static face picture, 2. audio only (voice), 3. mute video, and 4. full video. Participants then separately rated each type of stimuli for attractiveness. Correlation analyses revealed strong positive correlations among ratings of attractiveness for all types of stimuli. These findings demonstrate that the attractiveness of moving faces can be largely predicted by their static appearance. We also demonstrate that a person's facial attractiveness is related to their vocal attractiveness, replicating previous findings and suggesting that vocal and facial attractiveness may depend on some underlying biological quality. Finally, using regression analysis, we found that both voice and static face ratings were positively and independently related to attractiveness of the full video. In this analysis static face was a stronger predictor of attractiveness than voice. Voice and static face cues together predicted 80% of the variance and so the remaining 20% could be accounted for by movement cues. Overall, these data highlight the important role of static facial appearance in attractiveness judgements and the potentially independent contribution of vocal and movement cues in such judgements.

St 4:20pm

T-shirts and genes: The role of MHC in human kin recognition and mating preferences

Ilanit Tal, Amanda Watson, Debra Lieberman

The Major Histocompatibility Complex (MHC) is a large chromosomal region of immunological genes that function in self/non-self recognition, and in some way influence body scent. Though results are mixed, research suggests that humans and nonhumans prefer mates that are MHC-dissimilar to themselves. One explanation of this effect is that MHC-dissimilar matings produce heterozygous offspring which are protected against a wider array of pathogens than homozygotes. Another explanation is that the preference for dissimilarity at the MHC is a proximate mechanism for incest aversion and reduced deleterious mutations in other areas of the genome. Cross-fostering experiments with house mice suggest that MHC mate preferences are based on familial MHC and are not self-referent. To date there has been no research on scent-mediated MHC mate preferences among human relatives. The current study was designed to assess whether human preferences are self- or family-referent. We test this idea with data from opposite-sex sibling pairs. All participants slept in clean, previously unworn t-shirt for two nights without introducing confounding odors. Participants then rated the scent of the shirts on several traits, including sex appeal. Our results indicate that human MHC-mediated mate preferences are self-referent, though MHC-mediated kin recognition may be family-referent. Our results may provide evidence that preference for MHC-dissimilar mates has been driven by offspring heterozygote advantage and not by incest aversion.

Saturday Evening Sessions

Session I-1: **Life History 2**

Titan Theater

St 5:00pm

Child productive work and urban fertility: An embodied capital approach to the quality-quantity tradeoff among Indo-Fijians

Siobhan Mattison, Dawn Neill

The extent to which children engage in productive activities varies according to social and ecological context. Embodied capital theory predicts that costly childcare results in high parental investment in relatively few children. Furthermore, if skills-acquisition is important to the probability of a child's future success, children may be released from chores to focus instead on skill-building activities. In urban environments, increased skills acquisition in conjunction with residential constraints on available work may explain reduction in child productivity as well as reductions in fertility. Using multi-variate analysis, we examine whether self-reported frequency of engaging in productive activities differs among rural and urban Indo-Fijian children (N=561). We find that urban children engage less frequently in productive activities overall, principally via reducing outdoor work. Residency does not significantly affect participation in childcare or household chores. Increased participation by children in childcare is positively correlated with age- and income-adjusted fertility of their mothers.

St 5:20pm***Contributions and wellbeing among older Tsimane*****Eric Schniter, Michael Gurven**

Little is known about why humans have an extended juvenile development and long post-reproductive lifespan. One proposed reason for the long juvenile period in humans is that skills needed for survival and reproduction are difficult, requiring substantial social and individual learning as well as practice. The long post-reproductive lifespan appears to allow older adults who become frail to still “cash in” on their embodied capital, reliably facilitating skill acquisition in their descendants by redirecting their investments towards strength-independent cultural niches which broadcast cultural information and contribute other non-caloric forms of production. This study among the Tsimane' of the Bolivian Amazon, examines evidence of non-caloric intergenerational contributions and the psychological well-being, social support, and health of older adults, to see if those who contribute more are better off. Results indicate that wellbeing of older Tsimane' is contingent on their non-caloric contributions. These findings, which help explain when and why older Tsimane' are supported, also support the hypothesis that large brains and delayed development, with relatively late onset of adult productivity (both caloric and non-caloric), enable the long and slow life history that characterizes humans.

St 5:40pm***Perceived mortality risk and reproductive behavior over time in a sample of young adults in the United States*****Jeff Davis**

Life history theory predicts inter-individual variation in reproductive behaviors as a function of differential mortality risk. Recent research shows that humans and non-humans attend to changes in the probability of mortality and adjust reproductive behavior accordingly. In this study, I estimate the association between an individual's perceptions of impending mortality and long-term reproductive behavior using data from the National Longitudinal Survey of Youth (NLSY97), 1997-2003. The NLSY97 is a nationally-representative sample of youth in the United States. In this study, I use data from a subsample of respondents ages 15-16 in 1997 (N = 3,536). This subsample was chosen by NLSY97 researchers to respond to questions about perceptions of the future. Five questions queried respondents on the subjective probability of experiencing life threatening events (e.g. death, victimization, and jail) within the next few years of their lives. From these items, I develop a scale measuring perceived mortality risk (Cronbach's α ; = .78) and use it to estimate a model of fertility. Results indicate a perceived higher probability of impending mortality in 1997 is modestly associated with a larger number of biological children in 2003. Separate analyses of male (N = 1,786) and female (N = 1,749) respondents indicate that perceived mortality risk is a stronger predictor of males' reproductive outcomes. Both findings are predicted by human life history theories. I discuss possible reasons for the observed sex differences in the association.

St 6:00pm***Effects of early and adult environment on survival in humans*****Ian J. Rickard, Matthew R. Robinson, Virpi Lummaa**

The environmental conditions that an individual experiences during their early life can have profound and long-lasting consequences for their phenotype, and eventually their evolutionary fitness. In humans, this includes an effect of poor early nutrition on an increased risk of developing several diseases in adulthood, such as type II diabetes and coronary heart disease. Increasingly, these effects are being seen as not just the result of the environment itself, but as the result of evolved adaptive responses by the developing individual, which increase fitness under some conditions, but lead to illness under others. One hypothesis predicts that when individuals experience challenging environmental conditions during early life, their subsequent development proceeds so as to favour survival in similar conditions as adults. However, the extent to which long-term effects of the early environment on phenotype are the result of developmental constraint, and the extent to which they are evolved adaptive responses are unknown. We use data from pre-industrial Finnish humans to investigate the interactive effects of early and late-life environmental conditions on an individual's survival. We use infant mortality rate in a given year as a general index of environmental quality and track the survival of several thousand men and women born over a 140-year period, between 1750 and 1890. We describe how different environmental regimes experienced during early life and adulthood affect individual mortality risk. We discuss how testing evolutionary hypotheses can help inform our understanding of the environmental induction of human disease and ultimately aid the improvement of population health.

Session I-2: **Conflict and Dominance**

Gabrielino

St 5:00pm***Mapping the “grammar” of anger-based arguments*****Aaron Sell, Leda Cosmides, John Tooby**

It has been documented for at least thirty years that the most common behavioral response to an incident of anger is an argument, yet traditional theories of anger have made no headway into understanding the computational nature of anger-based arguments. According to the Recalibrational Theory of anger, anger is an adaptation designed to recalibrate variables relevant to resolving conflicts of interest. By understanding the selection pressures present during ancestral conflicts of interest, we were able to identify the conceptual primitives that trigger anger, explicate the “grammar” of arguments that result from such anger, and predict which types of arguments exacerbate and attenuate anger. Predictions were derived and tested in both naturalistic and experimental settings.

St 5:20pm***Patterns of male dyadic conflict with respect to kinship, cooperative networks, and social status in a small-scale human society*****Chris von Rueden, Paul L. Hooper, Dan Cummings, Michael Gurven, Hillard Kaplan**

Conflict in small-scale human societies is not restricted to warfare or inter-coalitional competition, but may also occur between close kin or cooperative partners. Among the Tsimane? forager-horticulturalists of Bolivia, we explore the likelihood of dyadic conflict among co-resident adult men based on their kinship, history of cooperation, and social status differentials. Reported sources of conflict include sexual jealousy, spousal abuse, alleged theft, land disputes, disputes over forest product sales, and community work. Disputes among consanguineal kin (related by birth) and affinal kin (related by marriage) account for more than 25% and 18% of dyadic conflicts, respectively. Individuals who cooperate on a regular basis are in conflict 3-5 times more than expected from random assortment of potential conflict partners, even after controlling for residential proximity. A man's social status does not predict the number of conflicts he reports but positively predicts the number of conflicts he mediates. Conflicts with higher status men are reported more frequently than conflicts with lower status men; dyadic conflicts are not primarily between men occupying adjacent positions in the social hierarchy. Conflicts may have fitness consequences in this population: men who name more conflict partners have fewer surviving offspring while men who are named more frequently as cooperative partners have more surviving offspring.

St 5:40pm***Paleolithic politics in Victorian novels*****Joseph Carroll, Jonathan Gottschall, John A. Johnson, Daniel J. Kruger**

Using basic motives from human life history theory, basic emotions, and the five-factor personality model, we constructed a questionnaire for characters in Victorian novels. We collected information on the attributes of characters, the emotional responses of readers to characters, and the “agonistic” roles readers assign to characters (protagonists, antagonists, and minor characters). More than 600 respondents completed about 1,600 character ratings. We hypothesized that antagonists would exemplify dominance behavior and that protagonists would exemplify affiliative dispositions. The larger evolutionary context for this hypothesis is delineated in Boehm's *Hierarchy in the Forest: The Evolution of Egalitarian Behavior*. Chimpanzee social organization is regulated by dominance. Humans have evolved a thin layer of altruistic or prosocial dispositions on top of dominance-oriented social dispositions. Those dispositions enable humans to subordinate, in some small measure, the interests of the individual to the interest of the social group. When humans achieved “ecological dominance” (Alexander), other human groups became the most important selective force in the human environment. Suppressing dominance in individuals helps organize a group for cooperative endeavor. Suppressing dominance in individuals is thus a functional part of “multi-level selection” in humans (D. S. Wilson). We hypothesize that verbal narratives provide a medium for transmitting and reinforcing the egalitarian norms that govern hunter-gatherers. The social dynamic we uncover in Victorian novels extends that egalitarian ethos across the whole community of its readers.

St 6:00pm

Sibling rivalry as a product of resource competition and dilution in rural Dominica

Michelle R. Dillon

Sibling rivalry occurs with predictable regularity and intensity between offspring. The resource competition framework suggests that the nature of sibling rivalry depends on the characteristics of other siblings, the structure of the family, and on the nature of the insufficient resource. Each sibling may be motivated toward selfish behaviors because, excepting identical twins, individuals share more genes with themselves than with siblings. Mothers in a rural village in Dominica were interviewed about factors which influence resource distribution on both the family level and the dyadic level. These factors include alloparenting (non-parental investment), sibling relatedness, birth spacing, birth order, family size, and paternal investment. Paternal investment, a main source of resources in this village, was found to decrease sibling rivalry. Large families and families with half siblings generated increased rivalry, as expected under resource competition. Additionally, closely spaced siblings and later born siblings (with many older siblings to redirect resources) had greater levels of rivalry. Alloparenting, relatedness within dyads, and same-sex dyads were non-significant for effects on sibling rivalry. Although not every hypothesis was supported, these findings suggest that resource competition can be a useful framework for predicting the occurrence of sibling rivalry within families.

St 6:20pm

What we say conveys more than how we say it: Vocalics in interview data

Bria Dunham, Lee Cronk, Shannon Steadman

Evolutionary hypotheses can be tested by interview data obtained within experimentally-altered contexts. This study reports on interviews conducted on Utila, the third largest of the Honduran Bay Islands. Adult Utilians were interviewed about spousal obligations and prevailing social norms either alone (n=91) or with spouse present (n=42). A trained coder evaluated the vocal characteristics of each interview response, recording scores for tone, volume, frequency, and fluency. Vocal characteristics were predicted to vary between interview conditions and to be associated with the content of interview response. In contrast to findings that showed an audience effect on the content and rhetorical domineeringness of interview responses, vocal characteristics were not predicted by either interview condition or the content of the response. Although the covariates of interest did not predict vocal characteristics, certain demographic variables did predict vocal characteristics for responses to specific interview questions. Sex significantly predicted tone, tempo, and fluency; age also predicted tone and tempo.

Session I-3: **Mate Choice II**

Ontiveros

St 5:00pm

Preferences for height and mate choice: A conflict between the sexes

Alexandre Courtiol, Jean Baptiste Ferdy, Julien Claude, Sandrine Picq, Bernard Godelle, Michel Raymond

Assortative mating for height has been demonstrated in numerous human populations. It is often argued that mating preferences generate such pattern. Yet, different alternative processes (e.g. reproductive selection or social homogamy) can also induce trait correlations between mates. We will present an experimental framework tailored to quantitatively assess homogamy in preferences: using an elliptic Fourier analysis, realistic stimuli differing in height are created automatically from true pictures; judges are then asked to sort several stimuli by successive pairwise comparisons; finally, using outcomes of these later comparisons, parameters defining mating preference functions are estimated using generalized linear mixed effect models. We applied this procedure on a sample of 200 individuals from Montpellier (France). Results show that perception of attractiveness is dependent on both the height of the stimuli and the stature of judges. This effect of judges' height is best modelled by a simple linear effect in both women and men. The main verbal models proposed in the literature for describing psychological mechanisms underlying preferences for height can all be expressed in terms of particular parameter values in our modelling framework. Using this possibility, we show that all these models are simultaneously concordant with our data. This suggests that psychological mechanisms need to be better defined in order to be statistically evaluated. Our analysis also demonstrates that preferences do not match between sexes. Evolutionary implications of this sexual conflict will be discussed.

St 5:20pm***Intralocus sexual conflict in humans: Evidence from siblings and implications for mate choice*****Christine E. Garver-Apgar, Melissa A. Heap, Joshua M. Tybur, Melissa Franklin**

Intralocus conflict occurs when alleles at one locus affect homologous traits in males and females, who have different optimal trait levels. Much of the literature on sexual selection and human mate choice and attraction implicitly assumes that genetic fitness effects correspond closely across the sexes. The current study aimed to launch a preliminary investigation of intralocus sexual conflict in humans, to characterize traits that may be under sexually antagonistic selection, and to investigate possible implications of sexually antagonistic selection on individual differences in human mate preferences. Families were recruited to examine the performance of related genotypes in men and women. Relationships between fitness indicators and sexually dimorphic traits were examined in same-sex and opposite-sex sibling pairs in both men and women. Results indicate that: 1) Consistent with a sexually antagonistic intralocus conflict model, men and women who are relatively physically masculine perceive their brothers as more *attractive* to members of the opposite sex and their sisters as relatively more *unattractive* to the opposite sex; and 2) Independent of women's mate value, women who are relatively masculine prefer more feminine men as short-term (but not long-term) mates, compared with more feminine women, suggesting that women may seek "hormonal compatibility" with potential mates.

St 5:40pm***Cross-cultural perceptions of proceptive behavior*****Andrew P. Clark, Ian S. Penton-Voak, Yangke Zhao, Zejun Huang, Isabel Scott**

Dynamic proceptive (i.e. flirtatious) behaviour may signal various potential benefits to a prospective mate, but determining which of these benefits are actually playing an important role in mate choice represents a challenge. At least some of these possibilities involve interpreting proceptivity as a social behaviour which is complex and costly to learn. As such, cultural variation in the perception of proceptive may be enlightening. Participants in the UK and China were shown videos of opposite-sex actors from the UK responding to questions proceptively or unproceptively. The responses were shown from two angles in an attempt to manipulate apparent signal direction (i.e. directly toward participant or averted toward an unseen third party). Each participant saw each actor in one combination of conditions only. Proceptive behaviour was preferred in China and the UK by both sexes, but more so in China. There was also a strong main effect of signal direction but, contrary to some previous research, we found that actors were rated higher in the averted direction condition than in the participant-directed condition. We found no evidence for an expected interaction between signal direction and proceptive condition. Our attempt to manipulate signal direction via camera angle may have failed. Chinese and UK participants did not agree about which actors 'benefited' most from behaving proceptively. There was also a significant interaction between sample nation and sex of actor, with male actors benefiting more in China and female actors benefiting more in the UK. The implications of these cross-cultural differences will be discussed.

St 6:00pm***Facial adiposity, a valid cue to health?*****Vinet Coetzee**

Sexual selection theory posits that individuals are attracted to partners that, amongst other things, display cues to health. These cues indicate a superior ability to survive, for instance a higher resistance to pathogens. Attractive individuals are therefore expected to be healthier. Several facial traits (i.e. symmetry, sexual dimorphism, averageness, skin colour and texture) have been proposed as cues to health and attractiveness, but none of these facial traits have been reliably linked to both perceived and actual health measures. We propose that perceived facial adiposity, or the perception of weight in the face, could serve as a valid cue to health. To test this hypothesis we recruited 43 female and 41 male Caucasian participants, asked them to complete a brief medical history questionnaire, measured their blood pressure and had their images rated for weight, health and attractiveness. Our results demonstrate two important prerequisites for any health cue. First, we show that perceived facial adiposity significantly predicts perceived health and attractiveness. Second, we show that perceived facial adiposity is significantly associated with measures of cardiovascular health and reported infections. Perceived facial adiposity, or a correlate thereof, is therefore an important and valid cue to health that should be included in future studies.

St 6:20pm

Faking it: Does faked voice pitch affect attractiveness?

David R. Feinberg, Paul Fraccaro, Jillian J.M. O'Connor, Daniel E. Re, Lisa M. DeBruine, Benedict C. Jones

The lowest and average speaking fundamental frequency tend to be reliable indicators of how testosterone alters the size and thickness of vocal-folds, suggesting that voice pitch may signal important aspects of mate quality (e.g., fertility). Indeed, both studies using computer manipulations of voice pitch and those that have measured pitch from unmanipulated voices have demonstrated that, in general, women prefer lowered pitch in male voices and that men prefer raised pitch in female voices. Humans can also consciously raise or lower their voice pitch, however, raising the question of how deliberately faked voice pitch might affect perceptions of attractiveness. To investigate this issue, we recorded participants speaking in their natural voice, speaking with raised voice pitch, and speaking with lowered voice pitch. These recordings were assessed by opposite-sex raters for attractiveness using a two-alternative forced-choice paradigm. We found that men preferred natural voice pitch to raised or lowered voice pitch when judging women's attractiveness. Women preferred natural voice pitch to raised voice pitch when judging men's attractiveness, but did not prefer natural pitch to lowered pitch. These results suggest that deliberately (i.e. artificially) modifying one's voice pitch does not always lead to increased attractiveness and can often make one sound less attractive. The implications of these findings for the evolution of signals of mate quality will be discussed.

Session I-4: **Kinship, Caregiving, and Familial Sentiment**

Alvarado

St 5:00pm

Testing the hormonal correlates of grandmothering in Jamaica

Peter B. Gray, Maureen Samms-Vaughan

Grandmothers have attracted growing scholarly interest. Extending that body of research, here we report on results of a naturalistic study conducted in greater Kingston, Jamaica designed to test for between- and within-subject effects of grandmaternal care on postmenopausal women's oxytocin, vasopressin, prolactin, and cortisol levels. We recruited 25 women who lived with and provided care for a biological grandchild aged five or younger (grandmothers) in addition to 20 women of similar ages, socioeconomic status, and health status who did not similarly provide such care (controls). Interviews and biological sample collection took place either in women's homes or a nearby church. Control women participated on a single day, whereas grandmothers participated on two days: one day when they had been caring for their youngest grandchild the previous four hours, and another day when not providing such care the previous four hours. Results from sociodemographic and qualitative interview data indicated that grandmothers were less likely to be involved in an ongoing sociosexual partnership with a man, suggesting a potential behavioral tradeoff between investment in descendant kin and an ongoing partnership. Hormonal data revealed that grandmothers did not exhibit differences in cortisol, oxytocin, and prolactin compared with control women. However, grandmothers had significantly higher vasopressin levels than controls. Results also revealed no significant differences in hormone levels on days grandmothers provided vs. did not provide care the previous four hours. We discuss results of the present study in light of potential behavioral tradeoffs faced by older women and interpretations of the findings.

St 5:20pm

Democratization and consanguinity: An underappreciated yet significant relationship

Michael A. Woodley

This study reports the existence of a significant and robust correlation at the ecological data scale between consanguinity (as measured by the coefficient of inbreeding F), and levels of democratization (as measured by the Economist Intelligence Unit's Democracy Index) for a sample of 67 countries ($r=-0.76$, $p<0.01$). Partial correlation analysis was used to control for the effects of IQ and log GDP per capita separately, and both simultaneously on the correlation ($r=-0.59$, -0.79 and -0.59 respectively, $p<0.01$). Multiple regression analysis also found that consanguinity was a better predictor of levels of democratization than either oil production (a test of the resource curse theory) or economic freedom (a test of the theory that democracy and capitalism are intrinsically linked) in a sample of 25 countries ($\beta=-0.57$, $p<0.01$; -0.03 , $p>0.05$ and 0.50 , $p<0.01$ respectively). Democracy only seems to be an optimal political system for nations in which consanguinity has not allowed for the extensive perpetuation of genetically closed ethnic kinship networks. The theory of inclusive fitness suggests that it would be to the advantage of such genetically closed networks to advance their own position politically and socially rather than compromise with other networks in terms of power sharing.

St 5:40pm***A twin-family study of social closeness and perceived similarity*****Nancy L. Segal, William D. Marelich**

Twin-family designs yield a rich array of genetically related individuals, conducive to testing evolutionary-based hypotheses regarding social closeness and similarity. Monozygotic (MZ) twins' genetic identity makes them equivalent to the "genetic parents" of their nieces/nephews. In contrast, DZ twins retain customary aunt/uncle relationships with their co-twin's children. Segal et al (2007) found that MZ twin aunts and uncles (n = 248) indicated higher levels of social closeness to their nieces and nephews than DZ twin aunts and uncles (n = 75), consistent with predictions from Hamilton's inclusive fitness theory. Moreover, greater closeness was expressed toward the children of female (n = 278) than male co-twins (45). These issues and others were revisited in a larger sample, gathered as part of this ongoing study. The updated sample included 320 MZ twins and 99 DZ twins, comprised of 55 males and 364 females. The new results closely parallel those based on the initial sample. In addition to those cited above, factor analysis of the closeness questionnaire yielded three factors: comparative closeness, perceived closeness and perceived similarity. MANOVA with step-down analyses showed that zygosity had significant or near-significant effects on perceived closeness and perceived similarity; co-twin sex had significant effects on all three factors. Mean values supported positive associations between genetic relatedness and social closeness, and greater closeness toward the children of twin sisters (for whom paternity is certain) than twin brothers. Additional relevant variables (e.g., distance between the families) were also explored, and additional analyses of interest will be suggested.

St 6:00pm***The effect of mother-daughter bonding on pregnancy behavior*****Brooke Scelza**

The bond between mother and child has been widely recognized by evolutionary psychologists and anthropologists to be critical to children's emotional and physical wellbeing. As children become adults, these bonds are likely to continue to be important, however, few studies have examined the effects of bonding between mothers and their adult children. Here, I investigate the importance of bonds between mothers and their adult daughters during the critical period of daughter's pregnancy. Using data from the Puerto Rican Maternal and Infant Health Survey (n=2,763), I first examine the importance of the mother-daughter bond in buffering daughters against risky behaviors including alcohol, tobacco and drug use. Next, I investigate how these bonds are correlated with positive pregnancy behaviors such as use of the prenatal care system. Finally, I look at the relationship between mother-daughter bonding and self-reported data on daughter's stress and ability to cope. Placed within the framework of parental investment theory, these results exemplify the importance of post-adolescent investment in humans.

Sunday, May 31

Sunday Morning Sessions

Session J-1: Theory of Mind**Titan Theater****Sn 9:30am*****Representing multiple mental states: Investigating "theory of mind" in a more ecologically valid context*****Annie E. Wertz**

Theory of mind (ToM) - the ability reason about agents in terms of mental state representations such as beliefs and desires - has been the subject of intensive study over the past 30 years. Previous research on this topic focused largely on when children develop this cognitive capacity. More recently, neuroimaging studies investigated where this ability is localized in the brain. The approach taken in the current experiments focused instead on the question of how the ToM cognitive mechanism works. In ecologically valid contexts, the ToM system is often presented with actions that are consistent with multiple different mental state representations. In previous work with adult participants, we demonstrated that when an agent approaches an object, the ToM system generates mental state representations about the approached object even when it is not the explicitly stated target of the agent's search. This established that the cue "agent approaches object" is an input to adults' ToM system, and that adults represent beliefs and desires about multiple objects simultaneously. Across two experiments presented here we demonstrate 1) that preschoolers' ToM system also uses the cue "agent approaches object" to generate mental state representations, and 2) that preschoolers, like adults, represent beliefs and desires about multiple objects simultaneously. The results of the current experiments suggest that evolution has equipped the ToM system with design features that allow it to deal effectively with mental state representations about multiple objects across development.

Sn 9:50am***What can children's narratives tell us about theory of mind?*****Michelle Scalise Sugiyama, Lawrence S. Sugiyama**

When Baron-Cohen (1996) initially parsed mindreading into four components, he noted that additional mechanisms might be involved, and later (2005) added two more to his model. Children's narratives may point to the existence of yet another set of mindreading mechanisms, which can be characterized as a goal-mapping system. Although mental-state terms begin to appear regularly in children's narratives around age three-and-a-half, children do not begin to organize their stories around a central character with a clear conflict until approximately age eight. Stories collected from pre-school and grade-school children indicate that focus on a central character, an overarching goal, and obstacles to that goal are separable structural components of narrative, with different developmental onsets. Given this finding, and given that mindreading comprises a suite of mechanisms, it is possible that goal mapping involves distinct cognitive tasks and mechanisms. In this paper, we compare the onset of mental-state term use in children's narratives with the developmental trajectory of three key components of narrative (*character constancy*, *goal-oriented action*, and *conflict*) to show that: (1) goal mapping is distinct from and emerges after the ability to attribute mental states to others; (2) this system consists of several sub-components with different developmental onsets; and (3) development of this system is not complete until late childhood.

Sn 10:10am***Dogs track knowledge states in humans*****Siamak T. Naficy H. Clark Barrett**

The attribution of knowledge states to others, sometimes known as "mindreading" or "theory of mind", is a milestone in the evolution of intelligence and plays a crucial role in many aspects of human social cognition, from cooperation, to communication, to social learning. Humans are adept mindreaders who can track hidden states such as knowledge and beliefs beginning in childhood. This ability is rare in other animals and, when present, occurs mostly in species that compete strategically for food, such as food caching birds. Chimpanzees also fit this pattern: they track what competitors know in food competition situations but are poor at following human cooperative pointing gestures to find food and don't take into account whether potential human cooperators know where food is or can see them. Dogs, on the other hand, excel at cooperative mindreading tasks: they follow pointing gestures to find hidden food, beg from humans who can see them but not from those who cannot, and refrain from inappropriate food-taking when being observed. This raises the possibility that dogs and humans may represent convergently evolved cases of cooperative mindreading. In a series of experiments, we show that dogs are sensitive to the knowledge states of humans, consistently relying on knowledgeable over ignorant informants when choosing between them in order to find hidden food. The ability to represent what others know and to use this for cooperative gain brings dogs much closer to humans in terms of social cognition than was previously

Session J-2: Testosterone

Gabrielino

Sn 9:30am***Testosterone changes provoked by competition: The importance of the opponent*****Leander van der Meij, Abraham P. Buunk, Alicia Salvador**

Testosterone (T) changes during competition have received much attention in the literature. Some authors have found that T typically increases among winners, suggesting a reciprocal relationship between status and T. However, other authors have found that only winning is not sufficient to provoke a T increase. A T change seems to be moderated by many psychological factors, such as the coping style and motivation to win. To our knowledge no research has looked at the characteristics of the opponent as moderators of a T change in competition. To try and fill this gap in the literature, this study investigated how the hormonal changes of men were affected by the self-efficacy, expectancies, and mood of the opponent when competing on a rigged competitive computer task. Results showed that, overall the competition lead to increases in heart rate, mood changes, and increases in T levels. T increased especially among losers and to a lesser extent also increased in winners. Overall, the T levels of the participants increased more when their opponents thought they were going to win and scored higher on self-efficacy. Only among losers T increased more when their winning opponent felt less negative and gave the competition less importance. The T changes can be explained by the Challenge Hypothesis. Both winners and losers were being challenged to compete for status, therefore the T changes were no different for winners or losers. T changes were moderated by a complex psychological interaction between winning and losing and characteristics of the opponent.

Sn 9:50am***Edocrine responses of men to social interactions with women*****James R. Roney, Aaron W. Lukaszewski, Zachary L. Simmons**

Males of most vertebrate species express neuroendocrine mechanisms that are activated during social encounters with potential mates. In most species examined, for instance, males exhibit rapid testosterone increases after exposure to cues from conspecific females, and recent research suggests that such responses may play functional roles in facilitating courtship and sexual behaviors. In this talk we will present a series of studies that provide evidence that human males also exhibit reactive increases in testosterone and cortisol concentrations after social interactions with women. The time-scale of these responses – as well as their correlations with measures of courtship-like behaviors – are similar to patterns found in the nonhuman literature and thus suggest that homologous brain mechanisms may regulate the human and nonhuman responses. Discussion of these studies will address individual differences in hormonal responses, possible functions of hormone increases, and also the broader role of testosterone in men's mating psychology.

Sn 10:10am***Puberty, testosterone, and aggression among Zimbabwe schoolboys*****Benjamin Campbell, Michael Mbizvo**

Testosterone is associated with male reproductive effort and aggression through out the animal world including non-human primates. However, its role in human aggression is less clear. Of particular interest is whether substantial increases in the testosterone during puberty are as associated with changes in aggression and social behavior. Thus we investigated the role of testosterone in aggression and problem behavior in 421 Zimbabwe schoolboys, ages 12 to 18. Measures included physical size, self-reported secondary sexual characteristics, blood spot testosterone, Olweus aggression scale, and self-reported problem behavior. Results indicated physical aggression but not problem behavior or lack of frustration tolerance decreased significantly with age, while testosterone was significantly related to problem behavior but not physical aggression. Physical aggression and problem behavior were also significantly related to lack of frustration tolerance. Path models indicate that both arm muscle area and lack of frustration tolerance were independent predictors of physical aggression, while frustration tolerance was the only significant predictor of problem behavior. These results support earlier findings in the U.S. and Europe that circulating testosterone is not directly tied to the development of aggression among normal boys. Instead they suggest that individual variation in frustration tolerance, a potential marker of impulse control may play a more important role in aggressive and antisocial behavior during adolescence. Compared to non-human primates it appear that the development of a larger human prefrontal cortex plays in important role in learning to control the expression of aggressive impulses at puberty.

Session J-3: Coalitional Psychology

Ontiveros

Sn 9:30am***On the perception of newcomers: Towards an evolved psychology of intergenerational coalitions*****Aldo Cimino, Andrew Delton**

Human coalitions frequently persist through multiple, overlapping membership generations, requiring new members to cooperate and coordinate with veteran members. Does the mind contain psychological adaptations for interacting with and within these intergenerational coalitions? In this paper, we examine whether the mind spontaneously encodes coalition newcomers as a distinct social category. Newcomers--though capable of benefiting coalitions--may also impose considerable costs (e.g., they may free ride on other members, they may be poor at completing group tasks, etc.). In three experiments we show (1) that the mind automatically categorizes newcomers; (2) that newcomer categorization persists in the presence of orthogonal and salient social dimensions; and (3) that newcomers elicit a pattern of impressions consistent with their probable ancestral costs. These results provide preliminary evidence for a specialized component of human coalitional psychology: an evolved concept of NEWCOMER.

Sn 9:50am***Evidence of alliance psychology in preschoolers: Children represent that the enemy of my friend is also my enemy*****David Pietraszewski**

A core component of alliance or coalitional psychology involves representing that what happens between agents can have consequences not only for those directly involved, but can extend to those who have relationships with those involved (e.g., my stance toward you will change if you treat my friend poorly). This inference is critical for predicting the outcome of social encounters. Using a story book vignette, we demonstrate that preschoolers (mean age 4years 8months) use information about standing social relationships to make inferences about the consequences of a particular social interaction that if A has a conflict with B, then A's friend is also likely to be angry at B. Control conditions demonstrate 1) that this inference is selective to alliance and does not occur when characters share just any common dimension and 2) that the content of what is extended across agents is selective. Children do not expect any and all internal states to extend across agents by virtue of their friendship. These results demonstrate that young children have a selective and sophisticated alliance psychology.

Sn 10:10am***Rethinking feelings in terror management theory and coalitional psychology: "Worldview defense" as misattributed affect*****Colin Holbrook, Paulo Sousa, Jennifer Hahn-Holbrook**

In previous studies, subtle death cues produced heightened in-group chauvinism and out-group derogation, a phenomenon known as worldview defense. Proponents of coalitional psychology and terror management theory have advanced rival explanations of worldview defense as the functional output of an evolved psychological adaptation. Both perspectives discount the role of incidental affect in producing the evaluation bias, largely because death primes evoke worldview defense without heightening conscious anxiety. This rationale overlooks a fundamental finding from affective science: awareness of incidental affect counters evaluation bias, while lack of awareness facilitates misattribution. Misattributed affect, rather than a content-specific adaptive module, may underlie worldview defense. To test this alternative, we conducted cross-cultural studies in the United States, Northern Ireland and Tibet investigating the role of aversive primes in generating biased evaluations of incidental targets. To directly access unconscious processing pathways, participants were exposed to subliminal angry faces prior to an evaluation task in which they rated the authors of in-group flattering or critical essays. Contrary to terror management claims that worldview defense uniquely relates to death concerns, exposure to covert angry faces produced evaluation bias. In a complimentary series of studies intended to demonstrate the indiscriminate (non-modular) nature of the affect misattribution, participants were reminded of death prior to aesthetically rating worldview-neutral images or sound targets. As predicted, reminders of death led to exaggerated aesthetic judgments. These results support the proposed synthesis of the worldview defense literature with research on the misattribution of affect in evaluation.

Session J-4: Group-living**Alvarado****Sn 9:30am*****Development of inferences based on ethnic and occupational categories*****Cristina Moya, Clark Barrett, Rob Boyd**

If humans have evolved cognitive rules for making predictions about strangers on the basis of their social category membership we might expect children to resemble each other more cross-culturally than will adults. That is children may have innate biases for choosing the same kinds of social categories as the basis for making predictions, whereas adults will have learned which categories are relevant sources of variation in their local contexts. Given the likely evolutionary recency of occupational specialization, inferences based on such categories are unlikely to reflect occupation-specific cognitive adaptations. A cross-cultural predisposition for ethnic, over occupation-based predictions may shed light on adaptations for social stereotype formation. Relying on real world social categories familiar to the research subjects, we will examine which kinds promote generalizations across the lifespan in the Peruvian altiplano, specifically pitting ethnic labels against occupational ones.

Sn 9:50am***Membership inheritance in permanent groups*****Frans Roes**

Permanent groups (groups with no inherent limit on group longevity) presumably exist in several species because over generations members share important interests. Considering the association between cooperation and degree of relatedness (Hamilton 1964), it follows that a collective interest is more likely to be achieved when members of a group show a higher degree of relatedness. Here it is hypothesized that if membership of permanent groups is inherited by only one sex, and this is the female sex, this will result in a higher degree of relatedness between group-members than when membership is inherited by both sexes, or by males instead of females. Hence the expectancy of female inheritance of membership in permanent groups. An evaluation of species living in permanent groups generally supports these ideas. Some exceptions to the rule are discussed, with special emphasis on humans.

Sn 10:10am***Reciprocity, not kinship explains labor exchange in a Dominican village*****Shane J. Macfarlan**

Throughout the 1950-60s, Caribbean anthropologists recorded a diverse array of labor-exchange types. Labor Exchange was described as reciprocal in nature and part of the general sharing ethos typical of peasant populations; however, a true cost accounting never occurred to determine whether it met the requirements for reciprocity. I present data collected from a horticultural, Dominican village over a one-year period within the village's primary cash economic opportunity, Bay Oil Production. Results suggest that reciprocity and living proximity, but not close kinship, explains labor-exchange. In a separate analysis, indirect and direct reciprocity are found to independently predict the occurrence of labor exchange. I suggest that labor-exchange in bay oil production in this village not only provides economic opportunities, but serves as a venue for males to negotiate same-sex social relationships.

Sunday Late Morning Sessions

Session K-1: Social Emotions**Titan Theater****Sn 10:40am*****Spite and the evolution of ethnocentrism*****Daniel Brian Krupp**

In 1970, Hamilton refined his theory of inclusive fitness. In so doing, he simultaneously introduced and provided the solution to a problem of social evolution: *spite*. Hamiltonian spite refers to a social action that decreases the net lifetime direct fitness of both the actor and the recipient at the level of the population. Such actions are favored by selection when the following two conditions are met: (1) the cost to the recipient is sufficiently larger than the cost to the actor; and (2) the relatedness between actor and recipient is sufficiently *negative*, which arises when neighbors are less likely than chance to share identical copies of the focal allele (and thus more likely to possess rival alleles). Integrating research on the conditions that are expected to foment spite with the psychological design of human kin recognition systems, I present a model of the evolution of ethnocentrism. The model predicts the following: (1) ethnocentrism will vary as a function of the *scale* and *slope* of competition; (2) spiteful conflict will tend to fall along the lines of ethnicity (rather than age or sex); (3) perceptions of relatedness (and, thus, ethnicity) are labile; (4) perceptions of relatedness will be asymmetrical between social partners under certain conditions; and (5) this asymmetry will affect ethnic group-specific rates of altruistic and spiteful behavior. I then marshal preliminary evidence that bears on these predictions.

Sn 11:00am***The evolved function of social anxiety: Are moderate levels adaptive?*****Nicole R. Buttermore, Randolph M. Nesse**

Social anxiety – like other responsive defenses – is useful only when the magnitude of the response is appropriate to the demands of situations that involve genuine social threats. We argue that the computational systems that underlie social anxiety function to: 1) detect high stakes social interactions; and, 2) minimize the risk of subsequent negative evaluation. We present the results of a series of studies in which participants from across the distribution of trait social anxiety levels completed a threatening or non-threatening priming task, after which they were asked to identify the emotion displayed in a series of faces. Results showed a curvilinear relationship between dispositional social anxiety scores and response time, and were broadly consistent with a model of social anxiety that construes the disorder in terms of an overactive defense system. At least with respect to some measures, we conclude that moderate amounts of dispositional social anxiety can be better than not only high amounts, but also very small amounts.

Sn 11:20am***Distinguishing emotions and attitudes in evolutionary psychology: The case of contempt*****Matthew Gervais, Daniel M.T. Fessler**

Contempt is typically studied as a uniquely human moral emotion, though it has at times been discussed as an attitude. I present a functional model of social cognition that distinguishes emotions from attitudes but sees them as reciprocally related: emotions update attitudes, while attitudes play a key role in the appraisal processes that regulate emotions. In light of this model, the nearest functional referent of “contempt” is an attitude, not an emotion. Specifically, it is an attitude of zero *liking*, distinct from *hatred* or *fear*, that is a proxy for another’s welfare having no value to oneself. This attitude results from cues to low relationship value – including repeated relational *anger* – and it implements exploitation and exclusion by creating two constellations of emotional dispositions: muted prosociality (disengaged empathy, reduced *guilt* and *pity*) and potentiated intolerance (potentiated *anger* and *disgust*). This plausibly creates the phenomenology of “cool indifference” that is implicated in “contempt,” and it accounts for findings such as the frequent association of “contempt” with “anger” and “disgust.” This framework also suggests how to proceed with a phylogenetic analysis of *contempt* that moves beyond consideration of emotional expressions, and it explains why *contempt* stands out as markedly “negative” in the context of the human cooperative syndrome.

Sn 11:40am***The regulatory theory of shame*****Daniel Sznycer, John Tooby, Leda Cosmides**

We make decisions all the time that require trading off our own welfare against the welfare of another. The weighting of others’ welfare is set by many factors, including their physical strength, skillfulness, and generosity. The consequence of this is that revealing decrements in the value of those factors (e.g. ineptitude, stinginess) can cause others to devalue one, and therefore impose more costs and grant fewer benefits. Given this adaptive problem, it is likely that natural selection crafted adaptations for buffering social devaluation. We propose that the emotion of shame is one such adaptation. The activation of shame deploys a suite of behavioral programs for minimizing the spread of damaging information and for negotiating higher social value. We derived the following predictions: (1) The intensity of shame increases as the incriminating action goes from private to public, (2) Shame is mobilized preemptively—e.g., in situations where one’s actions are not known by others, (3) Shame tracks other’s assessments of one’s actions, (4) When socially devalued, stronger males are likelier to react with aggression and less likely to display submissive behaviors. These predictions were supported in three experiments. The proposed theory includes computational elements that are evolvable and well specified; explains why failures, a commonly presumed shame elicitor, are neither necessary nor sufficient to elicit shame; and explains phenomena that are puzzling under some alternative theories (e.g., why shame would be coactivated with anger). As with other emotions, an evolutionary-computational analysis is a promising way for elucidating the architecture of shame.

Session K-2: Cognition and Modularity

Gabriellino

Sn 10:40am***Hominid brain evolution: Testing climactic, ecological, and social competition models*****Drew H. Bailey**

Hypotheses regarding the selective pressures driving the threefold increase in the size of the hominid brain since *Homo habilis* include climatic conditions, ecological demands, and social competition. We provide a multivariate analysis that enables the simultaneous assessment of variables representing each of these potential selective forces. Data were collated for latitude, prevalence of harmful parasites, mean annual temperature, and variation in annual temperature for the location of 175 hominid crania dating from 1.9 million to 10 thousand years ago. We also included a proxy for population density and two indexes of paleoclimatic variability for the time at which each cranium was discovered. Results revealed independent contributions of population density, variation in paleoclimate, and temperature variation to the prediction of change in hominid cranial capacity (CC). Although the effects of paleoclimatic variability and temperature variation provide support for climatic hypotheses, the proxy for population density predicted more unique variance in CC than all other variables. The pattern suggests multiple pressures drove hominid brain evolution and that the core selective force was social competition.

Sn 11:00am***Reason and the passions are not opposed: They are domain-specific*****Laurence Fiddick, Sean Lee, Ryo Oda, Gary Brase, Ryo Tamura, Kai Hiraishi**

Tooby and Cosmides (1990) have proposed that emotions regulate the de/activation of adaptive subcomponents of the human mind. This suggests that emotions might selectively enhance a persons reasoning when the emotion activated and the reasoning processes engaged converge on the same adaptive problem. We tested this proposal in two complementary studies. In Study 1, we gave participants scenarios depicting two adaptive problems – social cooperation and hazard management – and asked them to indicate which facial expression of emotion they would expect someone to react with if they saw the situation (a rule violation) transpire. Participants from five different cultures associated infractions in the domain of social cooperation with anger and infractions in the domain of hazard management with fear. In Study 2, Japanese and American participants displayed enhanced reasoning about rule violations in the domain of social cooperation when they were shown that someone would react with anger when the rule was broken, conversely they displayed enhanced reasoning about rule violations in the domain of hazard management when they were shown that someone would react with fear when the rule was broken. The results demonstrate that emotions can enhance reasoning performance, but only in a domain-specific manner when the emotion expressed matches the adaptive problem to be solved.

Sn 11:20***When well-designed adaptations produce poor performance: How different types of participant payments alter task performance*****Gary L. Brase**

Evaluating hypotheses that the mind is well-designed to perform particular tasks sometimes comes down (for better or worse) to levels of performance in research studies; relatively better performance indicates better design. There is also variation, however, in how researchers design studies in terms of the incentives (such as money or course credit) used to obtain willing participants. There is little understanding or agreement on the effects of different types and levels of incentives used. Different incentive structures are shown here to significantly affect statistical reasoning task performance in ways related to both the type of incentive used and the task difficulty. Research with 704 participants receiving either course credit, flat fee payment, or performance-based payment incentives, found that incentives tied to successful performance have the largest effect, even controlling for average payment. Furthermore, moderately difficult tasks (compared to very easy and very hard tasks) appear to be most sensitive to incentives. These results can help resolve existing debates about inconsistent findings and their relevance to hypotheses of well-designed evolutionary adaptations. More generally, these findings can guide more accurate comparisons across studies which vary in participant recruitment methodologies.

Sn 11:40am***To be or to become: An evolutionary model of ontogenetic specialization*****Willem E. Frankenhuis, Karthik Panchanathan**

While adaptive thinking has been fruitfully applied to the study of mature phenotypes, it can also be applied to the study of developmental processes. Consider, for example, cognitive systems that specialize ontogenetically towards specific phenotypic outcomes, contingent on input. Rather than contrasting ontogenetic specialization with genetic evolution, we explore an adaptive dynamic program, which uses Bayesian updating, to investigate the evolutionary conditions that may have led to different specialization onsets in different cognitive systems. Our model assumes a tradeoff between specializing and sampling; specializing early may lead to a tighter correspondence with the environment, but sampling may yield a more accurate estimate of the state of the world. The model generates optimal developmental rules for a range of evolutionary conditions. These developmental rules are subjected to data to observe the phenotypic distributions they would produce, which may lead to insight into patterns of individual differences in adults. The model will be discussed in light of empirical research on the development of stress reactivity, contingent mate strategies, levels of aggression, and cultural learning of expertise.

Session K-3: **Paternal Investment: Predictors and Consequences of**

Ontiveros

Sn 10:40am***Father-child resemblance belief and paternal investment as functions of living with paternal grandparents*****Miranda Chi Kuan Mak, Lei Chang, Huijing Lu, Shasha Sui**

Father-favoring parent-child resemblance belief has been extensively studied but not in relation to other behavioral or cultural adaptations that serve the same function of calming paternity uncertainty. Some of the cultures and customs that serve to calm paternity uncertainty may include patrilocality and co-residence with paternal relatives, legal and common practice to name offspring after paternal family names, and penal laws and traditions showing double standards about adultery. The present study examined the relation between perceived father-child resemblance from both parents and paternal investment as a function of whether the couple lived with paternal grandparents at the time of the child's birth. Based on a sample of 150 kindergarten and primary school children and their parents, we found higher paternal warmth and lower paternal depression for fathers believing father-child resemblance than those who do not. These mean differences were more pronounced for those living as nuclear families than those living with paternal grandparents. Living with paternal grandparents was also found to moderate the relation between paternal warmth and child behaviors with stronger associations being found among families living with paternal grandparents. These and other results will be discussed as evidence of behavioral and cultural adaptations to calm paternity uncertainty and to facilitate monogamy and paternal investment.

Sn 11:00am***Women with children sired by a previous partner and risk of non-lethal and lethal intimate partner abuse*****Emily J. Miner, Todd K. Shackelford, Valerie G. Starratt**

Women who are abused by their male intimate partner incur many costs, ranging in severity from fleeting physical pain to death. Woman abuse may be triggered or exacerbated by the presence of the woman's genetic children in the household who are not genetically related to her current partner. Previous research has linked the presence of children sired by a previous partner to increased risk of woman abuse and to increased risk of femicide. The current research uses a sample of 208 non-abused women, 255 less severely abused women, 238 more severely abused women, and 49 victims of intimate partner femicide to document a linear trend in the risk of experiencing severe forms of violence for women who have children sired by a previous partner in the household. The discussion addresses limitations of the archival data used and highlights directions for future research.

Sn 11:20am***The consequences of paternal investment for child status: A test case from South India*****Mary Shenk, Brooke Scelza**

Recent work in behavioral ecology has suggested that analyses focusing on early childhood may underestimate the importance of paternal investment to child outcomes since such investment may not become crucial until adolescence or beyond. This may be especially important in societies with a heritable component to status, as investment by fathers during later childhood or adolescence may be more strongly related to a child's adult status than early-childhood forms of investment affecting child survival and child health. In such societies, the death or absence of a father may have profoundly negative effects on the adult outcomes of his children which cannot be easily compensated for by the investment of mothers or other relatives. We test this proposition using a multigenerational dataset from Bangalore, India, containing information on paternal mortality and several child outcomes dependent on parental investment during adolescence and young adulthood. We examine the effects of a father's death, and the timing of his death, on the education, income, marriage costs, and age at marriage of his children, as well as the education and income of their spouses. Results indicate that a father's death has a negative impact on virtually all child outcomes (though the effect often varies by the child's sex) which is only partly mediated through the loss of paternal income. We also find that the consequences of a father's death are worst if he dies during adolescence, and that the benefits of a father's presence to a child extend well past the age of 30.

Poster Abstracts

Friday, 4:00-7:00pm

TSU Courtyard

Carey J. Fitzgerald

Retaliating against kinship insults: Examining the kinship acceptance rejection model of altruism and aggression (KARMAA)

Webster's (2008) Kinship, Acceptance, Rejection Model of Altruism and Aggression (KARMAA) illustrates that kinship cues facilitate altruism, which is mediated by social acceptance, and that kinship insults lead to aggression, which is mediated by social exclusion. Although the relationship between kinship cues and altruism has been robustly supported, no research to date has examined the relationship between kinship insults and aggression. Therefore, the current study examined how different types of insults— social status insults and reproductive status insults – toward one's kin and friends influenced the likelihood of verbal and physical retaliation. Participants were given a questionnaire containing scenarios in which a hypothetical person insulted each participant's actual sibling, cousin, or friend. Participants were asked to indicate their likelihood of insulting the insulter in return and the likelihood of physically harming the insulter on 5-point Likert-type scales. Results indicated people were significantly less likely to verbally retaliate when a cousin was insulted than when a sibling or friend was insulted. Additionally, people were just as likely to physically retaliate regardless of whether the insulter was a sibling, cousin, or friend. Males were more likely to physically retaliate toward male insulters, and females were more likely to physically retaliate toward female insulters. Females were also more likely to verbally retaliate than males, but only when the insulter was female. Finally, people were more likely to verbally and physically retaliate when a female was insulted.

Jeremy E. C. Genovese

Body symmetry correlates with IQ in an archival somatotype sample

The purpose of this study was to test a hypothesized relationship between body symmetry and IQ (Furrow, et al., 1997). Developmental stability refers to the ability of an organism to translate its genotype into phenotype. In bilaterally symmetric organisms, body symmetry has been shown to be a good index of developmental stability and it has been suggested that IQ might be an indicator of the developmental stability of nervous system functioning. In 1949, Sheldon published IQ data on 200 young males living at Boston's Hayden Goodwill Inn. Using Sheldon's somatotype photographs, Hartl, Monnelly, and Elderkin (1982) rated each subject on two scales of body symmetry; primary and secondary structural integration. Both variables were positively correlated with IQ ($r = .37, p < .001$ and $r = .41, p < .001$, respectively). Consistent with a prediction made by Sheldon (1942) ectomorphy was also correlated with IQ ($r = .18, p < .05$).

Steve Moxon

Dominance as adaptive stressing and ranking of males, serving to allocate reproduction by differential self-suppressed fertility: Towards a fully biological understanding of social system

Dominance is a biological concept of 'power' relationship between individuals, resulting from previous encounters with others biasing likelihood of contesting. It can be shown to be adaptive, and it's thought that fitness is increased through dominance (hierarchy) minimising mutually unproductive contest over resources. But highly inconsistent data indicates that this operational definition is too wide, and given clear evidence that dominance is invariably same-sex, it seems instead to function primarily to allocate reproduction. Dominance contest exposes individual differences in various forms of vigour; and by a self-organising process same-sex individuals rank in a hierarchy. But this achieves nothing in itself without an integral mechanism of corresponding individual variable self-suppression of the physiology re reproduction – and mate-choice with rank as the criteria. Reproductive suppression appears to vary across fauna along a continuum, from a 100% reproductive skew with total suppression of all individuals bar the sole breeder, to a gradient down the length of the dominance hierarchy. The mechanism is usually hormonal or pheromonal, on top of an indirect consequence of stress caused by relatively low rank. Dominance evolved as the major instrument of the proposed 'genetic filter' function of the male to deal with accumulated deleterious genetic material. This new conceptualization of dominance has major implications for the social as well as biological sciences, in that resource-competition models of the basis of sociality will give way to a thoroughgoing biological understanding placing reproduction centre-stage; with consequent radical revision of notions of 'power'.

Melanie MacEacheron

Factors associated with Hamilton, Ontario women's marital surname change attitudes

132 female, never-married, undergraduate psychology students were surveyed regarding attitudes concerning marriage/common law unions. Whether women who favour marital surname change also desire to a greater extent: (1) resource transfer from and involvement with in-laws, and (2) to garner resource transfer from and higher resource potential (HRP) in their mates, was tested. (1) was tested to determine whether women may be responsive to discriminative grandparental solicitude, and (2) was tested in order to determine whether women who want more resources from mates/HRP mates may try to present themselves as having greater mate value. Data concerning desired number of children, closeness to parents, and attitudes toward women's surname change or retention, desired partner traits, and in-law relations were collected. The following question groupings when principal component analyzed each yielded a component representing the following: marital surname questions --approval of retention ($\alpha=.64$); desired partner trait questions -- approval of partners with high resource potential ($\alpha=.70$); in-law questions --antipathy to in-laws and desire they not be involved with one's children ($\alpha=.58$). Greater approval of marital surname retention was predicted under OLS regressions by desire for in-laws to be uninvolved with their children and/or themselves and their partners and, in one such regression (involving only women in relationships), partner and his parents earning more than subject and hers, and (marginally) greater desire for a mate of high resource potential.

Christian M.D. von Pohle

Human Secondary Sex Ratio: Reconciling Mixed Results of Trivers-Willard Hypothesis

Trivers and Willard (1972) developed a hypothesis (TWH) explaining how natural selection allows parents to manipulate the birth or secondary sex ratio (SSR). Parents will favor the sex with the best reproductive success given current environmental conditions and adjust parental investment accordingly. Good conditions should bias conception toward male offspring; poor conditions toward female offspring. Males benefit more from good parental conditions and suffer more from poor paternal conditions than females. Numerous studies have attempted to investigate factors that predict variations in SSR. Inconsistent assessment and different criterion for parental investment provide misleading results. This study attempts three objectives: (1) present a comprehensive evaluation of studies examining the SSR bias (2) provide an account of predictors consistently supporting the TWH humans (3) offer hypotheses to account for the inconsistent findings. Sixty-three studies and 30 potential predictors of SSR were reviewed (58% support the TWH; 17% partial support; 25% no support). After classifying predictors into 4 categories (fixed biological, varying biological, ecological, status), the varying biological category provided support in 92% ($N = 13$) of the studies. The other categories functioned no better than chance. In summary, the secondary sex ratio in humans is influenced largely by biological factors that vary in both directions from some population mean. Fixed biological, ecological, and status predictors do not reliably predict SSR. The varying biological factor is contingent on an individual's physical condition. Natural selection can account for why this factor displaces the most reliable predictor for the TWH.

Robert P. Burriss, Hannah M. Rowland, Lisa M. DeBruine, Anthony C. Little

Chicks Dig Scars: Men with Scarring are More Attractive for Short-Term Relationships

Scarring is widely considered to have a negative impact on attractiveness. However, in many non-Western cultures scars derived from ritual scarification (intentional scarring) are prized, as are posttraumatic scars that are acquired through combat or other heroic behaviors. These scars may advertise risky behavior or heightened masculinity, traits which in some contexts women may find attractive. Here we show that non-severe posttraumatic facial scarring can enhance perceptions of attractiveness in men but not in women. We asked 147 women and 76 men to rate the attractiveness of opposite-sex faces either without scars or manipulated to exhibit photorealistic scarring, and found that scars enhanced women's ratings of male attractiveness for short-term, but not long-term, relationships. Women's attractiveness was unaffected by scarring. We also report the results of an additional study that show that, even when scars are identical in appearance, those borne by men are perceived to be more likely to have resulted from violence than are those borne by women, a greater proportion of which are perceived to be accidental. Furthermore, a survey of individuals with scars demonstrates that men who bear scars caused by violence feel that their scarring augments their attractiveness, while women or men with other types of scar do not. Our results suggest that under certain circumstances scars may signal valued information about their bearers and that the idea that scarring universally devalues social perceptions can no longer be assumed to be true.

Farnaz Kaighobadi, Todd K. Shackelford, Danielle Popp, Ryan M. Moyer, Vincent M. Bates, James R. Liddle
Perceived Risk of Female Infidelity Moderates the Relationship between Men's Personality and Partner-Directed Violence

Men's partner-directed violence may be produced by adaptations to decrease the risk of partner infidelity and subsequent cuckoldry. Men's perceptions of risk of partner infidelity may interact with men's stable dispositions such as personality traits to predict men's partner-directed violence. We hypothesized that men's personality traits as assessed by the Five Factor Model interact with men's perceived risk of their partner's infidelity to predict men's partner-directed violence. Four hundred and sixty-seven men completed assessments of their personality traits, perceptions of their partner's infidelity, and the frequency with which they perpetrated partner-directed violence. The results of the moderation analyses revealed that (1) men with lower emotional stability, agreeableness, and conscientiousness perpetrated more partner-directed violence, (2) men who perceived greater risk of partner infidelity perpetrated more partner-directed violence, and (3) the relationship between men's personality traits and partner-directed violence depends on their perceptions of the risk of their partner's infidelities. The results of simple slope analyses indicated that (a) men's emotional stability and agreeableness predict partner-directed violence only when the perceived risk of partner infidelity is low or medium, and (b) men's conscientiousness predicts partner-directed violence only when the perceived risk of partner infidelity is medium or high. The discussion addresses the results of the moderation and the simple slope analyses, notes limitations of the research, and highlights directions for future research.

Giovanni Maggini

The Function of Dreams: Animal Ancestors, Human Universal, and Serving Nightmares

Drawing heavily from current articles in evolutionary psychology, this paper delves into the possible function of dreams in an evolutionary context. Although most psychological dream work has focused on humans from the ages of five and up (who can linguistically describe their dreams), this paper takes into account that babies and indeed all placental mammals have REM sleep that most likely indicates that they have something which we can call dreams. From this perspective dreams are taken to have a function selected for since this trait is a placental mammalian universal. This paper presents arguments in current theoretical work that dreams have contributed to the overall fitness of mammals by engaging the dreamer in role-rehearsal scenarios which may enhance reaction time in novel and previously experienced situations. Furthermore, ontogenetic differences across lifespan indicate that dreaming may play a role in normal brain development and deviations from normal REM sleep patterns, such as those experienced by autistic children, may account for the difficulties those individuals face. Cross-cultural dreaming behavior is then discussed in order to determine human universal dreaming phenomena, and how dreaming may increase fitness in humans that it does not in other animals. It then goes on to take account of a few anecdotal dreams in order display how these fit into current dream theory.

Jaime C. Confer, Carin Perilloux, David M. Buss

More Than Just a Pretty Face: Men's Priority Shifts Toward Bodily Attractiveness in Short-Term Mating Contexts

Prior studies of physical attractiveness have emphasized the constituent features that make faces and bodies attractive, such as symmetry and waist-to-hip ratio. Few studies, however, have examined the relative importance of faces and bodies as whole units. The present study tested the hypothesis that men evaluating a woman as a short-term mate would give higher priority to information gleaned from her body than from her face, as compared to men evaluating a woman as a long-term mate. Male and female participants were instructed to consider dating an opposite-sex individual, whose image was occluded by a "face box" and a "body box," as either a short-term or long-term mate. With the instruction that only one box could be removed before making their decision, significantly more men assigned to the short-term, compared to the long-term, mating condition chose to remove the body box. For long-term mating, men and women chose to reveal the face more frequently than the body. Women's box choice was unaffected by mating condition. These results support our hypothesis that men have an adaptive bias to prioritize facial over bodily cues in long-term mating contexts, but shift their priorities toward bodily cues in short-term mating contexts. This pattern is consistent with the premise that cues of immediate fertility are relatively more concentrated in a woman's body, whereas cues of reproductive value are relatively more concentrated in a woman's face.

Robert O. Deaner, Benjamin Winegard

The Significance of Red Sox Nation: An Evolutionary Hypothesis for Sport Fandom

Many individuals show strong attachments to particular sports teams despite not being members of those teams. Although sport fandom has been previously studied, this paper develops the first explicitly evolutionary account of it. Specifically, we hypothesize that fandom is the byproduct of an evolved disposition to form coalitions with others, especially men, in the context of potential inter-group conflicts based on overt aggression (e.g. small-scale warfare). From this hypothesis, we derive the following predictions: (1) fandom should correlate positively with the endorsement of group-relevant moral concerns; (2) compared to female fans, male fans should report greater team loyalty; and (3) compared to female fans, male fans should possess greater knowledge about the rules of team sports relative to their knowledge about the outcomes. We administered surveys to 490 undergraduates and found support for all three predictions. Moreover, alternative explanations for each prediction were shown to be unsupported. These results collectively illustrate the value of an evolutionary perspective in explaining social behavior.

Stefan Goetz, Robert O. Deaner

Facial Width Predicts Violent Crime

Although expressions such as “never judge a book by its cover” suggest that facial features are uncorrelated with behavior, empirical research indicates otherwise. Of particular interest is Carre & McCormick’s (2008) finding that the ratio of a face’s width to its height predicted aggression in a lab task and penalty minutes among professional hockey players. We sought to replicate this finding, focusing on what is arguably the most unambiguous and ecologically-valid measure of aggression: the commission of violent crime. In addition, we extended our study to women, since the effects of testosterone might drive a similar correlation among them. Our sample included roughly 1200 individuals whose pictures and criminal records were available from the Michigan Department of Corrections offender tracking website. We classified individuals as those who had been convicted of at least one unambiguously violent crime (e.g. murder), those who only had been convicted of unambiguously non-violent crimes (e.g. receiving stolen property), and those who had been convicted of at least one possibly violent crime (e.g. armed robbery). We measured faces using previously established methods. Our main finding is that, as predicted, there were significant differences among males of all three groups: those convicted of at least one violent crime had the widest faces and those convicted of only non-violent crimes had the narrowest. These differences remained significant when we controlled for age and body size. Analyses of female faces is ongoing. These results provide further support for the claim that physical features correlate with ecologically important behavior.

Lyndsay Nelson, Jonathan Baker, Mark Remiker, Sarah Brandt, April Bleske-Rechek

Moral Decisions in the Trolley Problem: People Save Five over One Unless the One Is Young, Genetically Related, or a Romantic Partner

We investigated moral decision-making in an ethical thought experiment known as the Trolley Problem. In the original Trolley Problem, readers must decide whether they will save the lives of five people tied to a track by pulling a lever to sacrifice the life of one person tied to an alternate track. According to W. D. Hamilton's (1964) formulation of inclusive fitness, people's moral decisions should favor the well-being of those who are reproductively viable, share genes, and provide reproductive opportunity. In two studies (Ns = 652 and 956), we manipulated the sex, age (2, 20, 45, and 70 years old), genetic relatedness (0, .125, .25, and .50), and potential reproductive opportunity of the one person tied to the alternate track. As expected, men and women were less likely to sacrifice one life for five lives if the one hypothetical life was young, a genetic relative, or a current mate.

Bailey VandenHeuvel, Maria Vander Wyst, April Bleske-Rechek

Age Variation in Mating Strategies and Mate Preferences: Beliefs versus Reality

We conducted three studies to (1) investigate individuals’ beliefs about change in mating desires over the course of emerging adulthood and (2) determine whether those beliefs reflect actual variation in mating desires among emerging adults of varied ages (late teens through twenties). In Study 1, 103 men and women gave their thoughts on how college students change, if at all, in what they most desire in a relationship and relationship partner as they move from being incoming freshmen to graduating seniors. In Studies 2 and 3, using a college sample and then an internet sample (Ns = 288 and 307), men and women between the ages of 18 and 26 completed mating strategies inventories and allotted a limited number of “mate dollars” to 10 mate characteristics. Findings suggest that although emerging adults believe that their peers’ mating desires change systematically over time, emerging adults’ self-reported mating desires vary little with age.

Christine A. Caldwell, Ailsa E. Millen

Testing hypotheses about cumulative culture in laboratory microsocieties

We have developed methods for studying cumulative culture under laboratory conditions (Caldwell & Millen, 2008). Using these methods we can test hypotheses about the factors involved in generating cumulative culture, and the consequences of cumulative culture over multiple laboratory generations. We have tested which learning mechanisms are necessary for cumulative culture to occur. We have also tested the influence of predictable versus unpredictable outcomes on cumulative culture. We report these experiments.

Aaron T. Goetz, Kayla B. Causey, Gorge A. Romero, Ann Black

Coalitional Psychology in Young Children: Boys but Not Girls Draw an Imagined Ally as Taller and Larger than Themselves

Given that physical aggression associated with hierarchy negotiation was more likely a selection pressure operating on men than on women, men should be more likely to possess psychological mechanisms associated with the selection of formidable coalitional allies. Research has documented, for example, that when selecting coalitional allies men are more likely than women to select allies who are physically strong, good fighters, and formidable (DeKay, Buss, & Stone, unpublished manuscript). We examined whether this sex difference in coalitional psychology would emerge in childhood. We asked twenty-one children (Mage = 9.7 years) to draw a picture of themselves standing next to their ideal best friend. We then measured the height of the drawn characters and calculated the area of each character. Boys drew their ideal best friends as taller and larger than themselves. Girls, however, did not draw their ideal best friends as taller nor larger than themselves, but tended to draw themselves taller and larger. In documenting that young boys (but not girls) draw an imagined ally as taller and larger than themselves, we suggest that this is evidence that male coalitional psychology emerges early in childhood.

Carin Perilloux, Judith A. Easton, Diana S. Fleischman, David M. Buss

Which women are targets of men's sexual over-perception bias?

Previous research has documented design features of men's evolved tendency to overestimate the sexual interest of women based on cues such as smiling or touching, but has not documented when some women evoke more sexual over-perception than others. We hypothesized that men's sexual psychology contains design features to target some women more than others for sexual over-perception. We hypothesized that women's physical attractiveness, trait-level compliance, and agreeableness would predict their likelihood of being misperceived. In the current study, participants engaged in brief conversations with up to five previously unknown opposite-sex peers. After each conversation, the participants rated their sexual interest in their partner and estimated their partner's sexual interest in them. Participants also rated their partner on various hypothesized traits, as well as several others included for exploratory purposes. Results indicate that a woman's physical attractiveness, extraversion, and conscientiousness significantly predict the degree to which men over-perceive her sexual interest in them. Discussion focuses on potential design features of male sexual over-perception bias as well as practical implications for reduction of conflict between the sexes.

Victoria C. Ramenzoni

Reasoning with probabilities: Why ecology and culture matter in understanding cognitive evolution

Probabilistic reasoning and uncertainty estimation are critical skills for adaptation and have received ample attention in disciplines such as Philosophy and Psychology. In recent years, research within this area has expanded to explore how socio-ecological aspects affect human reasoning and its evolution. This project focuses on the relevance of cultural and ecological factors in reasoning about probabilities and challenges classic psychological assumptions about human irrationality. According to these perspectives, human failure to apply probability rules is interpreted as a cognitive fallacy; hence, an error that impairs judgment and affects rationality. This poses a conundrum in evolutionary terms. However, if socio-ecological contexts are considered, the non-application of the rule could reflect intelligent judgments. Rationality can thus be defined as bounded by environments, cognitive limitations, and culture. Relying on the conjunction rule, one of the simplest principles in probability calculus, 7 experimental tasks were presented to students at the University of Buenos Aires, Argentina. The tasks referred to diverse domains of information (sports, history, policy, social), and were posed in different probability formats (frequency and percentages). In addition, local notions of probability were explored. In accordance with socio-ecological interpretations, results showed that participants' responses varied depending on the domain and format in which the problem was framed and in relation to their definition of probability. Findings provide additional evidence of the sensitivity of probabilistic reasoning processes to socio-ecological factors and emphasize the importance of bounded rationality in the study of the evolution of cognition.

David Vazquez, Russell E. Jackson
Evolved Navigation Theory and the Preference for Nearer

A large body of research often assumes that humans prefer the closer of equivalent goals; however, no evidence addresses this notion empirically. Through natural selection, organisms that navigate their environment most efficiently differentially survive and reproduce. Evolved Navigation Theory (ENT) would suggest that selection pressures associated with navigating surfaces would shape perceptual and navigational mechanisms in order to avoid risky behaviors and costly surfaces. In line with ENT, we predicted that participants would preferentially navigate to the nearer of otherwise equivalent navigational goals. In two experiments, we tested participants' preference for nearer navigational goals at a variety of distances. Data indicated a strong preference for nearer goals. These results have implications toward a wide variety of human behaviors, including explaining modern day preferences for activities that avoid navigating further distances, even when we know that doing so negatively impacts our health and well-being. Furthermore, any deviations from these tendencies must be explained within the context of evolution by natural selection.

Chela Willey, Russell Jackson
Evolved Navigation Theory Applied to Horizontal Surfaces

Evolved Navigation Theory (ENT) suggests that some distance overestimation may adaptively deter people from risky navigation as a product of species exposure to risks, such as falling, over evolutionary time. Previous research suggests that distance perception may be largely determined by differential environmental contexts surrounding an observed surface. Research suggests that unconscious evaluations of posed risks within the environment may have a relatively large influence, particularly the risk of falling. Jackson & Cormack (2008) found that people tend to overestimate vertical distances due to the associated falling cost. Jackson & Cormack (2007) found that people tend to overestimate vertical distances more so from the top than from the bottom due to the differential falling costs present. However within current literature, there are no existing studies focusing on estimation of environmentally horizontal surfaces posing falling costs. This study, using a distance-matching task, examines the estimation of three environmentally horizontal surfaces varying in degrees of falling costs as well as a horizontal surface that poses no falling cost. As predicted under ENT, data suggested that participants overestimated horizontal surfaces with falling costs. Furthermore, overestimation increased with the magnitude of falling cost. Data from this study may indicate that through an evolved mechanism people overestimate even horizontal surfaces according to the amount of falling risk present.

Eschler, L., Hines, M.
Female Coital Orgasmic Ease, Sociosexuality and 2D:4D

Aim. Sociosexuality and coital orgasmic capacity have previously shown sex differences, and both traits have been associated with sex hormones, however, the two have never been previously linked. The aim of this study was to explore the relationship between variation in the orgasmic response (from coital and non-coital activities) in women and its behavioural/psychosexual correlates (sociosexuality, number of sexual partners, etc). In addition, the link between pre-natal androgen exposure (indirectly assessed using finger ratios) and both sociosexuality and orgasmic ease was explored. **Results.** As predicted, women who reported being able to orgasm from coitus reported a higher lifetime number of sexual partners, a higher number of one-off sexual encounters and a higher number of extra-pair partners after controlling for age. These women also had higher scores on the sociosexuality inventory (SOI), i.e. had a more permissive sexual attitude. However, while being orgasmic from coitus was linked to sociosexual variation, actual coital orgasmic frequency was not. Both orgasmic capacity and sociosexuality were also significantly linked to sexual desire. In addition, coital orgasmic ability was significantly correlated to 2D:4D. **Conclusion.** In sum, the current findings suggest that female sexual reward (orgasmic ease) may contribute to variation in socio-sexual orientation and number of sexual partners. Further research is needed to replicate these findings, to establish possible common underlying mechanisms linking those traits, such as androgenisation, and also to pinpoint the modulatory effects of differential orgasmic ease on sexual behaviour and attitudes (i.e. sociosexuality).

Judith A. Easton, Aaron T. Goetz, Todd K. Shackelford
Anti-Cuckoldry Tactics of Men with and without Erectile Dysfunction

Modern men are hypothesized to have evolved tactics to avoid cuckoldry—the unwitting investment of resources into genetically unrelated offspring. To thwart cuckoldry, men deploy both pre-copulatory and copulatory anti-cuckoldry tactics. Pre-copulatory tactics include, for example, mate guarding. Copulatory anti-cuckoldry tactics include, for example, inseminating a partner during periods of greater risk of sperm competition. However, some men may not be able to perform both classes of tactics, such as men with erectile dysfunction (ED). ED is a persistent inability to attain or maintain an erection through intromission and ejaculation. ED occurs along a continuum—some men experience partial ED and other men experience complete ED. We hypothesized that men with scores indicating greater severity of ED will be more likely to report feelings of sexual jealousy and to report performing more pre-copulatory anti-cuckoldry tactics than men with scores indicating lesser severity of ED. Independent samples of men ($n = 90$) and women ($n = 160$) in a committed relationship completed surveys about their own and their partner's relationship-relevant behaviors, respectively. Results corroborated the hypotheses: men with more severe ED are more sexually jealous and perform more pre-copulatory mate guarding than do men with less severe ED, according to men's self-reports and women's partner-reports. Discussion addresses limitations of the current research and highlights future directions for work on ED from an evolutionary perspective informed by sperm competition theory.

Vibeke Ottesen

Are parental reports in child studies objective? An evolutionary informed approach

Parental report is a common method in child studies as it takes advantage of the vast knowledge parents have of their child and is thought to secure the ecological validity that might be lost when attempting to observe a given trait in the laboratory. However, there are concerns that this method might be measuring the participating parents' perceptions of their child rather than the child's actual abilities. Studies using observation methods have found a sex difference in social interest and orientation already among newborns, with girls showing a stronger interest and orientation. The present study therefore tested whether parents would report this sex difference for their infants. Parents of 317 infants aged 5 – 8 months were recruited at child health clinics in Norway. Social interest and orientation was measured by parental reports on 3 items in the 6-month questionnaire of the Ages & Stages Questionnaires: Social-Emotional (ASQ: SE). The items ask to what extent the infant appears to make eye contact, to smile at parents and family members and to be interested in listening when talked to. Although the results from the present study showed the expected sex difference, the tendency was not statistically significant. However, in accordance with evolutionary informed principles of parental investment, parental sex and marital status was significantly correlated with how positively the infants were scored by their parents. The results of the present study are interpreted as suggesting a need to consider principles of parental investment when using parental reports to study children.

Bart Du Laing, Andreas De Block

Amusing ourselves to death? Superstimuli and the evolutionary social sciences

Some evolutionary psychologists claim that humans are good at creating superstimuli, and that the created pleasure technologies are detrimental to our reproductive fitness. Most of the evolutionary psychological literature makes use of some version of Lorenz' and Tinbergen's largely embryonic conceptual framework to make sense of supernormal stimulation and bias exploitation in humans. However, the early ethological concept 'superstimulus' was intimately connected to other erstwhile core ethological notions, such as the innate releasing mechanism, sign stimuli and the fixed action pattern, notions which nowadays seem mostly discarded by ethologists. Hence, it almost goes without saying that many problems lurk behind the current use of the superstimulus-idea in the evolutionary study of human behavior. The purpose of this presentation is twofold. First, we will reconnect the discussion of superstimuli in humans with more recent theoretical ethological literature on stimulus selection and supernormal stimulation. This will allow for a reconceptualisation of, and important corrections and additions to evolutionary psychology's formulation of (supernormal) stimulus selection in terms of domain-specificity and modularity. Second, we will argue that bias exploitation in a cultural species differs substantially from bias exploitation in non-cultural animals. We will explore several of those differences, and explicate why they put important constraints on the use of the superstimulus concept in the evolutionary social sciences.

Coke R. Smith

An Evolutionary Psychology Understanding of Post-Traumatic Stress Disorder

The primary etiology of post-traumatic stress disorder (PTSD) is broadly attributed to a range of environmental precipitants. The compelling events are generally violent, physically as well as psychologically, and operate on a complex landscape of individual vulnerabilities and risk. The multiple manifestations of PTSD, when examined directly, are found in all studied cultures, and there is no current contention that PTSD is isolated to any culture or period. This feature of apparent horizontal (place) and vertical (time) behavioral ubiquity provokes consideration of an adaptive mechanism. A proposal for a selected (evolved) process that underlies PTSD is presented. This proposal proceeds from a synthesis of established PTSD data and evolutionary psychology principles. The conclusion is argued that in many cases, post-traumatic stress disorder is emergency scaffolding for a corrupted sense of self, and is therefore more usefully seen, theoretically and therapeutically, as an evolved fitness solution and a psychological rescue process than as an individual proximate dysfunction.

Peter K. Jonason, Norman P. Li, David M. Buss

The possessiveness and poaching of those high on the Dark Triad

Pursuing mating strategies of either the long-term or the short-term kind come with both costs and benefits. For instance, being a “short-term mater” means that a person is going to risk losing mates because he/she does not properly invest in mates. One group who has shown to be short-term maters is those exhibiting the antisocial personality traits known as the “Dark Triad” (Jonason, Li, Webster, & Schmitt, 2009). Those high on the Dark Triad – narcissism, Machiavellianism, and psychopathy – tend to be aggressive, agentic, and duplicitous (Paulhus & Williams, 2002). When faced with the possibility that they might lose a mate, those high on the Dark Triad preferentially chose post hoc mate retention tactics that are characterized by aggressiveness towards the partner or a competitor over more a priori ones like vigilance. Although those high on Dark Triad use mate retention tactics, their short-term mating psychology leads them not only to try to poach mates and be poached as mates, but to lose mates to other poachers. We discuss our results in terms of adaptive individual differences and attempt to move the conceptualization of the Dark Triad away from the negative or “Dark” approach and to a conceptualization of them as instrumental in being an alpha male.

Benjamin S. Crosier, Justin R. Garcia, Glenn Geher, Gad Saad, Daniel Gambacorta, Laura Johnsen, Elissa Prancitias

The Interdisciplinarity of Evolutionary Approaches to Human Behavior: A Key to Survival in the Ivory Archipelago

In recent decades, the influence of evolutionary theory has increased in the behavioral sciences - allowing for the first coherent metatheoretical organization of psychology, uniting research from a wide range of disciplines (Buss, 2004). Interdisciplinarity is crucial for the continued success of a scientific enterprise (Barry, 2001), with the nascent field of evolutionary psychology (EP) being particularly adept along this dimension. The current investigation examined the relative academic diversity of EP versus other paradigmatic areas of psychology. Due to the metatheoretical nature of EP, it was hypothesized that EP would be significantly more interdisciplinary compared to neuroscience, cognitive psychology, learning/behaviorism, and psychodynamic psychology. Two premier journals from five perspective-based areas were selected for the analysis. 100 first authors per journal (as a classification proxy for their field of study) were identified and their departmental affiliations recorded. The 1,000 authors were subsequently compared across the included journals in two tests. The first examined if the proportion of non-psychologist first-authors differed across areas, yielding a marginally significant effect. The second sought to determine if the proportion of non-psychology disciplines contributing to research differs across areas. We found a significant effect of area in support of the notion that EP is the most interdisciplinary area. Notwithstanding the rich interdisciplinarity of EP, it faces important scientific and ideological obstacles, all of which will require continued rebuttals from evolutionary-minded scholars. With the active promotion of interdisciplinarity bolstering scientific progress, EP should enjoy a vibrant future.

Gregory D. Webster

Hot Topics and Historical Trends in Evolutionary Psychology: An Empirical Review

What do evolutionary psychologists study, where has the field been, and where might it be going? These are important questions for any emerging science. To help answer these questions, I present a five-study program of empirical research. Analyses of Google Scholar hit counts reveal that “evolutionary psychology” is eclipsing “sociobiology” in the scientific literature (Study 1; N= 44 years, 1960-2003). Evolutionary theory has been increasingly influential in related fields such as personality and social psychology (Study 2; N= 20 years, 1985-2004). Analyses of publication trends in evolutionary psychology’s flagship journal, *Evolution and Human Behavior* (and its predecessor, *Ethology and Sociobiology*) show that it has increased in impact, diversity, and empiricism over its first quarter century (Study 3; N= 81 articles from 1980, 1992, and 2004). Analyses of title words published in these journals show an increasing interest in researching sex, sex differences, and attractiveness between 1979 and 2008 (Study 4; N= 808 articles). For example, during the *Ethology and Sociobiology* era (1979-1996), the most frequent title words were “evolutionary,” “human,” “behavior,” “reproductive,” “evolution,” “selection,” and “altruism,” whereas during the *Evolution and Human Behavior* era (1997-2008), they were “sex,” “attractiveness,” “differences,” “sexual,” “human,” “male,” and “facial.” Citation analyses for these journals suggest that articles that cite more references are in turn cited more themselves ($r = .44$; Study 5; N= 562 articles, 1979-2002). I also reveal the 20 most-cited articles in these journals. Overall, this research suggests that evolutionary psychology is not only surviving, but also thriving, as a new interdisciplinary science.

David S. Gordon, Steven M. Platek

A face you can trust? Implicit neural responses to faces that vary in Dark Triad Personality characteristics

Trusting another individual is one of the most important decisions a person has to make. Making accurate judgements of trustworthiness is predicted to be evolutionarily advantageous. There is evidence for consistent consensus when rating faces on trustworthiness, and faces rated along dimensions of trustworthiness have been shown to activate the amygdala. We investigated the extent to which amygdala activation corresponds to actual untrustworthy traits associated with facial stimuli. Using functional magnetic resonance imaging (fMRI) six participants were scanned while viewing faces of people that varied in Dark Triad personality characteristics. There was significant activation in the amygdala in response to faces associated with high psychopathy and high Machiavellianism. These findings support recent work demonstrating a relationship between facial morphometric geometry as honest biological signals and personality traits. The psychopathy findings in particular support recent work suggesting threat to be a large component of implicit neurological response to trustworthiness.

Marissa A. Harrison, Susan M. Hughes

Keep wearing those sandals: Mixed evidence for the relationship between second toe length and testosterone-mediated behaviors

For humans, a longer second toe (“Morton’s toe” or “Greek foot”) compared to other toes may be related to higher prenatal testosterone exposure. One-hundred fifty-three college students provided self-reports of their relative second toe lengths and completed a questionnaire about behaviors and traits previously shown to be related to testosterone. Consistent with an androgenization hypothesis, men reported longer second toes more frequently than did women. Also supporting the present hypothesis, for women, there were positive correlations between longer second toe and sexual attraction to other women, participation in team sports, skill at video games, height, and likelihood of cheating on a partner if secrecy was ensured. However, for men, there were unexpected negative correlations between longer second toe length and purported testosterone-mediated behaviors such as participation in sports, competitiveness, physical fighting, having a bad temper, and exercising. As with other digit length studies, these findings present mixed evidence for the effects of androgenization on digit morphology and behavior, but do suggest that toe morphology may be a marker of fitness.

Susan M. Hughes, Marissa A. Harrison, Gordon G. Gallup, Jr.
Sex-Specific Body Configurations Can Be Estimated From Voice Samples

We investigated whether or not participants could infer a speaker's actual waist-to-hip ratio (WHR) and shoulder-to-hip ratio (SHR) based solely on hearing the target's voice. After listening to a voice sample, raters were asked to estimate the speaker's body configuration by choosing from an array of line-drawn figures that depicted variations in WHR and SHR. The estimated WHR (but not SHR) of the female speakers predicted the speakers' actual WHR measurements. In contrast, the estimated SHR (but not WHR) of male speakers predicted the speakers' actual SHR measurements. Even when choosing figures depicting variation in both SHR and WHR, the same pattern of sex-specific accuracy in ratings emerged. These findings make sense, as both the waist and shoulders appear to be primary features used in the assessment of masculinity and femininity (Evans, 1972; Lippa, 1983) and the ability to make fitness assessments based on voice may have been adaptive at night in the EEA where visual cues were limited. These findings also corroborate previous studies suggesting that the mere sound of a person's voice may reveal important biological information regarding their mate value.

William F. McKibbin, Todd K. Shackelford, Emily J. Miner, Vincent M. Bates, James R. Liddle
Individual Differences in Women's Rape Avoidance Behaviors

Rape can exact severe psychological, physical, and reproductive costs on women, and likely was a recurrent adaptive problem over human evolutionary history. Therefore, women may have evolved psychological mechanisms that motivate rape avoidance behaviors. Guided heuristically by an evolutionary perspective, we tested the hypothesis that women's rape avoidance behaviors vary with several individual difference variables. Specifically, we predicted that rape avoidance behaviors will covary positively with (1) women's attractiveness, (2) women's involvement in a committed romantic relationship, and (3) the number of women's family members living nearby. We also predicted that women's rape avoidance behaviors will covary negatively with women's age. We administered the Rape Avoidance Inventory (McKibbin et al., 2009) and a demographic survey to a sample of women ($n = 144$). The results of correlational and regression analyses were consistent with the predictions, with the exception that women's rape avoidance behaviors did not covary negatively with women's age. Discussion highlights limitations of the current research and several directions for future research on women's rape avoidance psychology and behaviors.

Markus Jokela

Men with many partners have many children: Evidence from the contemporary United States

In most traditional societies, socially successful men have been able to increase their reproductive success by obtaining more than one wife (polygyny). It has been suggested that in monogamous societies some men implement a polygynous reproductive strategy via serial monogamy, i.e., marrying several wives consecutively. We examined whether serial monogamy increases the probability of having children in contemporary Americans. The participants were men and women from the US National Longitudinal Survey of Youth ($n=6131$ men, 5436 women) followed from age 15-22 to 42-49. We assessed the age-specific probability of having children up to the sixth child as a function of number of marriages using discrete-time survival analysis. Compared to their counterparts in their first marriage, men in their second and third marriages were more likely to have a third, fourth, fifth, and sixth child (odds ratios ranging from 1.26 to 4.75). At age 42-49, men with two and three marriages had, respectively, 0.10 and 0.31 more children than men who had been married only once. Number of marriages was not related to childbearing in women. The findings suggest that serial monogamy may be associated with higher reproductive success in contemporary American men.

Ryo Tamura

Smile weakens other's aggression: adaptive function of expressing smile

Tamura (2008) revealed that handgrip while expressing smile decreased. This means the possibility that showing smile makes oneself vulnerable and releases others from anxiety of exploitation. In other words, smile has function as honest signal which transfer intention of making good relationship with others. Tamura(2008) focused on the meaning of expressing smile. On the other hand, this study attends the situation of looking other's smile. If smile is honest signal, physical ability while looking other's smile may decrease because there is no need to keep guard when other does not have intention of exploitation. I conducted experience which has two conditions to examine such hypothesis. One was looking neutral facial expression as control condition, and the other is looking smile as experimental condition. Participants gripped hand dynamometer while looking neutral or smile expression. Then the average of forearm strength was compared between conditions. If physical ability while looking other's smile decreases, it may mean that this facial expression has important role at communication among people. The adaptive function of expressing smile will be discussed.

Tiffany J. Littleton, Sarah E. Hill

The Effect of Intrasexual Competition on Body Shape Regulating Behaviors

Although the majority of research on intrasexual competition has focused on male/male competition, women must also compete intrasexually to secure the most desirable romantic partners available to them. Because men's mate preferences have been found to emphasize cues associated with youth and fertility, intrasexual competition among women should often take the form of increased motivation to perform behaviors aimed at rendering themselves more desirable than same-sex competitors. Among these behaviors are those aimed at enhancing one's body shape. Research has demonstrated that men indicate a preference for thinner figures (when rating the attractiveness of figure drawings of women), which mirror America's current 'thin is in' standard of attractiveness.

Thus, the degree to which women are motivated to engage in body-shape regulating behaviors should be positively related to women's perceptions about the ferocity of mate competition. Here we test the prediction that priming women with cues suggesting that the mating competition is steep will lead to greater calorie restriction when women are offered bowls of snacks from which they are free to eat. Our results provide preliminary evidence that women's perceptions regarding the ferocity of intrasexual competition may influence restrained eating behavior to gain advantage over social competitors.

Jillian J.M. O'Connor, Daniel E. Re, David R. Feinberg

Manipulations of vocal and facial sexual dimorphism influence perceived sexual infidelity

Sexual cheating can be costly to members of both the extra-pair and the paired couple. Thus, detecting potential infidelity could be adaptive to avoid cuckoldry or loss of parental and relationship investment. While masculinized male faces have been shown to be rated as less faithful, attributions of infidelity as a function of sexual dimorphism has yet to be investigated in female faces, and in voices of both sexes. Vocal and facial sexual dimorphism may be redundant cues to underlying testosterone levels, and hence mate quality. Indeed, female preferences for masculine male voices and faces are influenced in the same direction by self-rated attractiveness, conception risk, and relationship context. Given the above, we predicted that vocal and facial sexual dimorphism would be evaluated as a cue to infidelity risk, and such attributions would be concordant across these modalities. Results indicated that female participants attributed infidelity to masculinized male faces and voices, and to feminized female faces. There was no effect of voice pitch manipulations on attributions of infidelity to female voices. These data suggest that vocal and facial sexual dimorphism are used as indicators of sexual strategy. The aforementioned attributions may be adaptive if they prevent loss of parental and relationship investment via avoidance of masculine males who may be more likely to cheat sexually, and through identifying feminine-faced females as a threat to pair-bond fidelity.

Jennifer Crowhurst, Jean Twenge

Aggression After Social Rejection: Is It Mediated by Dominance?

This study was designed to investigate dominance as a possible mediator for the effect of social rejection on aggression. Previous research shows that people generally become more aggressive toward others, even strangers, after they have been rejected. Evolutionarily, humans have adapted to survive in groups, and many behaviors are affected by the group dynamic. Feelings of dominance or one's ranking in the social pecking order may become threatened after social rejection, and people may then resort to aggression as a strategy to re-establish rank. Social rejection was manipulated by informing the participant that none of the other participants in the study chose to work with him. Participants then completed an Implicit Associations Test (IAT) measuring how quickly he associated himself with dominant or non-dominant words. It was assumed that participants' reaction times were affected by implicit feelings of dominance. Aggression was measured by using the noise blast game in which participants believed they were blasting an unknown partner with white noise. The hypothesis was that social rejection will lead to lower feelings of dominance, and will therefore lead people to act more aggressively. The results showed that feelings of dominance after a rejection depended upon preexisting personality traits. Those who were low on narcissism and/or trait dominance felt significantly less dominant when rejected. This could mean that those who are narcissistic or high in trait dominance may be unaffected by a rejection whereas those who are low on these traits react in a way that makes them feel less dominant.

Dawn B. Neill, Deborah E. Schechter

Fast food foraging: The impact of neighborhood, household and cultural factors on dietary decision-making and BMI in South Los Angeles

Previous research has linked neighborhood characteristics and obesity trends. In particular, lack of access to affordable, healthy food is seen as contributing to poor dietary habits and low levels of physical activity. At the household level, food choices are often shaped by time constraints where working families use fast food to cope with low pay and long, inflexible work schedules, and as a strategy to reduce work-family conflict and minimize time and energy expenditures. For individuals, food preferences are related to cultural values such as eating traditional foods or consuming low calorie foods to maintain body weight. Thus, decisions about food are shaped by issues of access, time, and culture at both the macro- and individual-level. To better understand food choice decisions, we seek to expand applications of foraging theory to inner city food environments. In doing so, we will evaluate the impact of neighborhood-level (i.e. access to fast food versus full-service grocery stores), household-level (i.e. temporal and energy constraints on food procurement and meal preparation) and individual-level factors (i.e. cultural food values and preferences) on food choice in South Los Angeles County. In support of this model we present results from our previous research indicating that (1) maternal time budgets and access to fresh versus prepared foods impact children's dietary intake and BMI; and (2) children are very likely to model their cultural values and preferences on those of their parents.

Melissa M. McDonald, C. David Navarrete

The Roles of Stereotyping and Fertility in Race Bias

Although a considerable body of research has revealed changes in women's mate preferences across the menstrual cycle, only recently has research addressed mate preferences in an intergroup context. Here we propose two competing hypotheses about the effects of conception risk on intergroup bias. However, we suggest that both hypotheses could be operative depending on the degree to which women internalize stereotypes concerning the threat posed by ingroup and outgroup men. Our results indicate that women who are high on conception risk and who have strongly internalized stereotypes regarding the physicality of men of a racial outgroup compared to men of their racial ingroup evince greater race bias. Alternatively, women who are high on conception risk and have highly internalized stereotypes regarding the physicality of men of their racial ingroup display significantly less race bias. Stereotype internalization was shown to have no effect on women who are low on conception risk. These results provide support for both a sexual coercion avoidance hypothesis in which fertile women seek to maintain their reproductive choice by avoiding men who are perceived as physically threatening, and also a heterogeneity attraction hypothesis wherein fertile women seek out non-threatening mates whose genetic composition optimally differs from one's own.

J. N. Arthur, R. J. Williams

Determinates of Human Sex Ratio: A Multivariate Approach

Trivers and Willard (1973) hypothesized that maternal condition and ability to invest in offspring affect the secondary sex ratio of her offspring. The purpose of this study is to explore what psychological and behavioral factors determine human secondary sex ratio. A simultaneous logistic regression will be used to analyze data from a representative sample of 4,123 adults from southeastern Ontario. Previous work has identified several variables that are reliably related to human secondary sex ratio (e.g., parental age, parity, maternal nutrition, etc.). However, a comprehensive examination of what variables may be related, as well as examination of their relative importance via multivariate analysis has never been undertaken. Independent variables will include: Measures of race, ethnicity, education, intelligence, personality, socioeconomic status, physical health, height, weight, current and lifetime mental health, family history of mental illness, antisociality, relationship history, marital status and happiness, family functioning, community and social support, parity, and birth order of participant. We hypothesize: 1) Variables that are associated with a woman's effect on the reproductive success of her offspring should also be associated with the sex of that offspring, such that variables predicting higher than average offspring success will lead to a male-biased sex ratio; and 2) there will be a difference in which of, and to what extent, these variables affect the sex allocation of offspring as a function of parental sex.

Andrew Galperin

Domain-specificity in the Correspondence Bias: Anger is attributed to personality more strongly than disgust.

The Correspondence Bias (CB), one of the most studied phenomena in social psychology, occurs when observers attribute targets' behaviors to their personality (enduring disposition) more strongly than is logically warranted, usually by underestimating the importance of situational forces acting on the target. The current study is one of the first direct demonstrations that the magnitude of the CB can vary systematically across different domains. An error management perspective predicts that the CB can be adaptive when the fitness costs of mistakenly ascribing particular personality traits to targets (a false positive) have been lower throughout evolutionary history than the costs of mistakenly failing to detect those traits (a false negative). We tested this hypothesis by comparing the degree to which expressions of anger versus disgust are attributed to personality. We predicted that angry behaviors would be attributed to personality more so than disgusted behaviors, because a failure to detect high dispositional anger in individuals is more costly for future interactions than a failure to detect high dispositional disgust. Undergraduate participants read vignettes that showed a fictitious individual reacting to a range of anger- and disgust-inducing situations with an appropriate amount of each respective emotion, and then rated this individual's dispositional anger and disgust. Despite the fact that the individual's actions portrayed him as displaying a moderate and equal amount of both emotions, results showed that participants still rated the individual higher on dispositional anger than on disgust.

Michelle Escasa

In-group biases of opposite-sex religious members in trait rankings in urban Philippines

Coalitional affiliation has been given a remarkable amount of attention in the evolutionary psychology literature. Bias for in-group members and bias against out-group members is a beneficial strategy in allocating preferential treatment to individuals who are likely to provide a benefit in return. In areas with high conflict between groups formed into clear coalitional affiliations, in-group bias should be exaggerated. The rise of present day religiosity may affect individuals' judgments of in-group and out-group individuals. Previous data have shown in-group biases of same-sex affiliates. This study looks at biases in judgment of traits of opposite-sex affiliates among a religious group in urban Philippines. Individuals in the Philippines have a high rate of religiosity, with Catholicism being the predominant religion. Males (n=50) and females (n=66) from a Seventh-Day Adventist (SDA) university and student nurses from a Seventh-Day Adventist hospital were asked to view photographs of opposite sex members (standardized in a pilot study) and read a fictional vignette about the photographed person, including religious affiliation with either the SDA church or the Roman Catholic church. Data are currently under analysis and will be finalized prior to presentation. I hypothesize that both males and females will rank photographs of same religious affiliation higher on a number of traits valuable in a mate or an affiliate. Informants ranked photographs on generosity, intelligence, attractiveness, height, success, kindness, and family-orientation.

Alex Shaw, Robert Kurzban

Love as Burning Bridges

One current model designed to explain the evolutionary origins of love posits that love acts as a commitment device, causing individuals to overvalue their mates, which improves the chance of forming mutually committed relationships. However, in order to get the benefits from this putative commitment device, love must be honestly signaled. If love caused individuals to spend less time with friends, this would impart a cost on the person in love and could potentially act as an honest signal of commitment. To test this idea, we assigned subjects to receive either a Love or Normal day (control) prime. Subjects also then filled out a questionnaire that asked them how likely it was that they would spend time with friends, take a nap, surf the internet, or do school work after the experiment. We found that individuals in the love prime condition reported being less likely to spend time with friends after the experiment than individuals in the control prime condition, but that these primes did not influence the likelihood of doing other activities.

Kayla B. Causey, Virginia A. Periss, Alexander Pashos, & David F. Bjorklund
Proximate Influences on Grandchildren's Perceptions of Intergenerational Relationships

Grandchildren (N=285) reported their perceptions of phenotypic similarity and emotional closeness to each of their biological grandparents and rated how much they felt each grandparent invested in their well-being as a child. Findings replicate previous demonstrations of asymmetries in grandparental investment as a function of the number of male links between grandparent and grandchild (i.e., maternal grandmothers invested the most while paternal grandfathers invested the least). While it has been suggested that distal mechanisms, such as paternity uncertainty and sex-specific mating strategies, are responsible for these biases, our findings suggest that an interaction of proximate mechanisms, including those that assess phenotypic similarity (e.g., physical, behavioral, and personality) and feelings of emotional closeness, uniquely contribute to the perception of asymmetrical biases in grandparental investment. We also found support for the hypothesis that grandfathers' investment is subsumed by mating effort: When emotional closeness, phenotypic similarity, and years of coresidency were controlled for in hierarchical linear regression analyses, the investment of maternal and paternal grandmothers still provided a unique account of the differences in investment of paternal and maternal grandfathers ($\beta = -0.35$ for paternal grandmothers, 0.36 for maternal grandmothers). Moreover, preliminary findings revealed that grandchildren may be implicitly aware of the mediating role of grandmothers: Marital status of the grandparents not only moderates the investment of grandfathers (although not grandmothers) and grandchildren's perceptions of emotional closeness, but also grandchildren's perceptions of phenotypic similarity (e.g., grandchildren report their personality is more similar to their grandfather's if he is still married to their grandmother relative to grandchildren of widowed but not remarried grandfathers).

Benjamin M. Winegard, Bo M. Winegard, Robert O. Deaner
Misrepresentations of Evolutionary Theory in Social Science Textbooks

Evolutionary theory has long been attacked by right wing fundamentalists. In recent decades, however, it has become apparent that evolutionary theory, when applied to human behavior, suffers from similar misrepresentation and derogation by social scientists. We hypothesize that this arises from a cycle of misinformation: mainstream social scientists ignorant of evolutionary theory endorse scholarly products (e.g. publications, textbooks) that misrepresent evolution and portray it negatively; these products then foster hostility and ignorance among scholars and students. We derived predictions from this hypothesis and tested them by coding fifteen widely-used social science textbooks focusing on gender differences. As predicted, (1) the majority of textbooks contained several types of errors in their presentation of evolutionary theory; (2) textbooks with more errors showed more hostility towards evolutionary theory; (3) more popular textbooks made more errors; and (4) sociology textbooks contained more errors than psychology textbooks. These results collectively suggest that the goal of cross-disciplinary integration is being obstructed by hostility toward, and ignorance of, evolutionary theory in the social sciences.

Dillon E. Niederhut, Jeanine K. Stefanucci
The hare-trigger: What rabbits can tell us about human motion perception

As an organ designed to produce contextually dependent behaviors that are, on average, adaptive, we should expect the brain to bias perception to facilitate a flight response in a dangerous situation. In humans, adaptive perceptual biases have been demonstrated for slant, height, and sound amplitude. We hypothesized that the human visual system is biased to perceive others as being quicker and angrier when approaching the observer in a fearful situation. Two studies examined the effect of fear on biological motion perception. In experiment one, participants who viewed high-arousal picture sets from the IAPS library perceived motion capture wireframes as moving more quickly than participants who viewed low-arousal sets. In experiment two, participants wrote about either a happy or frightening memory. Those who reported feeling frightened during the recall perceived the wireframes as moving faster when the wireframe was approaching the participant. Males in the study perceived wireframes as angrier when approaching, and more scared when moving away than did females in the study. Nervousness produced a strong effect on speed and anger in both directions. The results support the hypothesis that biological speed perception is adaptively biased by fear, but perceived anger was not. Interestingly, males appear to see people approaching them as angry, and those moving away as afraid, suggesting that males sort others into threat categories based on observed movement. The surprising role of nervousness in the perception of biological motion may indicate that, in states of uncertainty, the brain assumes the worst.

Esuka Watanabe, Yohsuke Ohtsubo

Guilt Induces Costly Apologies: Test of a Costly Signaling Model of Apology from the Apologizer Perspective

In their recent study, Ohtsubo and Watanabe (2009) applied the costly signaling theory to human apology-making. Their model assumes that apologies are made to restore a relationship with a victim. If an apologizer highly values the relationship, he/she may be willing to incur some cost to restore it. Therefore, costliness of apologies is considered as a reliable cue of the apologizer's honest intent. Ohtsubo and Watanabe tested their model from the perceiver's perspective: Costly apologies are perceived sincerer than no cost apologies. In the present study, we tested the costly signaling model of apology from the apologizer's perspective. Some authors suggest that a sense of guilt is a proximate mechanism that drives us to maintain a good relationship with others (e.g., Trivers, 1971). Accordingly, we hypothesized that people who feel a strong guilt for their wrongdoing are willing to incur more cost just to make an apology. To test this hypothesis, we conducted an experiment, in which a randomization device elicited an unintentional unfair behavior from participants. Participants were then explained that they were allowed to make an apology if they would pay a certain amount of money to the experimenter. Without knowing the required amount, participants were asked to indicate the maximum price that they were willing to pay for making an apology. Finally, participants rated their sense of guilt on a 5-point scale. The result confirmed the hypothesis: those who reported a stronger sense of guilt were willing to incur a greater cost, $r = 0.48$, $p < .05$.

Michele K. Surbey, Jill Simpson

The bargaining model of depression: An empirical test

The bargaining model of depression (Hagen, 2003) suggests that depression is a tactic of withdrawing reciprocity in order to renegotiate a social contract or one's share of the resources. For this to be a successful tactic, group members would have to increase their investment in a depressed individual rather than engage in punishment or retribution. As an indirect test of this model, we examined people's reactions to hypothetical cheaters in written prisoner's dilemma-like situations when the cheater was described as happy or depressed. Sixty participants (42 women, 17 men, and one individual of unknown sex, $M = 31.78$ yrs) were asked to put themselves in the place of the victims and indicate their willingness to forgive, overlook, punish, or trust the two different types of cheaters. Participants additionally described the hypothetical cheaters on a number of dimensions and gauged the emotional reactions of their victims. Doubly multivariate ANOVA results indicated that participants were more likely to forgive and overlook the behaviour of depressed versus cheerful cheaters, hence providing some initial empirical support for the bargaining model. In addition, participants identified more with the depressed cheaters, attributed their behaviour more to the situation, and felt they were kinder and less Machiavellian than happy cheaters. Finally, when asked to gauge the emotional reactions of the hypothetical victims of cheating, participants indicated that victims would feel greater disgust, but not greater anger or contempt, after being cheated by a happy compared to depressed cheater.

P.D. Moncrief Jr.

Could Darwin Account for Kinsey?

The findings of Alfred Kinsey indicate that same sex attraction/behavior to some degree is a widespread phenomenon. These findings have both been disputed and supported. Many historical accounts, which could be regarded as anecdotal, are consistent with Kinsey's claims, as well as some anthropological evidence. Some would dismiss these as merely results of cultural influences. The hypothetical question discussed is, in the event that Kinsey ultimately is found to be largely correct, can adaptationist theory account for this widespread seemingly deleterious trait and can same sex selection with putative selection consequences play an explanatory role? The ideas of Clive Bromhall and others are discussed. It will be argued that same sex selection can explain much of the neotenization and gracilization that has occurred in the human species.

Lisa L.M. Welling, Benedict C. Jones, Lisa M. DeBruine, Anthony C. Little
Social transmission of attitudes influences women's attractiveness judgments of own-sex individuals

By contrast with the volume of recent evidence that social learning affects appraisals of potential mates, there is very little evidence that social learning also affects appraisals of own-sex individuals. The absence of such evidence is somewhat surprising, because social learning effects on judgments of own-sex individuals are a strong prediction of the widely held view that public information is used to infer information that is difficult to discern from visual cues alone (e.g., prosocial traits) and because such information would usefully inform allegiance decisions about own-sex individuals. Here we show that observing men smiling at female faces increases women's preferences for those women to a greater extent than does observing men with relatively negative expressions looking at the female faces. These findings suggest that social transmission of attitudes influences women's judgments of own-sex individuals and suggest that the effects of social learning on judgments of others' attractiveness are not limited simply to 'mate choice copying'. Moreover, since Jones et al. (2007 *Proc Roy Soc B*, 274, 899-903) have previously found that men decreased their preferences for men who were the target of positive social interest from women, our findings raise the possibility of a striking sex difference in how public information is used to assess own-sex individuals.

Vincent M. Bates, William F. McKibbin, Craig W. LaMunyon, Aaron T. Goetz, Valerie G. Starratt, Todd K. Shackelford
Does the Risk of Sperm Competition Predict Men's Interest in Their Partner's Copulatory Orgasm?

When the sperm of two or more men concurrently occupy the reproductive tract of a woman, the sperm compete to fertilize an egg she may have produced. Copulatory orgasm may be an adaptation that women use to retain preferentially the sperm of a favored man, and this function of female orgasm might be most selectively relevant in the context of sperm competition. If female orgasm has played a selective role in human evolutionary history, then we hypothesize men to have co-evolved an interest in promoting copulatory orgasm in their partner, and we predict this interest to be greatest during periods of greater risk of sperm competition. We secured self-report data from 124 heterosexual men in a committed relationship. We assessed the risk of sperm competition as the proportion of time the couple had spent apart since their last in-pair copulation. Contrary to predictions, the risk of sperm competition did not predict men's interest in their partner's copulatory orgasm. Total time since last in-pair copulation and a composite measure of men's relationship satisfaction did predict men's interest in their partner's copulatory orgasm. The discussion addresses several possible explanations for the current findings, limitations of the research, and highlights directions for future work.

Daniel E. Re, Jillian J.M. O'Connor, Patrick J. Bennett, David R. Feinberg
Psychophysical properties of perceived vocal attractiveness based on manipulations of fundamental frequency

Studies have shown that manipulations of human vocal fundamental frequency influence perceived vocal attractiveness. The degree of manipulation required, however, to produce changes in perceived vocal attractiveness has not yet been assessed. Here we manipulated vocal fundamental frequency in averaged ($n=32$) men's and women's voices by 2 Hz intervals to create a wide range of male and female voices speaking monophthong vowel sounds. We used a 2-alternative forced-choice design to compare the attractiveness of all voice samples within each sex. Raters were heterosexual members of the opposite sex. Logistic regression was used to construct psychometric functions that related participants' judgements to voice fundamental frequency, and to estimate just-noticeable differences (JNDs) in vocal attractiveness. We also assessed the relative attractiveness of voices with unnatural fundamental frequencies. Women did not show masculinity preferences for voices lower than the natural male frequency range, whereas men showed femininity preference for voices higher than the natural female frequency range. Vocal attractiveness JNDs were substantially larger than JNDs measured in standard pitch discrimination tasks using similar fundamental frequencies. The implications of these results on recent vocal attractiveness research will be discussed.

Andrew C. Gallup, Daniel T. O'Brien, David Sloan Wilson

Peer aggression and victimization during adolescence has different effects on the dating behavior of males and females

We studied levels of peer aggression and victimization from an evolutionary perspective by investigating the relationship between aggression and victimization and dating behavior during adolescence. One-hundred and fifty (72 female) undergraduates completed self-report measures of aggression and victimization during middle and high school, onset of dating activity, number of dating partners, and length of longest relationship. After controlling for length of relationship, total victimization during middle and high school was negatively correlated with the number of girlfriends males reported, and positively correlated with the number of boyfriends girls reported, findings that parallel previous results regarding victimization and sexual behavior. For females, victimization and aggression were highly correlated, and, as a result, self-reported aggression also predicted the number of boyfriends for females. Regression analysis reveals that the best individual predictor for the number of boyfriends a girl had while growing up was being a victim of teasing. When the model was simplified to include only total aggression, total victimization, and an interaction between the two, it was found that females with both high aggression and victimization reported the most boyfriends. Another interaction model found females that were high in aggression or low in victimization to report maintaining the longest adolescent relationships. This evidence is consistent with recent findings suggesting that indirect aggression during adolescence is a form of intrasexual competition associated with reproductive opportunities.

Lynda G Boothroyd, Juilitta Sofat, Katie Benson, Lauren Watts

Preferences for, and sensitivity to, apparent facial health in prepubertal children

Although children and adults agree about which faces are attractive from birth onwards, it is not clear what it is about 'attractive' faces that we and they prefer. Adults prefer faces which are feminine (if female), symmetric, average and healthy looking. Infants show mixed results when given faces varying in averageness and symmetry, while 11 year olds do not show any preference for symmetry or femininity in female faces. This study assessed preferences, using identical methods, in 7-9 year old girls and adult females; participants rated their preferences for a. apparent health and b. general attractiveness in pairs of adult male faces. Results suggest that despite any early preferences for 'attractiveness' (be such preferences innate or not), pre-pubertal females do not show adult-type facial preferences for the known dimensions of attractiveness. Results will be discussed in the context of both methodological considerations and theoretical implications.

Chet Savage

Ethnographic Evidence for the Role of Lethal Treachery

The ethnographic record is filled with examples of lethal treachery; with stories that span the globe, from the Pacific Northwest to New Guinea to the jungles of the Amazon, it is clear that humans have had to negotiate a world of betrayal with lethal consequences throughout human evolutionary history. As a significant evolutionary pressure, lethal treachery has shaped human psychology as well as cultural traditions. Using Hamilton's Rule ($rB > C$), I hypothesize that lethal treachery will be more difficult to execute in a small-scale society composed of groups of related individuals; the kind of society typical of the vast majority of human evolutionary history. The increased costs associated with the execution of a treacherous event, along with the decreased benefits and the high degree of relatedness, all indicate that lethal treachery would have been less prevalent in small-scale societies. Even so, the severe costs to the victims made lethal treachery a significant evolutionary pressure. Psychologically, humans have evolved cheater detection mechanisms, in part, to detect those who would betray them, consequently creating an evolutionary arms race with would-be betrayers. Finally, oral histories serve as reminders of past betrayals. These traditions also serve to prime future generations to the possibility of being betrayed, thus acting as a descendent-leaving strategy under analogous evolutionary pressures.

Chris Reiber, Eric Shattuck, Sean Fiore, Vanessa Davis, Pauline van Goozen, Janice Moore
Do pathogens induce changes in human social behavior? A clue from vaccines

Some pathogens are known to manipulate the behavior of their hosts in ways that further their own life cycles and/or increase their transmission rates. Any pathogen able to do so would have a selective advantage over non-behavior modifying strains. As yet, there has been little investigation of whether pathogens modify human behavior for their own benefit. We therefore conducted a pilot study to test the hypothesis that individuals newly infected with directly transmitted pathogens should exhibit an increase in social behavior prior to the onset of clinical illness. Influenza immunization was used as a proxy for natural infection because it provides a known point-source exposure and elicits an immune response similar to that induced by wild-type infection. 36 participants recruited at a flu clinic were interviewed every other day for a week following administration of the vaccine. Using timeline follow-back methods for 48 hour recall, participants self-reported actual social behavior as well as feelings of sociability. Paired t-tests using each participant as his own control compared the two days pre-immunization to the two days post-, since the incubation period for influenza is typically two days. There were statistically significant increases in both total number of people encountered, and mean number of people per interaction. Duration of interactions significantly decreased, and total number of interactions remained unchanged. This indicates that immediately following immunization, participants increased their social interaction by engaging with larger groups.

Heidi Ann Manlove

Avoiding the Mind-Body Dichotomy: Investigation of Psychosocial and Psychosexual Behaviors of Women with Polycystic Ovary Syndrome (PCOS)

While obesity has a shallow human evolutionary history, the recent expansion of a global obesity epidemic warrants international research on the mechanisms, development, and consequences of obesity-related health problems such as Polycystic Ovary Syndrome (PCOS). Developing nations are undergoing rapid nutritional transitions toward a more westernized diet and sedentary lifestyle. As a result, nations such as India and China are experiencing a rapid increase in the prevalence of obesity and metabolic disorders such as PCOS. PCOS is a complex metabolic and endocrine disorder affecting approximately 5-10% of the female population. However, less appreciated in the literature are the impacts of PCOS on female psychosocial health, especially in developing countries. Results of our recent U.S. pilot study contribute to the growing literature demonstrating that women with PCOS report discrete psychosocial patterns compared to control groups. An example of these outcomes is women with PCOS recalled less feminine play patterns as children compared with controls. Also, as adults, PCOS women recalled lower happiness than controls, and trended toward a bisexual orientation and having changed their sexual orientation more often than controls. The increasing rates of PCOS in developing nations like China and India are similar to that of the U.S. Thus, it would be advantageous to compare possible cross-cultural psychosocial implications for women diagnosed with PCOS. Incorporating the biological manifestation of PCOS and the psychosocial and psychosexual health in the treatment of PCOS may aid in decreasing the severity of the syndrome.

Julie C Main, Benedict C Jones, Lisa M DeBruine, Anthony C Little

Integrating gaze direction and sexual dimorphism of face shape when perceiving others' dominance.

Although gaze direction and face shape have each been shown to affect perceptions of others' dominance, studies have not yet investigated whether gaze direction and face shape have independent main effects on perceptions of dominance, or if these effects interact. To investigate this issue, we compared dominance ratings of faces with masculinized shapes and direct gaze, masculinized shapes and averted gaze, feminized shapes and direct gaze, and feminized shapes and averted gaze. While faces with direct gaze were generally rated as more dominant than those with averted gaze, this effect of gaze direction was greater when judging faces with masculinized shapes than when judging faces with feminized shapes. Additionally, faces with masculinized shapes were rated as more dominant than those with feminized shapes when faces were presented with direct gaze, but not when faces were presented with averted gaze. Collectively, these findings reveal an interaction between the effects of gaze direction and sexually dimorphic facial cues on judgments of others' dominance, presenting novel evidence for the existence of complex integrative processes that underpin social perception of faces. Integrating information from face shape and gaze cues may increase the efficiency with which we perceive others' dominance.

Austen L. Krill¹, Steven M. Platek, Valerie Adams

Two Brains are Better than One: The Neural Correlates of Real-Time Cooperation

Cooperation is a fundamental part of human (and animal) social interaction. Cooperation may have provided the cognitive springboard for the evolution of division of labour, sophisticated agricultural development, and advanced planning (e.g. group hunting). The neural correlates of cooperation are traditionally investigated using fMRI where participants are asked to play a game or engage in a task with a computerized confederate. Although these investigations provide valuable insight into the neural basis for cooperation they fail to identify the real-time and ecologically valid components of cooperation between individuals. In order to investigate the proximate mechanisms of shared neural activation between two individuals, we conducted a hyperscanning fMRI study. fMRI hyperscanning entails scanning 2 (or more) individuals simultaneously while engaged in a common task (e.g., working together to solve a problem, communicating with each other, playing a game, etc.). We used a “blind driving” task, which involved participants alternating in guiding each other through a 3-D virtual environment. We discovered that successful cooperation in navigating through the 3-D virtual world recruited neural substrates associated with theory of mind and mental state attribution. The effects of first person versus third person perspective, cooperator familiarity, frustration, communication, sex, and intentionality will be discussed.

Key Words: hyperscanning, cooperation, evolutionary cognitive neuroscience

Marcos F. Rosetti, Luis Pacheco-Cobos, Hernan Larralde, Robyn Hudson

A model for childrens' search strategies: the effect of target conspicuity and spatial distributions

This work explores searching behavior, or the movements made in the attempt to find a target resource, in children. A task of ludic nature was developed to test the effect of conspicuity and spatial distribution of targets on the searcher's performance. The searcher's path was recorded by a GPS (global positioning system) attached to the waist. An austere motivation was given by not rewarding nor scoring the search effort. Strong effects of variation in target conspicuity were found; cryptic targets produced slower searches, longer and more tortuous paths, and an overall reduced searching performance. Extracting the main features of the paths revealed that the children: 1) Principally changed direction after contacting the arena borders or after collecting a target, 2) followed a nearest-neighbor pattern of target collection and 3) were strongly influenced by the conspicuity of the targets. Based on these findings, a simple numerical model for the searching rules was developed. The model allowed replication of the features of the childrens' paths while assuming a minimal participation of memory and planning.

David M. Lewis

Sibling Uncertainty: Facial Resemblance as an Indicator

Identifying siblings of shared maternal and paternal ancestry is a unique form of kin recognition, because it requires the detection of two common genetic lineages in the same individual. Previous research has shown that cues to shared maternal ancestry predict anti-incestuous sentiment and altruism towards siblings. The problem of sibling recognition, however, represents not one, but two distinct adaptive problems: that of recognizing individuals with the same biological mother, and that of recognizing siblings with the same biological father. Internal fertilization prevents human males from being certain of the paternity of their mates' offspring. Consequently, humans cannot use paternal association cues to unerringly identify paternal siblings. The ability of self-referent phenotype matching (SRPM) to reliably discriminate between individuals of differing degrees of genetic relatedness encountered in the same location renders it a viable paternal sibling detection mechanism. I hypothesized that facial resemblance between siblings would positively influence sibling relationship quality. In contrast to previous work on human SRPM in the context of offspring recognition, I hypothesized that this effect would be present in females. Study data support both hypotheses. Constraints of the study and future directions for research on kin recognition mechanisms and their context-sensitivity are discussed.

Elizabeth A. Osborne, Yexin Jessica Li, Adam B. Cohen
Yo Momma So Ugly... Unattractive Family Members Make A Potential Mate Less Appealing Long-Term

People should use every available cue to determine a potential partner's genetic fitness. Existing attractiveness research examines only cues directly from a prospective partner, like waist to hip ratio, or symmetry versus fluctuating asymmetry. In a new theory we call the Kin Inferred Selection Theory (KInS) we propose that people also evaluate a potential mate's genetic fitness by evaluating the fitness of their relatives. A person does not express all genes. Some may be recessive while others may be expressed later in life. But these genes may be expressed in family members. In a first experimental test of KInS theory, we exposed women to photos of an average male target who was surrounded by attractive, unattractive, or no family members (control). Participants made judgments on various traits about the target now and twenty years from now. While there was no significant difference between conditions for all traits for the target now, targets were expected to be more attractive, healthy, and desirable twenty years from now if they were surrounded by attractive family members, but not nicer or more intelligent. This first experiment provides evidence that we base long term mating decisions not only on the characteristics of a mate but also their family members.

J.L. Cheal, M.D. Rutherford
Categorical Perception of Surprise is Modulated by Threat Relevant Context

In past studies of categorical perception, testing for a clear category boundary between surprise and other basic emotional expressions has not lead to consistent results. We reasoned that because surprise has an ambiguous valence (it can be positive or negative) the context of the surprising situation might influence perception of surprised faces. We tested this hypothesis by providing participants with a short context story involving either a happy surprise or fear surprise before a categorical perception task. We found that performance was categorical (accuracy was higher on a discrimination task around the images where the identification task predicted the category boundary) when participants were given a context story and a happy-fear or surprise-fear continuum. Perception was not categorical for any continua when no context was given, nor was there evidence of categorical perception for the happy-surprise continuum in any condition. These results suggest that fear surprises are perceived differently from other types of surprises; it may be more important to quickly and accurately perceive this kind of face information because of the need to avoid threatening situations.

Rachael G. Falcon
Shades of green: The importance of distinguishing between benign and malicious envy

Evolutionary psychologists view emotions in terms of the functions they have evolved to serve. This perspective provides insight into the conditions that evoke different emotions, the manner in which emotions affect our behavior, and the valuable role of the subjectively distressing emotions. Sarah Hill and David Buss (2006, 2008) have applied an evolutionary perspective to the emotion of envy, elucidating the role it has evolved to play in resource competition. In doing so they have been able to explain previously inexplicable aspects of envy, generate novel hypotheses, and suggest methods of coping with the troubling effects of envy in organizations and in one's personal life. Their model does not make a distinction between benign and malicious envy however, a distinction that is considered to be important in the envy literature more broadly. I will argue that there are important, functional differences between the two and I will propose a small, but important, modification to Hill and Buss's model that incorporates this distinction, allowing for a clearer and more detailed specification of the mechanism by which envy functions.

Pound, N, Penton-Voak, I.S.
Cyclic changes in female selectivity for images of consumer goods

There is evidence that female preferences for various male traits vary systematically across the menstrual cycle. Some (but not all) of these findings can be interpreted as reduced female preference, during the late-follicular (fertile) phase of the cycle, for a consensually desired characteristic. In the present study a large set of images of non-human stimuli (houses, shoes, and handbags) were rated for desirability by a sample of women. These images were then presented to a second sample of women in a two-alternative forced-choice (2AFC) task in which they were asked to select the most desirable image from pairs drawn from each stimulus category. Women in the second sample completed the 2AFC task twice; once during the late-follicular (fertile) and once during the late-luteal (non-fertile) phase of the menstrual cycle. Overall there was a significant main of effect of cycle phase with women selecting the more desirable image more often during the non-fertile phase. Post-hoc analysis revealed that this effect was driven primarily by changes in selectivity for shoes. These findings could be attributable to cyclic changes in discriminative ability, task engagement or strength of preference itself.

Mons Bendixen, Leif Edward Ottesen Kennair
Sociosexual orientation and timing of sexual onset in adolescence

Most adolescents develop sexual behavior gradually, going through stages of kissing and petting until they reach sexual intercourse. An unrestricted sociosexual orientation (high-SOI) would predict a steeper, discontinuous development, skipping stages and reaching sexual intercourse at an earlier age – or at a faster pace. Data were collected on students (mean age 17.3) enrolled in upper secondary schools in Trondheim, Norway, 2007. Analyses were performed on a subsample of heterosexual students who had reported their age at first sexual intercourse (n=708). Results showed that SOI were moderately (negatively) associated with the reported age of reaching the various stages of sexual development in boys and girls. Cluster analyses identified four patterns of sexual development that were consistently associated with SOI for both genders. Regardless of developmental pace, early onset was most consistently associated with high SOI, while steep and discontinuous development was not. This paper is the first to report on SOI being a developmentally relevant predictive factor for sexual behavior among adolescents.

Leif Edward Ottesen Kennair, Robert Biegler
Sisters' evaluation of ideal long-term partners for herself and her sister: Sister conflict, sister guarding and sister cooperation.

The influence of parents on mate choice (Apostolou, 2007; Buunk et al., 2008; Kennair & Biegler, submitted) has received increasing interest the last few years. Recent research has also focused on the function of daughter guarding (Perilloux, Fleischman & Buss, 2008). The effects that make the generations' genetic interests diverge, should create the same conflict among siblings. The current study considers how sisters may (a) be competing for good genes while (b) at the same time guarding their sister and (c) wishing that sister's partner is more able to provide resources here and now. This should result in young females being (1) more interested in pursuing short term mating strategies compared to how interested she is in sisters pursuing such strategies, as well as (2) being more interested in indirect traits in her own ideal long term partner compared to direct traits in her choice for her sister's partner. Data is being collected Spring 09, using the same traits that were presented comparing mothers and daughters at HBES2008 (Kennair & Biegler, submitted). We will present preliminary findings from this study comparing sisters' own ideal with their ideal partner for their sister. Currently n=366, but it is too early to start matching pairs of sisters at the time of writing this abstract. We expect a pattern of similarities and differences for sisters' evaluation of ideal partner for herself and her sister, resembling the pattern we found for the comparison of mothers' and daughters' choice of the ideal partner for the daughter.

Keywords: Parent-offspring conflict - Sister guarding - Mate choice

Cari D. Goetz, Judith A. Easton, David M. Buss
Sex Differences in Attentional Adhesion to Mating-Related Cues

Research into mating psychology has documented circumstances in which mate-searching primes have altered attentional adhesion towards physically attractive members of the opposite sex, while mate-guarding primes have altered attentional adhesion towards same sex stimuli. Although this line of research has focused on cues directly associated with an individual, other work has documented the ways in which people use cues in an individual's immediate environment to make judgments about their personality. Because people can use reliable cues to judge others' personalities, these cues may also reveal mating-related information. In the current study, participants viewed images of bedrooms of same and opposite-sex peers. Items in the rooms were manipulated to alter perception of the room's owner in two domains: wealth/status (e.g. Blackberry) and sexual promiscuity/sexual exploitability (e.g. revealing clothing). Participants viewed a photograph of each room for four seconds and then rated their impressions of the room's owner, either rating the owner on a specific trait or indicating that they did not notice or could not tell how the owner should be rated for that trait. Males were more likely to indicate they could assess the sexual promiscuity/exploitability of a female room owner than her wealth/status. Females were more likely to indicate they could assess the wealth/status of a male room owner than his sexual promiscuity/exploitability. These results not only suggest that behavioral residue provides an additional source of information about a potential mate, but also indicates these cues are assessed as rapidly as those directly related to an individual.

John DeCesare, Lynne Honey

Disruption of Glucose Metabolism by Artificial Sweetener Use: Evidence to Support the Mismatch Hypothesis

In a natural environment like the EEA, sweet flavors signal the presence of calories and other nutrients. This correlation is not necessarily found in a modern environment where artificial sweeteners provide sweetness, but no nutritive value. Contrary to the advertised notion that 'sugar-free' products are the key to weight loss, rats fed diets containing artificial sweetener eat more than do rats on control diets (Davidson & Swithers, 2005) and humans who consume artificial sweeteners gain more weight than those who do not (Stellman & Garfinkel, 1986). Artificial sweeteners may disrupt satiety mechanisms by altering responses to sweet foods that do contain calories. To test this hypothesis, we looked for changes in fasting blood-glucose levels and blood-glucose reactivity among a sample of healthy young adults who consumed a solution made from Splenda and water, twice a day for two weeks. Each trial of sweetener consumption was explicitly unpaired with caloric intake. In contrast to participants in a control group, sweetener-exposed participants had higher fasting blood-glucose, and shifts in the time-course of reactivity to a sugar solution after two weeks of exposure. We suggest that these changes in glucose metabolism may be associated with the risk of obesity, insulin resistance and diabetes in our modern environment.

Schug, M., Barth, H., Patalano, A., Shusterman, A.

Group Bias, Prosocial Behavior and Social Judgments in Early Childhood

The human tendencies to behave altruistically and exhibit bias towards outgroups emerge early in childhood (Warnekan & Tomasello, 2006; Kinzler et al., in press). Children approve of prosocial behavior, tending to like generous over stingy individuals (McCrink et al., in press). However, there are indications that children behave more generously with ingroup members (Fehr, et al., 2008). The current study examines how young children respond to observations of generous and stingy individuals from their own and another group. Children (4-6 years old) were assigned to one of two artificial groups and rated how much they liked puppets from each group. Children then watched videos in which ingroup and outgroup puppets were sharing candy in a generous or stingy manner. Finally, children rated how much they liked new puppets from each group and had the opportunity to share with the puppets. We predicted children's attitudes about individuals and their willingness to share with them would be affected by puppets' group membership and their degree of generous or stingy behavior. Our results indicate that in certain conditions (e.g., after viewing the ingroup being extremely stingy and the outgroup being extremely generous) children reported liking outgroup individuals more than ingroup individuals.

However, in such conditions, children were willing to share with both ingroup and outgroup members. This suggests that, in some circumstances, children's judgments about outgroup individuals are affected by the degree of prosocial behavior observed in outgroup members.

Dieter Jehs

The Concept of Modernity in Neanderthal Studies.

Particularly during the final quarter of the 20th century, the concept of modernity gained prominence as a simple, yet effective means of interpreting the morphological, behavioural, and cultural variability evident in the hominin palaeontological and archaeological records, while at the same time fueling new research. By the turn of the century, the term was associated with a number of features that were believed to set apart and define ourselves as a species. In effect, the concept of modernity had become a heuristic tool to trace our species' origins, and differentiate ourselves from other hominins, especially the Neanderthals. Despite being criticised for nearly a decade now (mainly on empirical grounds), to this day the concept keeps resurfacing in the literature. In most cases though, the authors do acknowledge its problematic nature, i.e. by placing it between quotation marks; presumably however, they assume that a concept of modernity per se can be meaningful in Neanderthal studies, albeit not necessarily as it has been understood or defined in the past.

This paper draws from empirical evidence, as well as a conceptually integrated, i.e. evolutionary perspective, to argue that in the case of Neanderthal studies, the concept of modernity lacks both empirical validity and theoretical utility. It should therefore be abandoned in favour of a conceptual framework able to handle the intricacies of the archaeological and palaeontological records, particularly those documenting the key period of the transition from Middle to Upper Palaeolithic in Europe, between 45 and 30 ka BP.

Mark D. Cloud, Jaime C. Confer, Clare A. Cryar

Sex Differences in Conspicuous Consumption Following Intersexual Mating and Intrasexual Competition Primes

Previous experiments have supported the hypothesis that conspicuous displays of consumption serve as “costly signals” of mate value. Griskevicius et al. (2007) found that men, but not women, spent more hypothetical money to purchase a resource-displaying item (e.g., new watch, European vacation) following an intersexual mating prime. In this experiment, we sought to replicate this finding using an alternative measure of consumptive behavior that required participants to allocate dollars in a zero-sum fashion. In addition to the neutral and intersexual mating primes, we added an intrasexual competition prime to test the hypothesis that women conspicuously consume in response to intrasexual competition. Data from 100 participants have replicated the finding that an intersexual mating prime induces men, but not women, to allocate more hypothetical money to resource displaying items, such as iPods and designer clothing. In contrast, an intrasexual competition prime induced women, but not men, to conspicuously consume. Utilizing additional measures of relationship status, socioeconomic status, and sociosexual orientation, this pattern of results is discussed in relation to several hypothesized reproductive and social benefits of women’s conspicuously consumptive behavior, such as status enhancement and the deterrence of mate poachers through a display of a mate’s investment.

Erin S. Lavender-Stott, Richard L. Michalski

Influences of Paternity Uncertainty and Relational Uncertainty on Parental Naming Strategies

Using data collected from 221 participants, we tested hypotheses about naming practices and kin investment. We found support for the influence of similarity on kin investment. Perceived similarity to various kin was significantly positively associated with frequency of contact and with calling them sooner in a hypothetical emergency. We also found a pattern of contact between kin consistent with predictions derived from inclusive fitness theory (W.D. Hamilton, 1964) and an evolutionary history of paternity uncertainty. Participants reported that they would call female kin before male kin, genetically closer kin before more distal kin, maternal grandmothers before other grandparents, and kin related through mothers before kin related through fathers. We did not document a tendency for offspring to be named after either maternal or paternal kin. Additionally, for whom a participant was named was not predicted by the birth order of the participant or the maternal age at participant’s birth. Discussion addresses methodological limitations of the current study and future directions for research in the area of contact between kin.

David Salas, Camilo Olaya

No More “Learning”: Selectionist Education for the Classroom

Prevalent and established theories of education stand on Lamarckian ground since they presuppose that knowledge is transmitted from the environment to the organism. Here the premise is “learning”, that is, instruction, i.e. a passive process of combination, accumulation, and repetition in which knowledge is supposedly acquired stage-by-stage via cumulated inductive achievements; those theories also entail external agents that direct this evolution under an implicit notion of ‘progress’. However, following biology and cognitive science, a selectionist theory is a more plausible candidate for designing this process of acquisition, in this case, the growth of knowledge in a changing environment. We formulate a scheme for designing selectionist educational processes in the classroom; in short, education is conceived as a series of multilevel processes of free trials and error-elimination of unsuccessful responses. We implemented this proposal through twelve class sessions in a Colombian school. We show that our scheme promotes in students problem-solving abilities, critical thinking, creativity, communication skills, and autonomous decision-making. Furthermore, and more important, we show that a natural selection of knowledge enhances educational processes in several ways: (i) Students become working and active agents that challenge preconceptions and external “authorities”. (ii) The role of teachers shifts from “instructors” to inventors of selectionist environments, e.g. the design of “selective pressures”. (iii) Our scheme questions the traditional imposition (i.e. transmission) of knowledge. (iv) It is consistent with what we know about man as product of biological evolution. (v) Finally, it promotes educational processes that work under the premise of freedom of thought.

Angela A. Stanton

Homo Irrationalicus: An Evolutionary Explanation of Rationality

Mainline economic theories base their models on axiomatic representation of an ideal "rational" agent. Key characteristics of this Homo rationalicus is that he maximizes his utility by consistently picking that option which provides the greatest measurable benefit to him in terms of outcome. Experimental results show that human decision-making is not rational - as defined by economics. Thus many researchers argue in favor of an irrational human agent. I propose that since economic theory has no base to suggest what rational behavior is outside of mathematics, it is premature to call actual decision outcomes irrational when they don't match economic expectations. From the perspective of evolutionary processes, human decisions are rational. Decision-making is guided by neuronal activity that is stimulated by hormones in response to specific environmental stimuli. Rational decisions are those that give pleasurable processes to their beholders. The currency of rationality is not the outcome but that of the process of making the decision itself, which is governed by the continuously evolving human. From the perspective of evolution, there is no such as irrational.

Key words: Homo Economicus, Rational, Irrational

Nushien Shahnam, Valerie Sims, Peter Hancock

Evolutionary perspectives on the effects of novel stimuli on memory and learning

The effect of exposure of novel information on memory and learning has been explored in numerous cognitive studies. These studies have depicted a positive relationship between learning, as well as memory performance, and exposure to novel stimuli. Here the authors discuss the unanimous positive correlation. Utilizing the concept that the human memory system employs information from the past to envisage information relating to the future, exposure to novel stimulus increases the number of future inferences an individual could make. The authors propose that during evolutionary history, particularly as Pleistocene hunter-gatherers, alleles that caused its carriers to seek novel information had greater fitness than alleles without such effects.

Yohsuke Ohtsubo, Ayaka Murakami

Monetary Cost Cannot Make an Effective Signal to Communicate Men's Commitment to Their Romantic Relationship

Women have a cognitive bias to underestimate men's commitment to their romantic relationship (Haselton & Buss, 2000). According to the costly signaling theory, in order for truly committed men to prove their sincere commitment to the relationship, they might give expensive gifts to their mate (Sozou & Seymour, 2005) or spend a substantial amount of time with the mate (Bergstrom et al., 2008). It is possible that women use various types of costly courtship signal to assess men's commitment. To explore this possibility, we conducted a vignette experiment, in which 33 female undergraduates were asked to imagine that their boyfriend incurred substantial cost or little cost to do them a favor. The cost condition (costly favor vs. no cost favor) was a between-participants factor. Four types of the cost (spending money or time, sacrificing his health or relationship with a same-sex friend) were manipulated as a within-participant factor. For every cost type, participants in the costly favor condition considered that their boyfriend loved them more ardently than those in the no cost favor condition, all $t(31)'s > 3$. For every but the money cost condition, participants inferred that their boyfriend generally follows the long-term mating strategy rather than the short-term mating strategy, $t(31) = 1.06$, ns, for the money condition; $t(31)'s > 2.6$ for the other three conditions. Unlike spending other types of resource, spending money was ineffective to communicate men's ommitment. This may be because spending money is frequently associated with men's status signaling, which is in turn related to their short-term mating style.

Rie Mashima, Nobuyuki Takahashi

The linkage between social dilemma and indirect reciprocity

Although attaining mutual cooperation in a social dilemma (SD) situation has been considered extremely difficult, Panchanathan & Boyd (2004) argued that if a population contains a sufficient number of players who adopt a 'linkage strategy' (which excludes defectors in SD from indirect reciprocity (IR)), cooperation emerges. However, they did not show whether or not that strategy is an ESS, which prevents invasion of other types of strategies, especially cooperative strategies without the linkage trait ('no-link strategy'). Furthermore, although there can be various types of linkage strategies, they only focused on one particular type of strategy. In order to address these issues, we conducted a series of computer simulations which aimed to systematically examine whether linkage is the key to maintain cooperation in both SD and IR. In our simulations, players engage in a one-shot SD game following several rounds of IR game in each generation. Each player's behavior is regulated by two strategies. SD strategy regulates player's behavior in SD. IR strategy regulates player's behavior in IR (unilaterally giving his resource to the recipient or keeping it for himself) based on the recipient's past behaviors in SD and IR. There can be many types of IR strategies, such as linkage strategies, no-link strategies, and unconditional strategies. Our focus is to figure out whether there is any linkage strategy that can not only maintain cooperation but also be an ESS. Results showed that certain types of linkage strategies are an ESS, which implies that linkage enables cooperation to emerge in SD.

Asami Matsumura, Yohsuke Ohtsubo

Flattery Makes Us Feel Good

Praise can be manipulative: People might unfaithfully praise someone out of the desire to induce his/her favor. It is not adaptive if people are insensitive to the difference between honest praise and flattery. In the present study, we explored how people react to honest/dishonest praise. Participants were assigned to either the evaluator or target role. Each target wrote a brief description of him-/herself, based on which the evaluator rated the target's likeability. Each target rated his/her emotional response (e.g., How pleased are you by the evaluation?) on a 7-point scale. There were two conditions. In the flattery condition, it was explained that each pair of participants was to play the dictator game, in which the target would play the dictator role. Therefore, the evaluator had an incentive to use flattery because the target had fate-control over the evaluator. In the honest praise condition, no such explanation was provided. Thus participants did not anticipate any fate-control. The results showed that the evaluators rated the targets' likeability higher in the flattery condition ($M=7.67$) than in the honest praise condition ($M=6.30$), $t(45)=2.79$, $p<.001$, and that the targets were more pleased by the evaluation in the flattery condition ($M=4.46$) than in the honest praise condition ($M=3.17$), $t(46)=2.97$, $p<.001$. However, the latter difference was no longer significant once the evaluation was statistically controlled for by ANCOVA, $F(1,44)=1.16$, ns. These results suggest that people are insensitive to a manipulative motive behind praise because potentially unfaithful praise was equally effective as believable praise to please participants.

Sharp, M.A., Matthews, M.J.

Prenatal Androgen Exposure and Female Dominance

In females the relationship between dominance and testosterone is notably under researched despite a similar, although not entirely straightforward, relationship being found in males (Kemper, 1990; Mazur and Booth, 1998). Drawing upon contemporary interpretations of sexual selection theory (c.f. Blaffer-Hrdy, 1999) and utilizing 2D:4D digit ratio as a proxy marker for prenatal androgen exposure (Manning, 2008) this paper explores sex differences in the relationship between digit ratio and dominance as a personality construct. 2D:4D was determined using digital Vernier calipers to measure the ventral proximal crease to the fingertip from photocopies of both hands in 117 right-handed participants (57 male, 60 female). Dominance was determined using the dominance subscale of the 16PF Cattell questionnaire. Results indicate that digit ratio was sexually differentiated and dominance scores were significantly higher in males than in females. High dominance scores were significantly correlated to low 2D:4D (high exposure to fetal androgens compared to estrogens) in both males and females and the relationship was marginally stronger in the right rather than left hands. These findings, of an association between digit ratio and dominance, suggest a biological underpinning to female dominance in a manner similar to that claimed for males.

Nobuyuki Takahashi, Ryoichi Onoda, Yohta Takaoka
Social exchange - An anomaly in time-discounting?

There is a consensus among researchers that social exchange is the most important activity that only human beings engage in. However, what social exchange means has not been made very clear. Especially the difference between social exchange and economic exchange has been ambiguous both theoretically and empirically. Utilizing the concept of time-discounting in natural science and economics, this study proposes a new way to distinguish social exchange from economic exchange. We hypothesized that people would engage in time-discounting in economic exchange as they do in other situations since it is evolutionarily adaptive in general. However, they would not engage in time-discounting in social exchange. This is because reducing social uncertainty is the main concern in social exchange, and the best way to do it is to form a long-term relationship with a partner. If a partner wants to return a favor as soon as possible after you did a favor to him, his behavior would be seen as the indication of desire to quit the relationship quickly. Then, such a person who wants a short-term relationship would not be considered a desirable exchange partner. As a result, people would prefer a partner who returns a favor after certain period of time, and such a phenomenon is against the pattern of time-discounting. In order to examine this hypothesis, we conducted a vignette study and found that actually people do not show time-discounting when they engage in social exchange, while it is taken for granted in economic exchange.

Yutaka Horita, Toshio Yamagishi
Adaptive advantages of punishing free-riders

Punishment of free-riders is thought to be a key to sustaining large scale human cooperation. However, since punishment incurs costs, punishment of free-riders is not sustained unless punishers can acquire benefits that surpass these costs. Some studies (e.g., Barclay, 2006; Nelissen, 2008) have shown that punishers are perceived as trustworthy, and are chosen more frequently as an interaction partner than non-punishers. However, other studies (e.g., Kiyonari & Barclay, 2008) have demonstrated that punishers are evaluated more negatively and do not receive more resources than non-punishers. To demonstrate the benefits of punishment, we conducted a scenario experiment. Participants first read a scenario describing either a public goods game (PGG) or a third-party punishment game (TPG). In each scenario, a punisher and a non-punisher appeared. Participants were asked to choose either the punisher or the non-punisher as an interaction partner in other games. In addition, participants were asked how they perceived the punisher and non-punisher. Results showed that punishers were chosen more frequently as interaction partners than non-punishers in roles in which they allocated resources. However, punishers were chosen less frequently than non-punishers when they were the recipients of rewards. Punishers were evaluated as more trustworthy than non-punishers. However, punishers were perceived to be less friendly than non-punishers, especially when they punished in the PGG. These results suggest that punishers may receive advantages when group members need a trustworthy interaction partner, but they may be excluded in resource exchange situation because they are not perceived to be friendly.

Aiko Murata, Tatsuya Kameda
Does blocking facial mimicry reduce your empathetic ability? A laboratory test of the embodied emotion.

Facial mimicry refers to an automatic, reflex-like process where an observers' emotional facial expression matches the facial expression displayed by another individual. In a series of laboratory studies using Facial Action Coding System (FACS; Ekman, & Friesen, 1978), Saito and Kameda (2008, 2009) have shown that facial mimicry is more likely to occur when participants are explicitly asked to infer emotional states of a target person than when asked to infer non-emotional features (e.g., age) of the target. This finding is in line with the notion that facial mimicry may help our understanding of another's emotional states, thus functioning as a part of the "embodied" empathy (Niedenthal, 2007). The present study aimed to test this hypothesis by an experimental manipulation different from the one in Saito and Kameda (2008, 2009). More specifically, following recent studies which showed that inhibition of facial mimicry reduces accuracy in recognition of emotional faces (Niedenthal, et al., 2001; Oberman et al., 2007; Stel & Knippenberg, 2008), we examined whether or not recognition of happy faces would be impaired by physically inhibiting activities of observers' facial muscles involved in expression of happiness. Although the manipulation of muscle-inhibition was successful, the results yielded no significant difference in recognition accuracy as a function of the muscle-inhibition. Thus, the causal relation between facial mimicry and accuracy in emotion recognition was not supported □□ this data, leaving the question for further investigations.

Makoto Kawamura, Tatsuya Kameda

Toward a computational algorithm for the sunk-cost fallacy in human decision making: A vignette study.

Sunk cost fallacy refers to an economically irrational decision whereby people invest further resources into an unpromising project. Anecdotal evidence suggests that this phenomenon, also known as the Concorde fallacy, may exist in non-human species including Digger Wasps (Dawkins & Brockmann, 1980; Dawkins, 1982, "The Extended Phenotype"). However, the previous experimental literature about human sunk-cost fallacy has confounded closely-related but theoretically distinct notions that may underlie this behavioral phenomenon. Specifically, the purely economic definition of sunk-cost fallacy should hinge solely on the notion of, viz., whether or not there is another alternative where higher return can be expected by investing available resource in the option than investing in the present course of action. If such an alternative exists, further commitment in the current project should be seen as a sunk-cost fallacy, even if it yields a positive (and satisfactory) return. In a series of vignette experiments, we manipulated the opportunity-cost factor (is the presence of another alternative yielding higher return than that expected from continuing the current project) orthogonally to the positive/negative return factor (whether or not the current project yields a positive or negative return from further investment). The results showed that both factors contribute to the continuation of the current course of action, indicating that computational algorithms underlying the "sunk-cost fallacy" do not match the purely economic reasoning that constitutes the definition of the phenomenon.

Sanaa Butt, Achim Schützwohl

Are emotional responses to infidelity regulated by the jealousy and/or attachment system?

Infidelity in romantic relationships involves a threat to reproductive success as well as the threatened loss of an attachment figure. The jealousy system presumably evolved to counter the threat to reproductive success associated with a partner's infidelity. The attachment system presumably evolved to prevent the loss of an attachment figure. Thus, cues to infidelity might trigger both the jealousy and the attachment system. As a consequence, emotional responses to infidelity could be determined by both systems (Sharpsteen & Kirkpatrick, 1997). To test this assumption, 76 male and 61 female participants (mean age 23.1 years; age range from 18 to 52) completed a questionnaire assessing the (a) attachment style (secure, avoidant, or ambivalent); (b) jealousy in response to sexual and emotional infidelity; (c) relief in response to the disconfirmation of suspected sexual and emotional infidelity; and (d) trust in the current relationship. The results showed that jealousy and relief responses were exclusively determined by sex-specific jealousy systems: (a) Men reported more jealousy than women about sexual infidelity; women reported more jealousy than men about emotional infidelity. (b) Men reported more relief than women about the disconfirmation of suspected sexual infidelity; women reported more relief than men about the disconfirmation of suspected emotional infidelity. However, trust in the relationship was found to be clearly determined by sex-unspecific attachment style; (c) both secure men and women reported more trust than avoidant men and women who reported more trust than ambivalent men and women.

Takumi Komuro, Taiki Takahashi, Tatsuya Kameda

Human's risk preference under timing risk -A comparison between Energy Budget Rule Model and Discounted Expected Utility Model-

Decision making under uncertainty is an important topic in animal ecology, economics and psychology. Although previous research has revealed factors affecting people's risk preferences involving variable monetary outcomes (e.g., gambles), risk preference involving variable time ("timing-risk preference") has been understudied. Timing risk refers to the uncertainty of the exact realization time of the future payoff. Models predicting preference under timing risks are available in behavioral ecology and economics. In behavioral ecology, the energy-budget rule (EBR) is an optimal foraging model that has been proposed to explain animal's food choices when the waiting time until food acquisition is variable (e.g., Stephens, 1981). In economics, Discounted Expected Utility (DEU) Model has been proposed which assumes that individual's choice under timing risk depends on time discounting function. Yet, the EBR and DEU models' predictions are not consistent. More specifically, EBR predicts that animals are timing-risk averse when they are in "positive energy budget" where net energy gains exceed energy requirements, whereas DEU predicts that individuals are generally timing-risk prone. This experiment was designed to investigate relative accuracy of the two models with Japanese undergraduate participants. The results revealed that majority of participants in our experiment had timing-risk prone preferences, which provides a support for the DEU model. However, subsequent analysis revealed that the result is not entirely consistent with the DEU model. This leaves the question open including possible cultural roles in fostering people's preferences about timing-risks.

Keigo Inukai, Tatsuya Kameda

Socio-economic condition and emotional function: Findings from two experiments employing experience sampling and physiological measurement

Emotions are the driving force behind much of our everyday behavior and decisions, and as such the ability to feel and express the appropriate affect in the right situations is essential (Frank, 1988). However, people may develop distinct emotional tendencies as adaptive strategies in different socio-ecological contexts. In this study, we examined relationship between socio-economic status (SES) and affect as a first step toward this question. We created a new research paradigm, whereby participants' emotional experiences were assessed by a field survey as well as by a laboratory experiment. The field survey employed an experience-sampling methodology (Csikszentmihalyi & Larson, 1987). More specifically, participants received instant messages in their web-enabled phones every two hours on average for 7 consecutive days, and reported their momentary feelings along with other behavioral information (e.g., where they are, whom they are with) on our Web-site. The same set of participants were later called in for a laboratory experiment in which participants' psychophysiological responses (salivary Alpha-amylase) were measured in response to anger-provoking stimuli. The results indicated that, compared with upper-middle class youth, lower-middle class youth revealed more flattened emotional patterns in their momentary reports sampled over a week, as well as in their physiological reactions in the laboratory experiment. Implications for adaptive roles of emotions are discussed, in relation to the robust empirical relationship between SES and health, which has been known as the "SES-health gradient" in epidemiology.

Hirofumi Hashimoto, Toshio Yamagishi

Default Strategies as a Form of Error Management

Culture-specific psychology or behavior can be interpreted as a set of default adaptive strategies each of which is dedicated to a particular social adaptation task (Yamagishi, Hashimoto & Schug, 2008). In collectivistic societies where groups are typically closed to outsiders (Greif, 1994; Yamagishi, Cook & Watabe, 1998), those who are excluded from their group may find no alternatives and therefore the cost of being excluded is extremely high. In these societies, it is better to by default avoid any behavior that might offend others and potentially commit a Type I error (i.e., one pays a cost by refraining from asserting one's self-interest when unnecessary), so as to reduce the possibility of committing a Type II error (i.e., one acts in a way which offends others, thus increasing the chance of being excluded from current relationships). The purpose of this study is to interpret the Japanese self-effacing tendency, which has been explained in terms of self-construal (Heine, Lehman, Markus, & Kitayama, 1999), as a default adaptive strategy to avoid committing Type II errors. In a series of studies, our results showed that self-effacing tendencies completely disappeared in both American and Japanese participants when a reason to accurately report self-judgments was provided. However, when there was no reason to accurately report self-judgements, the self-effacing tendency was stronger among Japanese than Americans, as well as women than men. We suggest that these differences are due to the cost of offending others (i.e., opportunities to acquire resources from outside current relationships).

Dori Edwards, Matthew H. Scheel

Captive black-handed spider monkeys (*Ateles geoffroyi*) gesture to solicit allo-grooming

In the wild, spider monkeys spend most of their time high in the trees. These animals live in fission-fusion societies, where larger communities are comprised of small unstable groups that dissolve and recombine. Sub-groups split and come together several times per day, splitting when food is scarce, and converging when they discover a cluster of trees with ripe fruit. Because spider monkeys spend a large percentage of their time spread out from other individuals in their group, their communicative repertoire would have evolved to include signals other monkeys can discriminate from a distance. For example, spider monkeys emit vocalizations, loud enough to be heard up to 300 meters away, which may serve a role in regulating spacing among group members. The unique social and environmental pressures that spider monkeys face would have also favored developing pronounced visual gestures discernable from a distance. We video recorded eight captive spider monkeys for eighty-one hours over an eight week period. Six of the monkeys made a heretofore unreported arm-raise gesture that reliably solicited allo-grooming within five seconds. Allo-grooming bout durations following arm-raise solicitations tended to be longer than other bouts. Monkeys raised their arms at least 90-degrees away from the body while making the gestures, resulting in a discernable signal consistent with the ecological need to communicate from a distance.

Shelli L. Dubbs, Abraham P. Buunk

Why do my Parents Hate all of my Dates?! Parent-Offspring Conflict over Mate Preferences

A feature that sets *Homo sapiens* apart from all known extant species is that kin (especially parents) play a large role in determining the mate choice of individuals. Drawing on the logic of parent-offspring conflict and evolutionary trade-offs, we hypothesized that parents' mate preferences (for their children's mates) will differ from the mate preferences of their children. Specifically, we predict that parents prefer children's mates to have characteristics that suggest high parental investment and cooperation with the ingroup (same ethnic background), whereas children will prefer mate characteristics which indicate high genetic quality (attractiveness). Previous studies have supported these hypotheses using culturally diverse samples of children of mating age. The present research uses a sample of 474 Dutch parents, mothers (n= 234) and fathers (n=240), with children of mating age. This is important as relatively few studies have taken into account the perspective of parents. The results revealed sex differences between mothers and fathers and sons and daughters. Notably, there is a higher degree of parent-offspring conflict for daughters than for sons. Parents perceived the traits being poor, having a different ethnicity, having different religious beliefs, and being divorced in a child's potential partner as being more unacceptable when they had a daughter rather than a son. Lastly, a comparison between parents with a single child to parents with multiple children did not reveal a significant difference in the degree of conflict.

Hisamichi Saito, Tatsuya Kameda

Facial mimicry in understanding the emotional states of others – Further investigation using FACS coding

Embodied cognition theory has led to the hypothesis that facial mimicry, or the spontaneous imitation of the emotional facial expressions of others, helps us to understand other's emotional states (Niedenthal, 2007). Saito & Kameda (2008) partly showed that facial mimicry was more frequently elicited when participants were motivated to understand another's emotional states than otherwise. To verify the robustness of these results, we conducted a followup study with minor changes. We presented participants with animated facial morphs movies showing the transition between neutral expressions and six kinds of emotional facial expressions. Some participants were asked to infer the emotional state of the target person in the movie ("emotion condition"), while the other participants were asked to infer non-emotional features such as age ("control condition"). We used the Facial Action Coding System (FACS) to measure participants' facial actions. In the emotion condition, facial mimicry was elicited more often than in the control condition when seeing the happy, anger, sad and surprise expressions. This result supported the results of Saito & Kameda (2007).

Deanna Forrester & Lynne Honey

Both Age and Dominance Influence Female-Female Rivalry

Humans face the dual task of determining which members of the same sex are allies, as well as rivals. Previous results from our lab suggest that females attend to cues of attractiveness as well as cues of behavioural dominance when judging whether other females would make good friends or are perceived as competitors. Because females have a limited window of reproduction, and age is a reliable predictor of fertility, we conducted the present study to determine whether females' impressions of other females' dominance shifts with age, and whether that influences the likelihood of perceiving a female as a rival. We presented 588 female participants, who ranged in age from 17-77 years, with a photograph and bio of a target female and asked participants to rate her on a number of dimensions including friendship, rivalry, and appeal to males. We used two photographs that had been rated as moderately attractive, but different in age (early 20s vs. late 30s). We paired these photos with bios that differed in cues related to behavioural dominance (leadership, assertiveness, extraversion). We found that younger participants (under age 35) rated all targets higher for rivalry, suggesting that more-fertile females may be more prone than older females to perceive all females as potential competitors. Still, females of all ages gave higher rivalry ratings to targets described as higher in behavioural dominance.

Cody Lakevold, Lynne Honey

Can 'Retail Therapy' be Understood as an Evolved Response to Stress?

Although there is considerable anecdotal evidence to suggest that people engage in 'retail therapy', or shopping as a stress-reduction tool, there is little empirical evidence to support the existence of such a phenomenon. From an evolutionary perspective, shopping is a method of resource-acquisition, and should be expected to increase under times of stress or uncertainty. In an exploratory survey, we asked participants to indicate whether they find a variety of activities (including shopping) to be relaxing, if they engage in those activities when stressed, if they perceived that they 'should' engage in those activities when they are stressed, and where they ranked shopping as a method of stress-reduction compared to other activities including massage, napping, seeking support, watching TV and eating. We determined that respondents in our sample view shopping as a relaxing or stress-reducing activity in a manner that is comparable to other 'escapist' activities like massage or watching TV, as well as supportive activities like seeking out the company of friends or family. Thus, shopping is perceived as a method of stress-reduction. We have yet to determine whether shopping functions to reduce stress by providing escapism, or whether resource-acquisition is an important aspect of 'retail therapy'.

6. Three Key Words shopping, stress, resources

Luis Pacheco-Cobos, Marcos Rosetti, Cecilia Cuatianquiz, Robyn Hudson

GPS-tracking of men and women searching for mushrooms at high altitude forests

Evolutionary hypotheses concerning how the sexes differ in their use of space, although well sustained still have not been adequately tested. In order to test some of these, we GPS-tracked the foraging movements of 21 pairs of men and women searching for mushrooms in a natural environment. Parameters related to costs, benefits and performance were analyzed and tested for potential differences in the sexes' foraging patterns. Results showed that costs were significantly higher for men than for women in the distance traveled, altitude displacement and energy expended. Benefits, although equivalent between sexes, were significantly higher for women than for men in the number of species collected. Finally, general performance of the search, as energy expended per distance traveled, weight of fungi collected or duration of the search, was found to be significantly fewer for women than for men. Our findings suggest that indeed different strategies may be underlying the foraging patterns of men and women.

Kathryn Demps, Victoria Ramenzoni, Ruth Magtanong, Eric Kightley, Gayatri Thampy, Victoria Reyes-García
Social learning patterns and the diffusion of technology into the Bolivian Amazon: Results of a pilot study

Abstract: This research looks at how socio-cultural factors affect the spread of a new technology within the Tsimane', a native Amazonian society in Bolivia. Our sample from one village includes 1 woman and 10 men between the ages of 14 and 60+ who learned to use the rice-seeder, a more efficient tool for planting rice than traditional technology for dry agriculture. Age and wealth bear an association with the order of adoption. Individuals who are currently wealthier adopted sooner and were more likely to teach themselves to use the rice-seeder than later or non-adopters and social learners. We also found that people learned from individuals in the same or older generation and taught the same or younger generation how to use the technology. And regardless of generation, all individuals adopted the technology when they reached the age of 22 or 23 and began planting their own agricultural plots. These results suggest that 1) social transmission of information can be simultaneously vertical and horizontal, yet maintain directional inter-generational flow, 2) technology is adopted as needed, which retards the rate of diffusion, and 3) even a small initial disparity of wealth can lead to different adoption patterns.

Melanie L. Shoup, Andrew C. Gallup, Gordon G. Gallup, Jr., Ewan C. McNay
Yawning is a Brain Cooling Mechanism

Yawning is an evolutionarily ancient behavior that occurs in most vertebrate species and appears prenatally in humans, yet previous attempts to identify its function have proven largely unsuccessful. Interdisciplinary evidence has documented that yawning occurs before, after, and during instances of abnormal thermoregulation, heat stress, and hyperthermia. We have previously shown that the propensity to yawn can be experimentally diminished in humans by forehead cooling and nasal breathing; conversely, increasing ambient temperature increases yawning frequency. Nasal breathing has also been shown to decrease frontal lobe temperature. Taken together these data suggest that one function of yawning may be to cool the brain via a combination of increased air inhalation and vascular effects. We tested this hypothesis directly by recording cortical brain temperature, using an indwelling thermocouple, in freely-moving rats prior to, during, and after the incidence of yawning. In all rats and all instances, yawning significantly decreased brain temperature. Brain temperature dropped immediately in response to a yawn, reaching its lowest 75 seconds post-yawn and remaining significantly lower than pre-yawn temperatures for up to five minutes. These data are the first to establish a functional brain cooling effect of yawning.

Jeffrey L. Niehaus, Joshua New, Tamsin C. M. German
Animate Monitoring in Preschool Children

Coherent and goal-directed behavior in our complex world is supported by attentional systems that facilitate the selective processing of some information at the expense of other information. Detecting animacy may be important for rapidly orienting to stimuli that are potentially dangerous or beneficial (Barrett et al., 2005; Rakison, 2005). Following results reported by New, Cosmides and Tooby (2007) showing enhanced change detection in adults when the targets of search in a change blindness paradigm were animate (e.g. people or animals) as opposed to non-animate (artifacts or plants), we seek evidence on the developmental trajectory of this animate monitoring. To this end, we used the a slightly modified change detection paradigm with 35 preschool children (ages 3, 4 and 5 years). Two versions of a scene were briefly displayed on a laptop computer in sequence (separated by a visual mask), and in each pair of scene one object was different. When the child detected the change, he or she verbally reported doing so to the experimenter, who stopped the display sequence. Children then pointed out where they thought the change was, in order to determine accuracy. When the changing object was animate (a person or animal), children were faster and more accurate in detecting the change than when the object was inanimate (a plant or artifact), lending support to the idea that children as young as four years old appear to show evidence of adult-like animate monitoring.

William D. Lassek, Steven JC Gaulin
Cross-National Data Indicate Opposite Effects of Omega-3 and Omega-6 Fatty Acids on Female Body Mass Indices (BMI), with Weaker Effects in Males

The omega-3 fatty acid docosahexaenoic (DHA) constitutes a high percentage of neural membranes and plays a critical role in brain development. Women's gluteofemoral fat stores DHA during childhood in proportion to the amount of omega-3 in the diet; this Gluteofemoral fat is mobilized during late pregnancy and lactation and is the source for most of the DHA in breast milk. Dietary omega-6 such as linoleic, found in corn and soybean oils, and arachidonic, found in corn-fed animal products, compete enzymatically with omega-3 and reduce the production and storage of DHA. Evidence suggests the ratio of omega-3 to omega-6 for hunter-gatherers was no worse than 1/2, while the marked increase of vegetable-seed oils in the modern diet has lowered it to 1/10. If omega-3 storage is the primary role of female fat, and if the homeostatic system is sensitive to the omega-3/6 balance, as it should be, more dietary omega-3 should lead to a reduced need for fat storage, while more dietary omega-6, because it competes with omega-3, should trigger "fat hunger" and hence weight gain. We test these predictions by examining national differences in female BMI in relationship to dietary fatty acids estimated from food disappearance data in 167 countries and in relation to the fatty acid composition of maternal milk in 43 countries. In both cases, we find that female BMI is negatively related to the amount of omega-3 and positively related to the amount of omega-6, and that this relationship is weaker in males.

Aanchal Sharma, Tracy Vaillancourt
'Frienemies': An evolutionary explanation of why women love to hate each other

In recent years, the field of aggression research has made considerable progress in understanding the various forms and functions that underlie aggressive behaviors. For instance, there is now a wealth of knowledge on the previously under-investigated form of indirect aggression. Indirect aggression is the predominant strategy used in female-to-female conflict and includes conniving acts such as getting others to dislike a person, befriending others as a form of revenge, encouraging the isolation of others, and rumour spreading (e.g., Crick & Grotpeter, 1995). Campbell (1995) and Vaillancourt (2005) addressed indirect aggression in light of its evolutionary roots and linked its high prevalence among women, both in terms of victimization and perpetration, to intrasexual competition. The purpose of our study was to explore indirect aggression's impact on female intrasexual friendships. Using an exploratory phenomenological study based on semi-structured interviews we collected information from undergraduate females regarding their subjective experiences with indirect aggression, within the context of female friendships. All females interviewed acknowledged having been exposed to/directly victimized by a female peer in an indirectly aggressive manner. While interviewees unanimously expressed strong displeasure and frustration with the impact of indirect aggression on their interpersonal relationships, they nevertheless admitted to using indirectly aggressive tactics themselves. Participants identified access and retention of mates as forming the bases of female conflict, without explicitly acknowledging evolutionary mechanisms. We argue that women's strong affinity for using indirect aggression combined with their claims that they "can't help it" suggests that there are evolutionary processes at work, namely intrasexual competition.

Rory Deol, Derrick McAdams, Robert T. Hitlan, M. Catherine DeSoto
Friendly outgroups and the effect on Testosterone change

The current study analyzed how interactions with others, believed to be either highly similar or dissimilar to oneself, related to testosterone levels. Eighty-two males (Mage=19.52) provided saliva samples 20 minutes prior to a group-based chat-room interaction with three other “participants” (confederates). At the end of the interaction period, participants completed a survey (20 minutes) after which a second sample of saliva was collected. The confederates either included the participant in the discussion, or ignored/downplayed the responses of the participant. Assays of saliva indicated a significant difference between the high and low similarity conditions, $t = -2.21$, $p < 0.05$. Of interest, decreases in the levels of testosterone were particularly pronounced when interacting with highly dissimilar, but inclusive others. Such a biological response to out-group inclusion could be adaptive by increasing submissive behavior in a novel environment where group acceptance is likely. It is possible that testosterone drop is a biological substrate that serves to tone down dominance seeking behavior.

Virginia A. Periss, David F. Bjorklund, Carlos Hernández Blasi
“The Rainmaker Pulls a Trigger in the Sky, and Rain Falls from the Clouds”: Developmental Trends in the Judgments of Children’s Expressions of Mature and Immature Cognition

In previous research we found that some forms of immature cognition bias adults to feel more favorably toward children who express them and may foster positive parent-child relationships. For example, in a series of studies adults were presented pairs of scenarios with children (3-years-of-age) expressing either agentive or nonagentive cognition. For cognition we described as agentive, in which children express a purposive/intentional explanation for some behavior or phenomenon, children expressing immature cognition were rated higher for statements reflecting positive affect (e.g., cute, likeable) than children expressing mature cognition. There were no differences in ratings of negative affect (e.g., sneaky, likely to lie) between children expressing immature and mature agentive cognition. For cognition we described as nonagentive, which does not involve an attributing agency in explaining an event, adults judged children expressing immature cognition lower for positive affect and higher for negative affect. These results provide support for the hypothesis that cognitive immaturity may serve an adaptive purpose for children at a time in ontogeny when they are not capable of ensuring their own survival. To further investigate whether these biases are present throughout childhood or develops sometime before adulthood we replicated these studies with children 10-17-years-of-age (N=278). We found that 10- to 15-year-old children judged mature children across all vignette types as having greater positive affect relative to immature children. It was not until 16-years of age that children began demonstrating adult like patterns in their judgments. The findings are discussed in terms of evolutionary hypotheses and preparation for parenthood.

Katherine N. Hanson Sobraske, James R. Roney
Written all over his face? Testosterone, masculinity and men’s facial morphology

Testosterone is thought to be an immunohandicap and that the extent of growth influenced by testosterone can be used as an honest indicator of underlying genetic quality (Andersson 1994, Folstad and Karter 1992, Roberts et al. 2004). Male-typical facial morphology of humans has long been suspected of indicating levels of testosterone in men, however the specific relationship of testosterone and male facial morphology is poorly understood. Gestalt masculinity ratings of faces are often used as proxies for testosterone but their efficacy is questionable as testosterone does not consistently correlate with masculinity judgments and it is unknown which facial features are generating these judgments and whether these same features predict testosterone levels in men. In the present study we examine the relationship between current levels of testosterone, masculinity judgments and facial feature size. Of fifteen candidate facial features, only one was significantly correlated with testosterone. Of these same features, six predict masculinity judgments made by women. Masculinity judgments were based mainly on facial features with enhanced growth during puberty. These preliminary data suggest that women may use men’s facial features as signals of genetic quality but if so, they are attending more to pubertal than to current T influences on male facial features.

William Jankowiak, Laura Mixson

Sex, Love, Companionship, and American Spouse Exchange: commonalities and differences in men's and women's motivation

The balance between the longing for sex and the longing for love is rendered more complicated in the modern world. As cultures become more complex, extramarital sex norms become more restrictive, has long been an anthropological truism. If so, how do we account for the increased emphasis on the sexualization of love and eroticization of sex within the marital union? Evolutionary theorists note that the primary reason behind females agreeing to participate in contemporary spouse exchange situations arise less out of the pursuit of sexual variety for its own sake and more on pleasing her male lover. But what if this assumption is incorrect? How then can the sexual exchange of spouses for the purpose of carnal enjoyment be accounted for? Our three year research found what appears on the surface to be narcissistic and strikingly hedonistic behavior operates in many ways as another vehicle by which couples enhance their spousal-centric focus. Swinging seems to compel its participants to become ever more attentive or romantic oriented toward their spouse. Moreover, we found that sexual jealousy is the primary mechanism through which couples appear to enhance their emotional bonds with one another and thereby strengthen their marital relation. In addition, unlike cross-culture spousal exchange patterns, where individuals barter sexual access in return for resources or other indicators of social entitlement, contemporary swinging norms are based in a notion of emotional mutuality; whereby women and men both participate for sexual pleasure and pair bond solidarity.

Andrew White, Yexin Jessica Li, Adam B. Cohen
Culture and Religion in the Time of Cholera

Previous research done at the country level has demonstrated that disease threat relates to a host of personality characteristics such as openness to experience and collectivism (Schaller & Murray, 2008; Fincher, Thornhill, Murray, & Schaller, 2008). On an individual level, individuals may cope with disease threat by being more likely to adopt cultural (including religious) practices that minimize exposure to disease. We hypothesized that individuals primed with disease may be more willing to support sexual restrictions, food restrictions, and attitudes that help avoid contact with members of outgroups, such as fundamentalism or collectivism. We compared the cultural and religious beliefs of individuals in an experimental disease prime condition with individuals in a no-prime control condition. The experimental condition did not significantly alter individuals' support for religious sexual restrictions, food restrictions, fundamentalism, or collectivism. However, across conditions, there was a significant correlation between perceived vulnerability to disease (pvd) and collectivistic attitudes ($r = .19, p = .02$) and between collectivistic attitudes and religiosity ($r = .29, p < .001$). The pvd scale is composed of two subscales, one measuring concern with germs and one measuring beliefs of disease vulnerability. Religiosity correlated significantly and positively with concern with germs, but significantly and negatively with beliefs of disease vulnerability. Results from this study are the first to reveal a correlation between pvd and collectivism on the individual level and reveal a complex relationship between pvd, collectivism, and religiosity.

Kelly Gildersleeve, Christina Larson, Elizabeth Pillsworth, & Martie Haselton
Detection of Human Female Ovulation Through Scent Cues: Preference, Discrimination, and Individual Variation Among Men

A growing body of evidence indicates that ovulation is accompanied by subtle cues. One cue is changes in women's body scent, and several studies have shown that men rate women's high-fertility body scents as sexier and more pleasant than low-fertility body scents. This study builds on this work by including a direct measure of ovulation (luteinizing hormone tests), collecting measures of both men's preference and discrimination ability, and examining the generality of this preference within men. We asked 21 regularly-cycling women who were not using hormonal contraceptives to wear gauze pads under both arms for 24 hours in the high-fertility phase and new pads in the low-fertility phase of their ovulatory cycle. Ovulation was verified by a series of urine tests measuring luteinizing hormone. At above-chance levels, 26 male judges selected the gauze pads collected from women in the high-fertility phase (57.7%) rather than the low-fertility phase (42.3%) as smelling more attractive. Additionally, looking within the fertile window, we found evidence of an association between proximity to ovulation and the frequency with which men chose high-fertility samples, suggesting that high-fertility samples collected closest to ovulation were most likely to be selected by men as more attractive than low-fertility samples. Lastly, we examined individual difference variables predicting men's preference for high-fertility body scents. We will discuss implications of these findings for sexual strategies and the role of body odor in human mating.

Schreck, A.R., Hodges, C.R., Gaulin, S.J.C, Puts, D.A.
Higher pitched female voices sound more trustworthy to women

Previous research has shown that listeners attend to various non-linguistic features of the voice when making attractiveness and dominance judgments. However, no previous research has explored whether listeners use the voice when making judgments of trustworthiness. Other types of non-verbal communication, such as facial expressions, factor into perceptions of trustworthiness; therefore, we hypothesized that vocal parameters associated with positive emotion--i.e., higher pitch (F0) and pitch variation (F0)--would be associated with greater trust. Participants listened to same-sex targets and were asked to indicate their perception of the targets' trustworthiness and allot a portion of money to them in a mock investment game. Results revealed that women with higher pitch were trusted significantly more than women with lower pitch. Follow-up questions revealed that participants were basing their decisions on varied criteria: When women based their decisions on friendliness, higher voices were trusted more, but for the minority of women who based their decisions on confidence, lower voices were trusted more. Men did not use pitch or pitch variation when making trust assessments.

Aaron T. Goetz, Kayla B. Causey, Shiloh A. Betterley
Are men designed to suspect infidelity?

Given that the costs of underperceiving (i.e., failing to detect) a partner's sexual infidelity would have been greater for men than for women, we hypothesized that men may possess evolved psychological mechanisms designed to overperceive the likelihood of their partner's sexual infidelity. We found support for this hypothesis using two different response formats, a Likert-type scale (Study 1) and a visual analog scale (Study 2). In both studies, men were more likely than women to judge that their partners would commit sexual infidelity in the future. Discussion will address additional design features of the infidelity detection system.

Michael Stirrat, David Perrett
Valid facial cues to cooperation and trust: The human skull and trustworthiness

Decisions about who we trust are biased by stable facial traits such as attractiveness, kinship and perceived trustworthiness. Studies demonstrate the pervasive influence of perceived facial trustworthiness on brain activity – and that brain activity relates to the learned moral valence of individual faces – but little research addresses the validity of facial trustworthiness or its basis in facial features and those that do have produced inconsistent results. We measured male cooperation operationally in Trust Games where participants had options to collaborate for mutual financial gain or exploit for greater personal gain. We also measured facial (bizygomatic) width (scaled for face height) as this is a sexually dimorphic, testosterone-linked trait predictive of male aggression. We found that men with greater facial width were more likely to exploit the trust of others and that other players were less likely to trust male counterparts with wide rather than narrow faces (independent of their attractiveness). Moreover, manipulating face width controlled attributions of trustworthiness, particularly for young, subordinate evaluators. As physical strength and fighting ability are apparent in male faces we interpret the validity in perception of who to trust may derive from a robust physical build enabling some men to exploit with relative impunity. This exploitative behaviour appears to have created a generalized stereotypic association of wide facial structure to untrustworthiness. The decrease in sexual dimorphism and reduction of robustness in skull shape accompanying hominid evolution may have facilitated the cooperation and trust that a functional human society demands.

Kunihiro Yokota, Masaki Yuki
Outgroup contamination priming enhances intergroup discrimination in women but not men.

Previous studies have emphasized the role of intrasexual selection among men in shaping the psychological mechanisms underlying bias against outgroups. In this study, we investigate the adaptive psychological mechanisms specific for women, namely, the mechanisms evolved to generate prophylactic behavior against contamination of pathogens from outgroups. Contamination of pathogens is extremely dangerous for women, who might be in the early stage of pregnancy, when the developing embryo is most vulnerable to pathogens. Since pathogens transmitted from outgroup members are more virulent than those from in-group members, it is adaptive for females to avoid outgroup members when cues that out-groups have contagious pathogens are salient. To test this idea, one-hundred sixty-one (82 females, 84 males) Japanese research participants were assigned to one of two group conditions in a minimal group paradigm. Participants in the experimental condition were primed with contamination threat by performing a task to search for nouns in an essay about a neighboring country which exported contaminated objects to Japan. Participants in the control condition received a neutral prime. Results showed that in the contamination threat condition, women, but not men, showed ingroup favoritism. It was also found that ingroup favoritism was associated with the motivation for outgroup-avoidance.

Marcus Perlman, Ashley A. Cain

Vocal Charades: An Exploratory Study of the Human Capacity for Iconic Vocal Expression

A major set of language origin theories posits that human language evolved from the manual gestural communication of our ape ancestors and somehow transitioned to the vocal modality over the course of hominid evolution. Relatively little is understood about this transition, although it is commonly assumed that the vocal modality has only a trivial capacity for iconic gesture-style expression (e.g., Tomasello, 2008). Thus the transition could not have undergone significant progress until certain linguistic prerequisites were already in place. The present study questions this modality transition assumption by exploring peoples' ability to communicate with iconic vocal expression. Participants were recorded as they played a game of "vocal charades," in which they tried to get their partner to guess various words using only their voice to gesticulate. The game was played with two players, each given a stack of shuffled cards with words from 23 various antonym pairs such as 'small'/'large', 'bright'/'dark', 'up'/'down,' etc. We generally wondered how people would use their voice to depict concepts across different modalities and semantic categories like concrete and abstract concepts, physical qualities, and spatial relationships. A major point of interest was to observe the sorts of cross-modal, metaphorical, and metonymical mappings people utilized. Analysis aims to uncover systematic differences in the acoustic properties of participants' vocalizations between antonym pair items, including dependent measures of pitch, pitch contour, and intensity. Preliminary analysis reveals that people are able to communicate about a remarkably varied set of concepts, using only the iconic sound of their voice.

Lee A. Kirkpatrick

Sex Differences in Religious Belief and Behavior: Some Hypotheses Derived from Theories of Religion as an Evolutionary Byproduct

Perhaps the most well established, yet least well understood, empirical finding in the field of Psychology of Religion is that women score higher than men – at least in modern Western societies – across a variety of measures of religious belief and behavior. Theories extant in that research literature, which focus primarily on socialization, sex roles, and other proximal factors, have been generated post-hoc and without consideration of the (evolved) psychological systems that enable and shape religious belief. Moreover, purported empirical support for many of these hypotheses is based on severely flawed statistical models. The recent emergence of numerous evolutionary-psychological theories of religion as a byproduct of evolved psychological systems (i.e., that evolved for other, non-religion functions) provides the basis for generating a host of new, theory-driven hypotheses about the origins of sex differences in religion: If religion is a byproduct of evolved psychological systems that are themselves sexually differentiated, religious beliefs produced or shaped by them might similarly be expected to evince sex differences. That is, sex differences in religiosity might themselves be an evolutionary byproduct. In this paper I suggest several such hypotheses involving psychological systems related to agency detection, theory of mind, coalitional psychology, mating psychology, intrasexual status competition, and attachment. Empirical testing of these hypotheses not only has promise for answering a long-standing question in the Psychology of Religion literature, but also represents one important methodological approach to testing the validity of the various byproduct theories of religion themselves.

Sharon Young, Daniel C. Benyshek

Human Placentophagy: Maladaptive or Misplaced Cultural Taboo?

The consumption of the placenta, or placentophagy, is a common behavior among placental mammals, including non-human primates. A number of hypotheses have been offered to explain the adaptive value of this practice, however each explanation has been disputed with contradictory evidence and is thus unsatisfactory. While placentophagy is ubiquitous among mammals, it is very rare to non-existent as a "traditional cultural practice" among humans in the ethnographic record. Modern proponents of the human practice have suggested that this behavior is a natural evolutionary mechanism to replenish the nutrients and hormones lost during parturition, and by not practicing placentophagy, human mothers have become susceptible to postpartum affective disorders and nutritional deficiencies. The conspicuous absence of placentophagy in the ethnographic record raises questions regarding the evolutionary path that lead to its disappearance in our species. A search of the Human Relations Area Files was conducted to identify cultural perceptions of the placenta, and practices surrounding its disposal. The search revealed that many cultural ideas surrounding the placenta involve beliefs that the way the organ is treated can impact some aspect of a person's life, usually the mother or the child. Some cultures also attribute to it human qualities and a special tie to the infant. If this is the case, it can be argued that evolving beliefs regarding this organ have transformed the practice of placentophagy from a natural and potentially beneficial behavior into a universal human taboo.

Solis, Nathaniel, Pratarelli, Marc

Interspecies Empathy: Context Effects of Images on Human Physiology

Actions taken by humans such as the preservation and rehabilitation of nonhuman species suggest some degree of interspecies empathy. However, ecology research shows an overwhelming amount of unrestrained usage and destruction of the natural environment and habitats other species rely upon for survival. Based on the premise that empathy has evolved in humans as reinforcement for inclusive fitness and thus a means to ensure the survival of our species, it would seem likely that interspecies empathy should exist. The lack of such an empathy response might lead to profound destruction of the environment and compromise the survival of the species. Past studies have quantified emotion based on physiological responses elicited to affective images of animals. Presently, a slide show containing images of three groups of life forms; Animals, Humans and Plants was assembled, which either reflected negative or positive contexts. Physiological changes in blood pressure, pulse rate and respiration were recorded to determine the level of empathy-related differences. Results suggest a significant difference, responding with greater empathy to other humans than to non-human images. Findings appear to correlate with current ecological data related to overexploitation of the natural environment. They may also suggest on a metaphysical level a shortsighted flaw in the evolved human empathetic/morality system.

Holzer, Candi, M., Pratarelli, Marc, E.

Social Welfare and Population Economics: Human Survival or Extinction

According to the US Census Bureau (2008), the current head count in the United States makes up about 4.5% of the world's total population. There is approximately one birth every seven seconds to one death every 12 seconds. With this birth to death ratio, in addition to immigration, it is evident that America is rapidly moving toward overpopulation. The United States already runs a trade deficit, relying more on imports than is offset by exports. The number of mouths to feed raises important questions about the distribution and availability of limited future resources, i.e., whether or not there will be enough to go around in 1000, 100, or even as few as 50 years. Thomas Malthus' conclusions about population growth and economics written over 200 years ago appear to be increasingly a reality. Moreover, social welfare seems to have stalled or interfered with the process of natural selection by allowing many to live who would not have otherwise survived natural conditions. In this presentation, we will address the parallels in global and national overpopulation, how social welfare systems influence this, and the possible consequences to human survival. We will also address the capacity to save people without jeopardizing the integrity of the species, levels of prosperity, peace, security and human dignity.

Johnson, Sarah, M., Pratarelli, Marc, E.

Environmental Values & Sustainability vs. Survival of the Fittest?

Some environmentalists have argued that reframing value judgments about nature in ecological terms will achieve environmental sustainability. However, their arguments rely upon the noble savage philosophical view, which is inconsistent with basic evolutionary principles. Human ancestors were driven by the same survival motives as people today. In this paper we will argue that changing people's values about nature and our place within it is difficult because they are predominately economic for purely biological/evolutionary reasons. The main reason given for a biologically-based value system is that humans—like all other species—live and exist in a relative present and thus their focus is on short term gain. A short term focus enhances the likelihood of survival. Since a long term focus (i.e., in terms of geologic time) requires an individual to plan beyond its own life time, it is both counterintuitive and potentially conflicts with our biological motives. Our Pleistocene brain was not adapted to an environment with 6.8 billion competing consumers or the culture and technology that today accelerates the destruction and depletion of limited natural resources. Thus, nature-values are dictated by our predisposition toward a short term focus rather than a long term concern for the integrity of the ecosystem. In terms of solutions, one approach recently advanced is to encourage people everywhere to adopt an ecocentric nondualist or Buddhist-like nonmaterialist philosophy. Whether such belief systems are practical or viable in light of evolutionary principles is the subject of this paper.

Alissa Miller, Stacey Rucas, Rikki Murphy, Michael Muehlenbein, Alex Roa

Sleep, risk and reproduction: The behavioral ecology of San Luis Obispo/Cal Fire firefighters

Several lines of evidence indicate that sleep is an anabolic process that helps reduce stress and moderates optimal functioning of biological systems. Due to the principal of energy allocation, time used for sleep cannot then be used for the waking state, thus these daily anabolic and catabolic stages may be in competition. Therefore, it was predicted that circumstances resulting in less sleep may proximally indicate difficult environments, ones that require greater productive and reproductive investment in order to survive. Firefighters are a high risk population that exhibit great variation in measurements of sleep quantity and quality, due to variable rates of wakeful events during emergency shift work. It was predicted that high risk sleep events are followed by increased reproductive investment in rates of intercourse and number of sexual partners among a population of San Luis Obispo County Firefighters.

Pratarelli, Marc, E.

Universality of Self-deception and Its Impact on the Global Environment

One enigma involving humans and their environment concerns the observation that we seem to know what the problems are that we're facing with environmental decay, and yet, are quite unable to change people's mind-set about personal, political and economic behavior. The importance of this problem concerns the integrity of the ecosystem upon which future human survival is dependent. One factor is our biological predisposition to behave in ways that enhance individual and group short term success, at the expense of long term survival. When we stop to consider how history repeats itself, and then what hasn't changed about our behavior today, there is only one causal explanation that defies repudiation. The answer is self-deception; the ability to replace a painful or inconvenient truth that invades consciousness with a more convenient and pleasant one. Societies will continue to live beyond their means until environmental pressures force them to adapt or perish, and this is the real inconvenient truth that even prominent environmentalists like Al Gore have to deny. This paper will examine the relevance of Robert Triver's scientific model of self-deception as a potential causal explanation of anthropogenic environmental problems. The origins of specific cultural (i.e., proximal) factors (including religion, media, advertising, politics, technology, the myth of unlimited growth), and their contribution to individual and group-wide denial will be discussed.

Lauri Jang, Paul Wehr

Reason in the Passionate Throes of Love: On Love in Excess, Sex Differences, and the Emotive Process

One of the first female writers of the English novel, Eliza Haywood published *Love in Excess* in 1719. Although an instant bestseller, *Love in Excess* received much criticism for its depictions of women proactively pursuing and enjoying sexual relationships. Through this novel, Haywood can be seen entering into the debate circulating in her own day regarding the roles of reason (rationality) and emotion (irrationality) in decision-making. Haywood especially advises her female readership of the complexities that result, as both reason and emotion compete to influence the romantic choices they make. Current evolutionary theories of conflict between the sexes provide us with a basis to argue that men and women will weigh reason and emotion differently in decisions regarding romantic alliances. In this theoretical exploration, we argue that while most emotions, like fear, can help men and women equally to make decisions about how to act in various situations, romantic love works to inform male and female choices very differently. Conceptualizing the emotive process as an intermediary stage that processes sensory input into behavioral output, we argue that because the costs of reproduction are much higher for women, natural selection should have designed female mate selection to be relatively more rational (reason should more often trump emotion). Conversely, reason should play a more modest role in men's decisions about whether or not to engage in romantic affairs. Through our readings of three female characters in *Love in Excess*, we explore how Haywood allows for these sex differences to play out.

Christina M. Larson, Kelly A. Gildersleeve, Martie Haselton

Male Physical Strength is Associated with Favorable Attitudes towards Casual Sex and Sexual Success

Men who are more physically dominant and masculine are preferred by women as sex partners and are more likely to pursue a short-term mating strategy. Likewise, men with greater physical strength should also be preferred as sex partners and thus more likely to pursue an unrestricted, short-term mating strategy. Previous research has shown that stronger men have a greater number of sex partners (Gallup et al., 2007; Sell, 2005; Shoup & Gallup, 2008), but this could reflect female choice, not male strategy. If strength influences which sexual strategy a man pursues, strength should be also associated with men's desire to pursue an unrestricted mating strategy. We hypothesized that physically stronger males would be more likely to pursue more unrestricted mating strategy, as reflected in their favorable attitudes towards casual sex. We tested this prediction with male undergraduates (N= 59). Physical strength was assessed by measuring participant's handgrip strength, chest-press strength, and bicep circumference. Participants completed the Sociosexuality Orientation Inventory (Simpson & Gangestad 1991), other sexual history measures, and were assessed for physical attractiveness. As expected, strength was positively associated with both the attitude and behavioral components of sociosexuality. Although attractiveness was positively related to both strength and sociosexuality, the correlation between strength and sociosexuality remained significant after controlling for participant's attractiveness, indicating that physical formidability may contribute independently to male sexual prowess.

Gregg R. Murray

Caveman Politics: Evolutionary Leadership Preferences and Anatomical Sex

There is increasing recognition that human behavior is subject to evolutionary and other non-environmental factors (e.g., Alford et al. 2005; Buss 1989, 2005; Hatemi et al. 2007; Fowler et al. 2008; Lawrence and Nohria 2002; Mayr 2001). This research uses cross-cultural analyses and original experimental data to investigate whether, and to argue that, evolutionary psychology can shed light on the persistent gender gap in leadership. The proposed explanation is grounded in theories of evolution. That is, the tendency for males to emerge as leaders may have evolved to promote group survivability in the violent ancestral history of humans (Chagnon 1997; Diamond 1999; Van Vugt et al. 2008), which left a legacy that affects modern life as a result of the glacial speed of evolution (Mayr 2001; Miller and Kanazawa 2007). This research presents cross-cultural analyses and analyses of original data that support the assertion that there is an evolutionary tendency for males to emerge as leaders of social groups. The contributions of this research are intended to include the further advancement of the investigation of biological and non-environmental effects in the domain of human and political behavior and the proffer of a new theoretical approach to the investigation of a persistent modern bias.

Melissa Fales, David A. Frederick, Martie G. Haselton, Elizabeth G. Pillsworth

Future discounting in monetary and sexual domains

Life history theorists propose that individuals develop different preferences due to varying developmental and environmental conditions. For example, individual variation in preferences for present versus future financial rewards may be contingent on uncertainty about the future. We propose that future uncertainty should also affect sexual strategies, and hence individuals who prefer immediate financial rewards will also engage in more opportunistic, short-term mating and require less commitment from a partner before having sex. Because men may be able to translate immediate financial gains into mating opportunities to a greater extent than women can, we further predict that the relationship between financial future discounting and permissive sexuality will be greater among men than among women. In a study of 612 online participants, we examined the links between present-oriented financial preferences (i.e., preferring smaller, immediate rewards over larger, later rewards), interest in short-term vs. long-term sexual relationships, and number of sex partners. Participants completed established measures of future discounting (e.g., would you prefer 25 dollars now or 38 dollars in three weeks?). Individuals choosing immediate rewards were considered more present-oriented. Participants also completed measures of their sexual history and their attitudes towards casual sex. Consistent with the predictions, present-oriented individuals reported greater interest in short-term mating, more sex partners, and less interest in long term mating. As predicted, these associations were stronger among men than women. These findings provide support for a link between future discounting in the monetary and sexual domains.

Danielle Truxaw, Max M. Krasnow, Tamsin C.M. German

Understanding Artifacts: Prepared Learning from Subtle Social Cues to Function

While infants and young children possess knowledge systems that allow understanding of mechanical properties of objects, learning about object functions is likely facilitated by observing interactions with artifacts (German, Truxaw & Defeyter, 2007). For naïve learners, there are potentially countless features and possible uses for a given artifact; these possibilities can be constrained by observing the actions of knowledgeable others. Simply handling an object can be very informative: it can illuminate which part of the object is meant to be held (the handle) and, by exclusion, which part might be relevant for supporting a function (the effector). In two studies, we studied the potential impact of this information. In Study 1, preschoolers (age 3-5years) were asked to extend the name of a target object to one of 2 other objects – each of which had a side in common with the target object (pictured). Participants were dramatically effected by the handling event – the number of subjects who selected the object which shared the smaller portion with the target object went from 0% to nearly 50%. In Study 2, infants (mean age = 7 mos, range 5mos-10mos) were shown four videos in which novel two-sided artifact were picked up. Gaze patterns were recorded during a baseline, a handling event and a post-handling phase. After the handling event, infants younger than nine months shifted their attention toward the handled end. It appears that very young infants' attention is drawn toward gathering information about the handled end of an artifact.

Rebecca Neel, D. Vaughn Becker, Steven L. Neuberg, Douglas T. Kenrick
Illusory conjunctions of angry facial expressions follow intergroup biases

Illusory conjunctions occur when features of one stimulus are mistakenly perceived as belonging to another adjacent stimulus (e.g., mistakenly seeing a green "L" as being colored red when it was next to a red "O"). Do illusory conjunctions occur when perceiving emotionally expressive faces? The current research examines how heuristically threat-relevant faces (Black males) and non-threat relevant faces (White males) generate just such an illusory conjunction effect for White participants: When presented with an angry White male distractor, Black neutral faces were more likely to be reported as angry. The effect did not hold when the White distractor was neutral instead of angry, suggesting that anger "leapt" from White faces to the Black faces. The complementary effect emerged for angry White targets: they were more often perceived to be neutral when paired with a neutral Black distractor than when with an angry Black distractor. These results support an error-management-based process of social cognition, in which stereotypes of threatening outgroups alter how our perceptual system assembles facial information to minimize costly errors. When anger is briefly seen in a crowd, we are biased to assign that emotion to an outgroup male, over and above the degree to which stereotypes alone cause such false alarms.

Henry F. Lyle III, Eric A. Smith, Roger J. Sullivan
Blood donations as costly signals

Costly signaling theory has provided powerful insight into evolutionary puzzles such as risk taking and unconditional generosity. A costly act of generosity can be favored by natural selection or rational choice if it honestly signals one's cooperative intent, economic status, trustworthiness and/or physical vitality to potential mates and/or reciprocal partners. Unremunerated blood donations are examples of unconditional generosity that is perceived as costly and risky. We examine blood donor and non-donor attitudes about health and injury risks, donor characteristics, and the social value of donor participation. We propose that blood donations may communicate qualities about donors to third parties. Observers may benefit from information about the donor's health, value as a reciprocal partner, and/or ability to endure what is perceived as an anxiety-provoking and risky experience. Donors may benefit from an enhanced reputation, which can lead to greater access to cooperative networks and high-quality partners. We found that participants recognized the need for blood and perceived blood donors as generous and healthy. Study results indicated that anxiety and the perceived risk of a negative health consequence dramatically affected the willingness of donors and non-donors to donate blood in the future. These findings support our hypothesis that the act of blood donation may signal adaptive information about donor quality to third parties.

Corey L. Cook and Catherine A. Cottrell

A Threat-Based Approach to Prejudice: Do Different Subgroups of Gay Men Elicit Different Prejudices?

How do people react toward different subgroups of gay men? Previous research has suggested that the process of subgrouping can lead people to more readily recognize different characteristics among members of a stereotyped superordinate group (e.g., gay men). In particular, an evolutionary, threat-based approach to prejudice suggests that different subgroups of gay men (e.g., those perceived to be politically active, feminine, masculine, or promiscuous) should evoke different patterns of tangible threat perceptions. These perceptions of threat should then result in distinct adaptive emotional and behavioral reactions focused on minimizing the perceived threat. In the current research, we hypothesized that gay male targets in general will be perceived as posing greater health and values threats than will straight targets, resulting in greater feelings of moral and physical disgust. These threat patterns were predicted to differ among the various subgroups of gay men, as were emotional and behavioral reactions to these groups. Students at a large university in the southeastern U.S. ($n = 202$) reported threat perceptions and behavioral and emotional reactions to the different subgroups in question. Differences in threat perception and behavioral and emotional reactions to subgroups were observed as a function of subgroup status and sexual orientation of targets, thus supporting the overall hypothesis that subgroup recognition can cue different threat perceptions. In all, this work illustrates the importance of investigating reactions to subgroups, which may be viewed differently from each other and the superordinate group.

Uriah S. Anderson, D. Vaughn Becker, and Douglas T. Kenrick
Mere Exposure and Sociosexual Orientation

Researchers have repeatedly found that individuals rate familiar stimuli more positively than other similar, but unfamiliar, stimuli—a phenomenon known as the mere exposure effect. Few studies, however, have explored the effects of personality traits on this apparent preference for the familiar. In this study, we explored the effects of an individual's sociosexual orientation on his or her ratings of familiar and unfamiliar faces. Participants rated a variety of faces, half of which were familiar, on three dimensions: 1) physical attractiveness, 2) likeability, 3) conscientiousness. Overall, participants rated familiar faces higher than unfamiliar faces on all three dimensions. However, compared to those reporting a restricted sociosexual orientation, unrestricted individuals showed a smaller preference for familiarity in their ratings of physical attractiveness and likeability, but no such difference was found for the conscientiousness ratings. This lessened attraction to (and liking of) familiar faces may lead unrestricted individuals to seek more casual, short-term sexual encounters. Results are discussed in terms of the links between mating strategies and ongoing cognitive processes.

Rick O'Gorman
Relative cognitive evaluations of friendship and kinship

In non-human animals, cooperation is usually due to kinship, interpretable within inclusive fitness theory (Hamilton, 1964), which predicts that closer relatedness fosters greater altruism. Humans are unusual in that we extensively cooperate with non-kin and are capable of assorting into groups of non-related yet like-minded individuals (Sheldon, Sheldon, & Osbaldiston, 2000). A challenge to the latter is that individuals have different genetic interests that can often be maximised by selfish behaviour. Indeed, individuals are not necessarily averse to cheating kin and so any relationship ideally should be based on prior experience and expected future interactions (O'Gorman, Wilson, & Miller, 2005). A solution to the cheating problem is to form reliable long-lasting relationships based on ongoing evaluation. Such relationships represent an effective means to achieve stable groups that are not resistant to cheating. Friendship may represent a category that is likely to be psychologically important for humans and potentially equivalent to kinship. I shall present data from two related studies examining dispositions toward friends and family. In one study, a questionnaire approach is used to quantify various relationships between participants and their friends and relations of varying closeness, incorporating past relationship duration and quality, expected future interactions, and perceived similarity. The second study uses an Implicit Association Task methodology to examine attitudes toward family and friends with regard to general attitudes, similarity, and perceived ingroup membership. Using different methodologies and building on previous research, these two studies should shed further light on kinship versus friendship.

José Brites, Isabel Santos, Américo Baptista
How tall are you? Sexual dimorphism in height as a variable of mate preferences: developmental and gender differences

The present investigation aims to study the existence of some mate preferences related with sexual dimorphism and how stature play a role of influence in strategies to obtain a larger field of potential partners between human beings. A sample of 593 individuals, 130 adolescents and 463 adults, from both sexes was evaluated using a questionnaire of demographic data, the Marlowe-Crowne Social Desirability Scale and Images of 6 Pairs of Silhouettes adapted to the participants ages. The results revealed that men prefer women with lower stature and women prefer higher stature men, compared to their own height. Both men and women choose their ideal silhouette pair taking in consideration their own stature. As expected no differences were found for social desirability. These findings were stable for both sexes in different ages. The results are discussed according to the theory.

Isabel Santos, Américo Baptista, José Brites
Attractiveness and its relationship with facial symmetry, physical and mental health in Portuguese sample

The aim of the present investigation was to study the relation between attractiveness, facial symmetry and physical and mental health. Sixty nine individuals, with ages between 19 and 30 years old, were photographed and evaluated in what concerned to their mental and physical health. All facial photos were measured and their symmetry was calculated through Adobe Photoshop CS. Photos were then rated by a 44 individuals sample in terms of their attractiveness popularity and familiarity. Men with more self-rated physical health were evaluated as more attractive while women considered as more attractive were the ones that presented more mental health problems. Facial symmetry was directly related to attractiveness in both men and women. All results were analyzed according to theoretical models.

Key-words: attractiveness; facial symmetry; health

Lara Silva, Isabel Santos, Américo Baptista, José Brites

Are you cheating on me? Mate retention strategies used in infidelity perception and its relation with jealousy

This study aim to evaluate the relation between the infidelity perception, jealousy and the use of mate retention strategies. A sample of 200 participants, from both sexes, with ages from 19 and 47 years old was used. All participants were engaged in a long term romantic relationship. Individuals were evaluated using a questionnaire of romantic and sexual relationship history, the Mate Retention Inventory, the Multidimensional Jealousy Scale, the Chronic Jealousy Scale, and the Reactive and Suspicious Jealousy Scale. Both men and women revealed the use of mate retention strategies but sex differences were found in what concerns to the most used techniques. Men used more resource display and physical possession signals while women presented more appearance enhancement. Women presented more jealousy than men but men were the ones who showed higher use of mate retention strategies. For both sexes a directed relation was found between infidelity perception and the increase of mate retention strategies. These results seem to indicate that women feel more jealousy than men but this isn't a condition for them to react more to the infidelity perception using more mate retention strategies. Other results are discussed according to relevant theory.

Key-words: mate retention; infidelity; jealousy

Jack Demarest, Whitney Cohen

Gender Differences and the Role of Body Esteem on Mate Choice for Leg/Trunk Body Ratio

Previous research examined sex differences in body image and body self esteem. The current study replicated the procedure used by Rozin and Fallon (1985) to assess body shape satisfaction in a sample of 52 participants aged 18 to 38 years. The Body Esteem scale used by Franzoi and Shields (1984) was also included. However, this study also examined the impact of body esteem, presumably a reflection of self-perceived mate value, on mate choice using the images created by Swami, Eimon, and Furnham (2006) which varied the leg to body length ratio of opposite sex figure drawings. The results of this study confirmed the research hypotheses regarding body satisfaction, i.e., females were more dissatisfied with their current body shape than males. In selecting the most attractive opposite sex figure varying in leg to body length ratio, high mate value males preferred the female figure with the longest legs (replicating the results of Swami et al.) while low mate value males preferred the female figure with shorter legs. High mate value females also preferred longer legged male figures, and did so more often than low mate value females, but their highest ratings were given for the male figure drawing with the most proportional leg to body length ratio, also replicating the results of Swami et al. (2006). These results show that females are more concerned with their own body image than males, i.e., that their self-perceived mate value is typically lower than for males, and that body shape satisfaction influences mate choices for both males and females.

Ryan Nichols

Early Confucian Filial Piety, Genetic Relatedness and the Origins of Early Chinese Morality

In the spirit of the emergent sub-discipline of Experimental Philosophy, I construct an interpretation and analysis of Confucius' and Mencius' discussions of filial piety in terms of evolutionary psychology. I accomplish this through close textual readings of key passages in Confucius (about the Duke of She) and Mencius (about Emperor Shun). The use of filial piety in Mencian inspired Confucian thought [Kong Meng zhidao □□□□] corresponds remarkably well with research in evolutionary psychology regarding perceived obligations to kin, the stratification of resource allocations to kin in parallel to degrees of genetic relatedness, and the failure of impartial moral principles to generate moral motivation. Following my discussion of the texts, I consider potential objections to my analysis.

Gorge A. Romero, Aaron T. Goetz, Michel Madruga

Evidence for the Savanna-IQ Interaction Hypothesis with Pornography: Intelligence Moderates the Relationship between Consumption of Pornography and Perceptions of Female Sexuality

Kanazawa (2004) proposed the Savanna Principle, offering that humans will have difficulty processing and understanding evolutionary novel information. Drawing on his theory of general intelligence, Kanazawa amended the Savanna Principle, stating that intelligence moderates the Savanna Principle, such that the Savanna Principle holds stronger for less intelligent individuals than for more intelligent individuals. We tested the proposed Savanna-IQ Interaction Hypothesis with respect to pornography, an evolutionary novel medium. We first documented a relationship between consumption of pornography and perceptions of women's sexuality in a sample of undergraduate males (Mean = 19.56 years). Men who reported viewing more pornography were more likely to perceive women as hypersexual. Next, we tested for moderation to determine if intelligence (assessed by a subset of items from a standard IQ test) moderated the relationship between men's consumption of pornography and their perceptions of women's sexuality. Results provide support for this interaction as low intelligent men, who consume large amounts of pornography, perceived women as hypersexual. This was contrasted by high intelligent men, who consume large amounts of pornography, and feature no inflation in their perceptions of women's sexuality. Discussion addresses the relevance of this evidence as it applies to the Savanna-IQ Interaction Hypothesis as well as implications for future research.

Trumble BC, Brindle E, Kupsik M, O'Connor KA

The effect of a single missed meal on male reproductive hormones

The male reproductive axis is highly responsive to energetic deficits caused by immune system activation or multi-day fasts. Reduced testosterone in low-energy balance situations is hypothesized to reflect redirection of resources from reproduction to survival. Previous studies in humans and non-human primates found that fasting for as little as forty-eight hours influenced the pulsatility of hypothalamic gonadotropin-releasing hormone (GnRH), slowing production of pituitary luteinizing hormone (LH), and down regulating gonadal testosterone (T). Preliminary evidence suggests that ghrelin, a hormone which rises in response to hunger, has down regulatory effects male reproductive hormones, and may be a signal to the reproductive axis of decreased energy availability. This study tests the hypothesis that T levels decrease during minor caloric deficiency by assessing the effects of a single missed (evening) meal on morning T in 23 healthy male participants, age 19-36. Participants provided daily saliva and urine samples for three days. On the first day, participants ate their typical diet. On day two, participants fasted after 4PM (water available ad-libitum). On day three, participants resumed normal eating. T, ghrelin, cortisol and LH were measured with EIAs. Fasting caused a significant reduction in overnight urinary LH, and morning salivary T. There was a significant increase in overnight urinary cortisol, but not morning salivary cortisol. Baseline and fasting levels of salivary ghrelin were not statistically significant, though ghrelin was highly associated with salivary T. The male reproductive axis reacts more quickly to energetic imbalances than previously appreciated.

Cristina M. Gomes, Christophe Boesch

Wild Chimpanzees Exchange Meat for Sex on a Long-Term Basis

Humans and chimpanzees are unusual among primates in that they frequently perform group hunts of mammalian prey and share meat with conspecifics. Especially interesting are cases in which males give meat to unrelated females. The meat-for-sex hypothesis aims at explaining these cases by proposing that males and females exchange meat for sex, which would result in males increasing their mating success and females increasing their caloric intake without suffering the energetic costs and potential risk of injury related to hunting. Although chimpanzees have been shown to share meat extensively with females, there has not been much direct evidence in this species to support the meat-for-sex hypothesis. Here we show that female wild chimpanzees copulate more frequently with those males who, over a period of 22 months, share meat with them. We excluded other alternative hypotheses to exchanging meat for sex, by statistically controlling for rank of the male, age, rank and gregariousness of the female, association patterns of each male-female dyad and meat begging frequency of each female. Although males were more likely to share meat with estrous than anestrus females, the relationship between mating success and sharing meat was significant when including in the analysis only sharing episodes with anestrus females. These results strongly suggest that wild chimpanzees exchange meat for sex, and do so on a long-term basis. Similar studies on humans will determine if the direct nutritional benefits that women receive from hunters in foraging societies could also be driving the relationship between reproductive success and good hunting skills.

Michael E. Mills

Ecological challenges of the 21st Century: How can evolutionary psychology help?

Evolution is not forward-looking, therefore natural selection cannot evolve organismic adaptations specifically designed to avoid species self-ecocide. Indeed, several investigators have documented cases of self-ecocide in isolated groups of rabbits, deer, yeast, and humans. Several commentators have suggested that humans, isolated on our planet, risk self-ecocide in this century. The basic question is this: can humans be smarter than yeast? That is, can we use a knowledge of our own evolved psychological adaptations to intentionally "deceive" ourselves to collectively behave in a more ecologically sustainable manner? Methods that have been tried so far, such as ecological information labeling, meting of punishment or costs to polluters, international sanctions on ecologically defecting nations, etc., are based on well known psychological principles of self interest in current environments. However, another, less explored approach, is to use virtual environments to trigger motivations that lead to more ecologically sustainable behavior. Engineered self-deception, intentionally designed activate psychological adaptations, may help to mitigate ecological challenges. I will explore several possibilities to use both real and virtual environments designed to trigger, for example, adaptations for kin altruism, "tit-for-tat" reciprocity, and generalized reciprocity, which, in turn, can trigger psychological motivations to behave in ways that are more ecological sustainable. Although such self-deception may help to mitigate the social dilemmas associated with the ecological "tragedy of the commons," clearly, a political consensus, and the political will to implement such methods, is required first.

Thomas R. Sunderland, Patricia H. Hawley, Carrie E. Mendoza

What's the Matter with Kansas?

Has the ID propaganda machine been effective in Kansas? What predicts the endorsement of intelligent design fallacies (and conversely, comprehension of evolutionary science)? Over the course of 3 semesters, a multi-item survey was developed and tested on over 1500 students in Lawrence, KS. The survey comprises 10 constructs: Political Conservatism (5 items; $\alpha=.81$) Political Activity (6 items; $\alpha=.88$), Religious Activity (6 items; $\alpha=.96$), Evolutionary Knowledge (8 items; $\alpha=.78$), Attitudes of Relevance (9 items; $\alpha=.94$), Trust of the Scientific Enterprise underlying evolutionary science (9 items; $\alpha=.82$), Moral Objections (6 items; $\alpha=.78$), Social Objections (6 items; $\alpha=.84$), Young Earth Creationist Beliefs (9 items; $\alpha=.91$), and endorsement of Intelligent Design Fallacies (IDFs: 12 items; $\alpha=.91$). Openness to Experience (of The Big 5) was also assessed. Demographic variables (gender, rural, urban, education of parents) played little role in predicting Knowledge or IDFs, but Openness to Experience (an aspect of personality) positively predicted Knowledge. Knowledge, Attitudes of Relevance, and IDFs were all ill-served by Religious Activity, but well-served by Exposure to Science. Educators cannot necessarily affect change in personality or religious activity. On the other hand, Exposure to Science mitigates IDFs and positively affects Knowledge and Relevancy Attitudes. The present survey was designed as a tool for university educators to assess a) predominant regional belief systems and their roles in science understanding and attitudes, b) curricular effectiveness and attainment of specified learning goals, and c) changes in attitudes about course material.

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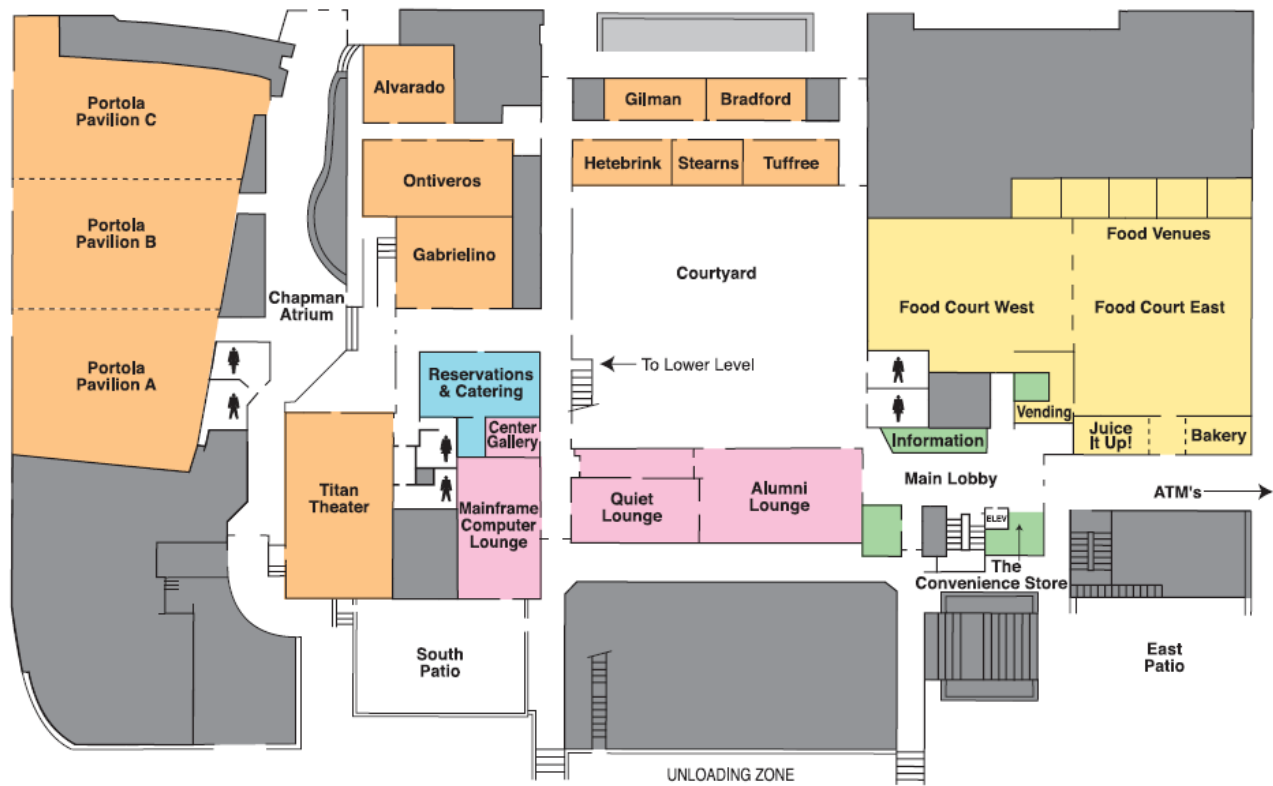
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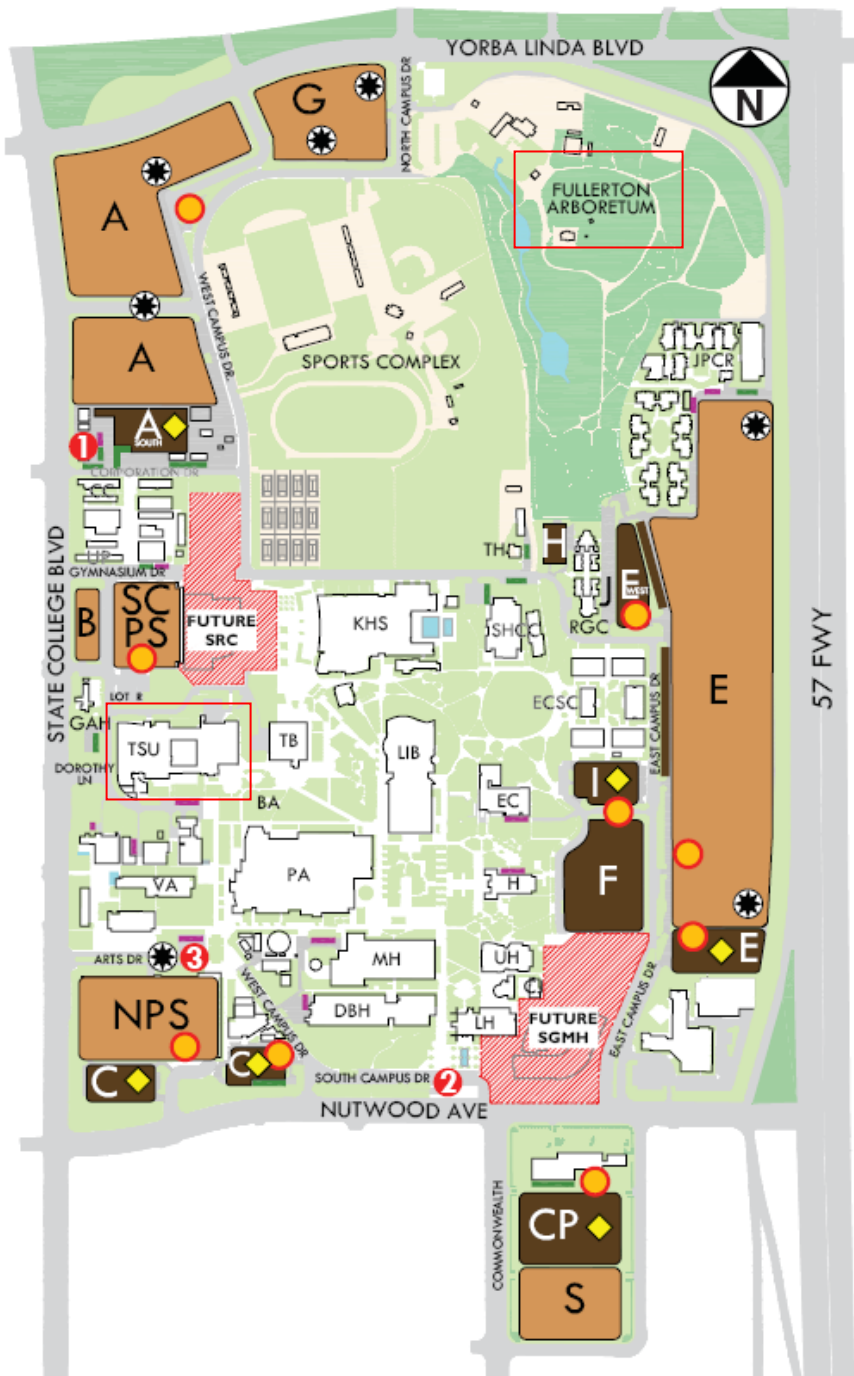
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Titan Student Union

MAIN LEVEL



Campus Map



- BA BECKER AMPITHEATRE
- CC CHILDREN'S CENTER
- CJ CARL'S Jr
- CP COLLEGE PARK
- DBH DAN BLACK HALL (FORMERLY SLC)
- EC EDUCATION CLASSROOM
- ECS ENG. COMPUTER SCIENCE
- GAH GOLLEHER ALUMNI HOUSE
- H HUMANITIES
- JPCR JEWEL PLUMMER COB RESIDENCE HALLS
- LH LANGSDORF HALL
- MH McCARTHY HALL
- NPS NUTWOOD PARKING STRUCTURE
- PA PERFORMING ARTS CENTER
- KHS KINESIOLOGY & HEALTH SCIENCE
- LIB POLLAK LIBRARY
- RGC RUBY GERONTOLOGY CENTER
- SCPS STATE COLLEGE PARKING STRUCTURE
- SHCC STUDENT HEALTH & COUNSELING CENTER
- TB TITAN BOOKSTORE
- TH TITAN HOUSE
- TSU TITAN STUDENT UNION**
- UH UNIVERSITY HALL
- UP UNIVERSITY POLICE
- VA VISUAL ARTS

- LOT J CONTINUED LEARNING EXPERIENCE
- LOT R BY RESERVATION ONLY

- FACULTY / STAFF PARKING
- STUDENT PARKING
- STUDENT PARKING AFTER 6PM
- VISITORS / 30 MINUTE PARKING
- 15 MINUTE PARKING
- 1 PARKING & TRANSPORTATION
- 2 VISITOR INFORMATION CENTER
- 3 PARKING INFORMATION (FUTURE SITE)
- * PERMIT MACHINE - \$5 DAILY FEE ACCEPTS \$1 & \$5 BILLS ONLY
- MOTORCYCLE
- ♿ DISABLED PARKING - LOCATED THROUGH DMV PLACARD / PLATES AND CSUF PERMIT

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