

## WELCOME TO HBES 2005

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Dear HBES Members and Conference Attendees,

We would like to wish you a warm welcome to Austin for the 17<sup>th</sup> Annual Meeting of the Human Behavior and Evolution Society. We are blessed with a fantastic lineup of plenary and keynote addresses by some of the brightest stars in the field. The schedule of paper and poster presentations has exceeded our high expectations. All signs look excellent for this being an exceptionally stimulating HBES—we hope the best one ever.

Although it may be difficult to tear yourself away from the conference itself, we hope that you have some free time to explore the wonderful city of Austin and the University of Texas.

If there is anything we can do to make your visit more enjoyable, please do not hesitate to let us know.

Warm wishes,

David M. Buss  
Conference Co-Organizer  
President-elect HBES

Norman P. Li  
Conference Co-Organizer

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## ACKNOWLEDGEMENTS

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### HOSTS:



**David Buss**



**Norm Li**

### PROGRAM COMMITTEE:



**Todd Shackelford**



**Mark Flinn**

### UNIVERSITY OF TEXAS COLLEGE OF LIBERAL ARTS:

**Joey Walker**

### Graduate Student Volunteers:

**Sean Conlan  
Joshua Duntley  
Paula Duntley  
Kristina Durante  
Diana Fleischman  
Carin Perilloux**

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Steven Pinker (2009)

Douglas Kenrick (2009)

**Student Representative:** Jessica Ash

# TABLE OF CONTENTS

	PAGE
<b>Quick Timetable</b>	
<b>Program of Events</b>	
Thursday Talks.....	3
Thursday Evening Poster Sessions.....	8
Friday Talks.....	9
Saturday Talks.....	14
Sunday Talks.....	18
<b>Talk Abstracts</b>	
<b>Thursday Morning Plenary by Margo Wilson &amp; Martin Daly</b> .....	22
<b>Thursday Early Morning Sessions</b> .....	22
Session 1.1: <i>Cooperation I</i>	
Session 1.2: <i>2D:4D</i>	
Session 1.3: <i>Modularity and Cognition</i>	
Session 1.4: <i>Darwinian Literary Studies</i>	
<b>Thursday Late Morning Sessions</b> .....	28
Session 2.1: <i>New Perspectives on the Evolutionary Foundations of Religion</i>	
Session 2.2: <i>Humor and Laughter</i>	
Session 2.3: <i>Sex Ratio</i>	
Session 2.4: <i>Menstrual Cycle I</i>	
<b>Thursday Afternoon Plenary by Douglas Mock</b> .....	34
<b>Thursday Early Afternoon Sessions</b> .....	34
Session 3.1: <i>No Longer a Cherry But Still a Tomato: Browsing the Salad Bar of Mating</i>	
Session 3.2: <i>Testosterone Research</i>	
Session 3.3: <i>Emotional Expression</i>	
Session 3.4: <i>WHR</i>	
<b>Thursday Late Afternoon Sessions</b> .....	40
Session 4.1: <i>Sperm Competition in Humans</i>	
Session 4.2: <i>Interpersonal and Media Gossip in Evolutionary Perspective</i>	
Session 4.3: <i>Menstrual Cycle II</i>	
Session 4.4: <i>Mating Strategies I</i>	
<b>Friday Morning Plenary by Robert Trivers</b> .....	47
<b>Friday Early Morning Sessions</b> .....	47
Session 5.1: <i>Chagnon Fest I</i>	
Session 5.2: <i>Attractiveness I</i>	
Session 5.3: <i>Kinship I</i>	
Session 5.4: <i>Mating Strategies II</i>	
<b>Friday Late Morning Sessions</b> .....	53
Session 6.1: <i>Intrasexual Competition and Competitiveness</i>	
Session 6.2: <i>Attractiveness II</i>	
Session 6.3: <i>Culture II</i>	
Session 6.4: <i>Mating Strategies III</i>	
<b>Friday Afternoon Plenary by Leda Cosmides &amp; John Tooby</b> .....	59
<b>Friday Early Afternoon Sessions</b> .....	59
Session 7.1: <i>Homicide</i>	
Session 7.2: <i>Emotion I</i>	
Session 7.3: <i>Sex Differences</i>	
Session 7.4: <i>Mating Strategies IV</i>	
<b>Friday Late Afternoon Sessions</b> .....	65
Session 8.1: <i>Kinship II</i>	
Session 8.2: <i>Emotion II</i>	
Session 8.3: <i>Human Behavioral Ecology</i>	

Session 8.4: *Applied Evolutionary Psychology*

**Saturday Morning Plenary by Napoleon Chagnon**.....72

**Saturday Early Morning Sessions**.....72

Session 9.1: Roundtable: *Commentaries on the Life’s Work and Humor of Napoleon Chagnon*

Session 9.2: *Sensational Interests as a Signal of Mating Effort in Delinquents*

Session 9.3: *Cooperation II*

Session 9.4: *Mate Choice I*

**Saturday Late Morning Sessions**.....77

Session 10.1: *Sex Differences: Political, Cultural and Policy Implications*

Session 10.2: *The Psychometrics and Behavioral Genetics of Life History Strategy*

Session 10.3: *Chagnon Fest II*

Session 10.4: *Cooperation III*

**Saturday Afternoon Plenary by Edward O. Wilson**.....83

**Saturday Early Afternoon Sessions**.....83

Session 11.1: *Methodological Development(s) in Evolutionary Psychology*

Session 11.2: *Motivation*

Session 11.3: *Chagnon Fest III*

Session 11.4: *Mate Choice II*

**Saturday Late Afternoon Sessions**.....89

Session 12.1: *Perception, Deception, Self-Deception, and Self-Awareness*

Session 12.2: *Sexual Orientation and Gender*

Session 12.3: *Culture II*

Session 12.4: *Anxiety, Stress, and Depression*

**Keynote Address by Steven Pinker**.....96

**Sunday Early Morning Sessions**.....96

Session 13.1: *Experimental Studies of Cultural Evolution*

Session 13.2: *Evolution of Self-Awareness and Theory of Mind*

Session 13.3: *Race and Ethnicity*

Session 13.4: *Parental Investment I*

**Sunday Late Morning Sessions**.....104

Session 14.1: *Darwinian Medicine*

Session 14.2: *Communication*

Session 14.3: *Parental Investment II*

Session 14.4: *Social Networks*

**Poster Abstracts**.....112

**Index**.....160

## QUICK TIMETABLE

### Wednesday June 1st

Noon-9:00 p.m.	Registration	Texas Foyer
6:30-9:00 p.m.	Welcome Reception	Texas Ballroom 1-3

### Thursday June 2nd

7:00-8:00 a.m.	Continental Breakfast	Texas Foyer
8:00-5:00 p.m.	Registration	Texas Foyer
8:00-9:00 a.m.	Morning Plenary - Margo Wilson & Martin Daly	Texas 5-7
9:00- 9:10 a.m.	Coffee Break	Texas Foyer
9:10-10:30 a.m.	Early Morning Sessions	Texas 5-7, Hill Country A-D
10:30-10:40 a.m.	Coffee Break	Texas Foyer
10:40-Noon	Late Morning Sessions	Texas 5-7, Hill Country A-D
Noon-1:00 p.m.	Lunch On Your Own	
1:00-2:00 p.m.	Afternoon Plenary - Douglas Mock	Texas 5-7
2:00-2:10p.m.	Coffee Break	Texas Foyer
2:10-3:30 p.m.	Early Afternoon Sessions	Texas 5-7, Hill Country A-D
3:30-3:40 p.m.	Coffee Break	Texas Foyer
3:40-5:20 p.m.	Late Afternoon Sessions	Texas 5-7, Hill Country A-D
5:20-7:00 p.m.	Dinner On Your Own	
7:00-8:00 p.m.	Poster Session I	Texas 1-3
8:00-9:00 p.m.	Poster Session II	Texas 1-3
9:00-10:00 p.m.	Posters and Mingling	Texas 1-3

### Friday June 3rd

7:00-8:00 a.m.	Continental Breakfast	Texas Foyer
8:00-5:00 p.m.	Registration	Texas Foyer
8:00-9:00 a.m.	Morning Plenary - Robert Trivers	Texas 5-7
9:00- 9:10 a.m.	Coffee Break	Texas Foyer
9:10-10:30 a.m.	Early Morning Sessions	Texas 5-7, Hill Country A-D
10:30-10:40 a.m.	Coffee Break	Texas Foyer
10:40-Noon	Late Morning Sessions	Texas 5-7, Hill Country A-D
Noon-1:00 p.m.	Lunch On Your Own	
1:00-2:00 p.m.	Afternoon Plenary - Leda Cosmides & John Tooby	Texas 5-7
2:00-2:10p.m.	Coffee Break	Texas Foyer
2:10-3:30 p.m.	Early Afternoon Sessions	Texas 5-7, Hill Country A-D
3:30-3:40 p.m.	Coffee Break	Texas Foyer
3:40-5:20 p.m.	Late Afternoon Sessions	Texas 5-7, Hill Country A-D
7:00 p.m.	BBQ Dinner	Hyatt Grassy Knoll

**Saturday June 4th**

7:00-8:00 a.m.	Continental Breakfast	Texas Foyer
8:00-5:00 p.m.	Registration	Texas Foyer
8:00-9:00 a.m.	Morning Plenary - Napoleon Chagnon	Texas 1-3
9:00- 9:10 a.m.	Coffee Break	Texas Foyer
9:10-10:30 a.m.	Early Morning Sessions	Texas 5-7, Hill Country A-D
10:30-10:40 a.m.	Coffee Break	Texas Foyer
10:40-Noon	Late Morning Sessions	Texas 5-7, Hill Country A-D
Noon-1:00 p.m.	Lunch On Your Own	
1:00-2:00 p.m.	Afternoon Plenary - E.O. Wilson	Texas 1-3
2:00-2:10p.m.	Coffee Break	Texas Foyer
2:10-3:30 p.m.	Early Afternoon Sessions	Texas 5-7, Hill Country A-D
3:30-3:40 p.m.	Coffee Break	Texas Foyer
3:40-5:20 p.m.	Late Afternoon Sessions	Texas 5-7, Hill Country A-D
7:00-9:30p	Banquet	Texas 1-3
8:00 p.m.	Keynote Address - Steven Pinker	Texas 1-3

**Sunday June 5th**

7:00-8:00 a.m.	Continental Breakfast	Texas Foyer
8:00-1:00 p.m.	Registration	Texas Foyer
9:00-10:40 a.m.	Early Morning Sessions	Texas 5-7, Hill Country A-D
10:40-11:00 a.m	Coffee Break	Texas Foyer
11:00-1:00 p.m.	Late Morning Sessions	Texas 5-7, Hill Country A-D

**1:00 p.m. Conference Ends**

# PROGRAM OF EVENTS

## WEDNESDAY, JUNE 1

Noon-9:00 p.m.	Registration	Texas Foyer
6:30-9:00 p.m.	Welcome Reception	Texas Ballroom 1

## THURSDAY, JUNE 2

8:00-9:00 a.m.	Morning Plenary by Margo Wilson & Martin Daly <i>Gambling on the Future</i>	Texas 5-7
9:00-9:10 a.m.	Coffee Break	

### Early Morning Paper Sessions

Session 1.1: *Cooperation I* Texas 5 & 6

TH 9:10	<i>Nobody's Watching: Subtle Cues Affect Generosity in Anonymous Economic Games.</i> Haley KJ, Fessler DMT
TH 9:30	<i>What Counts as Free Riding? Using Intentions—but Not Contribution Level—to Identify Free Riders.</i> Delton AW
TH 9:50	<i>Guilt-Prone People Contribute More in the Public Good Game.</i> Price J, Price ME, Curry O
TH 10:10	<i>Character Counts: Character Information Regulates Trust in Economic Games.</i> Krasnow MM, Cosmides I, Tooby J

Session 1.2: *2D:4D* Texas 7

TH 9:10	<i>Facial Masculinity is Not Associated With Digit Masculinity.</i> Pound N, Penton-Voak I, Kempe V
TH 9:30	<i>Second to Fourth Digit Ratio and Cooperative Behavior.</i> Millet K, Dewitte S, Van den Bergh B
TH 9:50	<i>The 2D4D Ratio and Cyclic Shifts as Predictors of Self-Perception of Quality and Sexual Permissiveness.</i> Lyons J, Mellgren R
TH 10:10	<i>The 2<sup>nd</sup> to 4<sup>th</sup> Digit Ratio, Physical Condition and Face Preferences Over the Menstrual Cycle.</i> Fink B, Neave N, Manning JT, Soevegjarto O, Windhager S

Session 1.3: *Modularity and Cognition*

Hill Country A &amp; B

TH 9:10	<i>What Massive Modularity Must Be.</i> Carruthers P
TH 9:30	<i>Cognitive Ontogeny Among the Ache of Paraguay as Measured by Visual Evoked Potentials and Psychometrics.</i> Wagner JD, Walker RS
TH 9:50	<i>Disentangling Data Representations in Statistical Reasoning.</i> Brase GL
TH 10:10	<i>Are Computational Adaptations for Reasoning About Social Exchange and Precautions Neurally as Well as Functionally Distinct? An fMRI Study.</i> Ermer E, Cosmides L, Tobby J, Guerin S, Miller M

Session 1.4: *Darwinian Literary Studies*

Hill Country C &amp; D

TH 9:10	<i>New Darwinism, New Methods: Evolutionary Science and Literary Study.</i> Court A
TH 9:30	<i>Evolution and Fiction.</i> Boyd B
TH 9:50	<i>QWERTYUIOP and EP: Implications of Evolutionary Psychology for the Working Fiction Writer.</i> Horvath T
TH 10:10	<i>Individual Differences in the Achievement of Evolutionary Relevant Goals in Victorian Novels.</i> Carroll J, Gottschall J, Johnson JA, Kruger D

**10:30-10:40 a.m. Coffee Break****Late Morning Paper Sessions**Session 2.1: *New Perspectives on the Evolutionary Foundations of Religion*

Texas 5 &amp; 6

TH 10:40	<i>Adaptationist Versus Byproduct Theories of Religion.</i> Kirkpatrick LA
TH 11:00	<i>Supernatural Punishment and the Evolution of Cooperation.</i> Johnson D
TH 11:20	<i>Ritual, Emotion, and Sacred Symbols: The Evolution of Religion as an Adaptive Complex.</i> Alcorta CS, Sosis R
TH 11:40	<i>On the Possibility of Adapted Responses to Dead Agents' Minds.</i> Bering J, McLeod K, Shackelford TK

Session 2.2: *Humor and Laughter*

Texas 7

TH 10:40	<i>Costly Signaling and Humor.</i> Greengross G
TH 11:00	<i>Slapstick Brains: Does the New Neurology of Humor Shed Light on Humor's Evolution and Function?</i> Thomson JA, Jr
TH 11:20	<i>Laughter in Congenitally Deaf Versus Normally Hearing College Students.</i> Makagon MM, Owren MJ, Funayama ES
TH 11:40	<i>Evidence for the Encryption Model of Humor.</i> Flamson T

Session 2.3: *Sex Ratio*

Hill Country A & B

TH 10:40	<i>Famine, Operational Sex Ratio, and Discriminative Parental Solicitude.</i> Scheyd GJ
TH 11:00	<i>Low Operational Sex-Ratios, Risky Sexual Behavior, and the Spread of HIV/AIDS among African-American Women.</i> Gant LM, Heath KM
TH 11:20	<i>Adaptive Control of the Sex Ratio in Mammals?</i> Grant V
TH 11:40	<i>Sex Ratio at Birth Affects Reproductive Success in Humans.</i> Lummaa V, Pettay JE, Russell AF

Session 2.4: *Menstrual Cycle I*

Hill Country C & D

TH 10:40	<i>Dietary Changes Across the Menstrual Cycle.</i> Fleischman, DS
TH 11:00	<i>The Effects of Ovulatory Cycle on Women's Clothing Preferences.</i> Li N, Durante K
TH 11:20	<i>Cell Phones and Pheromones: Mate Guarding in Humans.</i> Rohwer SA
TH 11:40	<i>An Alternative Explanation for Menstrual Phase Effects on Women's Psychology and Behavior.</i> Roney J

**1:00 p.m. Afternoon Plenary by Douglas Mock**

**Texas 5-7**

***Children Left Behind: Contrarian Views of the Nuclear Family***

**2:00 p.m. Coffee Break**

**Texas Foyer**

<b>Early Afternoon Paper Sessions</b>
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Session 3.1: *No Longer a Cherry But Still a Tomato:  
Browsing the Salad Bar of Mating*

Texas 5 &amp; 6

TH 2:10	<i>Luring a Mate: An Exploitation of Mate Preferences.</i> Weekes-Shackelford VA, Shackelford TK, Stone EA, Easton JA
TH 2:30	<i>How Having a Child Changes Female Mating Psychology.</i> Stone EA, Weekes-Shackelford VA, Easton JA, Shackelford TK
TH 2:50	<i>Adaptations for Mating Relationships Involving Single Parents.</i> Duntley JD
TH 3:10	<i>After Having Children: Sex-Differentiated Changes in Mate Preferences.</i> Easton JA, Stone EA, Weekes-Shackelford VA, Shackelford TK

Session 3.2: *Testosterone Research*

Texas 7

TH 2:10	<i>Men's Testosterone and Life History in a Caribbean Rural Village.</i> Gangestad SW, Thornhill R, Flinn MV, Dane LK, Flacon RG, Garver-Apgar CE, Franklin M, England BC
TH 2:30	<i>Diurnal Shifts in Testosterone Predict Diurnal Shifts in Vocal Dominance in Men.</i> Feinberg DR, Law Smith JM, Jones BC, Cornwell RE, DeBruine LM, Moore RE, Sharpe M, Al-Dujalli EAS, Perrett DI
TH 2:50	<i>Fathers Have Lower Salivary Testosterone Levels Than Unmarried Men and Married Non-Fathers in Beijing, China.</i> Gray PB, Yang CJ, Pope HG, Jr.
TH 3:10	<i>Testosterone and Human Aggression: An Evaluation of the Challenge Hypothesis.</i> Archer J

Session 3.3: *Emotional Expression*

Hill Country A &amp; B

TH 2:10	<i>Genetic and Cultural Components of Emotional Expression Observed in Movie Remakes.</i> Ozawa N, Togawa T
TH 2:30	<i>Physical Strength Predicts Entitlement, Anger and Attitudes About Aggression in Men.</i> Sell A, Tooby J, Cosmides L
TH 2:50	TBA
TH 3:10	<i>Emotion Perception and Expression: Developmental and Evolutionary Aspects of Social Behavior in Adolescents.</i> Coultas JC, Ho TY

Session 3.4: *WHR*

Hill Country C &amp; D

TH 2:10	<i>Beauty is in the Eyes of Plastic Surgeons: Waist-to-Hip Ratio is More Important Than Weight.</i> Singh D
TH 2:30	<i>The Structure and Measurement of Human Mating Strategies.</i> Jackson JJ, Kirkpatrick LA
TH 2:50	<i>Does Low WHR Signal Maximal Brain-Building Capacity?</i> Lassek W, Gaulin S
TH 3:10	<i>Preference for Symmetry and Waist-to-Hip Ratio is Influenced by Relative Mate Quality in a Sample of Young Jamaicans.</i> Jacobson AS, Brown WM, Trivers RL

**3:30 p.m. Coffee Break**

<b>Late Afternoon Paper Sessions</b>
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Session 4.1: *Sperm Competition in Humans*

Texas 5 &amp; 6

TH 3:40	<i>Forced In-Pair Copulation as a Sperm Competition Tactic in Humans.</i> Goetz AT, Shackelford TK
TH 4:00	<i>Sperm Competition as an Explanation for Constant Male Sexual Motivation in a Long Term Partnership.</i> Klusmann D
TH 4:20	<i>Mate Preferences for a Short-Term Sexual Relationship.</i> LaMunyon CW, Shackelford TK, Goetz AT, Quintus B, Weekes-Shackelford VA
TH 4:40	<i>Mate Guarding and Frequent Copulation in Humans: Complementary Anti-Cuckoldry Tactics.</i> Shackelford TK, Goetz AT, Guta FE, Schmitt DP
TH 5:00	<i>Commentary.</i> Pound N

Session 4.2: *Interpersonal and Media Gossip in Evolutionary Perspective* Texas 7

TH 3:40	<i>Who Do We Tell, and Whom Do We Tell On? Explorations in the Evolutionary Psychology of Gossip.</i> McAndrew FT, Bell EK, Garcia CM
TH 4:00	<i>Bitching to Win the Bachelor. An Analysis of the Use of Gossip in Reality Television Dating shows "Temptation Island" and "The Bachelor."</i> De Graeve T, De Backer C
TH 4:20	<i>Selective Information Sharing and Intrasexual Competition.</i> Noseworthy L, Fisher M, De Backer C
TH 4:40	<i>"Teachers or Friends?" Two Hypotheses to Explain Our Interest in Celebrity Gossip Across the Lifespan.</i> De Backer C

Session 4.3: *Menstrual Cycle II*

Hill Country A &amp; B

TH 3:40	<i>Changes in Romantic Relationships During the Menstrual Cycle: A Diary Study.</i> Chen JY
TH 4:00	<i>Women's Attractiveness Judgments of Self-Resembling Faces Change Across the Menstrual Cycle.</i> DeBruine LM, Jones BC, Perrett DI
TH 4:20	<i>Variations in Gait Across the Menstrual Cycle.</i> Provost MP, Troje NF, Quinsey VL
TH 4:40	<i>Revisiting the Hypotheses for the Evolution of Woman's Concealed Ovulation in Light of Her Recently Discovered Estrus.</i> Thornhill R, Gangestad SW

Session 4.4: *Mating Strategies I*

Hill Country C &amp; D

TH 3:40	<i>Men's Reproductive Investment Decisions: Mating, Parenting and Self-Perceived Mate Value.</i> Apicella CL, Marlowe FW
TH 4:00	<i>The Role of Conspicuous Consumption in Mate Attraction.</i> Sundie J
TH 4:20	<i>Cooperative Courtship: Facilitation Flirtation With Friends.</i> Ackerman J, Kenrick DT
TH 4:40	<i>Tactics of Mate Expulsion.</i> Conlan SK
TH 5:00	<i>Why Women Derogate the Competition.</i> Fisher M, Clarke A

<b>Poster Sessions</b>
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All posters will be displayed from 7:00-10:00 p.m. with snacks available as well as a cash bar. Presenters are required to stand by their poster for the hour that they are assigned. For the rest of the time they are free to roam around the room and view the other posters. From 9:00-10:00 p.m. no one is required to stand by their poster and everyone is free to mingle and view all of the posters.

**7:00-8:00 p.m.**      **Poster Session I:** Cognition, Cognition and Sex,      Texas 1-3  
 Philosophy, Politics, Cooperation and Reciprocity

**8:00-9:00 p.m.**      **Poster Session II:** Prenatal Hormones,      Texas 1-3  
 Hormones and Sex, Mating and Sex, Mate Choice,  
 Mating Relationships, Parenting, Evolution and Medicine

**9:00-10:00 p.m.**      **Free time to mingle and view all of the posters**

**FRIDAY, JUNE 3**

**8:00-9:00 a.m. Morning Plenary by Robert Trivers Texas 5-7**  
***Selfish Genetic Elements and Social Behavior***

**Early Morning Paper Sessions**

Session 5.1: *Chagnon Fest I* Texas 5&6

FR 9:10	<i>Human Behavioral Ecology &amp; Ethnography: Dialogues Between Behavior and Culture.</i> Gerkey A, Cronk L
FR 9:30	<i>Sex Matters.</i> Hewlett BS, Hewlett BL
FR 9:50	<i>Fathers vs. Sons: Why Jocasta Matters.</i> Betzig L
FR 10:10	<i>Disturbances in the Dreamtime: Evidence for Prehistoric Violence in Subarctic Dene Traditional Oral Narratives.</i> Allen W

Session 5.2: *Attractiveness I* Texas 7

FR 9:10	<i>How Men and Women Live in Groups: Intragroup Cooperation and/or Intergroup Competition.</i> Yuki M, Yokota K
FR 9:30	<i>Strategic Preferences for Facial Symmetry and Sexual Dimorphism.</i> Little AC, Jones BC
FR 9:50	<i>How Mere is Mere Exposure? A Plausible Proximate Mechanism for Adaptive Face Preferences.</i> Jones BC, DeBruine LM, Little AC, Feinberg DR
FR 10:10	<i>Preliminary Evidence That Sexual Dimorphism in Proportionate Foot Size is the Product of Intersexual Selection.</i> Fessler DMT, Haley K, Lal R, Nettle D, Afshar Y, Pinheiro IA, Bolyanatz A, Mulder MB, Cravalho M, Delgado T, Gruzd B, Correia MO, Khaltourina D, Korotayev A, Marrow J, Souza LS, Zbarauskaite A

Session 5.3: *Kinship I* Hill Country A & B

FR 9:10	<i>Cognitive Problems for Human Kin Detection Regulate Patterns of Incest Avoidance and Altruism.</i> Lieberman D
FR 9:30	<i>A Cue of Kinship Affects Cooperation in a 'Tragedy of the Commons'.</i> Krupp DB, DeBruine LM, Barclay P
FR 9:50	<i>Do Children Resemble Their Fathers More Than Their Mothers? A Reassessment.</i> Faurie C, Alvergne A
FR 10:10	<i>Kin Selection and Lineage: Cooperative Hunting Groups in Indonesia.</i> Alvard M

Session 5.4: *Mating Strategies II*

Hill Country C &amp; D

FR 9:10	<i>Human Mate Poaching: How Frequent is it and What Motivates it?</i> Davies AP, Shackelford TK, Hass RG
FR 9:30	<i>Subliminal Rivals. Unconscious Processed in Jealousy and Rival Evaluation.</i> Massar K, Buunk BP, Dechesne M
FR 9:50	<i>Male Mate Retention Tactics as a Function of Male Sexual Attractiveness and Female Ovulatory Cycle Phase.</i> Pillsworth EG, Haselton MG
FR 10:10	<i>Sexual Attraction and MHC-Similarity: Implications for Romantic Relationships.</i> Garver-Apgar CE, Gangestad SW, Thornhill R, Miller RD, Olp J

10:30 a.m. **Coffee Break****Texas Foyer****Late Morning Paper Sessions**Session 6.1: *Intrasexual Competition and Competitiveness*

Texas 5 &amp; 6

FR 10:40	<i>Relationship Status Influences Intrasexual Competition.</i> Gordon F, Fisher M
FR 11:00	<i>Social Context, Male Competition, and sex Differences in Mortality.</i> Kruger DJ, Nesse. RM
FR 11:20	<i>Is the Sex Difference in Competitiveness Disappearing? A Test in Populations of U. S. Distance Runners.</i> Deaner RO
FR 11:40	<i>Dissatisfied by Design: The Evolution of Discontent.</i> Hill SE, Buss DM

Session 6.2: *Attractiveness II*

Texas 7

FR 10:40	<i>Mirror, Mirror on the Wall: The Long-Term Effects of Experience on Judgments of Attractiveness.</i> Cooper PA, DeBruine LM, Maurer D
FR 11:00	<i>Hot or Not? A Meta-Analytic Evaluation of Evolutionary Explanations for Determinants of Facial Attractiveness.</i> Hönekopp J
FR 11:20	<i>Can't Take my Eyes Off You: Mating Goals and Biases in Attentional Adhesion.</i> Maner JK, Gailliot MT
FR 11:40	<i>The Puzzle of Human Female Beauty: A Theoretical Refinement and Empirical Test.</i> Gottschall J, Gardiner A

**Session 6.3: Culture II**

Hill Country A & B

FR 10:40	<i>The Evolution of Cultural Evolution.</i> McElreath R, Henrich J
FR 11:00	<i>Natural Selection and Information Theory: On the Difference Between Intrinsic and Extrinsic Inheritance.</i> Dickins TE
FR 11:20	<i>The Effect of Initial Endowment and Consistency of Preferences in Chimpanzees.</i> Brosnan SF, Grady M, Lambeth SP, Theile E, Shapiro SJ
FR 11:40	<i>Are There Content Biases in Social Transmission? The Case of Animals.</i> Barrett C

**Session 6.4: Mating Strategies III**

Hill Country C & D

FR 10:40	<i>Timing of Reproductive Maturation in South Africa: Testing the Belsky-Draper Hypothesis With Three Ethnic Groups.</i> Anderson KG
FR 11:00	<i>Effects of Early Experience on Female Reproductive Maturation in Human and Nonhuman Primates.</i> Maestriperi D
FR 11:20	<i>Satisfaction and Regret Following First Sexual Intercourse.</i> Gordon AK, Kaplar ME, Cacciapaglia H, Miller AB, Flowers J
FR 11:40	<i>Sexual Regret.</i> Haselton MG, Poore J, von Hippel W, Gonzaga G, Buss DM

**12:00-1:00 p.m. Lunch on Your Own**

**1:00- 2 p.m. Afternoon Plenary**  
**Leda Cosmides & John Tooby** **Texas 5-7**  
**“The Functional Architecture of Human Motivation”**

**2:00 p.m. Coffee Break** **Texas Foyer**

<b>Early Afternoon Paper Sessions</b>
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**Session 7.1: Homicide**

Texas 5 & 6

FR 2:10	<i>Spousal Homicide in Korea: Analysis of data from the 18th, 19th, and 20th century.</i> Choe JDC, Hwang H, Jang D
FR 2:30	<i>Contexts and Circumstances of Filicide-Suicide in Chicago, 1870-1930.</i> Beasley SL, Weekes-Shackelford VA, Shackelford TK
FR 2:50	<i>An Evolutionary Exploration of the Sex-Biased Differential Reaction to Infanticide.</i> Nedelec JL
FR 3:10	<i>The Murderer Next Door: Why the Mind is Designed to Kill.</i> Buss DM

**Session 7.2: Emotion I**

**Texas 7**

FR 2:10	<i>A Psychoevolutionary Model of Surprise.</i> Schützwohl A,
FR 2:30	<i>"Same Emotion, Different Actions": The Specific Impact of Different Hope-Types on Explorative Behavior.</i> Poels K, Dewitte S
FR 2:50	<i>Political Choice and Emotional Response: A Biofeedback Test of Political Preferences.</i> Sautter J, Hatemi P, Litvay L, Larimer C
FR 3:10	<i>Top 10 Reasons Why Orgasm Should be Classed as a Basic Human Emotion.</i> Jenkins COE, Miller GF

**Session 7.3: Sex Differences**

**Hill Country A & B**

FR 2:10	<i>An Ecologically Valid Foraging Task Yields a Female Spatial Advantage and Significant Content Effects.</i> Gaulin S, Krasnow M, Truxaw D, New J
FR 2:30	<i>Non-Euclidean Navigational Strategies of Women: Compensatory Response or Evolved Dimorphism?</i> Silverman I, Choi J
FR 2:50	<i>Sex Differences in Query Formation.</i> Cox A, Fisher M
FR 3:10	<i>Evolutionary Domains of Risk and Life History.</i> Wang XT, Kruger DJ, Wilke A

**Session 7.4: Mating Strategies IV**

**Hill Country C & D**

FR 2:10	<i>Attachment and Ecological Condition as Determinants of Female Mate Preferences.</i> Cohen D, Belsky J
FR 2:30	<i>Is Short-Term Mating the Maladaptive Result of Insecure Attachment? A Test of Competing Evolutionary Perspectives.</i> Schmitt DP
FR 2:50	<i>Who are the Heroes? Characteristics of People Who Rescue Others.</i> Lyons M
FR 3:10	<i>Gender Differences in the Development of Trust in Romantic Relationships.</i> Wiginton TL, Campbell L

**3:30 p.m. Coffee Break**

**Texas Foyer**

**Late Afternoon Paper Sessions**

**Session 8.1: Kinship II**

**Texas 5 & 6**

FR 3:40	<i>Genetic Density: Meaning, Models, and Some Effects.</i> Spranger JL, Colarelli SM
FR 4:00	<i>Wealth and Lineage as Moderators of Inclusive Fitness: Evidence from an Archival Analysis of Inheritance Data.</i> Webster GD
FR 4:20	<i>Genetic and Environmental Influences on the Frequency of Orgasm in Women.</i> Dawood K, Kirk KM, Bailey JM, Andrews PW, Martin NG
FR 4:40	<i>Choice of Mates and Friends by Twins Support a Novel Hamilton Prediction.</i> Rushton JP, Bons TA

Session 8.2: *Emotion II*

Texas 7

FR 3:40	<i>Sexual Jealousy and Its Impact on Cognitive Tasks.</i> Thomson JW, Shackelford TK, Platek SM
FR 4:00	<i>Temper Tantrums: Dysfunction or Display?.</i> Flinn, MV
FR 4:20	<i>Animal Disgust: a Model Emotion.</i> Curtis VA, Aunger RV, Rubio-Godoy M
FR 4:40	<i>Cognitive and Physiological Evidence of Fear Contagion.</i> Tamura R, Kameda T

Session 8.3: *Human Behavioral Ecology*

Hill Country A & B

FR 3:40	<i>Human Foraging Behavior in Patchy Environments.</i> Wilke A, Hutchinson JMC, Todd PM, Czienshowski U
FR 4:00	<i>Prosociality, Evolution, and the Experience Sampling Method.</i> Wilson DS
FR 4:20	<i>Disease-Avoidance and Intergroup Bias: The Effects of Disgust Sensitivity and Pregnancy on Ethnocentric Attitudes.</i> Navarrete CD, Fessler DMT, Eng S
FR 4:40	<i>What Types of Others do People Regard as "Good" in Indirect Reciprocity? : A Vignette Study to Examine Strategies in Indirect Reciprocity Settings.</i> Mashima R, Takahashi N

Session 8.4: *Applied Evolutionary Psychology*

Hill Country C & D

FR 3:40	<i>Evolutionary Human Information Behavior.</i> Spink A, Currier J, Narayan B
FR 4:00	<i>Are Consumers Biological Beings? No, If You Ask Consumer Scholars.</i> Saad G
FR 4:20	<i>Human Evolution and the Ontogeny of the Self: Can Evolutionary Psychology Enhance Psychoanalytic Theory?</i> Lewis AJ
FR 4:40	<i>The Future for Evolutionary Analysis in Law.</i> Jones OD, Goldsmith TH
FR 5:00	<i>Is Human Non-Kin Altruism Really Such a Problem for Evolutionists?</i> Qirko HN

7:00 p.m.

BBQ

Hyatt Grassy Knoll

**SATURDAY, JUNE 4**

7:00-8:00 a.m. **Continental Breakfast**

8:00-9:00 a.m. **Morning Plenary** Texas 1-3  
**Napoleon Chagnon**  
**“Warre and Striving for Security Among the Yanomamö and Paleolithic Peoples”**

9:00 a.m. **Coffee Break**

Texas Foyer

**Early Morning Paper Sessions**

Session 9.1: Texas 5 & 6  
 Roundtable: *Commentaries on the Life's Work and Humor of Napoleon Chagnon*

SA 9:10	Irons, W.	Tooby, J.
SA 9:30	Wilson, E. O.	Harrell, M-A
SA 9:50	Triver, R. L.	Alexander, R.
SA 10:10	Daly, M. & Wilson M.	Chagnon, N.

Session 9.2: Texas 7  
*Sensational Interests as a Signal of Mating Effort in Delinquents*

SA 9:10	<i>Sensational Interests, Mating Effort, and Personality: Evidence for Cross-Cultural Validity.</i> Egan V, Figueredo AJ, Wolfe P, McBride K, Sefcek J, Vasquez G, Charles K	
SA 9:30	<i>Psychopathology, Sensational Interests, and Mating Effort in a Sample of Scottish Adolescents.</i> Charles KE	
SA 9:50	<i>Are Sensational Interests as a Signal of Mating Effort in Delinquents?</i> Vasquez G, Sefcek JA, Douglas J, Figueredo AJ	
SA 10:10	<i>Sonora Study of Assortative Pairing for Sensational Interests, Mate Value, Life History, and Delinquency.</i> Wolf P, Vasquez G, Frías-Armenta M, Coral-Verdugo V, Figueredo AJ	

Session 9.3: *Cooperation II* Hill Country A & B

SA 9:10	<i>Contribution and Punishment as Reciprocal Altruism in the Public Good Game.</i> Price ME, Price J, Curry O	
SA 9:30	<i>Is Patience a Virtue? Individual Differences in Discount Rates and Cooperativeness.</i> Curry O, Price ME, Price J	
SA 9:50	<i>Does Intention Matter in Third-Party Punishment?</i> Takahashi N, Mashima R, Miyahara M	
SA 10:10	<i>Giving for Glory: The Evolutionary Psychology of Altruism and Status.</i> Hardy C, Van Vugt M	

Session 9.4: *Mate Choice I* Hill Country C & D

SA 9:10	<i>Happy Babies Make Men More Attractive: Evidence for Female Preferences for Parentally-Investing Men.</i> Bleske-Rechek A, Swanson M, Remiker M, Zeug N, Rohloff A	
SA 9:30	<i>Cues of Receptivity Influence Judgments of Attractiveness.</i> Clark AP	
SA 9:50	<i>Assessing the Father of My First Baby.</i> Spinelli LHP, Yamamoto ME, Cordeiro de Sousa MB	
SA 10:10	<i>HurryDate: Mate Preferences in Action.</i> Kurzban R, Weeden J	

**10:30 a.m. Coffee Break**

**Texas Foyer**

<b>Late Morning Paper Sessions</b>
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Session 10.1: *Sex Differences: Political, Cultural and Policy Implications* Texas 5 & 6

SA 10:40	<i>The Blank Slate.</i> Pinker S
SA 11:00	<i>Sex Differences: Political, Cultural and Policy Implications.</i> Blum D
SA 11:20	<i>Taking Sex Differences Seriously.</i> Rhoads S
SA 11:40	<i>Women in Science: An Evolutionary Psychological Perspective.</i> Browne KR

Session 10.2: *The Psychometrics and Behavioral Genetics of Life History Strategy* Texas 7

SA 10:40	<i>The Heritability of Life History Strategy: The K-Factor, Covitality, and Personality.</i> Figueredo AJ, Brumbach BH, Vasquez G, Schneider S
SA 11:00	<i>A Constructive Replication of the Super-K Factor Using the "Mini-K" Short Form.</i> Brumbach BH, Figueredo AJ, MacDonald K
SA 11:20	<i>Predictive Validation of the "Mini-K" Using Socially Problematic Behaviors.</i> Wenner C, Figueredo AJ, Jacobs WJ
SA 11:40	<i>If They Mated: A Life-History Model of Human Fitness Indicators.</i> Sefcek JA, Figueredo AJ, Miller G

Session 10.3: *Chagnon Fest II* Hill Country A & B

SA 10:40	<i>Yanomamo Ethnography and Human Nature.</i> Irons W
SA 11:00	<i>The Growth, Development, and Health of Yanomamö Orphans in Relation to Parental Loss and Kinship.</i> Hames R, Oliver WJ Chagnon NA
SA 11:20	<i>The Kinship Structure of a Shuar Village.</i> Hagen EH
SA 11:40	<i>What's Under the Rug of Household Economic Organization? Time Allocation Tradeoffs, Life History, and the 'Decay' of the Nuclear Family.</i> Sugiyama LS, Chacon R

Session 10.4: *Cooperation III* Hill Country C & D

SA 10:40	<i>The Role of Generosity in the Noisy Continuous Prisoner's Dilemma.</i> Le S, Boyd R
SA 11:00	<i>The Robustness of the 'Raise-The-Stakes' Strategy: Confronting Cheaters in Noisy Prisoner's Dilemma Games..</i> Van den Bergh B, Dewitte S
SA 11:20	<i>Preference and Structure: A Social Network Analysis of an Indonesian Whaling Fleet.</i> Nolin DA, Alvard MS
SA 11:40	<i>Does size matter? Cheating and Cooperation in Small and Large School Children Groups.</i> Yamamoto ME, Irene de Alencar A, Rocha DM

12:00 p.m.	Lunch	
1:00-2:00 p.m.	Afternoon Plenary Edward O. Wilson "Thirty Years After <i>Sociobiology</i> : Some Thoughts"	Texas 1-3
2:00 p.m.	Coffee Break	Texas Foyer

### Early Afternoon Paper Sessions

Session 11.1: Texas 5 & 6  
*Methodological Development(s) in Evolutionary Psychology*

SA 2:10	<i>Getting the Big Picture: Methodological Constraints on Evolutionary Approaches to Psychological Research Using Horizontal and Vertical Integration.</i> Jones DN, Wenner C, Jacobs JJ
SA 2:30	<i>Testing the SPFit Model of Addictive Behavior: Development of the Self-Perceived Fitness Questionnaire (SPFQ).</i> Coleman SL, MacKillop J, Castelda BA, Newlin DB
SA 2:50	<i>Functional Near Infrared Spectroscopy (fNIRS): A Methodology for Investigating Brain-Behavior Interaction Under Ecologically Valid Conditions.</i> Levin SL, Patel S, Thomson JW, Platek SM
SA 3:10	<i>Using Brain Mapping to Chart Evolution: Methods and Processes.</i> Guise K, Kelly K, Steven S, Keenan JP

Session 11.2: *Motivation* Texas 7

SA 2:10	<i>A New Classification and Phylogeny of Motivations.</i> Aunger R, Curtis V
SA 2:30	<i>An Evolutionary Theory of Human Motivation: Adaptive Mental Mechanisms and Behavior.</i> Bernard LC, Mills M, Swenson L, Walsh RP
SA 2:50	<i>Emotional Reward As Motivation for Human Drug Use: An Evolutionary Critique.</i> Sullivan R
SA 3:10	<i>How Evolution can Bridge the Nomothetic Idiographic Chasm.</i> Neese RM

Session 11.3: *Chagnon Fest III* Hill Country A & B

SA 2:10	<i>Kin as Friend and Foe.</i> Borgerhoff Mulder M
SA 2:30	<i>Evolutionary Ecology of Lineal Social Organization.</i> Quinlan R
SA 2:50	<i>Warfare, Status, and Reproductive Success in the Ecuadorian Amazon: a Study Inspired by Chagnon's Discovery of the Unokai Correlation.</i> Patton JQ
SA 3:10	<i>An Evolutionary Analysis of Indigenous Siberian Food-Sharing Networks.</i> Ziker JP

Session 11.4: *Mate Choice II*

Hill Country C &amp; D

SA 2:10	<i>The Relationship Between Fluctuating Asymmetry and Motion-Captured Dance Movements in Rural Jamaica: Is Dance a Fitness Indicator?</i> Brown WM, Cronk L, Jacobson A, Popovic Z, Grochow K, Liu K, Trivers RL
SA 2:30	<i>Do Visual Art Products Act as Fitness Indicators in Mate Choice?</i> Keenoo HT
SA 2:50	<i>An Evolutionary Psychology Approach to Unintended Pregnancy.</i> Spohn M
SA 3:10	<i>Sexual Selection and Female Choice in American Primetime Drama Series.</i> Coultas JC, Hoang S

3:30 p.m.

Coffee Break

Texas Foyer

<b>Late Afternoon Paper Sessions</b>
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## Session 12.1:

Texas 5 &amp; 6

*Perception, Deception, Self-Deception, and Self-Awareness*

SA 3:40	<i>What Doesn't Go Up Mustn't Fall Down: The Vertical-Horizontal Illusion and Evolved Fall Avoidance Theory.</i> Jackson RE
SA 4:00	<i>Sex, Lies, and fMRI: Shooting blanks...</i> Platek SM, Levin SL, Thomson JW, Mohamed FB, Faro S, Gordon N
SA 4:20	<i>The Deceptive Roots of Human Mentation.</i> Beahrs JO
SA 4:40	<i>The Evolutionary Neuroscience of Perspective Taking.</i> Kelly K, Guise K, Stevens S, Platek SM, Keenan JP
SA 5:00	<i>The Selfish Brain.</i> Keenan JP

Session 12.2: *Sexual Orientation and Gender*

Texas 7

SA 3:40	<i>Male Aggression: Differences Between Heterosexual and Homosexual Individuals.</i> Sergeant MJT
SA 4:00	<i>Homosexuality: The Evolution of a Social Construction.</i> De Block A
SA 4:20	<i>A Darwinian Feminist Perspective on Gender.</i> Vandermassen G
SA 4:40	<i>Relationship Experience as a Predictor of Jealousy.</i> Murphy SM, Vallacher RR, Shackelford TK, Bjorklund DF, Yunger JL

Session 12.3: *Culture II*

Hill Country A & B

SA 3:40	<i>Dissecting the Environmentalist Attitude: What Kind of People Call Themselves Environmentalist?</i> Mize KD, Pratarelli ME, Browne BL
SA 4:00	<i>The 'Duh' Factor: Why History Appears to Repeat Itself.</i> Pratarelli M
SA 4:20	<i>The Shock and Awe of Religion as Memetic Equilibrium.</i> diCarlo CW
SA 5:00	<i>Biological Origins of Religiosity: The Shamanic Paradigm.</i> Winkelman M

Session 12.4: *Anxiety, Stress, and Depression*

Hill Country C & D

SA 3:40	<i>Exploring Anxiety and Self-Esteem from an Evolutionary Perspective.</i> Arigo D, Rodak K, Sackawicz M, Patel S, Platek SM
SA 4:00	<i>Biological Sensitivity to Context: An Evolutionary-Developmental Theory of the Origins and Functions of Stress Reactivity.</i> Ellis BJ, Boyce WT
SA 4:20	<i>The Relationship of Psychological Symptoms (Anxiety, Depression, and Eating Concerns), and Mating Strategies and Current Relationship Attachment.</i> Allen JS
SA 4:40	<i>The Chemistry of Seminal Fluid and Implications for Sexual Behavior.</i> Burch RL
SA 5:00	<i>Kindling and Concentration in Depression.</i> Andrews PW, Kuhn JW, Gardner CO, Miller GF, Neale MC, Aggen S, Radi C, Dencoff J, Prescott CA, Kendler KS

**7:00pm**

**Banquet**

**Texas 1-3**

**8:00pm**

**Keynote Address  
Steven Pinker  
"The Blank Slate"**

**Texas 1-3**

**SUNDAY, JUNE 5**

**7:00-8:00am**

**Continental Breakfast**

**Texas Foyer**

**Early Morning Paper Sessions**

Session 13.1: *Experimental Studies of Cultural Evolution*

Texas 5 & 6

SU 9:00	<i>Cultural Transmission Experiments Among Bolivian Pastoralists.</i> Efferson C
SU 9:20	<i>A Laboratory Model of the Evolution of Complex Social Traditions.</i> Richerson PJ, Baum W, Paciotti B, Waring T, Sasaki T, McElreath R, Lubell M, Efferson C, Edsten E
SU 9:40	<i>Evaluation the Effect of Religion and Personality on Altruistic Behavior.</i> Paciotti B, Richerson PJ, Waring T, McElreath R, Lubell M, Baum W, Efferson C, Edsten E, Sasaki T
SU 10:00	<i>Wheat and Potatoes: Estimating the Importance of Social Learning.</i> McElreath R, Lubell M, Richerson P, Waring T, Baum W, Edsten E, Efferson C, Paciotti B
SU 10:20	<i>Why Bad Reproductive Decisions are the Norm Nowadays.</i> Newson L

Session 13.2: *Evolution of Self-Awareness and Theory of Mind*

Texas 7

SU 9:00	<i>The Evolution of Self-Awareness and Theory of Mind.</i> Santos L, Flombaum J, Lyons D
SW 9:20	<i>Theory of Mind in Non-Human Primates: An Empirical Challenge.</i> Vonk J, Povinelli DJ
SU 9:40	<i>First-Person Experience and Understanding Others: Developing Agency Fosters Infants' Action Analysis.</i> Sommerville JA
SU 10:00	<i>Introspective Awareness: Dual Benefits in Terms of Third-Person Mind-Reading.</i> Focquaert F
SU 10:20	<i>Planet of the Joint Attenders.</i> Terrace HS

Session 13.3: *Race and Ethnicity*

Hill Country A & B

SU 9:00	<i>Variation in Cognitive Abilities Between Hindu Castes.</i> Palmer JA, Meenakshi P, Mangala P, McCown W
SW 9:20	<i>Do People Find Members of Their Own Race More Attractive (and if so, why)?</i> Burke D, Nolan C, Hayward WG
SU 9:40	<i>Thinking Race in Brazil: Looks, Groups, and Living Kinds.</i> Jones D
SU 10:00	<i>Is Conflict Necessary to Erase Race? Coalition Computation in the Absence of Competition.</i> Pietraszewski D
SU 10:20	<i>Race Predicts Behavior in Cross-Cultural and Cross-National Data.</i> Sanderson SK

Session 13.4: *Parental Investment I*

Hill Country C & D

SU 9:00	<i>The Optimal Allocation of Parental Investment Among Different-Aged Sons and Daughters.</i> Jeon J.
SU 9:20	<i>Parental Progeny Olfactory Recognition and Kin Investment.</i> Dubas JS, Marianne Heijkoop M, van Aken M
SU 9:40	<i>Investigating the Cinderella Effect in Cases Unintentional Childhood Fatalities.</i> Tooley GA, Karakis M, Stokes M, Ozanne-Smith J
SU 10:00	<i>The Evolution of Adult Attachment: A Comparative and Phylogenetic Analysis.</i> Brumbaugh CC, Fraley RC
SU 10:20	<i>Helpful Grandmothers in Rural Ethiopia: A Study of the Effect of Kin on Child Survival and Growth.</i> Mace R, Gibson M

10:40 a.m.

Coffee Break

Texas Foyer

<b>Late Morning Paper Sessions</b>
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Session 14.1: *Darwinian Medicine*

Texas 5 &amp; 6

SU 11:00	<i>Vaginismus as an Adaptive Anti-Copulation Defense.</i> Miller G
SU 11:20	<i>The Body's Borders and Their Functional Bouncer.</i> Tybur J
SU 11:40	<i>Borna Disease Virus and Human Mental Illness.</i> Smith LC
SU 12:00	<i>The Evolution of Adrenarche in Humans.</i> Campbell B
SU 12:20	<i>The Role of Mutation in Human Mental Disorders.</i> Keller MC

Session 14.2: *Communication*

Texas 7

SU 11:00	<i>Look Who's Talking: Developmental Trends in the Size of Conversational Cliques.</i> Barrett L, Henzi P
SU 11:20	<i>Vocal Emotion Recognition Across Disparate Cultures.</i> Bryant G, Barrett C
SU 11:40	<i>Horns on Display – Human Male Appropriation of an Animal Signal.</i> Goldberg R
SU 12:00	<i>Interring Personality Traits and Physical Characteristics From Facial Displays of Emotion.</i> Ketelaar T, Tost J, Davis M, Russell D
SU 12:20	<i>Children's Whining: The Adaptive Pleas of an Attachment Vocalization.</i> Sokol RI, Thompson NS

Session 14.3: *Parental Investment II*

Hill Country A &amp; B

SU 11:00	<i>Fathering Among the Tsimane' of Bolivia: Are They Simply Showing Off?</i> Winking J
SU 11:20	<i>An Interactional Model of Parental Investment.</i> Beaulieu D, Bugenthal D
SU 11:40	<i>The Preferential Investment Hypothesis: An Evolutionary Perspective on Kin Investment.</i> Laham SM, Gonsalkorale K, von Hippel W
SU 12:00	<i>How Much Gold Will You Put on Your Daughter? A Behavioral Ecology Perspective on Dowry and Dowry Inflation.</i> Shenk MK

Session 14.4: *Social Networks*

Hill Country C &amp; D

SU 11:00	<i>Selective Incentives for Cooperation: Second-Order Punishment vs. Second-Order Reward.</i> Kiyonari T, Barclay P
SU 11:20	<i>From Darwin to Churchill: Evolutionary Origins of Leadership.</i> Van Vugt M
SU 11:40	<i>Co-Wife Conflict and Cooperation: Implications for the Universality of the Human Pair Bond.</i> Jankowiak W
SU 12:00	<i>Women's Social Dynamics and Demographic Outcomes Among the Tsimane of Bolivia.</i> Rucas S
SU 12:20	<i>Characterizing Reciprocity in Groups: Information-Seeking in a Public Goods Game.</i> DeScioli P, Kurzban R
SU 12:40	<i>How Men and Women Live in Groups: Intragroup Cooperation and/or Intergroup Competition.</i> Yuki M, Yokota K

**1:00 p.m. Conference ends.**

## Talk Abstracts

### Thursday, June 1

#### Morning Plenary 8am

Texas 5-7

#### Martin Daly & Margo Wilson - Gambling on the future

Evolutionary biologists, economists, criminologists and psychologists have all been interested in how and why organisms "discount the future." Some tendency to behave as if a given reward is more valuable sooner than later is easily explained, but the precise forms of discount functions and the ways in which they differ between demographic groups present some surprises and puzzles. We will discuss both our own and others' research on this topic, and argue that an evolutionary adaptationist approach is required to achieve an understanding of variations in patience, impulsivity, recklessness, and related phenomena.

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### Thursday Morning Paper Sessions

#### Session 1.1 *Cooperation I*: Chair, M. Price

Texas 5 & 6

TH 9:10AM

*Nobody's Watching: subtle cues affect generosity in anonymous economic games*

**Haley KJ & Fessler DM**

Models indicate opportunities for reputation formation can play a role in sustaining prosocial behavior and economic game results support this conclusion. Noting that some prosociality remains in anonymous noniterated games, some researchers assert humans possess a propensity for prosociality independent of reputation management. However, decision-making processes employ both explicit propositional knowledge and intuitive judgments elicited by tacit cues. Manipulating game parameters alters explicit information employed in overt strategizing but leaves intact cues that may affect intuitive judgments relevant to reputation formation. To explore how subtle cues impact prosociality, we manipulated auditory cues (via earmuffs) and visual cues (stylized eyespots) of observability in Dictator Games. Earmuffs reduced generosity, but not significantly. Eyespots substantially increased generosity-despite no differences in anonymity, almost twice as many participants allocated to their partners when using computers displaying eyespots compared to controls. Investigations of prosocial behavior must consider both overt information about games and subtle cues influencing intuitive judgments.

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TH 9:30AM

*What counts as free riding? Using intentions -- but not contribution level -- to identify free riders \*Submitted for New Investigator Award*

**Delton AW**

For coalitional cooperation to evolve and be maintained, the mind must be equipped with computational procedures designed to identify free riders. But how does the mind define a free rider? Under-contributing can occur by intention or by accident, but only intentional under-contributing reveals a design difference. Four

experiments revealed that the mind does not categorize under-contributing per se as free riding. Studies 1 & 2 showed that individuals who intentionally failed to contribute were categorized as free riders, even when holding objective contribution level constant. When intentions were held constant, under-contributing was not used to categorize individuals as free riders - although categorization did occur along a dimension of competence (Study 3). These effects were not due to general categorization abilities (Study 4). The results implicate a procedure specialized for identifying free rider designs as opposed to identifying under-contributing per se.

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TH 9:50AM

*Guilt-prone people contribute more in the public good game*

**Price J, Price ME, & Curry O.**

It is inevitable that individuals will sometimes injure or defect on valued cooperative partners. It has been proposed that guilt functions to help people maintain relationships in the face of such defections by causing a recalibration such that, in the future, the injured partner's welfare is more strongly favored relative to the individual's own. Even when an actual defection has not occurred, guilt may function as an emotional disincentive that motivates people to avoid damaging their valuable cooperative relationships. From this perspective, relatively guilt-prone individuals should be relatively motivated to avoid defecting in reciprocal interactions. We conducted a series of anonymous, one-shot public good games. After completing the game, subjects were given a guilt-proneness inventory. Overall, subjects exhibiting higher levels of guilt-proneness made more generous offers, as did subjects who reported that they would feel guilty if they discovered that they were the lowest contributor in their group. These results suggest that more guilt-prone individuals may be more attuned to the potential negative impacts of their actions on the welfare of cooperative partners, and on the status of their reciprocal relationships.

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TH 10:10AM

*Character counts: character information regulates trust in economic games*

**Krasnow M, Cosmides L & Tooby J**

Is the mind designed to use behavior to infer an individual's character, and are these inferences used to regulate decisions to engage in social exchange with that individual? Using an experimental economics paradigm (with real monetary consequences), we show that participants' decisions to trust, cooperate and punish are regulated by character information. Evidence from these studies suggests individuals 1) down-regulate trust for interactants who displayed cheating character outside the context of the game, 2) conditionally defect when defected on first, 3) are less likely to withdraw cooperation if they have punished a defection, and 4) treat cheating as more diagnostic of character than honest behavior. These results support the hypothesis that character information regulates social exchange, and that humans employ a form of 'tit for tat' strategy when making social exchange decisions.

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## 1.2 2D:4D, *Attractiveness*: Chair, N. Pound

Texas 7

TH 9:10AM

*Facial masculinity is not associated with digit masculinity*

**Pound N, Penton-Voak I, & Kempe V**

Second-to-fourth digit ratio (2D:4D) has recently attracted a great deal of attention as a possible index of exposure to prenatal testosterone and as a correlate of variation on a number of sexually dimorphic traits. For example, Neave et al (2003) reported that the faces of men with low (masculine) 2D:4D ratios were perceived to be more dominant and masculine, but not more attractive. Here, however, we show that digit masculinity (low 2D:4D) is not associated with facial masculinity in a sample of 83 men. We use masculinity ratings and error rates in a sex identification task to assess perceptual masculinity. Moreover, we use a principal components analysis of 168 facial landmarks to examine structural masculinity. Digit ratio was not significantly negatively associated with either perceptual or structural facial masculinity. Digit ratio, however, was negatively associated with attractiveness ratings.

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TH 9:30AM

*Second to fourth digit ratio and cooperative behavior*

**Millet K, Dewitte S & Van den Bergh B.**

Low second to fourth digit ratio (2D:4D) is related to high testosterone levels and to markers of high status. In a social dilemma, status can be obtained by acting egoistically (i.e. not contributing one's fair share) or altruistically (i.e. contributing more than one's share). So, we predicted that a low 2D:4D would be associated with high levels of egoism and altruism and low levels of common cooperativeness but we found the exact opposite. Participants with low 2D:4D were more likely to act cooperatively (i.e. contributing exactly one's share) and less likely to act altruistically or egoistically. This suggests (1) that there might be a high and a low testosterone strategy to gain status and (2) that the high testosterone strategy is characterized by a preference for normative behavior. Similarly, in a follow-up study we found that 2D:4D is related with Social Value Orientation: people valuing equality had lower 2D:4D than people valuing either own or joint outcomes.

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Naamsestraat 69

TH 9:50AM

*The 2D4D Ratio and Cyclic Shifts as Predictors of Self-Perception of Quality and Sexual Permissiveness*

**Lyons J & Mellgren R**

This study examines the relationship between the 2D4D ratio and cyclic shifts as predictors of self-perception of quality and sexual permissiveness. A woman's self-perceived quality was predicted to negatively correlate with acceptance of sexual propositions. It was further predicted that when male quality was relatively greater than female SPQ, the probability of accepting a casual sex proposition would be greater. Partial support for this prediction was found. Older females were more likely to accept sexual propositions than younger females, although this age difference decreased with increased male quality. Current research including the effects of activational and developmental levels of hormones on the relationships between sexual permissiveness, self-perceived quality, jealousy, and willingness to engage in casual sex will be discussed. In this ongoing research, the 2D4D ratio is being utilized as an external measure of prenatal exposure to testosterone, and activational levels of estradiol will be estimated by the position in the menstruation cycle reported by the participants will be discussed.

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TH 10:10AM

*Father absence, parent-child relationships and facial attraction in women*

**Boothroyd LG, & Perrett DI**

The purpose of this research was to determine whether or not the father absence literature can be successfully used to predict patterns of female partner preference in adulthood. Study 1 assessed facial masculinity preference, while Study 2 assessed both facial age and real age preference. Predictions were made based on the effect father absence may have on: A. reproductive strategy, B. female 'condition', and C. parental imprinting. Father absence had mixed effects on masculinity preference and was associated with reduced age preference. Daughters who reported low quality relationships with parents showed reduced masculinity and age preferences. These results predominantly support the condition dependence predictions.

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### 1.3 Modularity and Cognition: Chair, G. L. Brase

Hill Country A & B

TH 9:10AM

*What massive modularity must be*

**Carruthers P**

The notion of "modularity" has been given many interpretations in cognitive science, in Fodor (1983) and elsewhere. Which of those notions should be employed, in order that a massively modular account of human cognitive architecture can be defensible? The way to answer this question is to consider the main arguments that have been offered in support of massively modular accounts of the mind, extracting from them a matching account of modularity. These are the arguments from biological design generally, the argument from the organization of learning / animal minds, and the argument from computational tractability. The account of modularity that emerges is much weaker than Fodor's (in particular, modules needn't be encapsulated), but nevertheless substantive enough to be interesting. Viz.: the mind consists of a great many distinct and dissociable processing systems, all of which are computationally frugal in their operations, and with internal processing that is inaccessible elsewhere.

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TH 9:30AM

*Cognitive ontogeny among the Ache of Paraguay as measured by visual evoked potentials and psychometrics*

**Wagner JD, & Walker RS**

Objective assessment of cognitive function among non-Western populations can provide clues to determinants of human brain evolution. This study investigates visual evoked potential (VEP) in 170 Ache (3-75yo) in eastern Paraguay. VEP records electrical activity over the occipital cortex in response to visual stimuli (checkerboard pattern reversal) to define a major peak latency occurring around 100ms after the stimulus (P100). P100 shows rapid maturation (cross-sectional) into adolescence with gradual senescence during adulthood followed by steep senescence after 60 years. Cross-sectional age trends of a fluid intelligence measure (Raven's Progressive Matrices, RPM) demonstrate steeper standardized rates of senescence during adulthood and very low scores in comparison with US values. Working memory assessed by spatial span (SS) shows an age decline intermediate to P100 and RPM and less disparity in comparison with US scores. A sex difference was found for RPM, which we conclude is most affected by past exposure to testing scenarios, and SS to a lesser extent. We encourage neurophysiological methodologies to augment psychometrics in the study of modern human cognitive variation.

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TH 9:50AM

*Disentangling Data Representations in Statistical Reasoning*

**Brase GL**

In the domain of statistical judgments under uncertainty, there is continuing debate about the "frequency hypothesis"; the idea that frequency representations of information are cognitively privileged based on evolved, ecologically rational, dispositions. Two recent criticisms of this hypothesis have involved the use of "chances," which ostensibly are probabilities rather than frequencies, and the use of pictorial representations to increase the transparency of nested-set relationships (Sloman, Over, Slovak, & Stibel, 2003). Experiments are presented here that are designed to address these criticisms, as well as extend our understanding of human statistical reasoning. It appears that the utility of phrasing data as chances and providing pictorial representations is primarily gained by implicitly inducing frequency representations.

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TH 10:10AM

*Are computational adaptations for reasoning about social exchange and precautions neurally as well as functionally distinct? An fMRI study*

**Ermer E, Cosmides L, Tooby J, Guerin S, & Miller M**

Engaging in social exchange and taking precautions to mitigate hazards are distinct adaptive problems. Cognitive studies indicate that reasoning about these two domains is regulated by two different, functionally distinct mechanisms (Fiddick et al. 2000). Recent neuropsychological evidence from a patient with bilateral limbic system damage suggests these mechanisms may be neurally distinct as well: cheater detection was impaired while precautionary reasoning was spared (Stone et al. 2002). If social exchange and precautionary reasoning are caused by neurally distinct mechanisms, there should also be evidence of this in normal, brain-intact individuals. Using event-related functional magnetic resonance imaging, we found different patterns of neural activation in response to Wason tasks involving social exchange, precautions, and descriptive rules. These results contradict hypotheses that claim reasoning about social exchange and precautions is caused by a single computational mechanism.

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## **1.4 Darwinian Literary Studies: Chair, J. Johnson**

**Hill Country C & D**

Room#

9:10AM

*New Darwinism, New Methods: Evolutionary Science and Literary Study.*

**Court A**

This paper will consider the methodological consequences of the concept of human universals as used by Joseph Carroll, Robert Storey, and Brett Cooke, among others, in their proposals for a new Darwinist literary theory. As a scientific hypothesis drawn from the increasingly convergent evolutionary sciences, the concept of human universals has three modes in literary Darwinism: (1) it is a test for the validity of competing theories; (2) it provides for the testing of hypothetical predictions with literary texts; and (3) it suggests the utility of strictly quantitative analyses in literary study. I will briefly evaluate these modes individually, before considering the broader ramifications of the concept of human universals for literary study as a professional practice. Applying

scientific understanding to literature calls for clearly spelled-out methodological arguments, and my contention is that literary Darwinism is not entirely coherent when it addresses questions of method. I suggest that as part of the move toward unification of the sciences and the arts from the evolutionary point of view, the methodological arguments of literary Darwinism must become more compelling.

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9:30AM

*Evolution and Fiction*

**Boyd B**

As a species, humans invent and imbibe fiction compulsively. Why? I propose a multileveled adaptive explanation, in terms of our adaptations for 1) understanding events (especially our intuitive ontologies, or theories of things, kinds, minds); 2) representing events (narrative); 3) art in general (the evidence suggests that music and the visual arts preceded fiction); and 4) inventing events, in fiction from pretend play to Proust. Fiction cannot be explained as a byproduct even of our capacity for narrative, or in terms of sexual selection. It is an adaptation, its prime function to allow us, with our intensely agential focus, to develop a capacity to think beyond the here and now, and so to free us in some measure from the given. An evolutionary explanation of fiction cannot ignore the role fictions have had in pre-scientific explanation and in religion, but it must still seek to disentangle the functions of "pure" fiction, fiction recognized as fiction.

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9:50AM

*QWERTYUIOP and EP: Implications of Evolutionary Psychology for the Working Fiction Writer*

**Horvath T**

The evolutionary psychological paradigm has at last entered the halls of literary study under various monickers, most prominently "Literary Darwinism" and "biopoetics." The surge of interest in this promising intersection of fields is marked by the publication of Joseph Carroll's *Literary Darwinism*, as well as the debut of a new Biopoetics listserv. It is crucial that fiction writers not be excluded from the conversation at this critical juncture, as the creative process poses fundamental challenges in terms of how we can understand the relationship between evolved propensities and literature. Using Carroll's "Diagram of Human Nature" (pg. 201) and Robert Boswell's essay "Narrative Spandrels," we will argue that EP offers working writers a rich combinatorial palette that can be almost infinitely generative in terms of charting and representing human behavior. As working fiction writers, we will show how the adaptationist perspective informs and shapes our work. Finally, we will conclude by speculating as to why fiction endures as such a compelling art form, and why it should therefore be of great interest to anyone working with an evolutionary framework.

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10:10AM

*Individual Differences in the Achievement of Evolutionarily Relevant Goals in Victorian Novels*

**Carroll J, Gottschall J, Johnson JA, & Kruger D**

This is a progress report on an ongoing project that replicates and extends earlier Darwinian analyses of characters from canonical British novels (Carroll & Gottschall, 2004). The scope of the project has been extended

from 270 characters in 44 novels in the previous study to roughly 2100 characters from 200 novels. Whereas characters in the earlier study were rated by 12 students using novel summaries, thus far over 500 characters in the present study have been rated on the Web by over 900 scholars of 19th Century British literature. Preliminary analyses replicate Carroll and Gottschall's findings of differences between protagonists and antagonists in motives, mate selection preferences, and personal qualities. New findings indicate that successful achievement of five evolutionarily relevant goals (achieving status, building coalitions, being creative, physically surviving, and finding a mate) are significantly related to one or more of the Big 5 personality dimensions for protagonists, but only weakly related for antagonists. The current analyses indicate how Victorian literature embodies assumptions about how individual differences in personality and character impact on life success.

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## 2.1

## Texas 5 & 6

### ***New Perspectives on the Evolutionary Foundations of Religion: Chair, J. Bering***

This symposium addresses the byproduct hypothesis of religion by pitting it against several novel theoretical models. Most of the presenters argue that aspects of religion were uniquely evolved for life in complex groups. Kirkpatrick reasons that religion simply capitalizes on mundane psychological systems that solved specific adaptive problems. Investigating the adaptive function of religion is likely misguided. Johnson sees the threat of supernatural punishment as solving an adaptive problem specific to human sociality. Such beliefs conferred selective advantages by restraining selfish acts and promoting cooperation. Alcorta proposes that there is an adaptive complex that is unique to religion. She argues that religious rituals communicate information about social relations by broadcasting commitment to group norms. Bering shows that distinct processes underlie beliefs about dead agents' minds and argues that the illusion of a supernatural morality may be an illusion by design.

TH 10:40AM

*Adaptationist Versus Byproduct Theories of Religion.*

**Kirkpatrick LA**

In this paper I present several arguments against the proposition that religion reflects a functionally distinct adaptation designed specifically to produce religious beliefs or behaviors. For example, adaptationist theories of religion tend to explain only one or a few of the diverse features of religion; fail to account adequately for individual differences in these phenomena; fail to address a variety of phenomena that seem closely related to religious belief, such as superstition, astrology, and other paranormal beliefs; overlook the availability of much simpler designs available to natural selection for solving the same presumed adaptive problems more efficiently; tend to focus on postulated adaptive benefits without adequately weighing adaptive costs of proposed designs; overestimate the inclusive-fitness value of purported psychological and physical-health benefits; and/or propose group solidarity/cooperation benefits that fail to adequately solve well-known theoretical obstacles in this domain. I argue instead for the alternative view that religion reflects byproducts of numerous adaptive psychological mechanisms designed for other (non-religion) purposes.

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TH 11:00AM

*Supernatural Punishment and the Evolution of Cooperation.*

**Johnson D**

Cooperation relies on a credible threat of punishment to deter cheats. However, punishing is costly, so it remains unclear who incurred the costs of enforcement in our evolutionary past. Building on the work of Johnson and Kruger (2004; *Political Theology*, 5: 159-176), I suggest that cooperation was promoted by a belief in supernatural punishment for social transgressions. Whether genuine or not, such beliefs commonly impact on people's

selfish/cooperative behaviour in modern, hunter-gatherer and ancient societies. A belief in supernatural punishment, I argue, conferred individual-level selective advantages, by restraining more ancient selfish motives that had become counter-productive with the advent of a dramatic novelty in all of evolutionary history: the human "theory of mind" and complex language, both of which increased the risk of social exposure and retaliation for selfishness (Bering & Shackelford, in press, Review of General Psychology).

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TH 11:20AM

*Ritual, Emotion, and Sacred Symbols: The Evolution of Religion as an Adaptive Complex.*

**Alcorta CS, Sosis R**

This presentation considers religion as a unique human adaptation growing out of non-human ritualized display but diverging from such display through the emergence of four novel components. These components include: music-based communal ritual, separation of the sacred and the profane, belief systems incorporating supernatural agents and counterintuitive concepts, and the importance of adolescence as a preferred developmental period for religious transmission. We consider the critical element differentiating religious from non-human ritual to be the conditioned association of emotion and abstract symbols. Neurophysiological mechanisms underlying such associations are proposed. We argue that the brain plasticity of human adolescence constitutes an "experience expectant" developmental period for ritual conditioning of sacred symbols, and we suggest that such symbols evolved to solve an ecological problem by extending communication and coordination of social relations across time and space.

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TH 11:50AM

*On the Possibility of Adapted Responses to Dead Agents' Minds.*

**Bering J, McLeod K, Shackelford TK**

We investigated whether (a) people positively reevaluate the characters of recently dead others and (b) supernatural primes concerning an ambient dead agent serve to curb selfish intentions. In Study 1, participants made trait attributions to three strangers depicted in photographs; one week later, they returned to do the same, but were informed that one of the strangers had died over the weekend. Participants rated the decedent target more favorably after learning of his death whereas ratings for the control targets remained unchanged between sessions. This effect was especially pronounced for traits dealing with the decedent's prosocial tendencies (e.g., ethical, kind). In Study 2, a content analysis of obituaries revealed a similar emphasis on decedents' prosocial attributes over other personality dimensions (e.g., achievement-relatedness, social skills). Finally, in Study 3, participants who were told of an alleged ghost in the laboratory were less likely to cheat on a competitive task than those who did not receive this supernatural prime. The findings are interpreted as evidence suggestive of adaptive design.

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**Session 2.2: Humor and Laughter: Chair, J. A. Thomson Jr.**

**Texas 7**

TH 10:40AM

*Costly Signaling and Humor.*

**Greengross G**

Although not easy to define, humor has largely been considered to be an adaptation mainly due to its universality, early onset and similarity in related species. Sense of humor seems to play an important role in sexual selection and, as a mental indicator, may be an indirect signal of fitness. This signal seems to be more important for women, who consider it one of the most desired traits in a mate. In recent years there has been an increased focus on the role of costly signaling theory (CST) in human behavior. For example, in hunter gatherer societies, individuals handicap themselves by hunting more than they actually can consume. An application of CST to humor is suggested. Humor can be seen as a reliable indicator of mate value in those who can afford to use it against themselves. Therefore, we expect that individual status will be the key to the extent that people use self-deprecating humor and how successful they are in using it.

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TH 11:00AM

*Slapstick Brains: Does the New Neurology of Humor Shed Light on Humor's Evolution and Function?*

**Thomson JA, Jr**

Advances in neural imaging now permit studies of laughing brains. Several groups of scientists with different modalities demonstrated common areas of brain activation. These studies suggest a revised theory of humor's evolution and function and a relation to depression. Humor in all its known varieties and techniques is universal. Hobbes thought humor expressed superiority. Freud believed it allows satisfaction of sexual or hostile instincts, the momentary expression of undesirable impulses from the unconscious. Evolutionary thinkers have joined the fray. Chafe sees humor as a disabling mechanism. Alexander believes it manipulates status. Weisfeld theorizes humor functions for social learning. Dunbar places it in his arena of social grooming. Pinker postulates humor as both an anti-dominance weapon and a dominance-dissolver friendship glue. Ramachandran, using neurologic patients, proposes a 'false alarm' theory. With "wit to woo," Miller moves it to the domain of sexual selection. Humor signals creativity, intelligence, energy, and youth. Flamson offers a synthesis: humor arose from assessing trust in dyadic bonds to differential exaptation for service in coalitions, mating, and rank negotiation. Neural imaging data support some of these theories more than others.

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TH 11:20AM

*Laughter in Congenitally Deaf Versus Normally Hearing College Students.*

**Makagon MM, Owren MJ, Funayama ES**

The developmental and phylogenetic origins of human laughter are not well understood, with available evidence inconsistently suggesting both innate stereotypy and high variability in laugh acoustics. We examined this issue by investigating laughter in 19 congenitally deaf students, with little or no auditory experience, and in 23 normally hearing students. Acoustic analyses focused on temporal and spectral features, as well as vocal production modes. Repeated-measures ANOVA testing indicated marked similarity in laughter produced by the two groups. Acoustic differences in amplitudes ( $p < 0.01$ ) and durations ( $p < 0.01$ ) likely reflect socially prescribed suppression of loud vocalizations by the profoundly deaf, but may also result from higher phonation thresholds or weakened vocal-fold responsiveness. Finding overall similarity in laugh acoustics indicates an innate foundation for the neural circuitry involved, and that specific auditory experience is not a prerequisite for the development of these species-typical sounds. Nonetheless, laugh acoustics within both groups were also quite variable, suggesting a corresponding diversity, rather than stereotypy in underlying motor behavior.

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TH 11:40AM

*Evidence for the Encryption Model of Humor.*

**Flamson T**

This talk will present a computational model of a relatively unexplored feature of the production and processing of humor - encryption. Drawing on the framework of Relevance Theory, this hypothesis proposes that a necessary component of humorous production is the compression of multiple, divergent lines of inference within a given utterance. Only those individuals who share the assumptions necessary to derive the extra implicatures are able to decrypt them, and to draw additional inferences about the producer of the humor, including the inference that the producer and audience share these implicit assumptions. The results of preliminary studies showing evidence for the encryption hypothesis will be presented, and the evolutionary origins of such a mechanism will be discussed.

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**Session 2.3: Sex Ratio: Chair, V. Lummaa**

**Hill Country A & B**

TH 10:40AM

*Famine, Operational Sex Ratio, and Discriminative Parental Solicitude.*

**Scheyd GJ**

Famine has been a recurrent problem in human evolutionary history. The onset of famine brings with it a sharp decrease in fertility, while the aftermath reliably includes a period of unusually high fertility. This phenomenon, in conjunction with female preferences for mates slightly older than themselves, eventually yields a population with a low (Male/Female) operational sex ratio. The skewed sex ratio, in turn, leads to increased female intrasexual competition, diminished choosiness, more sexually permissive attitudes, and higher male reproductive success. Therefore, those males born or conceived during a famine have unusually high reproductive value. Parents who are biased either toward the production of male as opposed to female offspring during famine (granting that production of any offspring during a famine is rare) or who show favoritism toward sons born or conceived during a famine will consequently be selectively advantaged compared to parents with no such bias. I have examined historical reports of five famines: Ireland (1845-1850), China (1935), Holland (1944-1945), Bangladesh (1974-1975), and Ethiopia (1984-1985) and found modest evidence in support of the predicted parental bias.

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TH 11:00AM

*Low Operational Sex-Ratios, Risky Sexual Behavior, and the Spread of HIV/AIDS among African-American Women.*

**Gant LM, Heath KM**

Current data show that the highest increase in HIV/AIDS rates in the United States is among heterosexual African-American women. Despite prevention initiatives emphasizing ABC (abstinence, be faithful, condom use) safe sex practices, one or both partners in many relationships continue to engage in risky sexual behavior. Here we argue that low operational sex ratios coupled with cultural features of endogamous partner preference and monogamous marriage laws foster risky sexual behavior responsible for the majority of new HIV/AIDS cases in the United States. We calculated the operational sex ratio for African-Americans for each state based on the number of single heterosexual males and females over 18 years old not incarcerated and found sex ratios as low as 70 males per 100 females. Such extreme operational sex ratios in the United States are the result of structural and systemic inequalities and unless the underlying causes are addressed, HIV/AIDS rates will continue to increase, not decrease, in the most prosperous of developed nations.

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TH 11:20AM

*Adaptive Control of the Sex Ratio in Mammals?*

**Grant V**

Although sex determination in mammals is thought by many to be a matter of chance, others are reluctant to conclude that significant results in studies showing alterations in the sex ratio must therefore be due to sampling error. Furthermore the chance view of sex allocation is not consistent with the fact that in humans, the normal secondary sex ratio is 105:100 in favor of males, even though x- and y- sperm are present in equal numbers. Some of the problems in sex allocation theory might be solved if more consideration were given to maternal factors. I argue that the maternal dominance-testosterone link could provide the basis for a physiological pathway to sex-predetermination, and, since stress raises maternal testosterone levels, could also lead to adaptive alterations in the sex ratio. This idea does not preclude the sex-determining role of spermatozoa. It is the "gets-there-first" part of the proposition I question.

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TH 11:40AM

*Sex Ratio at Birth Affects Reproductive Success in Humans.*

**Lummaa V, Pettay JE, Russell AF**

In litter-bearing mammals prenatal exposure of females to hormones from adjacent males can lead to downstream effects on female anatomy, physiology, behaviour and reproduction. We tested the hypothesis that hormones of a co-twin affect prenatal masculinisation in humans. We investigated whether such effects have consequences for female and male lifetime reproductive success using demographic data from pre-industrial Finns living in natural mortality and fertility conditions. We show that adult women from male-female twin births have reduced probabilities of marrying and reproducing compared to women from female-female twin births. Furthermore, they produce fewer offspring in their lifetime and raise fewer to adulthood. In contrast, adult men from male-female twin births have similar breeding probabilities and lifetime reproductive success as men from male-male twins. Our analyses control for maternal age, birth order, survival of the other twin and socio-economic status. Furthermore, the differences found are unlikely to be caused by postnatal socialization experiences unique to girls growing with a same-aged brother, as the results remained unchanged when we only included women whose brother died immediately after birth.

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## Second Session 2.4: *Menstrual Cycle I*: Chair, S. A. Rohwer

Hill Country C & D

TH 10:40AM

*Dietary Changes Across the Menstrual Cycle.*

**Fleischman, DS**

The female menstrual cycle consists of three phases each with differing adaptive goals. During the luteal phase the female body prepares for conception and implantation. Midluteal immunosuppression is an adaptation that prevents the maternal immune system from attacking the half-foreign blastocyst thereby facilitating implantation and survival. Fessler (2001) has hypothesized that during the luteal phase an aversion to meat, a historically pathogen-rich food, would be adaptive in preventing infection. I used a diary survey which recorded food intake and physical symptoms to test the following hypotheses: 1) rates of meat intake will decrease midluteally 2)

women who are not sexually active will display less immunosuppression and will eat more meat midluteally because meat is highly nutritious and abstaining from meat is costly 3) women will compensate for a drop in meat intake by eating other protein rich foods midluteally 4) during menstruation women will "rebound" on their meat intake 5) contraception which increases progesterone, correlated with both luteal phase immunosuppression and pregnancy sickness, will cause a greater drop in midluteal meat intake.

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TH 11:00AM

*The Effects of Ovulatory Cycle on Women's Clothing Preferences.*

**Li N, Durante K**

Because the costs of pregnancy and nursing are high for women, and offspring require significant resources, a long-term mating strategy is generally more reproductively beneficial for women than a short-term strategy (i.e., sex with no commitment) is (e.g., Buss & Schmitt, 1993). However, there may be specific conditions or situations in which the reproductive benefits of short-term mating outweigh the costs. Obtaining better genes is a viable strategy when conception is likely. Because conception is most likely to occur around the time of ovulation, the point at which a woman is in her menstrual cycle may be a relevant factor in determining the potential reproductive benefits of a short-term mating strategy. One way to signal short-term availability may be to wear more revealing clothing (Grammer, 1996). The current study sheds light on whether women's clothing preferences are influenced by their ovulatory cycles as well as other variables that may interact with the menstrual cycle. We compare women's clothing preferences around the time of ovulation to preferences on days in which fertility is expected to be low.

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TH 11:20

*Cell Phones and Pheromones: Mate Guarding in Humans.*

**Rohwer SA**

Previous research suggests that females are more likely to engage in extra-pair copulations during fertile phases of their cycle (Thornhill & Gangestad, 2003). Males are thus predicted to increase mate guarding intensity during these times (Buss & Schmitt, 1993). Novel technologies, such as cell phones, may allow for close monitoring of a mate's behavior especially when couples do not live in close proximity. I tested whether male call frequency to his partner increased during the fertile phase of her cycle and whether females increased calls to extra pair males during fertile phases. Results indicate that call frequency is mediated by relationship quality and seriousness; there was no difference in male calling across his mate's cycle, however for females who co-habitated with their mates, call frequency peaked during the fertile phase of her cycle. Whereas if females were not living with their partners, calls to extra-pair males peaked during their fertile phase.

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TH 11:40

*An Alternative Explanation for Menstrual Phase Effects on Women's Psychology and Behavior.*

**Roney J**

A fascinating collection of studies has recently presented evidence that women may express mechanisms that shift their mate preferences toward men with indicators of "good genes" when women are within the fertile window

of the menstrual cycle. In this talk, I argue that within-cycle preference shifts may be by-products of mechanisms that regulate mating psychology between cycles. In particular, women may possess mechanisms that use hormonal signals to down-regulate the salience of mate choice characteristics during anovulatory cycles and up-regulate them during ovulatory cycles. If shifts in ovarian hormones within cycles parallel shifts when moving between anovulatory and ovulatory cycles, then within-cycle effects may be by-products of such a between-cycle mechanism. The talk will present evidence consistent with this position, explore its implications if correct, and suggest empirical means of arbitrating between the competing explanations for cycle phase effects.

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### Thursday Afternoon Plenary 1pm

Texas 5-7

#### Douglas Mock - *Children Left Behind: Contrarian Views of the Nuclear Family*

Natural selection is generally expected to favor reproductive strategies that maximize total numbers of viable offspring produced over a lifetime, but many unpredictable ecological forces obscure the optimal family size that delivers such a result. At the onset of a breeding cycle, parents must commit to an integer number of progeny (say, the number of eggs to lay in a bird nest) that can be adjusted only downward later. As a result, the practice of initial parental overproduction is extremely widespread, wherein adults aim high to create an "optimistic clutch size", coupled with various mechanisms for trimming away some of the progeny that exceed the family budget's capacity. Not surprisingly, the designated-victims resist being eliminated and it appears that parents take steps to minimize the costs of brood reduction, giving favored offspring larger eggs or more yolk steroids and occasionally even performing the execution. In many bird species, parents simply commence effective incubation before all eggs are laid, an act enabling senior embryos to hatch ahead of nestmates. The early growth achieved from that head-start produces enduring competitive asymmetries and nonrandom starvation. In species where the young also possess modest weaponry, overt aggression may enforce and exaggerate the senior sibs' greater access to parentally delivered food. Because the parents are typically architects of these handicaps and advantages, siblicide should often be viewed as part of a parent-offspring collaboration and not a conflict. In short, overt parental favoritism is likely to be extremely widespread across the animal and plant kingdoms.

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### Thursday Early Afternoon Paper Session

#### Session 3.1:

Texas 5 & 6

#### *No Longer a Cherry But Still a Tomato: Browsing the Salad Bar of Mating*

Chair, V. A. Weekes-Shackelford

The emphasis of this symposium is on examining how sexual psychology changes after becoming a parent. Past research on this topic has focused on the negative mating consequences (e.g., decreased mate value) for individuals with children compared to individuals without children, a finding to which the researchers in this symposium do not object. The researchers in this symposium offer an empirical enlightenment of some of the sexual psychological intricacies when a child becomes a part in the equation. Weekes-Shackelford et al. will address the possibility of mothers using their daughters to exploit men's mating preferences. Stone et al. will examine differences in mating preferences between women with children and women without children. Duntley will discuss men's and women's mate preferences for mating with single parents. Easton et al. will discuss how the sexes differ in their mate preferences after having children

TH 2:10PM

*Luring a Mate: An Exploitation of Mate Preferences.*

**Weekes-Shackelford VA, Shackelford TK, Stone EA, Easton JA**

Separation and relationship dissolution were likely recurrent features of ancestral human life. Women likely retained any children from a dissolved mateship, and, therefore, would have been the sole provider for herself and her children. If men have evolved preferences for cues that highlight women's current and future reproductive potential, then female psychology may include features designed to exploit these preferences in male psychology. I explore the possibility that women may use their reproductive age daughters from a previous mateship as "lures," to attract a new mate or maintain their current mate. It is hypothesized that women with daughters approaching or at reproductive age will remarry (a) at a higher rate and (b) sooner than will women with sons. Participants include university students who completed an online survey. Discussion includes alternative explanations for the current findings and future directions for this topic of research.

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TH 2:30PM

*How Having a Child Changes Female Mating Psychology.*

**Stone EA, Weekes-Shackelford VA, Easton JA, Shackelford TK**

Women with children from a previous mateship are likely to have been a recurrent feature of evolutionary history. Previous research indicates that contextual factors influence women's preferences for certain qualities in a potential mate. Because the presence of a child from a previous mateship yields a different set of problems than those yielded when there is no child from a past mateship, we hypothesize that women with children, relative to women without children, will differ in their ratings of the importance placed on a particular mate preference. The degree of mate preference changes are also predicted to be influenced by the woman's age and the child's age. To test this hypothesis, several hundred university students completed an online survey. Discussion will highlight other potential variables that might account for some variation in mate preference changes.

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TH 2:50PM

*Adaptations for Mating Relationships Involving Single Parents.*

**Duntley JD**

Due to the death of a spouse or the dissolution of a mateship, single parents were likely a recurrent feature of ancestral environments. I hypothesized four design features of psychological adaptations that may have evolved to address recurrent problems of mating relationships involving single parents. (1) As a strategy to obtain resources or a long-term mate, female single parents will be more agreeable to short-term relationships than women with no children. (2) Their greater agreeableness to short-term mating and demonstrated ability to bear offspring will make female single parents more attractive in some respects as short-term partners than women with no children. (3) Because men typically prefer younger women and women typically prefer older men as mates, men more than women will view single parents' opposite sex children as potential mates. (4) Because the ex-mates with whom single parents had children can inflict costs on new partners, single parents will be more attractive when their ex-mates are absent from their lives. Four empirical studies (Total N = 691) were conducted to evaluate these and other hypotheses. Discussion focuses on the nature of adaptations devoted to mating relationships with individuals who have children from previous relationships.

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TH 3:10PM

*After Having Children: Sex-Differentiated Changes in Mate Preferences.*

**Easton JA, Stone EA, Weekes-Shackelford VA, Shackelford TK**

Empirical evidence for sex differences in mating preferences has been widely documented. Some changes in mate preferences can be attributed to contextual factors. We propose that the presence of a child may be one context in which mate preferences change in a sex-differentiated ways. The current study replicates and extends prior research by examining how the sexes differ in mate preferences after having children. Several hundred participants recruited from a South Florida university completed an online survey asking them to rate a series of characteristics of a potential romantic partner. Results of the current study (a) replicate previous research on sex differences in mate preferences and (b) extend previous research by examining how changes in mate preferences may be attributable to an individual having a child from a previous partner.

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### Session 3.2: *Testosterone Research*: Chair, R. Thornhill

Texas 7

TH 2:10PM

*Men's Testosterone and Life History in a Caribbean Rural Village.*

**Gangestad SW, Thornhill R, Flinn MV, Dane LK, Flacon RG, Garver-Apgar CE, Franklin M, England BC**

Men's testosterone (T) has been conceptualized as a modulator of reproductive effort (e.g., Ellison, 2002). Through a distributed communication network, increases in T shift energetic resources toward greater effort to obtain and attract new mates, significantly through male-male competition. Decreases in T shift energetic resources away from these efforts and toward care for (and possibly retention of) existing mates and offspring (as well as, perhaps, somatic maintenance). Ability to mobilize mating effort through T may be condition-dependent under energetic constraints. We examined men's T levels in a rural village on Dominica, West Indies. With age controlled, men with children had lower and less variable T than unmated men. Among unmated but not paired men, those exhibiting greater developmental stability (higher symmetry) had higher T. Mated men spent more time with their partners during the fertile phase of the cycle, at which time men's T levels dropped.

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TH 2:30PM

*Diurnal Shifts in Testosterone Predict Diurnal Shifts in Vocal Dominance in Men.*

**Feinberg DR, Law Smith JM, Jones BC, Cornwell RE, DeBruine LM, Moore RE, Sharpe M, Al-Dujalli EAS, Perrett DI**

In men, testosterone (T) is positively related to aggression, competitiveness and dominance, all of which can aid in intrasexual competition. T also positively predicts masculinity of vocal traits. Men's T is lowest in the afternoon and highest in the morning. Danger of physical altercation may be particularly acute at time characterized by high T (e.g. morning). Men may benefit from being more perceptive of dominance cues in other men at these times as not to misjudge the dominance of others, risking physical and mental anguish, and lowered reproductive success incurred from loss in dominance bouts. We tested if men perceived masculinized voices (lowered pitch & increased vocal-tract length) as more dominant than feminized voices, and if this perceptual pattern was heightened in the morning. Masculinized voices were more dominant sounding than feminized voices. Discrimination of dominance was enhanced in the morning. Men with the largest change in T showed the largest change in attributions of dominance to men's, but not women's voices. This suggests that dominance perceptions depend on the expression of dominance in the signaler and in the perceiver's hormonal state.

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TH 2:50PM

*Fathers Have Lower Salivary Testosterone Levels Than Unmarried Men and Married Non-Fathers in Beijing, China.* **Gray PB, Yang CJ, Pope HG, Jr.**

A growing body of evidence, almost entirely from North America, has found that male testosterone levels are positively associated with mating effort (male-male competition and mate seeking behavior) while lower testosterone levels have been associated with affiliative pair bonding and paternal care. To expand the cross-cultural scope of this research, here we investigate variation in salivary testosterone levels among Chinese men in relation to marital and parenting variables. One hundred twenty-six men drawn from a Beijing university setting between the ages of 21 and 38 completed a questionnaire and provided both morning and late afternoon saliva samples from which testosterone levels were measured. The 66 unmarried men had higher levels of testosterone than the 30 married non-fathers, but this difference was not statistically significant. However, the 30 fathers exhibited significantly lower testosterone levels than both unmarried men and married non-fathers. These data are the first outside of North America to show lower testosterone levels among fathers, and lend support to the theoretical view that male testosterone levels differ according to mating and parenting effort.

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TH 3:10PM

*Testosterone and Human Aggression: An Evaluation of the Challenge Hypothesis.*

**Archer J**

Research on testosterone-behavior relationships in humans is assessed in relation to a version of the challenge hypothesis, originally proposed to account for testosterone-aggression associations in monogamous birds. Predictions were that that testosterone would rise at puberty to moderate levels, which supported reproductive physiology and behavior. Sexual arousal and challenges involving young males would raise testosterone levels further. In turn, this would facilitate direct competitive behavior, including aggression. When males are required to care for offspring, testosterone levels will decrease. Testosterone levels will also be associated with different behavioral profiles among men, associated with life history strategies involving emphasis on either mating or parental effort. Evidence from human studies is reviewed in relation to these predictions, where possible using meta-analysis. Most predictions were supported, although existing studies were not designed to specifically test the challenge hypothesis. Further studies arising specifically from the hypothesis are suggested.

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### **Session 3.3: Emotional Expression: Chair, A. Sell**

### **Hill Country A & B**

TH 2:10PM

*Genetic and Cultural Components of Emotional Expression Observed in Movie Remakes.*

**Ozawa N, Togawa T**

Both animals and humans have emotions, and even share some facial expressions. On the other hand, some cultural differences in human facial expression and gesture are easily recognized. This study examines cultural differences in emotional expression in movie remakes. Remakes provide a convenient comparison for observing the same emotional situation in different cultural contexts. While the actions of actors are not genuinely natural, commercial films might be made so that these acts would be commonly accepted. We compared in an original and its remake corresponding scenes in which emotional expression is essential to the story. One result was the recognition that the facial expression of each basic emotion is common among different cultures, although the strength of emotional expression is different. Significant differences are found in gestures, yet differences remain within a common range in which all understand one another.

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TH 2:30PM

*Physical Strength Predicts Entitlement, Anger and Attitudes About Aggression in Men.*

**Sell A, Tooby J, Cosmides L**

Anger is theorized to be an adaptation for increasing the extent to which another individual values your welfare relative to their own. Consistent with this theory, the primary causes of anger appear to be indications that another does not value your welfare, and the behaviors activated by anger appear designed to recalibrate another's valuation through argumentation or violence. In the EEA, the extent to which one could force another to value one's interests would have been partly determined by physical strength. Therefore, it was hypothesized that individuals who are physically stronger will expect their interests to be given more weight and thus will become angry over a greater range of offenses. In three separate studies of college-aged males, positive correlations were found between measures of physical strength and measures of entitlement, anger, past aggression, and attitudes about the utility of force.

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TH 2:50

**TBA**

TH 3:10PM

*Emotion Perception and Expression: Developmental and Evolutionary Aspects of Social Behavior in Adolescents.*

**Coultas JC, Ho TY**

Is there a link between emotion perception skills and the ability to describe and express prosocial and antisocial behaviors? Is awareness of rejection and belonging linked to a greater ability to recognize facial expressions of emotions? This paper focuses on the developmental aspects of emotional intelligence in 11/12 years old in two schools. 192 pupils were asked to identify facial expressions of emotions (happiness, sadness, fear, surprise, anger, and disgust) from photographs, at the beginning and end of the school year. 18 pupils were asked to identify fear from photographs of facial expressions of emotions, as a part of an in-depth study on fear recognition. The 192 pupils also described an incident in which another child made them happy and an incident when another child upset them. The results demonstrated that there was an increase in mean emotion perception scores. Logistic regression indicated that pupils who described rejection scored significantly higher on the emotion perception task. These results are discussed in terms of evolutionary aspects of emotional intelligence testing, the developmental aspects of fear recognition, and the contribution of an 'awareness of rejection' to group cohesive behavior.

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### Session 3.4: *WHR and Mating*: Chair, D. Singh

Hill Country C & D

TH 2:10PM

*Beauty is in the Eyes of Plastic Surgeons: Waist-to-Hip Ratio is More Important Than Weight.*

**Singh D**

Waist-to-hip ratio (WHR) is a reliable indicator of female reproductive age, risk for disease and sex hormone profile. Previous research has shown that changes in the size of WHR affects female attractiveness judgments. Some researchers have argued that changes in attractiveness judgments attributed to WHR are really due to body weight reduction of figures with low WHR. To show that the link between WHR and female attractiveness is not an artifact of reduced body weight, I obtained attractiveness judgments of pre- and post-operative photographs of the lower torso of normal weight women who underwent plastic surgery (microfatgrafting and intramuscular implants, none of which lead to weight reduction post-surgically). Results show that post-surgical photographs depicting lower WHR were judged to be more attractive than the pre-operative photograph depicting high WHR. These findings suggest that attractiveness judgments based on the size of WHR are not an artifact of reduction in weight.

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TH 2:30PM

*The Structure and Measurement of Human Mating Strategies.*

**Jackson JJ, Kirkpatrick LA**

Despite recent theoretical developments that focus on the importance of mixed mating strategies, the measurement of individual differences in this domain has continued to employ unidimensional scales that anchor long- and short-term mating at opposite ends of a bipolar continuum. Along these lines, the Sociosexual Orientation Inventory (SOI), which assesses a single dimension of restricted vs. unrestricted sociosexuality, has become the leading empirical measure of individual differences in mating strategy. We argue that unidimensional scales like the SOI fail to capture crucial variability in mating strategies and suggest that a multidimensional scale is needed. To develop and validate such a measure, we expanded the SOI to include attitudinal items measuring both long-term and short-term mating orientations. Principal components analysis distinguished between these two attitudinal factors, as well as a third distinct factor reflecting previous sexual behaviors. We also present data demonstrating that these long-term and short-term attitudinal dimensions are only moderately intercorrelated and are differentially predictive of other theoretically relevant variables.

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TH 2:50PM

*Does Low WHR Signal Maximal Brain-Building Capacity?*

**Lassek W, Gaulin S**

Why is the waist/hip ratio (WHR) a criterion of male mate choice? Among primates, humans show great sexual dimorphism in body fat probably due to the demands of brain growth. Brains are approximately 60% fat by dry weight, of which 30-35% is long-chain polyunsaturated fatty acids (LCPUFAs), rare in Western diets, and much more abundant in brain than in other tissues. We 1) use the National Health and Nutrition Survey to map life-history changes in WHR and 2) and detail lipid demands of pregnancy and lactation in relation to female fat metabolism. Controlling for age and BMI, WHR increases with parity: waist increases while hip and thigh fat deposits decrease. Women a) selectively store LCPUFAs in the hips and thighs during adolescence, b) do not metabolize fat from these depots except during the third trimester and lactation, times of peak brain growth, c) exhibit physiological signs that their ability to deliver LCPUFAs is operating at capacity during these times and d) even in well nourished populations, deplete these stores over their reproductive lifetime. Given these patterns, low WHR may signal maximum resources available for fetal and neonatal brain growth.

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TH 3:10PM

*Preference for Symmetry and Waist-to-Hip Ratio is Influenced by Relative Mate Quality in a Sample of Young Jamaicans.*

**Jacobson AS, Brown WM, Trivers RL**

Human mate preferences may not be absolute but rather dependent upon an individual's condition. A sample of 96 Jamaican children was examined to test whether the attractiveness of symmetry was affected by an individual's relative mate quality. Fluctuating asymmetry (FA) was used as a measure of mate quality in both sexes and Waist-to-Hip Ratio (WHR) in females only. Lower WHR in females was significantly associated with preference for symmetrical males. Lower FA in males was significantly correlated with preference for more symmetrical and lower waist-to-hip ratio females. These findings are consistent with previous research that condition-dependent selection operates in humans.

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## Thursday Late Afternoon Paper Sessions

**Session 4.1:**

**Texas 5 & 6**

***Sperm Competition in Humans: Chairs, A. T. Goetz & T. K. Shackelford***

This symposium will address current theoretical and empirical work on sperm competition (SC) in humans. SC is a unique selection pressure that has the potential to build unique adaptations in both sexes. SC has been studied in nonhuman animals since the 1970s and has recently been applied to human sexual behavior by a number of researchers. In this symposium, Goetz and Shackelford will discuss the possibility of wife rape as a SC tactic. Klusmann will discuss SC as an explanation for constant male sexual motivation in a long term partnership. LaMunyon et al. will discuss how sex differences in men's and women's sexual psychology produce sex-similar preferences for a short-term mate. Shackelford et al. will discuss whether mate retention and copulatory frequency are competing or complementary anti-cuckoldry tactics in humans. Pound will offer brief discussion on each of the presentations and suggest relevant future directions for work on human SC.

TH 3:40PM

*Forced In-Pair Copulation as a Sperm Competition Tactic in Humans.*

**Goetz AT, Shackelford TK**

Rape of women by men might be either an adaptation that was selected for because it contributed directly to reproductive success by increasing partner number, or it might be a byproduct of other male psychological adaptations associated with aggression and the desire for sexual variety. Although increasing sexual partner number is necessary for both the "rape as an adaptation" hypothesis and the "rape as a byproduct" hypothesis, neither hypothesis addresses directly why men sometimes rape their long-term partners, to whom they already have sexual access. In other species, forced in-pair copulations have been observed immediately following extra-pair copulations. This is often interpreted as a sperm competition tactic, whereby the in-pair male is attempting to minimize the risk of cuckoldry by placing his sperm in competition with sperm from the extra-pair male. We argue that forced in-pair copulation may be a sperm competition tactic in humans as well, and we present preliminary supportive evidence drawn from several literatures.

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TH 4:00PM

*Sperm Competition as an Explanation for Constant Male Sexual Motivation in a Long Term Partnership.*

**Klusmann D**

Changes of sexual motivation in relation to the duration of partnership are investigated in two studies, a sample of students (2000) and a set of three representative population samples (775) with age groups 30, 45 and 60. In the samples of 30 and 45 years male motivation stays at the same level regardless of how long the partnership had been lasting at the time of the interview; female sexual motivation matches male motivation up to about two years after the beginning of the partnership and then steadily drops to lower levels. In the sample aged 60 male sexual motivation drops in the same way as female motivation does, but always stays above the female's curve. These results are interpreted as expressing evolved designs for sexual motivation in long term couples, fine tuned to the specific life situations of males and females. Male motivation is hypothesized as having been shaped by the benefits of effective mate guarding. A constant frequency of copulation is seen as a safeguard against the risk of cuckoldry through sperm competition. In contrast, female motivation is seen as originating from the reproductive advantage of establishing a pair bond.

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TH 4:20PM

*Mate Preferences for a Short-Term Sexual Relationship.*

**LaMunyon CW, Shackelford TK, Goetz AT, Quintus B, Weekes-Shackelford VA**

Decisions about short-term sex have reproductive implications. To avoid sperm competition and thereby increase fertilization probability, men should prefer short-term mates with no other sexual partner. Alternatively, men might prefer women with a long-term partner to be cuckolded should pregnancy ensue. For women, short-term relationships may lead to long-term relationships, so we predicted women should prefer short-term sexual partners not already involved in relationships. A total of 209 men and 288 women reported their interest in a short-term sexual relationship with an attractive member of the opposite sex who was (1) married, (2) not married but has casual sexual partners, (3) or not married with no casual sexual partners. Men preferred short-term mates not involved in a sexual relationship, supporting the sperm competition hypothesis and refuting the cuckoldry hypothesis. Women also preferred men not involved in a sexual relationship but were less interested in short-term relationships overall.

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TH 4:40PM

*Mate Guarding and Frequent Copulation in Humans: Complementary Anti-Cuckoldry Tactics.*

**Shackelford TK, Goetz AT, Guta FE, Schmitt DP**

Cuckoldry is an adaptive problem faced by parentally-investing males of socially monogamous species (e.g., humans and many avian species). Mate guarding and frequent copulation may have evolved as solutions to cuckoldry in these species. In some avian species, the tactics are complementary, and in other avian species, the tactics are used alternatively. The relationship between mate guarding and copulation frequency is unknown in humans. Avian species that use these tactics complementarily share with humans an inability to guard their partners continuously during her peak fertile period. We hypothesized, therefore, that men's mate guarding and copulation frequency function as complimentary tactics. Study 1 (n = 305) secured men's self-reports of their mate guarding and copulation frequency. Study 2 (n = 367) secured women's reports of their partners' mate guarding and their copulation frequency. In both studies, the hypothesis was supported: Men deploy mate guarding and frequent copulation as complementary anti-cuckoldry tactics, and this association remains after statistically controlling for male age, female age, relationship satisfaction, and relationship length.

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TH 5:00PM  
*Commentary.*  
**Pound N**

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**Session 4.2:** **Texas 7**  
***Interpersonal and Media Gossip in Evolutionary Perspective: Chair, C. De Backer***

This symposium puts forward functional aspects of gossip in both an interpersonal and media context. Gossip evolved as an adaptive strategy in the context of interpersonal interactions. Media gossip mismatches the EEA but triggers our evolved interest in gossip, resulting in both adaptive and non-adaptive outcomes. It will be shown that we are most interested in gossip about same-sex others, in bad news about rivals and good news about lovers and friends. Making use of easy to access data from television dating shows it will be exposed how interpersonal gossip functions to solve problems of human mating. Next, looking at the gossipers it shows that we share most gossip with close friends, and least with rivals. However, differences occur for shared community and celebrity gossipees. To explain our interest in celebrity gossip across the lifespan two hypotheses are put forward. All research presented in this symposium explores new hypotheses and new research methods to study gossip

TH 3:40PM  
*Who Do We Tell, and Whom Do We Tell On? Explorations in the Evolutionary Psychology of Gossip.*  
**McAndrew FT, Bell EK, Garcia CM**

140 College students ranked 12 different types of stimulus persons on 12 different gossip scenarios for interest value, likelihood of spreading the information about them, and how likely they would be to confide in such people. The participants consistently preferred gossip about same-sex others, and exploitable information (negative news about rivals, positive news about allies) was most likely to be passed on. Males were most likely to share gossip with romantic partners; females were equally likely to share with romantic partners and same-sex friends. The findings confirm that gossip is a strategy of status enhancement for individuals and not just a means of social control within groups.

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TH 4:00PM  
*Bitching to Win the Bachelor. An Analysis of the Use of Gossip in Reality Television Dating shows "Temptation Island" and "The Bachelor."*  
**De Graeve T, De Backer C**

It has been suggested that gossip plays an important role in the context of human mating. Gossip is an ideal tool to combat rivals. By attacking the resource availabilities and willingness to commit of other men, male individuals can lower the mate value of their rivals. Gossiping about the negative physical appearance, promiscuity and chastity of other women, female individuals can rule out their female rivals. Besides this slanderous use of gossip to rule out rivals, gossip is also a handy tool to acquire information about the mate value of potential mates, to learn about the mating structures of our social networks, and to control our own and friends' partners. We analyzed reality television shows "Temptation Island" and "The Bachelor", that both reflect problems of human mating, focusing on the use of gossip by the candidates. Results of our analyses of "Temptation Island" show proof of the use of gossip as a mates-detection advice system and a tool to control mates' cheating behavior. Analyses of "The Bachelor" show proof of the use of slanderous gossip to rule out rivals. Clear sex differences are found in both the content and use of gossip in the context of human mating.

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TH 4:20PM

*Selective Information Sharing and Intrasexual Competition.* Noseworthy

**L, Fisher M, De Backer C**

Information, such as one's reputation, can be used as a weapon in intrasexual competition, especially in the hands of a rival. We conducted two studies to explore the types of information that is distributed to same-sex rivals, as compared to co-workers and friends. In study one, we asked participants to retell a vignette to an individual (rival, co-worker or friend) and then analyzed which information was relayed and to whom. We further divided the vignettes into stories relating to celebrities versus those from a shared community (eg, shared neighbours, friends). Participants were more likely to share celebrity over community information, and least likely to share any information with the rival. In study two, we asked participants to state in a free-form manner the top three items they discuss with rivals, co-workers and close friends. Participants discuss innocuous information with rivals, such as the weather or local current affairs, whereas they discuss moderately personal information with co-workers and extremely personal information with close friends. Our findings will be discussed within the framework of informational warfare and intrasexual competition.

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TH 4:40PM

*"Teachers or Friends?" Two Hypotheses to Explain Our Interest in Celebrity Gossip Across the Lifespan.*

**De Backer C**

Part of our daily gossip conversation concerns celebrities. The Social Learning Hypothesis explains anyone's interest in celebrity gossip with the fact that we vicariously learn from celebrities' behavior. Opposed to this, the Parasocial Hypothesis explains how some regard celebrities as social network members with whom they have parasocial, or one-way-interactions. Because of this some are interested in celebrity gossip for the same reasons as we are all interested in gossip about real social network members. I tested both hypotheses by interviewing 104 Belgian respondents and distributing a survey among 838 Belgian people. Results show proof for both hypotheses, with strongest support for the Social Learning Hypothesis. Age and sex are the strongest explaining factors for interest in celebrity gossip. Female adolescents are interested the most, and their answers support the Social Learning Hypothesis. As the age of the respondents increases the interest in celebrity gossip declines to almost zero for adults. A revival of interest occurs among elderly people, and their answers are in line with what the Parasocial Hypothesis predicts.

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### Session 4.3: *Menstrual Cycle II*: Chair, L. M. DeBruine

Hill Country A & B

TH 3:40PM

*Changes in Romantic Relationships During the Menstrual Cycle: A Diary Study.*

**Chen JY**

Research has shown that women behave differently during ovulation, when risk of conception is the highest. Additionally, women's preferences of romantic partners also fluctuate during ovulation. Accordingly, it is hypothesized that relationship quality in couples should also fluctuate during the menstrual cycle. Women may become less attentive to their partners, and men may become more jealous of their partners. In this study, 45

couples were recruited to complete a diary study. Couples completed daily diaries for 30 days answering questions about their relationship quality, mate guarding, and other behaviors. Saliva samples were collected from the women to confirm ovulation. Using Hierarchical Linear Modeling (HLM 6.0), changes within the couples during the ovulatory cycle were examined.

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TH 4:00PM

*Women's Attractiveness Judgments of Self-Resembling Faces Change Across the Menstrual Cycle.* DeBruine LM, Jones BC, Perrett DI

Two lines of reasoning predict that women's preferences for people exhibiting cues to kinship will be lower in the follicular phase than in the luteal phase of the menstrual cycle. Women may avoid kinship cues during the follicular phase when they are most fertile due to the costs of inbreeding. Alternatively, women may seek kinship cues during the luteal phase as a byproduct of the benefits of associating with kin during pregnancy, which is also characterized by high progesterone. We find that preferences for facial resemblance, a putative kinship cue, follow this predicted pattern and are positively correlated with estimated progesterone levels based on cycle day. Neither estimates estrogen levels nor conception risk predicted preferences for self-resemblance and the cyclic shift was stronger for preferences for female faces than male faces. These findings lead to the possibility that this cyclic change in preference for self-resemblance may be a byproduct of a hormonal mechanism for increasing affiliative behavior toward kin during pregnancy, rather than a mechanism for preventing inbreeding during fertile periods.

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TH 4:20PM

*Variations in Gait Across the Menstrual Cycle.*

**Provost MP, Troje NF, Quinsey VL**

Recent research has demonstrated that ovulation in women may be better described as unadvertised instead of concealed. If others could ascertain cues that a woman is fertile, their behavior toward that woman may change. We investigated what differences, if any, exist between women who are fertile and women who are not. In this experiment, women not using hormonal birth control, as well as women using hormonal birth control, were invited to participate in a motion capture study. Women not using hormonal birth control came into the lab at both the follicular stage and the luteal stage of their menstrual cycle. Simple movements, such as walking, were recorded with point light displays and categorized by group. Using a jackknife procedure, mathematical differences were found between naturally cycling women at their follicular and luteal phases, as well as between women in their follicular stage and women using hormonal birth control.

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TH 4:40PM

*Revisiting the Hypotheses for the Evolution of Woman's Concealed Ovulation in Light of Her Recently Discovered Estrus.*

**Thornhill R, Gangestad SW**

Contrary to conventional wisdom that woman evolutionarily lost estrus, recent studies provide convergent evidence that she has estrus that is both homologous with and functionally similar to estrus in other mammals. Woman, like other female mammals, appears to perceive and strategically act upon estrus. Estrus in mammals in general, including woman, appears to function to motivate choice of a sire of superior genetic quality. Moreover,

recent studies indicate that men perceive women's estrus and act upon it by increased mate guarding. Men's knowledge of estrus is limited relative to other male mammals, implying a co-evolutionary history of selection on females to conceal estrus from males and selection on males to detect it. All published hypotheses for the evolution of woman's concealed estrus are evaluated in light of these recent findings. The findings seem to falsify the various hypotheses that assume and require that neither women nor men know peak cycle fertility. The findings most consistently support the cuckoldry hypothesis that woman's concealment of estrus is an adaptation to conditionally copulate outside the pair-bond to secure a high quality sire for offspring.

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#### Session 4.4: *Mating Strategies I*: Chair, C. Apicella

Hill Country C & D

TH 3:40PM

*Men's Reproductive Investment Decisions: Mating, Parenting and Self-Perceived Mate Value.*

**Apicella CL, Marlowe FW**

Using questionnaire data completed by 170 men, we examine variation in paternal investment in relation to the trade-off between mating and parenting. We found that as men's self-perceived mate value increases so does their mating effort and in turn, as mating effort increases paternal investment decreases. This study also simultaneously examined the influence of men's mating effort, men's perception of their mates' fidelity and their perceived resemblance to their offspring on investment. All predicted investment. Finally, men with a low self-perceived mate value were less likely to respond to lowered mate fidelity by reducing their parental investment compared to men with a high self-perceived mate value.

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TH 4:00PM

*The Role of Conspicuous Consumption in Mate Attraction.*

**Sundie J**

Using the lens of sexual selection theory (Darwin 1859), conspicuous consumption can be a costly signal of mate quality (Miller 2000; Zahavi & Zahavi 1997). Because women value the economic resources of a potential mate more than men (Li, et al. 2003), conspicuous resource display should be a more effective mating tactic for men than women (Schmidt & Buss, 1996). And, if conspicuous consumption attracts mates, it should be more common among people open to multiple short-term mateships. My research employs a trait-based and a state-based (goal-activation) approach, and provides converging evidence that conspicuous consumption is linked to mating goals. In Study 1, people are more likely to recall instances of men, as opposed to women, conspicuously consuming. In Study 2, favorable attitudes towards engaging in sex early in a relationship predict more conspicuous product choices, and this relationship is stronger among men than women with active, as opposed to inactive, mating goals. In study 3, male targets are perceived as more open to having sex early in a romantic relationship if they conspicuously consume; social status and attractiveness held constant.

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TH 4:20PM

*Cooperative Courtship: Facilitation Flirtation With Friends.*

**Ackerman J, Kenrick DT**

Mate selection researchers have traditionally construed same-sex conspecifics as playing a competitive role in the process of attracting a mate. However, mate acquisition can also be thought of as a complex cooperative game involving interdependent groups who facilitate the sex-specific goals of their members. Here, a model is presented which differentiates the mate acquisition goals of males and females and suggests contexts in which cooperative strategies are likely to emerge. Under the cooperative courtship model, females are predicted to primarily use their groups in order to: (1) raise thresholds for male investment, and (2) construct barriers to unwanted romantic advances. Males, on the other hand, are predicted to primarily use their groups to: (1) meet female thresholds by appearing more socially desirable, and (2) break down barriers in order to achieve romantic access. Findings from three studies were consistent with the cooperative courtship model.

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TH 4:40PM

*Tactics of Mate Expulsion.*

**Conlan SK**

Over the course of human evolutionary history it would have been reproductively beneficial to end a long-term mating relationship under a variety of circumstances. Mates could divert resources to others, inflict costs, or merely lose the value inherent in the initial mate selection. Incrementally better mates could become available. Natural selection has likely forged decision rules favoring mate expulsion when the net benefits were sufficient to outweigh the costs. I outline a theory of the evolution of mate expulsion adaptations. The present three studies tested specific hypotheses about the decision rules and mate expulsion tactic usage that follow from this theory. Study 1 identified a diverse set of naturally occurring tactics used to end romantic relationships. In study 2, participants judged the likelihood of performance of a range of tactics. In study 3, participants judged the effectiveness of the same range of tactics. Discussion will focus on tactics men and women judged to be most likely to employ and those judged to be differentially effective.

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TH 5:00PM

*Why Women Derogate the Competition.*

**Fisher M, Clarke A**

Two strategies that are widely used for intrasexual competition are self promotion, which is increasing the mate value of oneself relative to rivals, and competitor derogation, which is decreasing the value of a rival relative to oneself. Previously it has been found that women derogate the attractiveness of other women, but there has been no investigation as to the ultimate purpose of this behaviour. Here we test the hypothesis that women derogate rivals' attractiveness with the aim of swaying potential mates' preferences. In phase one, we asked women to generate positive, neutral and negative evaluations of photographs of female and male faces. In phase two, men rated the attractiveness of these faces, completed a distracter task, and then viewed the faces a second time with the statements from phase one. Our results revealed that the negative comments produced significantly lower attractiveness ratings compared to the positive comments for both female and male faces, but the effect was stronger for female faces. We will discuss these findings in terms of female intrasexual competition.

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## FRIDAY, JUNE 3

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### Friday Morning Plenary 8am

Texas 5-7

#### Robert Trivers – *Selfish Genetic Elements and Social Behavior*

Selfish genetic elements are parts of the genome that spread in spite of being disadvantageous to the larger organism (and genome). They appear to be universal in eukaryotes (and are widespread in bacteria as well). They spread because they benefit themselves narrowly in one of two ways.

They sometimes act on special degrees of relatedness to other individuals (e.g. Y chromosome to Y chromosome) not shared by the rest of the genome. Two examples are cytoplasmic male sterility in plants and genomic imprinting in mammals. The latter is associated with strong conflict during early development in humans and probably in later behavior as well. Some degree of internal psychological conflict probably reflects the action of oppositely imprinted genes.

They may also bias transmission to the next generation by biasing meiosis or mitosis in their favor. That is, they may drive. There is a bewildering array of such driving elements, from classic gamete killers, to B chromosomes, to elements that exclude half the genome, to the ubiquitous transposable elements. Some of these selfish elements can also, in principle, be engineered by humans for purposes such as pest control—and active efforts are now underway to achieve this aim (using homing endonuclease genes). These driving elements induce numerous costs for the individuals possessing them.

Social variables at the level of individuals play a key role in the spread (or suppression) of both kinds of selfish genetic elements. Factors such as degree of relatedness, sexuality, the sex ratio, degree of outbreeding and sexual selection can have strong effects on the success of such elements. In turn, these selfish elements affect social processes at the level of individuals, e.g. kin interactions, the sex ratio and sexuality itself. The spread of driving elements—in particular, transposable elements—may also inflate genome size, which may constrain mental evolution (especially in salamanders) and increase chances of extinction (especially in flowering plants).

Finally, the world of selfish elements provides a new arena in which to study social interactions. Here the actors are no longer separate individuals within a species but separate genetic elements within an individual's genome. Yet here too actions can be conceptualized as selfish, spiteful, cooperative or altruistic and many of the same kinds of factors are important but with aspects of logic peculiar to the within-individual setting.

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## Friday Early Morning Paper Sessions

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### Session 5.1: *Chagnon Fest I*: Chair, R. Hames

Texas 5 & 6

FR 9:10AM

*Human Behavioral Ecology & Ethnography: Dialogues Between Behavior and Culture.*

**Gerkey A, Cronk L**

Human behavioral ecologists often eschew informant testimony in favor of behavioral observations, fearing that data gathered from interviews may be inaccurate or misleading. This approach has expanded the divide between human behavioral ecology and cultural anthropology, isolating recent field based research on evolution and human behavior from two important components of the ethnographic method: temporal and linguistic immersion. Human behavioral ecology can benefit from a broader appreciation and application of these traditional ethnographic methods. Chagnon's work on kin term manipulation is a powerful example of the utility of these methods and the unique insights they can provide. Through a dedication to local linguistic competency and long-term field immersion, Chagnon's interviews show the important role that people's statements play in their social strategies and behavior. This approach inspired fieldwork examining family relationships on the Honduran island of Utila. A total of 160 interviews were conducted, exploring the influence "audience effects" have on informants'

statements. Our findings demonstrate the potential for ethnographic methods to inform and improve research in human behavioral ecology.

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FR 9:30AM

*Sex Matters.*

**Hewlett BS, Hewlett BL**

Chagnon introduced life history theory to me and pointed out that most anthropological studies were ethnocentric in that they emphasized competition over scarce natural resources, such as gold or protein, but few studies examined competition over reproductive resources. He would often say that "sex matters!" This paper takes the view that sex is central to understanding human evolution but evolutionists seldom conduct research on human sexual activities. What we know about human sexuality is based primarily upon studies in urban industrial cultures; few systematic studies of sexual behavior exist in small-scale cultures, which are presumably somewhat closer to the non-stratified cultures that lived in the environments of evolutionary adaptation. This paper examines intercultural and intracultural variability in marital sexual behavior in two small scale cultures - Aka foragers and Ngandu farmers of central Africa. The paper focuses on the nature of and the relationships between a) the frequency of intercourse, b) cultural models of fertility and c) patterns of sexual jealousy.

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FR 9:50AM

*Fathers vs. Sons: Why Jocasta Matters.*

**Betzig L**

Back in the 8th century BCE, Heaven hated his children, and hid them away from the light of day. So mother Earth gave one of her sons a sickle, and he 'harvested his father's genitals.' Sons got the better of fathers again in Sophocles' 5th century play - where Oedipus Rex killed his father, and had sex with his mother. In the 20th century CE, Sigmund Freud resurrected the "Oedipus complex," and John Hartung explained it. In a Darwinian world, fathers should fight with sons - not over their wives, but over other women. And 'Jocasta' should determine the winner. Fathers should win when their wives are weak; and sons should win when their mothers are strong. This paper tests that hypothesis on English kings. Weaker queens' sons were less likely to rebel against their fathers, and succeeded at later ages. But a strong queen's son - like Edward III - had his father snuffed out 'with a hooted brooch putte thro the secret place posteriale,' and became king at 14.

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FR 10:10AM

*Disturbances in the Dreamtime: Evidence for Prehistoric Violence in Subarctic Dene Traditional Oral Narratives.*

**Allen W**

Oral narratives have been employed by traditional indigenous peoples the world over for millennia. The action in such narratives most often occurs in a liminal time known as the Dreamtime, a time that is not necessarily somewhere in the lineal past but, according to some traditional indigenes, can be here-and-now if we use narratives properly and dream them. Ubiquitous motifs about an ambivalence between ethnocentrism, xenophobia, violent acts towards strangers and revenge raids against enemies, and on the other hand marriages and exchanges between strangers who are often represented as animals can be found in the Dreamtime

narratives of most indigenous hunters and gatherers. Embedded in these narratives are universal themes that embody an innate need to reconcile an ambivalence between cooperating and competing, both with members of the in-group and those of an out-group. Such narratives likely have their origin in our evolutionary past where ethnocentrism and xenophobia led to chronic internecine violence combined with a need for out-group mating and trade. My presentation focuses on statistical thematic data obtained in a sociobiological analysis of 71 oral narratives collected among the Dene Athabascans in the Northwest Territories, Canada in the winter of 1993-94, along with a brief illustrated slide presentation and discussion of one such narrative.

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**Session 5.2: Attractiveness I: Chair, A. Little****Texas 7**

FR 9:10AM

*How Men and Women Live in Groups: Intragroup Cooperation and/or Intergroup Competition.***Yuki M, Yokota K**

In many societies, both men and women live in a within-group context where intragroup cooperation and negotiation is important, men also tend to find themselves in settings that emphasize between-group relations more often than women. This is especially the case when ingroup's survival is at stake in intergroup conflict/competition, where men take the role of soldiers to defend it. Thus, we hypothesized that, first, in group situations, both men and women's ingroup favoritism will be based on a consideration for interdependence within the ingroup. Second, men's ingroup favoritism will be also based on their proneness for intergroup competition. In an experiment with 90 male and 53 female students, we manipulated 1) existence/absence of generalized intragroup exchange structure and 2) priming of outgroup threat, and observed how they would affect ingroup favoritism in reward allocation in a minimal group paradigm. The results showed, as predicted, that both intragroup dependence and outgroup threat affected men's ingroup favoritism, whereas women's ingroup favoritism was influenced only by the intragroup dependence.

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FR 9:30AM

*Strategic Preferences for Facial Symmetry and Sexual Dimorphism.***Little AC, Jones BC**

Researchers have noted high agreement between individuals when judging faces for attractiveness. Sexual dimorphism and symmetry are both thought to be evolutionary relevant face traits. Our recent work using face images manipulated by computer graphics demonstrates preferences for levels of sexual dimorphism and symmetry differ between individuals. Such individual differences in attractiveness judgments appear to reflect multiple determinants including: age, hormonal status, own condition, partnership status and experience of social competition. Results are in line with what would be expected if both facial symmetry and sexual dimorphism in faces were associated with an individual's quality and, as the individual differences in preference appear to maximise benefits to the choosing individual, the variability we observe in preferences may be termed 'strategic'. For humans, as with other species, there is no optimal strategy for mate choice and parenting that applies to all individuals. The wide range of individual circumstances would predict that preferences will be highly dependent on the choosing individual.

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FR 9:50AM

*How Mere is Mere Exposure? A Plausible Proximate Mechanism for Adaptive Face Preferences.*  
**Jones BC, DeBruine LM, Little AC, Feinberg DR**

Previous studies of facial attractiveness have focused on the ultimate causes of attraction to some faces and aversion to others. While our understanding of these ultimate causes has become increasingly sophisticated, our understanding of the proximate mechanisms that explain how preferences arise within particular individuals has not progressed beyond the generalised mere exposure effect (whereby previously seen faces, and those with similar characteristics, are preferred simply because they are familiar). Here we report a series of experiments demonstrating that the valence of our experiences with faces qualifies the effect of 'mere' familiarity. Preferences for the average of individual faces viewed under unpleasant conditions were decreased relative to preferences for the same averages when the individual faces had been viewed under more pleasant conditions. While the generalised mere exposure effect is often cited as evidence against evolutionary advantage accounts of face preferences (as it suggests familiar faces are preferred regardless of their adaptive characteristics), our findings suggest experiential factors facilitate adaptive face preferences.

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FR 10:10AM

*Preliminary Evidence That Sexual Dimorphism in Proportionate Foot Size is the Product of Intersexual Selection.*  
**Fessler DMT, Haley K, Lal R, Nettle D, Afshar Y, Pinheiro IA, Bolyantz A, Mulder MB, Cravalho M, Delgado T, Gruzd B, Correia MO, Khaltourina D, Korotayev A, Marrow J, Souza LS, Zbarauskaite A**

Existing findings indicate that, proportionate to stature, women have smaller feet than men, a surprising pattern given the biomechanical challenges posed by pregnancy. Because problems plague many published accounts, we analyzed data from three genetically disparate populations. Although varying in degree across populations, proportionate female foot length is indeed consistently smaller than male foot length. Because a) human males generally exhibit a preference for cues of youth and nulliparity, and b) foot size increases with age and parity, pedal sexual dimorphism may reflect a history of intersexual selection. We therefore investigated the contribution of foot size to attractiveness in nine cultures using line drawings of women and men. Results reveal a preference for small female feet, and a dislike of large female feet, in a majority of these cultures. This preference cannot be explained as deriving from observations of sexual dimorphism, as participants strongly preferred average foot size on male figures. These results provide preliminary evidence for a history of intersexual selection wherein human female foot size was reduced at the expense of locomotor efficiency.

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**Session 5.3: Kinship I: Chair, C. Faurie**

**Hill Country A & B**

FR 9:10AM

*Cognitive Problems for Human Kin Detection Regulate Patterns of Incest Avoidance and Altruism.*  
**Lieberman D**

Mechanisms for detecting kin rely on cues that correlated with relatedness in ancestral environments to adaptively regulate mate selection and altruistic effort. For siblings, one potential cue, proposed by Edward Westermarck, is co-residence duration. However, a more reliable cue would have been available ancestrally that correlated with relatedness: seeing one's mother caring for (e.g., breast-feeding) a newborn. The arrow of time made this cue available only to older siblings. In its absence, as would have been the case for younger siblings, co-residence duration may have been the best cue available for identifying potential siblings. Converging lines of evidence that different cues may be used by kin detection mechanisms to detect older and younger siblings were sought by quantitatively matching variation in the hypothesized cues to patterns of sexual aversions (disgust toward sex with

a sib and moral opposition to 3rd party sib incest) and sib-directed altruism. For subjects and their older siblings, co-residence duration predicted all three measures whereas for subjects and their younger siblings, exposure to maternal parental investment predicted sibling-directed behaviors.

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FR 9:30AM

*A Cue of Kinship Affects Cooperation in a 'Tragedy of the Commons'.*

**Krupp DB, DeBruine LM, Barclay P**

Kin recognition systems may be designed to enhance nepotistic discrimination in the distribution of altruistic acts. Although this hypothesis has been applied to dyadic interactions, little research has investigated the effects of kin recognition in the complex arena of group cooperation, an important form of human sociality. Here we test the hypothesis that a cue of kinship may bias cooperative decision-making in circumstances in which the personal benefits of contributing and punishing are removed ("strongly" reciprocal behaviour). Participants played a series of one-shot public goods games with a costly punishment option; in this task, there is a group incentive to contribute to the public good and to punish free-riders as well as a selfish incentive to contribute nothing and to punish no one. The faces of the ostensible group members (in reality, pre-programmed computer strategies) were either self-resembling digital composites of the participant's own face and a stranger's face, or nonself-resembling composites of two strangers' faces. Our results support the notion that strongly reciprocal behaviour is affected by cues of kinship.

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FR 9:50AM

*Do Children Resemble Their Fathers More Than Their Mothers? A Reassessment.*

**Faurie C, Alvergne A**

Paternal incertitude is a challenge for paternal investment. There is a cultural response to this problem, by a verbal ascription (mainly the mother and the maternal family) of resemblance of the children to the father. Is there also a genetic response, i.e. do children resemble their fathers more than their mothers (i.e. is there a paternally-biased phenotype matching)? The published literature is ambiguous on this point. We have tested paternal and maternal resemblance of family pictures from Europe, Japan and Senegal, at different ages. Intra and inter-cultural comparisons allowed testing an eventual cultural variation of the genetic resemblance. Results are presented in the context of the parent/offspring conflict (parental investment) and father/mother conflict (EPC and mating strategies).

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FR 10:10AM

*Kin Selection and Lineage: Cooperative Hunting Groups in Indonesia.*

**Alvard M**

Anthropologists have long noted that unilineal descent systems are a common way of forming alliances for collective action. Some argue that such systems are incongruous with kin selection theory because one half of one's kin is excluded from those considered culturally as kin. Work conducted among traditional, subsistence

whale hunters in Lamalera, Indonesia indicates that hunting groups are more related than expected by chance, but this is because of the correlation between lineage membership and kinship. Crew identifications were collected for all 853 hunts that occurred between May 3 and August 5, 1999. Lineage identity and genetic relatedness were determined for a sample of 220 hunters. Results of matrix regression show that kinship explains little of the hunters' affiliations independent of lineage identity. Below  $r = 0.5$ , kin are just as likely not to affiliate because lineage systems disenfranchise half of one's kin. These results support the idea that hunting affiliations are organized according to culturally transmitted, socially constructed identities that serve to mitigate the transaction costs associated with cooperation.

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### Session 5.4: *Mating Strategies II*: Chair C. Garver-Apgar

Hill Country C & D

FR 9:10AM

*Human Mate Poaching: How Frequent is it and What Motivates it?*

**Davies AP, Shackelford TK, Hass RG**

Schmitt and Buss (2001) conducted a seminal study of mate poaching. The current research was designed to further investigate that topic. First, unlike the definition of mate poaching given in Schmitt and Buss's survey, that in the current study's survey makes it explicit that the poacher must know that the person he or she poaches is in an exclusive relationship. Second, the motivations for and against mate poaching considered in the current study may be specific to mate poaching, whereas those considered by Schmitt and Buss may have also been applicable to general romantic attraction. Relative to participants in Schmitt and Buss' study, the current participants reported fewer experiences of mate poaching and reported that the motivations identified determined their decision either to or not to poach. The present study thus provides alternative insight into the frequency of and the motivations for mate poaching to that provided by previous work.

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FR 9:30AM

*Subliminal Rivals. Unconscious Processed in Jealousy and Rival Evaluation.*

**Massar K, Buunk BP, Dechesne M**

Since correct evaluation of rivals was crucial to human reproductive success, in the present studies it is investigated whether it could be an unconscious process. Through a subliminal priming technique rival characteristics are presented to participants. Mate Value (Study 1) and women's Menstrual Cycle (Study 2) are included as moderators. Results from both studies show that women are more jealous after exposure to attractiveness words than after exposure to social dominance words, and men after exposure to social dominance rather than attractiveness words ( $p's < .05$ ). Moreover, participants low in Mate Value report more jealousy than people high in Mate Value, but people high in Mate Value differentiate more between rival characteristics ( $p < .01$ ). Women in the fertile period of their menstrual cycle report more jealousy to an attractive than to a socially dominant rival, while their partners report more jealousy to a socially dominant than to an attractive rival ( $p's < .05$ ).

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FR 9:50AM

*Male Mate Retention Tactics as a Function of Male Sexual Attractiveness and Female Ovulatory Cycle Phase.*  
**Pillsworth EG, Haselton MG**

Women often face tradeoffs in choosing mates and may have evolved to pursue a dual-mating strategy by securing investment through one partner and obtaining good genes through others. This strategy inflicts high costs on the long-term partner, and thus we expect evidence of male adaptations designed to retain sole access to their mates. Because less sexually attractive men are at the highest risk of cuckoldry, we expect evidence of mate retention to be highest in them. 44 women rated their partner's sexual attractiveness and separately reported his retention behaviors at high and low fertility. At high fertility, women reported more expressed love and sexual attraction by their partners ( $F=4.87$ ,  $p=.02$ ). The effect of fertility status on mate retention was stronger in men who were reported to be less sexually attractive ( $F=6.90$ ,  $p=.01$ ). There was no effect of fertility on prohibitive male tactics (e.g., jealousy), and other sources of evidence in the data indicate that participants' relationships were relatively low in sexual conflict; the results therefore suggest that prohibitive strategies may depend upon the degree to which partners' reproductive interests diverge.

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FR 10:10AM

*Sexual Attraction and MHC-Similarity: Implications for Romantic Relationships.*  
**Garver-Apgar CE, Gangestad SW, Thornhill R, Miller RD, Olp J**

The major histocompatibility complex (MHC) is a highly polymorphic gene complex involved in the recognition of self/non-self peptides, integral to immune function. Scent-based preferences for MHC-dissimilar mates have been observed in some birds, fish, and rodents, and may serve the function of inbreeding avoidance or increasing offspring pathogen resistance. In humans, results bearing on such preferences are mixed. The current study examined MHC-dependent sexual attraction in actual, romantically involved couples ( $N = 46$ ). All women normally ovulated. Number of alleles shared across three MHC loci (A, B, DRb) was calculated for each couple. With relationship duration controlled, women sharing relatively many MHC alleles with their mates (1) were less sexually responsive to mates, (2) reported greater sexual attraction to extra-pair men, particularly during the fertile (as opposed to luteal) phase, (3) reported having had more extra-pair partners during the relationship, (4) rejected their partner's attempts to initiate sex more, and (5) had fewer orgasms at mid-cycle. These results provide the first evidence that MHC-similarity affects attraction in human romantic relationships.

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## Friday Late Morning Paper Sessions

### Session 6.1:

Texas 5 & 6

#### *Intrasexual Competition and Competitiveness: Chair, R. M. Nesse*

FR 10:40AM

*Relationship Status Influences Intrasexual Competition.*

**Gordon F, Fisher M**

Two strategies used in intrasexual competition are self promotion and competitor derogation. We hypothesised that use of self promotion decreases as romantic relationships become more committed, as people do not need to sell their positive attributes to committed mates. Likewise, we hypothesised that use of competitor derogation would increase with to commitment, as people may need to defend their relationships from possible mate poaching by derogating rivals. We used a diverse community sample of 102 females and 83 males, with relationship status (single, dating one person, or married/common-law) serving as a proxy for commitment. The findings suggest that people primarily use self promotion, but use decreases as commitment increases. The same

pattern was found for competitor derogation. Thus, our results indicate that people intrasexually compete significantly less when they become married/common-law. We also discovered that the length of time married/common-law, for that subset of the sample, was significantly related to female's use of both strategies, but only self promotion for males. We will discuss this finding in terms of sex differences in intrasexual competition.

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FR 11:00AM

*Social Context, Male Competition, and sex Differences in Mortality.*

**Kruger DJ, Nesse. RM**

Male mortality rates are higher than those for females, with a maximal difference at sexual maturity, an expected result of sexual selection. We investigate whether cross cultural variations in the degree of male competition for resources, status, and mating opportunities affects male mortality risk, and whether mortality patterns will be influenced by relevant aspects of the socio-cultural context. We show that the Male to Female Mortality Ratio (M:F MR) was magnified during the recent Eastern European transition from centrally planned to free market economies across nine countries. In 1991, the International Social Justice Project gathered perceptions of socio-economic conditions from large representative samples in seven of these countries. Hierarchical Linear Models indicated that the magnitude of the M:F MR increase in each country was significantly related to perceptions of social class, likelihood of unemployment, estimates of wealth disparities, predicted trends in wealth disparities, and social consequences of wealth differentials. The increasing sex discrepancy in mortality as a consequence of increasing variance and skew in factors related to male mate value is consistent with our evolutionary model.

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FR 11:20AM

*Is the Sex Difference in Competitiveness Disappearing? A Test in Populations of U. S. Distance Runners.*

**Deaner RO**

Sex differences in competitiveness are well established, but it is unknown if they originate from social conditions or evolved predispositions. Testing these hypotheses requires a quantifiable sex difference in competitiveness and the application of a powerful social manipulation to eliminate it. Previous work shows that more male runners seek competition and maintain large training volumes, suggesting that more males should run fast relative to sex-specific world-class standards. In this talk, I provide the first support for this prediction, showing that in matched populations, more than twice as many males as females ran relatively fast in 2003. I then test whether the growth in opportunities for female athletes is eliminating this difference. Although there was an increase in fast female runners in the 1970s and early-1980s, there has been no increase in fast females since the mid-1980s. These results suggest that sex differences in competitiveness reflect evolved predispositions.

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FR 11:40AM

*Dissatisfied by Design: The Evolution of Discontent.*

**Hill SE, Buss DM**

Throughout human evolutionary history, individuals possessing characteristics that granted them preferential access to fitness-augmenting resources would have decisively out-competed individuals unable to secure such

resources. The ability to outperform rivals in resource competition games has thus been an important adaptive problem that humans have had to solve throughout evolutionary history. Since, from an evolutionary perspective, one is only successful insofar as he is better off than his competitors, we propose that the human mind has been designed by selection to 1) judge success in domains that affect fitness not in terms of absolutes, but in terms of where one stands relative to one's reference group (a positional bias) and 2) be alert to fitness-impacting advantages enjoyed by rivals and feel motivated to acquire those same advantages (envy). We present new data bearing on predictions derived from our hypotheses. The findings support the notion that, rather than being a pathological state, long-term dissatisfaction may be a design feature deliberately built into the system by natural selection to facilitate successful resource competition.

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## Session 6.2: *Attractiveness II*: Chair, N. Li

Texas 7

FR 10:40AM

*Mirror, Mirror on the Wall: The Long-Term Effects of Experience on Judgments of Attractiveness.*

**Cooper PA, DeBruine LM, Maurer D**

Although short-term adaptation is known to influence judgments of attractiveness (Rhodes et al., 2003), little is known about long-term effects. Here we took advantage of the documented influence of self-resemblance on attractiveness (DeBruine, 2004) to examine long-term effects of experience by contrasting the normal orientation of a participant's face and its mirror reversal. Participants ( $n = 48$ ) are asked to choose the face they find more attractive in each of 20 pairs of symmetrised faces that were transformed by 75% of the difference between an average, symmetric face and their own face in its normal orientation versus its mirror-reversed orientation. If there are long-term effects of experience, then participants should select the mirror-reversed morphs as being more attractive because of their experience with their own reflections being greater than their experience with their own photographs. Data from the 20 participants tested to date (all female) indicate that mirror-reversed morphs are chosen as more attractive ( $t_{19} = 2.54$ ,  $p < 0.05$ , two-tailed), a pattern suggesting that experience can have long-term effects on judgments of attractiveness.

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FR 11:00AM

*Hot or Not? A Meta-Analytic Evaluation of Evolutionary Explanations for Determinants of Facial Attractiveness.*

**Hönekopp J**

Facial attractiveness (fa) has been described as a signal of phenotypic quality. Within this framework, four determinants of fa have been proposed: averageness, symmetry, exaggerated sexual dimorphism, and neoteny; Enquist, Ghirlanda, Lundqvist & Wachtmeister (2002) proposed a model that reconciles the conflicting mechanisms of averageness and exaggeration. I use meta-analyses (comprising studies with  $> 8,000$  faces and  $> 10,000$  judges of fa) to evaluate whether the proposed mechanisms work and how well they can account for fa. I find that averageness, symmetry, and neoteny are related to female and male fa, however the effects are only moderate (averageness) or small (symmetry, neoteny), and often the type of measurement proves to be an important moderator of results. Results concerning exaggerated sexual dimorphism are equivocal, and they largely depend on the methods employed. The Enquist et al. model was not supported. Overall, evolutionary explanations contribute to the understanding of fa but fail to sufficiently explain it.

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FR 11:20AM

*Can't Take my Eyes Off You: Mating Goals and Biases in Attentional Adhesion.*

**Maner JK, Gailliot MT**

Results of three experiments suggest that mating-related goals functionally and selectively guide basic social perception. A well-validated visual cueing method was used to assess biases in attentional adhesion: a tendency to have one's attention captured and held by particular social stimuli. The experience of sexual arousal increased attentional adhesion to physically attractive members of the opposite sex (Study 1), as did a subliminal priming manipulation designed to elicit a mate-search goal (Study 2). The effect of activating a mate-search goal was reduced in participants who were already in a committed romantic relationship (Study 2). The salient experience of jealousy increased attentional adhesion to physically attractive members of participants' own sex, particularly among participants exhibiting chronic vigilance to intrasexual rivals (Study 3). Results are consistent with a functionalist evolutionary approach to motivation and basic social cognition.

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FR 11:40AM

*The Puzzle of Human Female Beauty: A Theoretical Refinement and Empirical Test.*

**Gottschall J, Gardiner A**

Greater emphasis on human female physical attractiveness is an evolutionary puzzle--in most animals sexual selection results in greater emphasis on male physical attractiveness (e.g., more conspicuous colors, ornaments, and courtship displays). On this basis, some authors have argued that emphasis on women's attractiveness is a product of western socialization pressures. On the other hand, evolutionists argue that greater emphasis on female beauty is found cross-culturally, and have suggested that this is ultimately rooted in stronger male preferences for attractive mates. We present new theoretical and empirical evidence that favors the evolutionary account. The theoretical refinement comes from applying the "basic model" of male mate choice - which has been mainly applied to non-human animals--to human mating preferences. The empirical contribution consists in a content analysis of attractiveness references in 100 collections of folk tales from highly diverse world populations. Results strongly favored the evolutionary model: there was significantly greater emphasis across culture areas on female physical attractiveness as measured by number of attractiveness references.

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### **Session 6.3: Culture I: Chair, C. Barrett**

### **Hill Country A & B**

FR 10:40AM

*The Evolution of Cultural Evolution.*

**McElreath R, Henrich J**

Humans are unique in their range of environments and in the nature and diversity of their behavioral adaptations. While a variety of local genetic adaptations exist within our species, it seems certain that the same basic genetic endowment produces arctic foraging, tropical horticulture, and desert pastoralism, a constellation that represents a greater range of subsistence behavior than the rest of the Primate Order combined. The behavioral adaptations that explain the immense success of our species are cultural in the sense that they are transmitted among individuals by social learning and have accumulated over generations. Understanding how and when such culturally evolved adaptations arise requires understanding of both the evolution of the psychological mechanisms that underlie human social learning and the evolutionary (population) dynamics of cultural systems. This talk

reviews work addressing three questions about the evolution of cultural evolution: (1) What cognitive process guide social learning? (2) If cultural variants do not replicate, can culture evolve? (3) How do genes and culture coevolve to produce human psychology?

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FR 11:00AM

*Natural Selection and Information Theory: On the Difference Between Intrinsic and Extrinsic Inheritance.*

**Dickins TE**

Recently a number of theorists have suggested that evolution can use non-genetic or environmental inheritance in order to pass on adaptations (e.g. Mamedi, 2004) and that non-genetic, or environmental factors, can play a central role in the process of evolution (e.g. Odling-Smee, Laland & Feldman, 2003). In this paper I demonstrate that these arguments have muddied the distinction and relationship between intrinsic and extrinsic inheritance. To clarify the true nature of this relationship I apply information theory (Shannon, 1948) to neo-Darwinism. According to this analysis there is no such thing as biologically independent non-genetic inheritance, all extrinsic inheritance is a consequence of traits and dispositions that are intrinsic to an organism and intrinsic design can only be explained through neo-Darwinism. This has implications for current conceptions of cultural evolution.

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FR 11:20AM

*The Effect of Initial Endowment and Consistency of Preferences in Chimpanzees.*

**Brosnan SF, Grady M, Lambeth SP, Theile E, Shapiro SJ**

A recent trend examines behavior in nonhuman species, including chimpanzees, in light of existing human economic models, however this may not be warranted. Here, we explicitly test the hypothesis that chimpanzees, like humans, will show consistency of preference for one food over another when endowed with one of the food items. Grapes were consistently the preferred food, and could be exchanged item-for-item with the endowment of carrots (low value), apple (high value), or cucumber (middle value). After extensive training in exchange, each of 10 subjects received 2 carrot sessions, 2 apple sessions, and 8 cucumber sessions. Reactions varied dramatically dependent upon the endowment. All chimpanzees consistently exchange all carrot for grapes and virtually never exchange apple for grapes (1.7% of apples exchanged). When endowed with cucumber, the average number of cucumbers exchanged is remarkably consistent across sessions (range: 12.8%-20.1%), however there is dramatic variation between sessions within an individual, which is not consistent with the human response. We suspect this is due to a variety of factors and discuss implications for the evolution of exchange behavior.

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FR 11:40AM

*Are There Content Biases in Social Transmission? The Case of Animals.*

**Barrett C**

For some domains of knowledge, one would expect heavy reliance on social transmission of information, because the costs of experience-based learning are high. For example, learning by direct experience that lions are dangerous would be very costly. This suggests that learning which animals are dangerous might rely on a combination of preparation to attend to certain cues (e.g., size, sharp teeth, motion) and reliance on acquisition of

information from others. However, what is learned via social transmission might depend not only on what information is available, but in predispositions in the receiver to preferentially attend to some aspects of the information and not others. For example, information about dangerousness might be privileged. I present a series of studies designed to investigate this hypothesis.

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## Session 6.4: *Mating Strategies III*: Chair, K. Anderson

Hill Country C & D

FR 10:40AM

*Timing of Reproductive Maturation in South Africa: Testing the Belsky-Draper Hypothesis With Three Ethnic Groups.*

**Anderson KG**

Belsky, Draper and colleagues have hypothesized that father absence and childhood psychosocial stress influence the timing of menarche and first sexual intercourse. Numerous studies have supported this model, most of which used data from North American or European samples. In this paper the model will be tested using data on three ethnic groups in South Africa, drawn from Wave I of the Cape Area Panel Study (CAPS). CAPS contains data on sexual behavior and childhood environments for a representative sample of 2,015 young women ages 14-22 living in Cape Town, South Africa. Blacks (n=857), coloureds (n=872), and whites (n=286) are examined separately. Using multivariate Cox proportional hazards modeling to control for censoring, the results support for the hypothesis for whites; both father absence in childhood and childhood household stress predict earlier menarche and earlier first sexual intercourse for whites. Father absence and stress have no effect on either menarche or first sex for blacks. For coloureds, father absence is associated with earlier first sexual intercourse only, and childhood stress has no statistically significant effects.

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FR 11:00AM

*Effects of Early Experience on Female Reproductive Maturation in Human and Nonhuman Primates.*

**Maestriperi D**

Previous studies have shown that early family conflict or father absence from home are associated with early menarche in girls. These effects may result from exposure to harsh or inconsistent parental care associated with family conflict or father absence. Adolescent girls in Chicago who grew up without a father reached menarche earlier and showed higher interest in infants than other girls, suggesting earlier puberty and readiness for parenting. In another study, rhesus macaque females that were exposed to harsh and inconsistent maternal care in infancy showed higher interest in infants during adolescence and earlier age at first conception. Evidence from cross-fostered females indicated that these effects resulted from early experience and not genetic inheritance. Macaque females exposed to harsh and inconsistent maternal care also had higher cortisol responses to stress and to CRH than controls in the first 3 years of life. Furthermore, females with higher cortisol responses to stress exhibited higher interest in infants. These findings support the hypothesis that early social experience can accelerate puberty and the development of maternal responsiveness in female primates and suggest that these effects are mediated by long-term alterations in the activity of the HPA axis.

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FR 11:20AM

*Satisfaction and Regret Following First Sexual Intercourse.*

**Gordon AK, Kaplar ME, Cacciapaglia H, Miller AB, Flowers J**

We examined sex differences in the precursors to and perceived consequences of first sexual intercourse. Based on parental investment theory (Trivers, 1972) and strategic interference theory (Buss, 1989), we expected females more so than males to have postponed intercourse until achieving emotional intimacy with their partner, felt more coercion from their partner but less pressure to have sex from other sources (e.g., peers), and experienced more regret and less satisfaction following first intercourse. We also expected partner mate value to be more strongly correlated with female than male regret and satisfaction. Men and women (N=248) completed surveys regarding the emotional, psychological, and relational context surrounding their first intercourse experience. Results were generally consistent with predictions and highlight the importance of first intercourse as a developmental milestone, especially for women, as well as the functional value of sexual satisfaction and regret.

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FR 11:40AM

*Sexual Regret.*

**Haselton MG, Poore J, von Hippel W, Gonzaga G, Buss DM**

We hypothesize that regret improves future decisions by enabling people to avoid mistakes that have important consequences. Anticipated regrets should therefore track sex-differentiated adaptive problems. We predicted that men would regret missed sexual opportunities (sexual omission) more than women, whereas women would regret sexual encounters (sexual commission) more than men. Women and men (N = 200) rated their own likely regret in response to various situations. Women more than men reported that they would regret having sex in a relationship that turned out to be only short-term ( $p < .001$ ), whereas men more than women reported that they would regret missing a sexual opportunity ( $p < .001$ ). These anticipated regrets were corroborated by women's and men's ratings of their own past regret experiences. In contrast to previous research, these results demonstrate sex differences in regret, and they indicate that the intensity of regrets of omission or commission differ by domain.

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**Friday Afternoon Plenary 1pm**

**Texas 5-7**

**Leda Cosmides & John Tooby - *The Functional Architecture of Human Motivation***

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**Friday Early Afternoon Paper Sessions**

**Session 7.1: *Homicide*: Chair, D. M. Buss**

**Texas 5 & 6**

FR 2:10PM

*Spousal Homicide in Korea: Analysis of data from the 18th, 19th, and 20th century.*

**Choe JDC, Hwang H, Jang D**

We performed a comparative and historical analysis of spousal homicide phenomena in Korea over the past three centuries in order to seek the universal operation of evolved psychological mechanism across a range of distinct populations. The data were derived from the 18th and 19th century Korea, a monarchical Confucian society, and from the 20th century Korea, a democratic modern society similar to most European and North American countries. All three datasets were obtained from the official documents of central government organizations, which reflect the actual homicide incidences with high credibility. Despite the samples' evident heterogeneity in their temporal and cultural aspects, they converged on a remarkably consistent pattern of spousal homicide, one that is generally expected from an evolutionary perspective. Males were predominant both as victim and offender in all three datasets. Like modern Western societies, male's sexual jealousy and proprietariness emerged as the most important factor in spousal homicide in old and present Korea. Our results show that the psychological mechanisms involved in homicide may reliably develop and operate over a wide range of contexts.

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FR 2:30PM

*Contexts and Circumstances of Filicide-Suicide in Chicago, 1870-1930.*

**Beasley SL, Weekes-Shackelford VA, Shackelford TK**

The contexts and circumstances surrounding filicide-suicide may provide insight into parental psychology. Previous research on filicide-suicide used a database that includes incident-level information on 22,000 homicides committed in Chicago during 1965-1994. This replicated earlier research indicating that: (1) filicides that include multiple victims are more likely to end in the offender's suicide than are filicides that include a single victim, (2) parents are more likely to commit suicide following a filicide of an older child than of a younger child, (3) older parents, relative to younger parents, are more likely to commit suicide following filicide, and (4) fathers, relative to mothers, are more likely to commit suicide following filicide. The current study uses a database that includes incident-level information on 11,000 homicides committed in Chicago during 1870-1930. We replicate previous work and present findings unique to this time period.

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FR 2:50PM

*An Evolutionary Exploration of the Sex-Biased Differential Reaction to Infanticide.*

**Nedelec JL**

Despite the existence of research exploring the evolutionary underpinnings of infanticidal behaviour evident in numerous organisms, including humans, there is a lack of inquiry into the seemingly sex-biased reaction to the act of infanticide. Examination of legal codes in most of the western world and informal codes of conduct in other societies illustrates there is an allowance for leniency for female perpetrated infanticide that is not provided for in male perpetrated infanticide. The current investigation is based on why people and societies tend to differentially create a narrative of excuse based on the sex of the perpetrator in infanticide cases. The results of survey research exploring this sex biased reaction will be discussed and an evolutionary explanation for this differentiation will be proposed. Briefly, the evolutionary basis for this differentiation lies in the selection of a psychological mechanism which recognizes that the conditions which lead to infanticide by a female tend to be in the fitness interests of the in-group; whereas, the conditions which lead to infanticide by a male tend to be of genetic self-interest only. This recognition therefore produces a much harsher response to male perpetrated infanticide.

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FR 3:10PM

*The Murderer Next Door: Why the Mind is Designed to Kill.***Buss DM**

The Murderer Next Door (Penguin, 2005) presents a radical new theory of why people kill. Murder has been a remarkably beneficial strategy that evolved to solve an astonishing array of adaptive problems. These include eliminating poor fitness vehicles, ascending status hierarchies, protecting social reputation, removing cost-inflicting competitors, destroying a rival's reproductive resources, and freeing up resources for future reproduction. Being killed, however, is extremely costly for victims. As soon as murder evolved as a strategy, selection immediately favored anti-homicide defenses, in turn favoring refined homicidal strategies to evade victim's defenses. A perpetual co-evolutionary arms race ensued. A study of 375 murderers and victims provides empirical support for facets of the theory, explaining many otherwise inexplicable design features of murder. The theory also parsimoniously accounts for several paradoxical phenomena, such as why women falsely believe that rapists will murder them despite the low conditional probability of rape-murder, and why people display an inordinate fear getting killed by strangers more than by familiar others, despite the fact that most murderers know their victims, often intimately.

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**Session 7.2: *Emotion I*: Chair, A. Schützwohl**
**Texas 7**

FR 2:10PM

*A Psychoevolutionary Model of Surprise.***Schützwohl A,**

A psychoevolutionary model of surprise (e.g., Schützwohl, 2000) is presented that addresses the following issues:

1. Evidence suggesting that surprise is an evolved psychological mechanism.
2. What is the adaptive problem the surprise mechanism evolved to solve?
3. What is the short-term and the long-term adaptive target?
4. What are the recurrent features common to all surprise eliciting events that were sufficiently stable in the ancestral world to support the evolution of the surprise mechanism?
5. The coordination between recurrent features and the short term and long-term adaptive target.
6. Assumptions concerning the functioning of the surprise mechanism.
7. Which hypotheses can be derived from these assumptions?
8. Empirical evidence supporting these hypotheses is presented (e.g., Schützwohl [1998], JEP: LMC; Schützwohl & Borgstedt [in press], Cognition and Emotion).

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FR 2:30pm

*"Same Emotion, Different Actions": The Specific Impact of Different Hope-Types on Explorative Behavior.***Poels K, Dewitte S**

Ever since Darwin (1872), emotions have been studied within an evolutionary perspective. Although research on the adaptive functions of specific emotions is abundant, most researchers focused on negative emotions. However, positive emotions also carry adaptive benefits. According to the Broaden-and-built theory (Fredrickson 2001), positive emotions broaden people's thought-action repertoires which in turn build people's resources making them more resistant in life. In this talk, we focus on the positive emotion hope. We distinguish negative hope (solving a negative situation) from positive hope (enhancing a positive situation) and study their specific effects in a context of persuasive product communication. Results of three experimental studies show that, although similar in intensity, negative hope leads to more explorative behavior than positive hope. We discuss our results within a functional emotion approach.

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FR 2:50PM

*Political Choice and Emotional Response: A Biofeedback Test of Political Preferences.*

**Sautter J, Hatemi P, Litvay L, Larimer C**

Recent evidence from neuroeconomics points to a more emotionally based understanding of the decision making process. In this research project, we use a biofeedback monitor as a means to measure psychological responses by censoring physiological reactions to political stimuli. Specifically, we test whether a participant's preexisting psychological disposition in regards to empathy, altruism, and selfishness affects the mean level of participant stress after having viewed conflicting political imagery and hearing inflammatory political language. Results from our analyses suggest that individuals with higher levels of empathy and altruism exhibit significantly higher stress levels than individuals with low levels of empathy and altruism and high levels of selfish attitudes. We conclude that the need to account for emotional and psychological dispositions as key factors in the expression of political preferences fits with the theoretical predictions of evolutionary psychology.

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FR 3:10PM

*Top 10 Reasons Why Orgasm Should be Classed as a Basic Human Emotion.*

**Jenkins COE, Miller GF**

Orgasm deserves a larger role in emotions research, since it fits all proposed 'basic emotion' criteria of functionality, universality, phenotypic complexity, subjective distinctiveness, and taxonomic distinctiveness. This talk will assess empirical evidence that orgasm shows (1) clear adaptive functions (in fertilization, mate choice, pair-bonding); (2) cross-cultural universality; (3) cross-species homologues; (4) specialized anatomy (e.g. clitoris, Bartholin's glands, vas deferens, seminal vesicles, prostate); (5) distinctive motor reflexes (rhythmic contractions in PC muscles, uterus, vagina, urethral bulb, urethra); (6) neurological double dissociations from other emotions (e.g. female anorgasmia); (7) a distinctive, universal facial expression; (8) a distinctive hormone release pattern (oxytocin, endorphins); (9) an affectively valenced subjective response that is unlearned, reinforcing, attribution-independent, non-propositional, and qualitatively distinct; and (10) irreducibility to other 'basic emotions' discussed by Darwin, Ekman, Forgas, Frijda, Gray, Haidt, Keltner, Nesse, Ohman, Ortony, Rozin, and Tooby. We'll discuss orgasm's implications for emotions research.

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### Session 7.3: Sex Differences: Chair, I. Silverman

### Hill Country A & B

FR 2:10PM

*An Ecologically Valid Foraging Task Yields a Female Spatial Advantage and Significant Content Effects.*

**Gaulin S, Krasnow M, Truxaw D, New J**

The division-of-labor hypothesis (Silverman & Eals 1992) purports to explain the established male advantage in spatial problem solving, but also predicts a female advantage on a particular spatial task: remembering the location of objects in arrays. However such tasks poorly approximate the spatial demands of gathering plant foods and thus lack both specificity and ecological validity. To address this inadequacy we implemented a foraging-analogue task at a large farmers' market. S's were individually led via a circuitous route to six food stalls; they

tasted and rated one pre-determined food item at each location. Routes and food items were varied over six weekly replicates. After the tasting circuit, S's were taken to a central location where all visited stalls were obscured and asked to point (using a large, tripod-mounted compass) to each of the visited locations. Mean vectoring error was significantly smaller in women than men. Because vectoring typically yields a male advantage, our method biases against the hypothesis. Further analysis suggests that our task appropriately activated foraging-related adaptations: Mean vectoring error was significantly negatively related to caloric density of the food items, but unrelated to subjective preference reports.

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FR 2:30PM

*Non-Euclidean Navigational Strategies of Women: Compensatory Response or Evolved Dimorphism?*

**Silverman I, Choi J**

The proposition underlying this study was that females' topological navigational strategies represent a domain specific, evolved mechanism rather than a compensatory response based on lesser Euclidean abilities. In support of this contention, it was found that increased use of a topological strategy by females, relative to males, began during the same age parameters (12 to 14 years) as their increased capacity for object location memory. Correspondingly, for males relative to females, both increased use of a Euclidean navigational strategy and performance on the water line test of Euclidean abilities were observed in the youngest age group (9-11 years) of the study. Furthermore, across age groups, object location memory was positively correlated to the use of topological strategies for females only, and Euclidean test performance was positively correlated to the use of Euclidean strategies for males only. Results are discussed in terms of their bearing on theories of spatial sex dimorphisms, in general, and to the long-standing issue of the relationship between ontogenetic and phylogenetic events.

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FR 2:50PM

*Sex Differences in Query Formation.*

**Cox A, Fisher M**

It is well known that men and women use language differently. Thus, as web-search tools (e.g. Google) use language-based interfaces, there should be measurable sex differences in tool use. We hypothesise that women will form longer queries, use a larger working vocabulary, and use less frequently occurring words. For tools that are sensitive to these factors, women should be more effective tool users. Using a paper-based survey, we explored the query formation skills of 40 men and women. To evaluate the responses, we are building a language model similar to "word-net" - an English word similarity and frequency model. We have not found significant sex differences for query length likely because search tools are optimized for 3 to 4 word queries and users are aware of this fact. Examination of the data confirm differences in performance on sex-biased tasks (e.g. those related to sports and baking) but without a language model these differences can not be quantified.

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FR 3:10PM

*Evolutionary Domains of Risk and Life History.*

**Wang XT, Kruger DJ, Wilke A**

Life-span and reproductive span reveal a universal pattern of sex differences: On average, women have a longer life span than men whereas men have a longer reproductive span than women. From a life-history perspective, age, subjective life-span expectancy, and reproductive goal settings are temporal reference points for survival and reproduction. Reduction in the values of these reference points would make reproductive goals more eminent and risky options worth taking. We developed an inventory to assess human risky behaviors in seven evolutionary domains (i.e., within-group competition, between-group competition, survival and physical risks, resource allocation, mating, foraging, and reproduction). We then examined how life-history variables affected attractiveness of risks and the likelihood of engaging in risky behaviors. Largely consistent with our predictions, the attractiveness and likelihood measures were negatively related to subjective life-expectancy, age, parental status, and reproductive goals (the maximum desired number of offspring). Men were more risk taking than women in five of the seven risk domains except within-group competition and foraging.

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**Session 7.4: *Mating Strategies IV*: Chair, D. Schmitt****Hill Country C & D**

FR 2:10PM

*Attachment and Ecological Condition as Determinants of Female Mate Preferences.*

**Cohen D, Belsky J**

Whereas attachment theory leads to the prediction that mate preferences (MP) are shaped by parent-child relationships in the family of origin, a behavioral ecological perspective predicts that MP will depend on the availability-predictability of resources encountered in adulthood. To test these contrasting but not necessarily mutually exclusive predictions, 334 female participants from the UK and USA were administered a specially-developed questionnaire assessing MP under three hypothetical ecological conditions that varied the availability-predictability of resources; attachment was assessed with a widely used adult attachment measure. Findings revealed that ecological condition strongly and consistently explained much more variation in female MP than did attachment; at least 50% of the variation in MP, in the USA and UK, was accounted for by ecology. The results demonstrate the need for mate-preference research to pay more attention to ecological conditions.

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FR 2:30PM

*Is Short-Term Mating the Maladaptive Result of Insecure Attachment? A Test of Competing Evolutionary Perspectives.*

**Schmitt DP**

Different evolutionary perspectives offer competing views on short-term mating and attachment. Some argue short-term mating results from insecure attachment, particularly the maladaptive features of low self-esteem, interpersonal distrust, social avoidance, and emotional instability. Others posit short-term mating is adaptive, having evolved as an ecologically-contingent reproductive strategy. In this view, short-term mating has multiple origins - developmental, heritable, and situational - and may not stem from all maladaptive traits of insecure attachment. Using data from 47 nations of the International Sexuality Description Project (Schmitt et al., 2003), short-term mating was moderately associated with insecure attachment, and insecure attachment was strongly related to maladaptive personality. However, short-term mating was largely independent of maladaptive traits across cultures. In some cases, especially among young men, short-term mating was linked with adaptive personality traits. Although insecure romantic attachment was associated with short-term mating, the causal links between early parent-child experiences and short-term mating in adulthood may be rather limited.

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FR 2:50PM

*Who are the Heroes? Characteristics of People Who Rescue Others.*

**Lyons M**

Humans sometimes engage in extreme rescuing behaviour, where an individual puts his/hers life in risk in order to save the life of another individual, who often is not related to the rescuer. Previous research has demonstrated that risky rescuing is a male-typical trait in humans, often performed by males in the lowest socio-economic class. This study looks at heroism in a naturalistic setting by analysing news reports in the UK. 243 rescuing incidences were analysed. Males were more likely rescuers than females were, and males in the lowest socio-economic class were more likely rescuers than males in the higher socio-economic classes. These results indicate that heroic rescuing behaviour in males could have involved as a sexually selected trait, evolving through female choice for risk taking males.

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FR 3:10PM

*Gender Differences in the Development of Trust in Romantic Relationships.*

**Wiginton TL, Campbell L**

According to Ellis (1998), partner-specific investments (PSIs) secure access to the long-term resources of a partner. PSIs include both tangible investments (e.g., buying gifts) and symbolic investments (e.g., discussing future plans). Critically, it is suggested that symbolic investments function to secure access to a partner by enhancing levels of trust and security within the relationship. In the present research, we reasoned that gender differences may exist regarding the types of investments that spur the development of trust. Specifically, men should be more sensitive to cues indicating sexual fidelity, whereas women should be more sensitive to cues indicating emotional fidelity. These hypotheses were tested with a sample of 129 heterosexual dating couples. Results generally supported hypotheses, indicating that women reported more trust for their partners when their partners reported making more expressive-nurturing investments, being more future-oriented, spending more time with their partners, being more socially attentive, and being more honest. By contrast, men reported more trust for their partners only when their partners reported investing more time with them. The evolutionary significance of trust is discussed.

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## Friday Late Afternoon Paper Sessions

**Session 8.1: Kinship II: Chair, S. Colarelli**

**Texas 5 & 6**

FR 3:40PM

*Genetic Density: Meaning, Models, and Some Effects.*

**Spranger JL, Colarelli SM**

Genetic relatedness is known to have implications for kin selection. However, much of what we know about relatedness and kin selection among humans has focused on dyads and on altruism. Less work exists on relatedness in larger groups that contain both kin and non-kin and on how relatedness affects a variety of behaviors and attitudes. Genetic density (the proportion of relatives, adjusted by average relatedness, in an organization) is one way to conceptualize the degree of relatedness in social systems that contain both kin and

non-kin. We describe the concept of genetic density, present a mathematical model of it, and contrast it with models that include non-genetic relatives bound by common descent, such as in-laws. We also examine the effects of genetic density on nepotism and justice perceptions in 21 family-owned businesses. We found that genetic density correlated with both perceptions of nepotism and justice perceptions among family and non-family employees.

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FR 4:00PM

*Wealth and Lineage as Moderators of Inclusive Fitness: Evidence from an Archival Analysis of Inheritance Data.*

**Webster GD**

Archival analyses of inheritance patterns in wills have revealed a robust effect of inclusive fitness, such that people give more of their estates to relatives of closer genetic relatedness (Judge & Hrdy, 1992; Smith, Kish, & Crawford, 1987). Using classroom experiments, recent research has focused on the extent to which this relationship is moderated by (a) the overall wealth of the benefactor and (b) whether the relatives in question are of direct lineage (e.g., children, grandchildren) or peripheral lineage (e.g., siblings, nieces, nephews; Webster, 2003, 2004). In the present research, multilevel modeling of 1,240 British Columbian wills revealed a strong linear effect of genetic relatedness on proportions of estates allocated to relatives. This effect was qualified by an interaction with lineage, such that direct relatives showed a strong genetic relatedness effect, whereas the same effect for peripheral relatives was weak. Both the linear effect of genetic relatedness and its interaction with lineage became stronger as the overall estate amounts of the benefactors increased. The importance of these moderators to understanding inclusive fitness in modern humans is discussed.

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FR 4:20PM

*Genetic and Environmental Influences on the Frequency of Orgasm in Women.*

**Dawood K, Kirk KM, Bailey JM, Andrews PW, Martin NG**

This study reports on genetic and environmental influences on the frequency of orgasm in women during sexual intercourse, during other sexual contact with a partner, and during masturbation. Participants were drawn from the Australian Twin Registry. 3080 women responded to the anonymous, self-report questionnaire including 667 monozygotic (MZ) pairs, 377 dizygotic (DZ) same-sex pairs, 366 women from DZ opposite-sex pairs, and 626 women whose co-twins did not participate. Significant twin correlations were found for both MZ and DZ twin pairs for all items of interest. While an independent pathway model fits the data most parsimoniously, a common pathway model incorporating additive genetic, shared environment, and unique environment effects cannot be ruled out. Overall, genetic influences account for approximately 31% of the variance of frequency of orgasm during sexual intercourse, 37% of the variance of frequency of orgasm during sexual contact other than intercourse, and 51% of the variance of frequency of orgasm during masturbation.

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FR 4:40PM

*Choice of Mates and Friends by Twins Support a Novel Hamilton Prediction.*

**Rushton JP, Bons TA**

A new twin study in press in Psychological Science analyzes a 130-item questionnaire on personality and social attitudes gathered from several hundred pairs of identical twins, fraternal twins, their spouses, and their best friends. It reports that: (a) spouses and best friends are as similar as siblings, a level of similarity not previously recognized; and (b) identical twins choose spouses and best friends who are more similar to their co-twin than do non-identical twins. The preference for similarity is 30% heritable. Social assortment is greater on more heritable items such as preferring "business to science" (heritability = 0.60) than on preferring to "travel the world alone" (24% heritable). The results confirm William Hamilton's (1971) prediction that similarity detection systems based on imprinting (Dawkins's "armpit effect") or recognition alleles (Dawkins's "green beard effect") use more heritable traits since they more accurately reflect the underlying genotype.

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**Session 8.2: *Emotion II*: Chair, T. Shackelford****Texas 7**

FR 3:40PM

*Sexual Jealousy and Its Impact on Cognitive Tasks.***Thomson JW, Shackelford TK, Platek SM**

Jealousy is a leading cause of conflict within romantic relationships and a common characteristic of stalking behavior. Previous studies have shown a gender difference in sexual and emotional jealousy. Males reported being most upset when imagining their romantic partner engaging in a sexual relationship with another partner while females reported being most upset when considering their partner being emotionally attached to someone else. The purpose of this study was to investigate the cognitive factors associated with romantic jealousy. Subjects completed a modified version of the Stroop task and the Implicit Associations Test as well as surveys assessing one's levels of jealousy and fitness. The reaction time for males on the stroop task was slower than females when primed with jealousy provoking scenarios of sexual infidelity. Males also made more mistakes on the IAT when they were asked to categorize words associated with sexual infidelity as pleasant. Studies such as this will present a more comprehensive understanding of the cognitive factors associated with jealousy.

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FR 4:00PM

*Temper Tantrums: Dysfunction or Display?.***Flinn, MV**

Temper tantrums are a common behavior problem for children. They appear cross-culturally universal, and occur in other species such as chimpanzees. Behaviors associated with tantrums include facial expressions of anger or sadness, shouting, crying, foot stomping, banging ground, and self-injury. Clinical studies suggest associations with subsequent externalizing psychopathology and antisocial behavior. Despite their importance and widespread occurrence, little is known about the underlying mechanisms and potential functions of tantrums. Sample and methods: A longitudinal seventeen-year study of child health in a rural community on Dominica provides sequential biyearly data on salivary cortisol, morbidity, growth, and social environment (N= 282 children, 32,432 saliva samples, 89,109 health observations, 42 months of residence in the community studying social environment). 1645 tantrum events were identified from field notes accompanying saliva collection and other sources.

Results: Cortisol is elevated during the hour following the tantrum event by >one standard deviation in 38% of the cases, and by >two SD in 15% of the cases. Most (56%) tantrum events have no apparent affect on cortisol response. Most (84%) tantrums involved conflict with a social partner, and suggest a display function.

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FR 4:20PM

*Animal Disgust: a Model Emotion.*

**Curtis VA, Aunger RV, Rubio-Godoy M**

In humans it has been suggested that the emotion of disgust serves to motivate behaviour that leads to the avoidance of infection. Since this function is fundamental to any organism, disgust is unlikely to have appeared de novo but to have evolved in our animal ancestors. We demonstrate that this is indeed the case, tracing the phylogeny of the disgust emotion from unicelled organisms, via invertebrates, vertebrates and mammals to humans. We distinguish four functional categories of disgust behaviours (prior to incorporation, during incorporation, after incorporation, and construction of a parasite-free niche). We show how disgust began as a hard-wired reflex, then served as a reward in behavioural learning, and now also serves as a social emotion motivating the shunning of defectors. We conclude that disgust provides an excellent model for understanding the purposes, structure and functions of the emotions in both animals and man.

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FR 4:40PM

*Cognitive and Physiological Evidence of Fear Contagion.*

**Tamura R, Kameda T**

Transmission of fear has been linked with early detection of a group-shared danger. Previous studies have revealed that the amygdala is activated when participants see a fearful facial expression. However, there has been no direct evidence that fear itself is transferable between individuals, or that there is a tendency to synchronize emotional responses. To test this possibility, we first exposed participants to a fear face, and then measured their response bias for fear stimuli as well as their facial electromyogram (facial EMG), blood value pulse (BVP), and skin conductance response (SCR). Fear contagion was suggested from the analysis; after viewing a fear face, participants were more likely to direct their attention towards another fear face while simultaneously avoiding a threatening stimulus (a snake or spider). Conversely, contagion of sadness was not confirmed in this experiment. An adaptive task which fear contagion might solve is discussed.

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### Session 8.3: *Human Behavioral Ecology*: Chair, D. Fessler

Hil Country A & B

FR 3:40PM

*Human Foraging Behavior in Patchy Environments.*

**Wilke A, Hutchinson JMC, Todd PM, Cziensowski U**

Animals in heterogeneous environments, where resources are distributed in patches, are required not only to make decisions on where to forage, but also on how long they should forage in a particular patch. The Marginal Value Theorem states that the optimal strategy is to leave a patch when the instantaneous rate of return from the current patch falls below the long-term mean return rate. The MVT has been successful in predicting animal behaviors, but as a mechanism it becomes problematic when animals are uncertain of the mean return rate in the environment and when foraging involves a succession of discrete stochastic events. Simple decision mechanisms to model animal patch departure have been proposed and it has been calculated in what kind of environments

each works well. Here, we study the mechanisms that underlie human foraging behavior and test whether the strategies directing animals when to leave a food patch also underlie human decision-making. We set up two experiments, which differ in whether search is internal or external, but whose environmental parameters are matched. We present data from our 1st experiment in which subjects were given a modified anagram task and had to generate meaningful words out of random letter sequences.

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FR 4:00PM

*Prosociality, Evolution, and the Experience Sampling Method.*

**Wilson DS**

Evolutionary theory offers both a theoretical framework and an empirical methodology for studying individual differences in prosociality. Ideally, empirical research should include the equivalent of field studies that are performed on nonhuman species in their natural environment. This kind of information on humans is possible thanks to the Experience Sampling Method (ESM), which involves "beeping" individuals at random times, prompting them to record their external circumstances (where they are, what they are doing, who they are with) and internal experience (what they are thinking and feeling). I will provide an overview of how I and my colleagues are using the ESM to study prosociality from an evolutionary perspective.

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FR 4:20PM

*Disease-Avoidance and Intergroup Bias: The Effects of Disgust Sensitivity and Pregnancy on Ethnocentric Attitudes.*

**Navarrete CD, Fessler DMT, Eng S**

Recently, researchers have begun to explore the notion that attitudes toward foreigners reflect the workings of psychological mechanisms that evolved to protect the individual from disease transmission. This thesis is consistent with the observation that people often react to foreigners with disgust, as disgust shapes behavior in ways that reduce exposure to pathogens. We conducted three online studies exploring the cognitive and emotional underpinnings of attitudes toward foreigners. Studies 1 and 2 found that ethnocentric attitudes increase as a function of both perceived disease vulnerability and disgust sensitivity. Study 3 found that, among pregnant women, intergroup bias peaks during the first trimester, (the period when the mother and fetus are most vulnerable to infection) and decreases thereafter. We discuss these results with attention to the relationships between disease-salience, outgroup negativity, and ingroup attraction.

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FR 4:40PM

*What Types of Others do People Regard as "Good" in Indirect Reciprocity? : A Vignette Study to Examine Strategies in Indirect Reciprocity Settings.*

**Mashima R, Takahashi N**

Recent theoretical studies have tried to model how indirect reciprocity can emerge (e.g., Ohtsuki and Iwasa, 2004; Panchanathan and Boyd, 2003; Takahashi and Mashima, 2003). These studies suggested that discriminate altruism is the key to the emergence of indirect reciprocity. Despite the rapid development of theoretical studies, there are few empirical studies that examine the strategies that people actually use. We conducted a vignette study in order to discover people's strategies - what type of person people regard as "good" or "bad" in the indirect reciprocity setting. Respondents read several scenarios and provided their impressions of the target person who was described in each scenario. Each scenario described what a target person did to potential

recipients. We manipulated two factors - first, information about the behavior of the target (whether or not he gave his resources); and second, information about the reputation of potential recipients ("good" or "bad"). Results showed that respondents evaluated the target 1) who gave to a good recipient as "good," 2) who gave to a bad recipient as "bad," and 3) who did not give to a good recipient as "bad."

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## Session 8.4: *Applied Evolutionary Psychology*: Chair, G. Saad

Hill Country C & D

FR 3:40PM

*Evolutionary Human Information Behavior.*

**Spink A, Currier J, Narayan B**

Human information behavior (HIB) is the totality of human behavior in relation to sources and channels of both active and passive information seeking, information organizing, and use. Humans have sought, organized, and used information for thousands of years, but have HIB's changed and evolved? Most HIB studies do not answer this question and focus on HIB in a contemporary context. We discuss the emerging evolutionary HIB approach from within information science, evolutionary psychology, and cognitive archeology and provide an initial framework and chronology of studies that have explored aspects of HIB from prehistoric times to the 21st century. Spink, A., & Currier, J. (in press). Emerging evolutionary approach to human information behavior. In: A. Spink & C. Cole (Eds.), *New Directions in Human Information Behavior*. Springer. Spink, A., & Currier, J. (in press). Toward an evolutionary perspective for human information behavior: An exploratory study. *Journal of*

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FR 4:00PM

*Are Consumers Biological Beings? No, If You Ask Consumer Scholars.*

**Saad G**

Consumer behavior adheres to the central tenets of the Standard Social Science Model. It solely espouses domain-general models and exclusively focuses on proximate phenomena. Socialization-based theorizing is the norm. There is a near-complete abdication of biology as a relevant force. Most consumer scholars are blissfully unaware of Darwinian theory while those that are aware of it are typically quite hostile towards it whilst being fully misinformed. I shall summarize key points stemming from my attempt to "Darwinize" the discipline (as fully discussed in Saad, 2005). For example, most consumption acts can be subsumed within key Darwinian modules (survival, mating, kin, and reciprocation). Forms of "dark side" consumption (e.g., pathological gambling) have sex-specific morbidity rates for very clear Darwinian reasons. Products of popular culture exist in their particular forms because they are an instantiation of our human nature. Homo Consumericus did not originate from a parallel universe where evolutionary forces were absent. Consumer behavior will further sink into a chasm of irrelevance if it continues to display the "No Darwinists" sign on its paradigmatic walls.

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FR 4:20PM

*Human Evolution and the Ontogeny of the Self: Can Evolutionary Psychology Enhance Psychoanalytic Theory?*  
**Lewis AJ**

This paper will use evolutionary psychology to discuss the psychoanalytic theory of the self. Psychoanalysis is unique amongst current psychotherapies for having a significant historical relationship with evolutionary theory. Freud's first scientific publications were within the biological sciences, which were attempting to substantiate evolutionary assumptions. However, Freud's use of psychological concepts derived from evolutionary biology relied upon Haeckels biogenetic law that development is an 'abbreviated recapitulation' of prior phylogenetic history and Lamarckian assumptions that the mechanism of heredity is based on acquired characteristics. This paper will examine a revised relationship between the key heterochronic shifts in human evolution and their impact on the developmental processes which constitute the ontogeny of the self: namely infantile imitation, self-other intersubjectivity, self-concept formation and the affective core of the self. Thus, the paper will contribute to the development of a modern psycho-biological framework for psychoanalysis and provide a methodological discussion showing how the study of natural mental competences can enhance psychoanalytic theory.

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FR 4:40PM

*The Future for Evolutionary Analysis in Law.*

**Jones OD, Goldsmith TH**

Society uses law to encourage people to behave differently than they would behave in the absence of law. This fundamental purpose makes law highly dependent on sound understandings of the multiple causes of human behavior. The better those understandings, the better law can achieve social goals with legal tools. This talk illustrates a wide variety of contexts in which the various fields connecting evolution and behavior can help improve law's effectiveness and efficiency. These include helping law to: discover useful patterns in regulable behavior; uncover conflicts among contemporaneously pursued legal policies; sharpen cost-benefit analyses that often influence legal policymaking; clarify links between various causal influences and their effects on human behavior; provide theoretical foundation for, and potential predictive power about, a variety of human behaviors; disentangle the multiple causes of various law-relevant behaviors; expose a variety of unwarranted assumptions underlying legal approaches for inspiring behavioral changes; assess the comparative effectiveness of legal strategies we employ to change specific behaviors; and identify under-noticed and unintended selection pressures that legal systems can themselves create.

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FR 5:00PM

*Is Human Non-Kin Altruism Really Such a Problem for Evolutionists?*

**Qirko HN**

At least three theories that seek to explain human non-kin altruism in evolutionary terms (memetic, new group selection, and costly signaling) are predicated on assumptions that this behavior is widespread and not easily explained through established Darwinian interpretations of reciprocity and inclusive fitness. However, these assumptions should instead be viewed as empirical questions deserving of more systematic attention than they have received to date. I make several suggestions in this regard: (1) that human non-kin altruism encompasses a wide range of behaviors, only some of which present even a potential challenge to established Darwinian theory; (2) that the role of kin-cue manipulation in the institutional reinforcement of non-kin altruistic behavior informs many of the challenging categories; and (3) that what remains of problematic altruistic behavior after (1) and (2) are taken into account is so rare that it does not require special evolutionary explanation.

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## SATURDAY, JUNE 4

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### Morning Plenary 8am-9am

Texas 1-3

### **Napoleon Chagnon - *Warre and Striving for Security Among the Yanomamö and Paleolithic Peoples***

The most widely accepted anthropological theories about prehistoric and primitive warfare are essentially derived from the 19th Century views of Karl von Clausewitz (1780-1831) that warfare was an armed conflict between territorially defined political entities (states) with the intent of inflicting lethal harm on the opponents. War was a 'pursuit of diplomacy by other means' and it took place in discrete units of time. Curiously, this eurocentric view of warfare stubbornly persists in Anthropology where it is intuitively appealing to accept as the "cause" of some lethal human conflict an explanation that it was a struggle over some scarce material resource. It should not be surprising that materialist explanations of tribal and prehistoric warfare have enjoyed an advantage in an Anthropology, a discipline that is itself a product of the same concern with material things that gave rise to Capitalism.

Most of the conflicts among tribesmen (and in the EEA) were over two non-material things: (1) mating opportunities (the means of reproduction) and (2) local group security (risk-reduction). Since both are chronic survival issues, conflicts have likewise tended to be chronic, constant, and interminable. John Hobbes (Leviathan, 1651) likened these kinds of struggles to "fowle weather", which was not just a shower or two of rain, but a tendency thereto for many days on end. He thus distinguished "war" from "warre" to emphasize the endless nature of the latter in a State of Nature, the long tract of time within which Human Nature evolved.

To understand and appreciate the role that cooperative violence played in our evolutionary past we will have to pay more attention to the behavior of creatures who do not have political economies...and to human conflict in pre-political economy circumstances.

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## Saturday Early Morning Paper Sessions

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### Session 9.1:

Texas 5 & 6

### ***Roundtable: Commentaries on the life's work and humor of Napoleon Chagnon***

9:10AM

**Irons, W.  
Tooby, J.**

9:30AM

**Wilson, E. O.  
Harrell, M-A**

9:50AM

**Trivers, R. L.  
Alexander, R.**

10:10AM

**Daly, M., & Wilson, M.  
Chagnon, N.**

Napoleon Chagnon's work among the Yanomamo stands as one of the most extraordinary ethnographic studies ever conducted. Our understanding of human relationships -- alliances, marriages, family and kin networks, group fission and fusion, reciprocity and exchange, religious beliefs, laughter, love, war, and tears -- has been

immeasurably enriched by his brilliant descriptions of life in the tribal world. This series of symposia brings together a few out of the millions of people that have been touched by Nap's irreplaceable gifts to humanity. This informal session allows both for broad discussion of effects of the Yanomamo ethnography on anthropology, biology, and psychology as well as personal anecdotes and humor.

## Session 9.2:

Texas 7

### ***Sensational interests as a signal of mating effort in delinquents: Chair, V. Egan***

Sensational interests reflect an interest in violence and power. Such interests are noted in the histories of offenders, although an interest in information about aggression or sex has a broader concern (see the symposium on Gossip, this conference). Mating effort has been found to be a reliable predictor of sensational interests, and mating effort is higher in offenders; however, mating effort is a predictor of many other behaviours. The current symposium presents research arguing for the universality of this phenomena (Egan). It continues with a study of the concurrent influences of sensational interests, personality, mating effort and mental health to predict delinquency in normal adolescents (Charles), the use of sensational interests as an intra- and inter-sexual display (Vasquez); and finally, the possibility that sensational interests reflect another means for assortative pairing (Wolf).

SA 9:10AM

*Sensational Interests, Mating Effort, and Personality: Evidence for Cross-Cultural Validity.*

**Egan V, Figueredo AJ, Wolfe P, McBride K, Sefcek J, Vasquez G, Charles K**

We assessed whether violent or macabre interests ('sensational interests'), were related to mating effort and a higher-order construct reflecting combining features of higher Extraversion, lower Psychoticism and lower Neuroticism, in 1,321 participants from English- and Spanish-speaking communities. Spanish-speaking communities generally had more sensational interests. Mating effort was positively related to sensational interests, though the relationship was weaker in Spanish-speaking communities. Personality effects were modest and moderated by language; personality was negatively related to sensational interests in English-speaking communities, positively associated to sensational interests in Spanish-speaking communities. These findings suggest the relationship between mating effort and sensational interests is universal and reflects general intrasexual competition, whereas the relationship between personality and sensational interests is more culture-specific.

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SA 9:30AM

*Psychopathology, Sensational Interests, and Mating Effort in a Sample of Scottish Adolescents.*

**Charles KE**

The aim of this study was to ascertain the degree to which sensational interests (SI), mating effort (ME) and psychopathology predict levels of self-reported delinquency in an adolescent sample. 564 adolescents (308:256 M:F mean age 14.1 (SD 0.92)) took part in the study providing measures of personality, SI, ME, psychopathology and self-reported delinquency. Structural equation modelling revealed no link between psychopathology and delinquency, SI or ME. ME showed the highest direct link to delinquency (+0.308) and was linked to delinquency via the militarism factor of SI (+0.206). The path directly from militarism to delinquency was also significant at +0.115. Other measures impacting directly on delinquency included age and low agreeableness. The model from this study is in line with previous findings on ME and offending in adults. It also demonstrates that militaristic SI are partly driven by ME and it is ME which may ultimately be responsible for delinquency and not the interests per se. Militaristic interests may be a manifestation of ME in some individuals.

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SA 9:50AM

*Are Sensational Interests as a Signal of Mating Effort in Delinquents?*

**Vasquez G, Sefcek JA, Douglas J, Figueredo AJ**

To investigate whether sensational interests (SIQR), mate value (MVI), or life history strategy (K) drive assortative pairing between individuals on delinquency (D20), university students rated themselves and either their romantic partner (N=105) or their same-sex best friend (N=85) on these traits. The within-person correlations among all four traits were similar for self, friends, and lovers: (1) SIQR correlated positively with delinquency and negatively with K; (2) SIQR did not correlate significantly with MVI; (3) MVI correlated positively with K; and (4) D20 correlated negatively with MVI and even more negatively with K. The assortative pairing coefficients for SIQR, MVI, and K were positive, but equivalent for friends and lovers. The assortative pairing coefficient for D20 was also positive but significantly higher for friends than for lovers. Otherwise, the assortative pairing coefficient for sensational interests was the highest. Thus, sensational interests are used as sexual displays both intrasexually and intersexually, and it is unlikely that assortative pairing on any one trait indirectly drives assortative pairing on any of the others.

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SA 10:10AM

*Sonora Study of Assortative Pairing for Sensational Interests, Mate Value, Life History, and Delinquency.*

**Wolf P, Vasquez G, Frías-Armenta M, Coral-Verdugo V, Figueredo AJ**

To further investigate whether sensational interests (SIQR), mate value (MVI), or life history strategy (K) drive assortative pairing between individuals on delinquency (D20), 107 pairs of romantic partners and 119 pairs of same-sex friends living in Sonora, Mexico rated themselves and each other on these traits. This replicated many findings presented in the Arizona Pilot but used self reports of both partners instead of just one partner to measure assortative pairing. The patterns of correlations were identical to those of the Arizona Pilot with one exception: there was no significant and direct negative correlation in the Mexican data between K and SIQR. Also, the assortative pairing and interrater reliability coefficients were found to be equivalent between friends and lovers for all four traits. This disconfirmed the hypotheses that assortative pairing on any of these traits: (1) is higher or lower among lovers than friends, and (2) is indirectly driven by any other trait measured. From these data, it looks like sensational interests are indeed being used as a sexual display both intrasexually and intersexually, but do not drive assortment on delinquency.

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### **Session 9.3: Cooperation II: Chair, O. Curry**

**Hill Country A & B**

SA 9:10AM

*Contribution and Punishment as Reciprocal Altruism in the Public Good Game.*

**Price ME, Price J, Curry O**

Many subjects will contribute to a 1st-order public good when they expect co-subjects to contribute too. We addressed two questions about such reciprocity. First: to what extent do reciprocators attempt to match the minimum, maximum, and average expected co-subject contributions? Second: are contributions to 2nd-order public goods, e.g. freerider punishment, also reciprocal? Our public good game included both a no-punishment and a punishment treatment. In both treatments, subjects guessed the amounts of maximum, minimum, and

average co-member contributions to a public fund, before deciding how much to contribute to this fund. In the punishment treatment, subjects also guessed the amounts of maximum, minimum, and average co-member contributions to a punishment fund, before deciding how much to contribute to this fund (higher punishment contributions = higher fines for below-average contributors to the public fund). Results suggest that a large majority of subjects intended their contributions to the public and punishment funds to be no smaller than the minimum contribution, and no greater than the maximum contribution, that they expected from co-subjects. Thus, reciprocity occurred in both 1st- and 2nd-order cooperative behavior.

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Workshop in Political Theory & Policy Analysis

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SA 9:30AM

*Is Patience a Virtue? Individual Differences in Discount Rates and Cooperativeness.*

**Curry O, Price ME, Price J**

In repeated prisoner's dilemmas, the weight attached to immediate versus delayed rewards in part determines whether reciprocity is an evolutionary stable strategy. It is possible then, that in addition to being sensitive to the probability of repeated interaction and to the behaviour of other players, the resulting adaptations for reciprocal altruism are contingent upon the rate at which an individual discounts the future. Specifically, individuals with low discount rates should be more likely to cooperate than people with high discount rates. We tested this prediction by correlating individuals' discount rates with their contributions in a public good game. We found that discount rates were indeed negatively correlated with contributions. One interpretation of this result is that there are mechanisms responsible for discounting future rewards that interact with the mechanisms responsible for reciprocal altruism. Another possible interpretation is that the discount rate test taps directly into the mechanisms responsible for reciprocal altruism.

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SA 9:50AM

*Does Intention Matter in Third-Party Punishment?*

**Takahashi N, Mashima R, Miyahara M**

Voluntary sanctioning is key to understanding the emergence of social order (Fehr & Fischbacher, 2003). Following previous findings on the ultimatum game, this study examines whether third-party punishment (TPP) occurs more when a player has an unfair intention. In this experiment, an allocator was given only two allocation options (X and Y) to divide 800 yen (\$8) between himself and a recipient. In the intention condition, X was (8, 2), which means to give 80% to himself and 20% to a recipient, and Y was (5, 5). In the no-intention condition, X and Y were identical: (8, 2). In both conditions, an allocator (a simulated actor) chose X. The observer (third party) was given 250 yen to decide how much to pay to subtract money from the allocator. Results showed that levels of punishment between conditions did not differ significantly. Analysis of responses to a post-experimental questionnaire found that intention had an opposite effect on punishment to that expected. The more participants thought that an allocator did have a fair intention, the more they subtracted because they thought that the allocator wished a fair allocation, which is the opposite of what he had to do.

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Department of Behavioral Science

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SA 10:10AM

*Giving for Glory: The Evolutionary Psychology of Altruism and Status.*

**Hardy C, Van Vugt M**

Synthesising social and evolutionary psychology theories it is argued that status hierarchies emerge in human groups as a result of differences in altruistic behaviour—the extent to which individuals have the ability or willingness to provide, at a cost to themselves, goods that contribute to the welfare of the group. This perspective may also help explain the behaviour of individuals occupying different status positions and reactions to status loss or gain. These theories were tested using public goods dilemma games with small interacting groups in the lab. In two studies, when behaviour was visible to all group members, those who behaved most altruistically gained the highest status (influence, esteem and respect) within their group (studies 1 & 2) and were most frequently preferred as future interaction partners (study 2). In further studies, those who held high status in the group behaved more altruistically than those with low status (study 3); status gain led to an increase in altruism and status loss led to a decrease in altruism (study 4). We interpret these findings using costly signalling theory and discuss the specific public goods that may be evolutionarily relevant to gaining status.

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### Session 9.4: *Mate Choice I*: Chair, A. Bleske-Rechek

Hill Country C & D

SA 9:10AM

*Happy Babies Make Men More Attractive: Evidence for Female Preferences for Parentally-Investing Men.*

**Bleske-Rechek A, Swanson M, Remiker M, Zeug N, Rohloff A**

The logic of Parental Investment Theory implicates adaptations in women devoted to the assessment of males' willingness to invest in offspring, and adaptations in men designed to detect women's fertility status and seek sexual variety. In keeping with this logic, La Cerra (1994) found that young women perceived a male stranger interacting with a child as more attractive than a male stranger ignoring a child, whereas men rated a female stranger as attractive regardless of context. In two studies, each with a different set of stimulus photos of a male and female pre-rated as slightly-to-moderately attractive, we replicated La Cerra's original research findings. Further, we extended her research by (1) utilizing a between-subjects rather than within-subjects design and (2) investigating potential moderators of sensitivity to cues of parental investment, including sociosexual orientation and egalitarian sex-role attitudes.

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SA 9:30AM

*Cues of Receptivity Influence Judgments of Attractiveness.*

**Clark AP**

Receptivity cues may influence men's judgements of female attractiveness because they indicate a high probable rate of return for mating effort but women may pay attention to cues of receptivity because they prefer men who display non-threatening behaviour. If this is so, men may be more sensitive to the direction of these cues than women because cues directed at other men do not predict what will be directed toward them. To test these predictions I made use of video stimuli composed of mock interviews with actors. Each actor did one proceptive and one unreceptive interview. Each interview was presented as being directed toward participants or toward an opposite sex interviewer. Proceptivity enhanced the attractiveness of the actors in the eyes of both male and female participants, but an interaction between the state and direction of receptivity was only found when male participants rated female actors. However, the patterns of interaction varied between actors when analyzed separately; it appears to be mediated by physical attractiveness for the female actors but this relationship is less clear for the male actors. Overall, the results support the idea that both men and women monitor cues of receptivity, but in different ways and for different reasons.

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SA 9:50AM

*Assessing the Father of My First Baby.*

**Spinelli LHP, Yamamoto ME, Cordeiro de Sousa MB**

From an evolutionary perspective, women should choose mates with good genes and that are willing to provide for their offspring. Most studies that investigate mate choice end up with ideal characteristics because they ask how a potential partner should be, but not how a real partner is. Do ideal partners resemble the real ones? To answer this question we asked 25 low income, first time pregnant women (which have already chosen a mate) from Natal, Brazil, to assess their partners. Our results showed that they are older and earn more than their female partners. Pregnant women evaluate that their partners are very kind, intelligent, generous and healthy, and most believe they are affectionate to children, and moderately handsome. The women consider their partners more intelligent and attractive than themselves. Many women admit that their partners cheated on them. Our results suggest that low income women present a few adjustments of their expectations when assessing a real partner, although the main attributes that human females want in their partners, which are resources to invest in their offspring and good genes, are present in their evaluation of the father of their first child.

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SA 10:10AM

*HurryDate: Mate Preferences in Action.*

**Kurzban R, Weeden J**

To investigate the choices people make in dating partners, we analyzed data provided by HurryDate, a commercial dating service aimed at adult singles in major metropolitan areas. Here we report data from 10,526 participants in HurryDate sessions, in which roughly 25 men and 25 women interacted with each other for three minutes and subsequently indicated which of the people they met they would be interested in having contact with in the future. We found that (1) HurryDate interactions are primarily driven by generally agreed upon mate values and less by niche-based or assortative patterns, (2) the agreed upon mate values for both men and women derive almost exclusively from physically observable features like attractiveness, BMI, height, and age, but not substantially related to harder-to-observe features such as education, religion, sociosexuality, having children, or desiring future children, and (3) small positive assortative trends arise in the areas of race and height.

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## Saturday Late Morning Paper Sessions

### Session 10.1:

Texas 5 & 6

### ***Sex Differences: Political, Cultural and Policy Implications: Chair, S. Rhoads***

Evolutionary research and other studies rooted in biology often find sex differences in sexuality, cognition, aggression, the desire to nurture children and the quest for high occupational status. Sex differences have recently been in the news because of the controversy that ensued in the wake of Harvard President Larry Summers' comments about women in science. In this symposium Steven Pinker (The Blank Slate), Deborah Blum (Sex on the Brain), and Steven Rhoads (Taking Sex Differences Seriously) will explore the broader implications of what we know (and don't know) about sex differences.

SA 10:40AM

*The Blank Slate.*

**Pinker S**

Why does talk of human nature inspire such fear and loathing in so many people, both on the left and the right? I suggest that it challenges three deeply held beliefs: the blank slate (the mind has no innate structure), the noble savage (people are naturally good), and the ghost in the machine (behavior is not caused by physical events). The beliefs are thought to undergird moral values, and challenges to the beliefs are feared as challenging those values. I show that the fears are based on non-sequiturs.

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SA 11:00AM

*Sex Differences: Political, Cultural and Policy Implications.*

**Blum D**

As the author of "Sex on the Brain", and as a science journalist specializing in writing about behavioral research, I will discuss the way media attitudes - such as a fascination with the idea that humans are "hard-wired" for behaviors - influences both cultural and individual perceptions of sex differences.

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SA 11:20AM

*Taking Sex Differences Seriously.*

**Rhoads S**

Hormonal, cross cultural, primatological and developmental evidence support predictions of evolutionists that men will be more interested in casual sex, more aggressive/competitive and less inclined to nurture the young than women. Often assumptions behind current ideas and public policies are faulty. Title IX, for example, assumes incorrectly that there are no biological reasons that could help explain why men participate more often in sports while simultaneously ignoring the potential of sports to channel and control male aggression. Concepts of sexual liberation for women have damaged most women's abilities to gain happiness through achieving the kind of relationships that they want and that civilization requires. The androgynous feminist's drive to ensure that women work as many hours as men, has left larger numbers of women anxious, guilty and longing for more time with their children.

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SA 11:40AM

*Women in Science: An Evolutionary Psychological Perspective.*

**Browne KR**

Harvard President Lawrence Summers's suggestion that innate sex differences might contribute to the dearth of women in science, he provoked many negative reactions. Some asserted that he was simply wrong; some argued that whether or not he was right, he should not have said it; and others argued that although he may be right, we do not have to live with the results. Although evolutionary psychology can shed only indirect light on the latter two arguments, many of its findings bear directly on the first. Evolutionary explanations have been suggested for differences in status-seeking, single-mindedness, attachment to children, preferences for "people versus things," and spatial, mathematical, and verbal abilities. A full explanation of women in science requires accounting for both

the fields in which they are "under-represented" and also those in which they are "over-represented." Women earn approximately the same proportion of doctorates in chemistry as men do in psychology, the same proportion in biology as men do in anthropology, and the same proportion in engineering as men do in developmental and child psychology. An explanation that incorporates findings about psychological sex differences accounts much better for observed patterns than one that does not.

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**Session 10.2:****Texas 7*****The Psychometrics and Behavioral Genetics of Life History Strategy: Chair, A. J. Figueredo***

This symposium includes four talks on the psychometrics and behavioral genetics of life history strategy. The first talk extends the study of the K-Factor into the realm of behavioral genetics. The other talks validate a short-form measure of life history strategy, called the Mini-K, and test hypotheses to provide greater construct validation of the K-Factor. The second talk addresses constructive replication of findings from the MIDUS survey using alternative measures, including the Mini-K. The third talk addresses the predictive validity of the Mini-K by exploring empirical associations of life history strategy suggesting that it has a major role in differentially inhibiting risky and socially problematic behaviors. The fourth talk tests fitness indicator theory as an alternative hypothesis to life history theory in the prediction of general intelligence and contributes to validation of the Mini-K by comparing the short form with a multivariate battery of measures.

SA 10:40AM

*The Heritability of Life History Strategy: The K-Factor, Covitality, and Personality.***Figueredo AJ, Brumbach BH, Vasquez G, Schneider S**

Using behavioral and cognitive traits from the MIDUS survey of monozygotic and dizygotic twins, the Phenotypic Super-K Factor was replicated, loading .82 on the K-Factor, .60 on the Covitality factor, and .75 on the Personality factor. Factor analyses were performed on the genetic variance-covariance matrices. The Genetic K-Factor accounted for 61%, the Genetic Covitality Factor 85%, and the Genetic General Personality Factor 55% of the genetic variance of their component scales. Estimated heritability of the K-Factor was .65, that of the Covitality Factor was .52, and that of the General Personality Factor was .59. A higher-order factor analysis of the genetic covariances between these three factors yielded Super-K Factor loadings of .92 on the K-Factor, .86 on the Covitality factor, and .92 on the General Personality factor. The Genetic Super-K Factor accounted for 82% of the genetic variance of the three lower-order factors; heritability of the Super-K Factor was .68.

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SA 11:00AM

*A Constructive Replication of the Super-K Factor Using the "Mini-K" Short Form.***Brumbach BH, Figueredo AJ, MacDonald K**

We sampled 113 state university undergraduates to replicate the MIDUS K-Factor results. The 20-item Mini-K short-form substituted for the full K-Factor battery, the Rand SF-36 Short Form Health Survey substituted for the Covitality Factor, and the Interpersonal Adjective Scales - Big Five Version (IASR-B5) measured the traditional Big Five Personality factors. Theoretically-specified common factors were constructed. A general Personality factor loaded .76 ( $p < .0001$ ) on Surgency, .40 ( $p < .0001$ ) on Nurturance, .66 ( $p < .0001$ ) on Conscientiousness, -.32 ( $p < .0005$ ) on Neuroticism, and .59 ( $p < .0001$ ) on Openness to Experience. The Super-K Factor loaded .70 ( $p < .0001$ ) on the Mini-K, .66 ( $p < .0001$ ) on the SF-36, and .72 ( $p < .0001$ ) on the general Personality factor. The

Experiences in Close Relationships questionnaire correlated  $-.21$  ( $p < .0247$ ) with the Mini-K and  $-.36$  ( $p < .0001$ ) with the Super-K Factor, again indicating that low-K individuals have problems in close relationships.

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SA 11:20AM

*Predictive Validation of the "Mini-K" Using Socially Problematic Behaviors.*

**Wenner C, Figueredo AJ, Jacobs WJ**

A sample of 35 university undergraduates completed a battery of questionnaires including: (1) 20-item short forms measuring Life History Strategy (the Mini-K); (2) 20-item short forms measuring Delinquent Behaviors; (3) revised forms measuring Risk Taking Behaviors, including drinking, smoking, drug-taking, risky sexual activity, reckless driving, and gambling; and purified measures of (4) Impulsive Behaviors; (5) Impulse Control; and (6) Impulsivity (Jake's Temptation), based on the Seven Deadly Sins, estimating frequency of temptation to engage in impulsive behaviors. The measures of Delinquent Behaviors, Risk-Taking Behaviors, and Impulsive Behaviors produced a single common factor, the "Risk Factor", which correlated  $-.49$  with the Mini-K and  $-.40$  with Impulse Control. The Mini-K correlated  $.64$  with Impulse Control. A high-K life history strategy is therefore a major protective factor against a cluster of socially problematic behaviors and is highly associated with impulse control.

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SA 11:40AM

*If They Mated: A Life-History Model of Human Fitness Indicators.*

**Sefcek JA, Figueredo AJ, Miller G**

The current study examined the relationship between Rushton's (1995) life-history model (denoted K) and Miller's (2000) Fitness Indicator Model (denoted F) for the variation of human mental and physical traits, including general intelligence (g). Due to known difficulties in using intelligence measures on undergraduate college samples, this study examined the potential for using a derived short-form of the Ravens Advanced Progressive Matrices (RAPM-18) for measurement of g. This study also sought to validate the Mini-K, a 20-item short-form for life-history strategy, by directly correlating it to a multivariate battery of measures of life history traits. Participants ( $N = 102$ ) from three southern Arizona college campuses completed a study designed to examine the relationships among life-history strategy, mental and physical health, fluctuating asymmetry, hormone markers, and intelligence. Preliminary results indicate direct relationships between K and F ( $r = .28$ ,  $p = .001$ ) and F and g ( $r = .24$ ;  $p < .05$ ), but not between K and g ( $r = .07$ ;  $p = .50$ ). These results suggest an indirect effect of life-history strategy on intelligence through phenotypic fitness.

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### Session 10.3: *Chagnon Fest II*: Chair, M. V. Flinn

Hill Country A & B

SA 10:40AM

*Yanomamo Ethnography and Human Nature.*

**Irons W**

Before the origin of the state, kinship institutions such as lineages, clans, and marital alliances were, for the most part, the only institutions uniting human communities beyond extended families. Although the state originated in Mesopotamia 6,000 years ago, some societies up to the present have continued as stateless societies. In these societies, every adult male has the right to use violence, or the threat of violence, to protect his and his family's rights of person and property. In fact, this is the only way such rights are ever protected. The result is a condition

of "warre," a situation of endemic violence. Understanding human nature requires a good understanding of life in stateless societies. Our species evolved in stateless societies and spent most of its history in such societies. The best body of data on a stateless society is that gathered by Napoleon Chagnon among the Yanomamo over the last 40 years. His data indicate, among other things, that the Iroquois kin system, the most common kin system in simple societies, consists of a set of strategies for competing for resources, especially mates for men, in a situation of "warre."

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SA 11:00AM

*The Growth, Development, and Health of Yanomamö Orphans in Relation to Parental Loss and Kinship.*

**Hames R, Oliver WJ Chagnon NA**

We present growth, development and health data on 110 Yanomamö children in two villages. Our goal is to determine the effects of parental loss on anthropometrics and health. Parental loss has negative consequences for children living in a tribal context. For example, one of us (Chagnon) in a preliminary analysis found that mortality rates among orphans in a sample of 593 Yanomamö children was twice as high (10.6%) as the death rate among non-orphans (5.3%). Similar results have been documented elsewhere. Absent from many of these studies is any information on the proximate factors that predispose orphans to greater mortality rates, a lacunae our study is designed to help fill. All child exams were made by one of us, a pediatrician (Oliver), without knowledge of the family status of the children. Our goal is to determine the role, if any, of parental loss on the outcome measures described above. We also examine the role that kin play in buffering the effects of parental loss.

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SA 11:20AM

*The Kinship Structure of a Shuar Village.*

**Hagen EH**

Chagnon pioneered the analysis of biological relatedness in small-scale human societies. His research relied heavily on software he and his students developed to compute coefficients of relatedness and inbreeding. Here I will describe and demonstrate Descent, new, open-source software that was inspired by this early work, but which has a much improved, modern graphical user interface and many additional genealogical functions. I will present results that reveal important aspects of the kinship structure of a Shuar village, relating these aspects to variables like nutrition, growth, and social status.

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SA 11:40AM

*What's Under the Rug of Household Economic Organization? Time Allocation Tradeoffs, Life History, and the 'Decay' of the Nuclear Family.*

**Sugiyama LS, Chacon R**

This talk explores variation in time allocation in response to life history variables affecting non-nuclear family household economic organization among Yora forager-horticulturalists of the Peruvian Amazon. That is, we use evolutionary life history theory to look "under the rug" of household economic organization to examine the effects

of age, sex, marriage, kinship, and household composition on tradeoffs in time allocation to different productive activities.

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**Session 10.4: Cooperation III: Chair, M. S. Alvard****Hill Country C & D**

SA 10:40AM

*The Role of Generosity in the Noisy Continuous Prisoner's Dilemma.*

**Le S, Boyd R**

The iterated prisoner's dilemma (IPD) is a model that has been widely used in the biological and social sciences to explore dyadic coordination problems. The following paper demonstrates that in a general model of the noisy continuous IPD, the most robust cooperative strategy is a generous strategy, and that small error terms have no effect on this strategy, even when the noise is biased. Furthermore, a much greater degree of assortment is required to proceed from a non-cooperative to a cooperative equilibrium than in the case of the discrete IPD. Since the characteristics of this continuous model differ markedly from the discrete IPD, we believe that it is important to ascertain whether phenomena being modeled corresponds to a discrete or a continuous IPD.

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SA 11:00AM

*The Robustness of the 'Raise-The-Stakes' Strategy: Confronting Cheaters in Noisy Prisoner's Dilemma Games.*

**Van den Bergh B, Dewitte S**

Recent studies point out the success of the 'Raise-The-Stakes' (RTS) strategy. RTS is difficult to exploit because it begins with a small investment in a Prisoner's Dilemma Game (PDG). When its cooperation is matched, RTS increases cooperation and takes advantage of cooperative opportunities. Human subjects adopt RTS but do not start out with a minimal investment. This raises the question how robust RTS is against cheating. We investigate whether players vary their cooperation in interaction with different strategies. When confronted with a strategy that matches the investment of the player, cooperation is increased. However, cooperation gradually breaks down in interaction with a strategy that undercuts the level of cooperation of the player, indicating the robustness of RTS. In line with RTS-theory, but in contrast with the cheater detection literature, we find that subjects are less willing to raise stakes when the perceived likelihood of mistakes increases.

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SA 11:20AM

*Preference and Structure: A Social Network Analysis of an Indonesian Whaling Fleet.*

**Nolin DA, Alvard MS**

We present the results of a social network analysis of the hunting fleet of the traditional whaling community of Lamalera, Indonesia. For half the year, the men of Lamalera practice open-sea hunting of whales and ray. Although most boats have a core crew they may rely on, crew participation is very fluid among boats. This fluidity of participation creates a network of ties between boats. We suggest that the emergent structure of this network reflects the preferences of individual crewmen, and provides a way of looking at how individual choices can shape social structure. Boats with more central positions within this network are those more commonly preferred by

crewmen, and are therefore more successful at mustering a crew. We also find that the overall structure of the boat network strongly reflects residential patterns in the village, suggesting a relationship between residential and economic affiliations.

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SA 11:40AM

*Does size matter? Cheating and Cooperation in Small and Large School Children Groups.*

**Yamamoto ME, Irene de Alencar A, Rocha DM**

Game theory has been widely used to study cooperation in humans. We used the public goods model to investigate how group size influences cooperation in children from a public school in Natal, Brazil. They were tested either in large or in small groups. The children received candy bars in an envelope and were instructed to donate 0 to all bars to a common fund. They were informed that for each bar in the fund, we would add two, and that they would be equally divided by the end of the session. Donations were performed behind a blind. Group size was the most important influence on cooperation. Children from small groups cooperated more than those from large groups, and their behavior was also more consistent over time. In large groups children cooperated more in the first sessions than afterwards. Our results, in accordance to studies with adults, suggest that children as well prefer to act as free riders in larger groups, choosing to increase their profits by failing to cooperate. In small groups the pressure for donation and the possibility of identification of cheaters favored cooperation.

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**Saturday Afternoon Plenary 1:00-2:00 p.m.**

**Texas 1-3**

**Edward O. Wilson – *Thirty Years After Sociobiology: Some Thoughts***

## **Saturday Early Afternoon Paper Sessions**

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**Session 11.1:**

**Texas 5 & 6**

***Methodological Development(s) in Evolutionary Psychology: Chair, D. B. Newlin***

Evolutionary Psychology is particularly rich in theory and distal concepts. Problems remain in developing proximal measures to test these theories empirically. The purpose for this symposium is to bring together evolutionary scientists who are “deep in the empirical trenches” to discuss methodology in Evolutionary Psychology. Evolutionary theories must “touch down” to empirical predictions, and one cannot study a theory or phenomenon without reliable and valid measures. The symposium presenters discuss a broad sample of these measures, from human brain imaging in an evolutionary context to questionnaire development and back to manipulation of people’s brain activity with neurotechnology. The focus of this symposium is on how different researchers have approached the problem of using proximal measures to test distal evolutionary concepts in their own research. There is special emphasis on construct validity of measurement.

SA 2:10PM

*Getting the Big Picture: Methodological Constraints on Evolutionary Approaches to Psychological Research Using Horizontal and Vertical Integration.*

**Jones DN, Wenner C, Jacobs JJ**

Research in areas like Psychology has come a long way due to the integration of evolutionary theory. The constraints that evolutionary framework provide results in the integration of Psychology into a larger set of theoretical systems. Two methodologically based mechanisms which are critical for research of this nature are referred to as vertical and horizontal integration. Vertical integration demands that theories and data be constrained by fields of broader and more focused interest in order for these theories to fit into a larger scientific framework. Horizontal integration refers to the cross-validation of proper field observations, self-report, interviews, and other forms of naturalistic observation to be concomitantly tested using experimental procedures. The importance of convergent and discriminant validity are also inherent in such processes. Thus, by acknowledging that Evolutionary Psychology is a life science we vastly expand the amount of data and procedures in need of consideration when conducting research.

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SA 2:30PM

*Testing the SPFit Model of Addictive Behavior: Development of the Self-Perceived Fitness Questionnaire (SPFQ).*  
**Coleman SL, MacKillop J, Castelda BA, Newlin DB**

Among several evolutionary theories of addictive behavior, Self-Perceived Fitness (SPFit) (Newlin, 2002, *Addiction*, 97: 427-446) views addiction as the pursuit of stimuli that increase the self-perception of evolutionary fitness (associated with cortico-mesolimbic dopamine system activation) - despite the fact that these stimuli actually decrease fitness. We developed a self-report paper-based measure, the Self-Perceived Fitness Questionnaire (SPFQ), to test hypotheses derived from the SPFit model. We first generated 112 items related to different facets of classical fitness and administered it to 800 undergraduate men and women. We will present principal components and confirmatory factor analyses of these data, as well as evidence of convergent and divergent validity with other self-report measures. This ongoing research represents an initial quantitative exploration of self-reported attributes of evolutionary adaptive fitness.

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SA 2:50PM

*Functional Near Infrared Spectroscopy (fNIRS): A Methodology for Investigating Brain-Behavior Interaction Under Ecologically Valid Conditions.*

**Levin SL, Patel S, Thomson JW, Platek SM**

Current brain imaging technologies offer a window into the mind, but are limited to stationary settings. We present a new portable imaging tool, functional near infrared spectroscopy (fNIRS) that can be used to monitor changes in cerebral oxygenation and metabolism in real-world settings. fNIRS relies on the placement of light sources and detectors on the scalp. Near infrared light (wavelengths between 700-1000 nm) is used to penetrate biological tissue to optically monitor physiological changes associated with brain activity. Brain activity induces increases in local cerebral blood volume, blood flow, and blood/hemoglobin oxygenation. Oxygenated and deoxygenated hemoglobin (oxy-Hb and deoxy-Hb, respectively) are the dominant light absorbing elements within the brain at the near infrared wavelengths and have different absorption functions. Thus, measurement of light absorption/refraction via fNIRS can record changes in oxy-Hb and deoxy-Hb concentrations, which occur during functional brain activation. Changes in the amount of light reaching the detectors correspond to changes in light absorption and scattering (photons reflected back to the surface of the skin) in the brain region located below and in between the light sources and detectors.

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SA 3:10PM

*Using Brain Mapping to Chart Evolution: Methods and Processes.***Guise K, Kelly K, Steven S, Keenan JP**

Evolutionary Cognitive Neuroscience is a growing field. Employing a number of brain mapping techniques, it is now possible to investigate the origins of higher order cognitive abilities. In a series of studies, we have employed Event-Related Potentials (ERPs) and Transcranial Magnetic Stimulation (TMS) to demonstrate a causal link between self-awareness and deception. It has been found that similar regions of the cortex are involved for both self-face recognition and deception (and deception detection). These data support the "Machiavellian Theory" which suggests a direct link between self-awareness and deception. By employing modern imaging techniques, evolutionary psychologists are able to establish links between evolution and behavior.

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**Session 11.2: Motivation: Chair, R. Aunger****Texas 7**

SA 2:10PM

*A New Classification and Phylogeny of Motivations.***Aunger R, Curtis V**

Motivations are brain-based systems that govern the achievement of evolutionarily significant tasks through behaviour. Behaviour monitoring systems determine which motivation should be pursued. Two classes of irruptive systems can lead to change in motivated behaviour: drives and emotions. Drives regulate levels of resources within or impinging on the body, such as nutrients (hunger and thirst), temperature/light (taxi), and gametes (sex). Emotions regulate the organism's relationships with objects that cannot or should not be contacted or consumed: predators (fear), pathogens (disgust), conspecifics (affiliation), social reputation (embarrassment), and norms (shame). Motivational systems have evolved through four phylogenetic stages in the lineage leading to humans, from (1) the Reflexive Stage (Protists), in which proto-motivations were manifest in inflexible responses; (2) the Reward Stage (Chordates), in which responses involved dopamine-based valuation; (3) the Cognitive Stage (Mammals), in which threats to social resources can inspire emotional interrupts: offspring (nurturing-protection), mates (jealousy), reputation (embarrassment); and (4) the Symbolic Stage (humans), in which new emotions govern behaviours supporting social norms (e.g., shame).

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SA 2:30PM

*An Evolutionary Theory of Human Motivation: Adaptive Mental Mechanisms and Behavior.***Bernard LC, Mills M, Swenson L, Walsh RP**

Motivation is purposeful behavior directed toward the goal of increasing inclusive fitness and motivation may be measured by individual differences in behavior. These individual differences are represented by multidimensional categories of covarying behaviors called "motives". Fifteen putative motives guide surface-level behaviors and interests related to one of five evolutionary social domains that apply to ever larger social systems; solve problems of adaptation by increasing inclusive fitness; and are measurable by strength of interest, desire, or concern with behaviors related to solving problems in a social domain. Motives are mediated by specific neuropsychological structures or mental modules that developed in relation to challenges of environmental problem-solving. As more mental modules developed and the neocortex grew, interactions with ever larger social-cultural environments could be supported.

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SA 2:50PM

*Emotional Reward As Motivation for Human Drug Use: An Evolutionary Critique.*

**Sullivan R**

Evolutionary models of human drug-seeking have emphasized the concepts of "reward" and "novelty". Reward models propose that motivational brain structures "reward" functional behavior with pleasurable emotions, and non-functional behavior with negative emotions. Contemporary human environments are considered to be evolutionarily "novel" in respect to the widespread availability of drugs that interfere with normal emotional functions. The viability of the reward model is dependent on the novelty concept: if humans have always been exposed to drugs, then emotional reward mechanisms vulnerable to the action of drugs cannot have evolved. I will argue that the novelty hypothesis is false. First, the process of "evolutionary neuromolecular modeling" indicates that plant toxins have evolved to target the mammalian central nervous system. Second, human hepatic enzyme systems have evolved with specificity for the metabolism of plant toxins. These human physiological legacies contradict the notion that drugs are an evolutionary novelty, and indicate that drug-reward models are incompatible with a broad evolutionary ecological perspective of human evolution.

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SA 3:10PM

*How Evolution can Bridge the Nomothetic Idiographic Chasm.*

**Nesse RM**

An evolutionary assessment of the motivational structures of individual's lives can help bridge the chasm that separates the search for universal nomothetic laws and the construction of idiographic narrative explanations for individual life trajectories. We describe methods for assessing an individual's motivational structure and for graphically illustrating the structure and extracting certain core variables. These methods were used to interpret data from selected psychiatric outpatients and 100 subjects in a community survey. The results show that individuals' expectations that current life goals are reachable predict affect better than levels of resources or recent life events. The affects that arise from individual life circumstances make sense in a nomothetic evolutionary framework based on the trade-offs and exigencies that arise in pursuit of reproductive resources.

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### Session 11.3: *Chagnon fest III*: Chair, E. Hagen

### Hill Country A & B

SA 2:10PM

*Kin as Friend and Foe.*

**Borgerhoff Mulder M**

Incorporating evolutionary theory into the study of human behavior requires, amongst many other skills, a sharp appreciation of how specific models are, or are not, appropriate to particular social context. Chagnon's pioneering research with the Yanomamo highlights the importance of appreciating ethnographic context, and more specifically the way in which kinship relations are deployed for individual gain. Building on recent theoretical developments over the factors influencing competition and cooperation among kin I examine how relatives can be either an asset or a liability, depending on the economic circumstances of the family. I test specific hypotheses using both intra and inter-populational variability, drawn from Pimbwe, Datoga, Kipsigis and Sukuma populations in East Africa, looking at child survival and child health outcomes. I conclude, as did Chagnon, that the coefficient of relatedness is only one part of a much more complicated story, and I discuss the implications of this for our field.

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SA 2:30PM

*Evolutionary Ecology of Lineal Social Organization.*

**Quinlan R**

Hamilton's rule predicts preference for close cognatic kin over more distant lineal relatives. Sometimes humans reckon kinship cognatically, conforming to Hamilton's rule, but we often reckon kinship lineally, excluding many genetic/cognatic kin. Why don't humans typically use a more "genetically efficient" mechanism for nepotism? Where "capital" can be accumulated over time, lineages can increase long-term benefits of individual effort by preventing loss of resources at the margins of incompletely overlapping kindreds. Hence, lineages may enhance multi-generational fitness at cost to other avenues for nepotism among collateral kin. Lineages offer a forward-looking investment strategy by promoting cooperation in a future where the composition of kindreds is unpredictable. Hence, lineages may be not just a culturally convenient way of organizing collective action, but rather they may reflect imposed norms that benefit ancestors' fitness at cost to individuals in the current generation. Benefits of lineage membership for descendants may, however, offset costs of excluding relatively close collateral kin. This study examines inclusive fitness tradeoffs associated with patrilineages in a horticultural Caribbean community.

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SA 2:50PM

*Warfare, Status, and Reproductive Success in the Ecuadorian Amazon: a Study Inspired by Chagnon's Discovery of the Unokai Correlation.*

**Patton JQ**

When Chagnon reported that Yanomamö men who had undergone the unokai ceremony, a public recognition that they had committed homicide, had significantly more wives and children compared to men who were not unokai, it drew immediate wide-spread attention. Despite its scientific importance and publication in the premier journal *Science*, the theoretical significance of the unokai correlation was largely misunderstood by non-evolutionary anthropologists who buried its significance under malicious accusations and politically motivated attacks. This paper focuses on the scientific contribution of Chagnon's unokai correlation, while presenting data collected in the Ecuadorian Amazon on warriorship, status, and reproductive success that indicate that the unokai correlation is not isolated to the Yanomamö, placing these data and Chagnon's findings within the larger theoretical context of the evolution of human cooperation, conflict, and reproductive striving.

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SA 3:10PM

*An Evolutionary Analysis of Indigenous Siberian Food-Sharing Networks.*

**Ziker JP**

Among the Dolgan in the Taimyr Autonomous Okrug, Russia, meals often include members of a number of families. A food-sharing network was derived from participant observation of 814 meals in 1995 and 1996. Coupled with sociodemographic and genealogical data, multivariate matrix regression showed that the strongest consistent predictor of household sharing at meals was a consanguineal kinship link between households. The summed number of hunters in paired households also accounted for much of the variation in the network.

Additional indices were investigated with reference to a series of cost-benefit models in studies of hunter-gatherer food sharing. The frequency of reciprocal meal sharing between families within this network subset correlated positively with average consanguineal relatedness between households. The evolution of cooperation through clustering may illuminate the relationship between kinship and reciprocity at this most personal phase of food sharing.

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**Session 11.4: *Mate Choice II*: Chair, J. Coultas****Hill Country C & D**

SA 2:10PM

*The Relationship Between Fluctuating Asymmetry and Motion-Captured Dance Movements in Rural Jamaica: Is Dance a Fitness Indicator?*

**Brown WM, Cronk L, Jacobson A, Popovic Z, Grochow K, Liu K, Trivers RL**

If the nearly universal association between dance and courtship is due to its utility as a mate quality display, then dancing ability may correlate with other indicators of quality. One such indicator is fluctuating asymmetry (FA). Deviations from perfect symmetry are associated negatively with physical performance, health, survival, and attractiveness in many species, including humans. To test the hypothesis that dancing ability is associated with symmetry, we used motion capture technology to record dance performances of 183 Jamaicans whose FA had been measured previously. Motion capture allows for the evaluation of a dancer's ability independent of his or her outward appearance. As predicted, FA was a negative correlate of dancing ability and perceived energy expenditure assessed from animations. The superiority of motion capture over videotape is shown by the fact that the association between FA and dancing ability is found for evaluations of the motion captures but not in evaluations of videotapes of the same dances. Future studies will include measures of actual energy expenditure while dancing so that we can test whether this perception is accurate.

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SA 2:30PM

*Do Visual Art Products Act as Fitness Indicators in Mate Choice?*

**Keenoo HT**

In this study 6 males who varied on a continuum of creativity each produced an artwork. The artworks were rated by female observers on intelligence, creativity, and personality traits and the results were compared to the males' actual scores. The results showed significant consensus among the females' ratings on nearly all variables. However, only intelligence ratings demonstrated significant accuracy. When participants were asked which "artist" they would most like to go out on a date with it was found that perceived creativity and conscientiousness were significantly correlated with the frequency of the "artists" being chosen. However, there were no significant results for the actual scores of the "artists". Moreover, the relationship between actual creative ability and frequency of being chosen was found to be negative. The data therefore suggests that using artworks as fitness indicators may be a high-risk strategy due to the likelihood of inaccurate interpretations.

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SA 2:50PM

*An Evolutionary Psychology Approach to Unintended Pregnancy.*

**Spohn M**

The science of evolutionary psychology, specifically mate selection theory, is used to frame the domestic and global issue of unintended pregnancy. Specifically, female mating preferences: commitment, the partner's desire for home and family, physical attractiveness, ambition, good financial prospects, intelligence, fitness and health, and social status, are hypothesized to be risk factors to become pregnant when displayed by a male partner or potential partner. Risk to become pregnant is defined as, a female who does not use a birth control method, or uses it inconsistently. The results supported the hypothesis that women are willing to risk pregnancy, and have risked pregnancy for assorted characteristics, specifically characteristics that support a long-term mating strategy. In addition, women strongly perceived that "other" women were willing to risk pregnancy for mating characteristics, but were less likely to admit their own willingness to risk especially for resources-based characteristics. The results of this study are poised to create a paradigm shift in how organizations craft social policy when looking at unintended pregnancy, education, and abstinence programs.

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SA 3:10PM

*Sexual Selection and Female Choice in American Primetime Drama Series.*

**Coultas JC, Hoang S**

Are there themes within American primetime drama series that reflect issues linked to sexual selection and mate choice? Can people be influenced by television shows? Moreover, are the characteristics of actors and actresses favoured by viewers an indication of mate preferences? These questions are addressed by analysing American primetime drama series with a focus on the memorable themes and preferred actor/actress characteristics indicated by forty American college students. This qualitative study extends Coultas's (2001) female choice in UK soap operas findings and addresses issues related to parental investment and Buss's (1989) proposed universal mate preferences. Findings indicate that females identify more relationship themes in primetime drama series and males identify more conflict/action/justice themes. Additionally, physical attractiveness and a sense of humour are qualities more often reported by participants in this study. This is not entirely congruent with Buss (1989) where understanding and kindness were the preferred characteristics in a mate by both males and females. The question of the influence of the media on female choice and mate preferences is explored.

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## Saturday Late Afternoon Paper Sessions

**Session 12.1:**

**Texas 5 & 6**

***Perception, Deception, Self-Deception, and Self-Awareness: Chair, R. Trivers***

SA 3:40PM

*What Doesn't Go Up Mustn't Fall Down: The Vertical-Horizontal Illusion and Evolved Fall Avoidance Theory.*

**Jackson RE**

The Vertical-horizontal illusion (VHI) is the tendency to perceive vertical distances as longer than equal horizontal distances. Contrary to current theories, I suggest that the VHI evolved in response to costs associated with falling. Falling is costly, yet vertical surfaces persisted over our evolution and offered benefits via successful navigation. Evolved Fall Avoidance Theory (EFAT) suggests the importance of these navigational pressures in shaping many perceptual mechanisms. A unique prediction derived from EFAT specific to the VHI suggests that vertical length

should appear greater from the top of a vertical surface than the bottom. Descending more often results in falls and falls during descent are usually costlier than falls during ascent. Subjects changed the length of a horizontal to appear equal to the height of a 14.39 m vertical surface from both its top and bottom. Consistent with EFAT, subjects perceived greater vertical distance from the top of the vertical surface than from the bottom. Additional data suggest that subject height and testing conditions failed to influence distance estimates. EFAT implications for perception and navigation will be discussed.

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SA 4:00PM

***Sex, Lies, and fMRI: Shooting blanks...***

**Platek SM, Levin SL, Thomson JW, Mohamed FB, Faro S, Gordon N**

Intentional deception is an introspectively based social strategy related to theory of mind and self-processing. Deception (e.g., death feigning) is common in animals, but intentional deception appears to exist only in great apes that show mirror self-recognition (humans, orangutans, chimpanzees). This phylogenetic discontinuity parallels deception's emergence during ontogeny (i.e. it emerges after an individual passes a self-recognition test). Thus, self-awareness provides a cognitive springboard for the capacity to intentionally deceive. We predicted that the neural substrates implicated in intentional deception would be similar to those observed during self-processing and theory of mind. 4 subjects were assigned to an innocent condition and were informed of a shooting. 4 subjects were assigned to a guilty condition and were asked to fire a handgun. Subjects were then queried about this event while being scanned using fMRI. Truthful answers correlated with posterior medial cortical regions and deceptive answers correlated with right anterior cortical regions. These findings confirm our hypothesis that deception taps substrates implicated in self-processing. These data suggest that deception is part of a network involved in self-processing that was selected for in Homo.

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SA 4:20PM

***The Deceptive Roots of Human Mentation.***

**Behrs JO**

Human mentation arose through and consists of shared self-deception in the service of social cooperation where interests conflict. This process enabled homo sapiens to surmount an evolutionary bottleneck that still traps other intelligent species, and helps to explicate unsolved binding problems in the evolution of language. It arose within social systems governed by indirect reciprocity that were pitted against lethal enemies, with uncertain in-group alliances, and with high risk of in-group punishment. This hypothesis predicts the duality of conscious versus unconscious awareness, and the context-dependence of psychosocial structures. It is confirmed by data from over two centuries of hypnosis research, and their extension into everyday living. Its productivity arises from its ability to integrate many diverse human disciplines. It predicts that cultural units or "memes" are best interpreted as complex interactional phenomena, inseparable from their mode of transmission, highly context dependent, and unlike genes, governed by the rules of motivated intentionality.

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SA 4:40PM

***The Evolutionary Neuroscience of Perspective Taking.***

**Kelly K, Guise K, Stevens S, Platek SM, Keenan JP**

In terms of evolutionary cognitive neuroscience, there are a number of higher-order abilities that provide insight in brain development. One such capacity is self-awareness (SA), which is 1) found only in the greater apes and 2) remains unclear in terms of both cortical underpinning and possible fitness benefit. In the current experiment, Transcranial Magnetic Stimulation (TMS) was applied to the prefrontal cortex during a perspective-taking task involving self and other viewpoints. Participants were required to take wither their own perspective or the perspective on another person. It was found that delivery of TMS to the right prefrontal region disrupted self, but not other-perspective. These data suggest that self-awareness may have evolved in concert with other right hemisphere cognitive abilities.

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SA 5:00PM

*The Selfish Brain.*

**Keenan JP**

The evolutionary origins of self-awareness and Theory of Mind (ToM) have been debated extensively in the last decade. Because the brain is 'expensive' in evolutionary terms (it has been estimated that adult human brain processes about 20% of the calories that a person consumes), the value of increased brain matter must be justified. Here, recent research on higher-order cognition is examined. Specifically, the possible association of non-verbal, right hemisphere mediated higher-order tasks is examined in terms of the reproductive advantages that it may add. It is speculated that perspective taking in terms of both deception and deception detection may be key to the increased mass of the cortex, as speculated by Byrne & Corp (2004). Our recent data in humans support such a hypothesis.

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## **Session 12.2:**

**Texas 7**

### ***Sexual Orientation and Gender: Chair, M. J. Sergeant***

SA 3:40PM

*Male Aggression: Differences Between Heterosexual and Homosexual Individuals.*

**Sergeant MJT**

Homosexual males are reported to be less physically aggressive than heterosexual males (Ellis, Hoffman, & Burke, 1990; Gladue & Bailey, 1995). Previous aggression studies have not, however, compared all forms of direct aggression, indirect aggression and empathy among these populations. Empathy is a significant factor to consider since it both mitigates the expression of aggression (Kaukiainen, Björkqvist, Lagerspetz, Österman, Salmivalli, Rothberg, & Ahlbom, 1998) and differs between heterosexual and homosexual males (Salais & Fischer, 1995). This study therefore evaluated levels of direct and indirect aggression and empathy among homosexual (n = 91) and heterosexual (n = 91) males. Data was collected from an Internet-based sample of the two groups using self-report psychometric measures in order to reduce social desirability effects. Homosexual males reported significantly lower levels of physical aggression and higher levels of empathy but report similar levels of indirect aggression, and other forms of direct aggression, to heterosexual males.

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SA 4:00PM

*Homosexuality: The Evolution of a Social Construction.*

**De Block A**

Recent findings are thought to suggest that homosexuality is a trade off for adaptive and fitness enhancing traits. Corna and others (2004), for instance, reported that genetic factors favouring homosexuality in males could increase fecundity in females. Others keep arguing that some forms of homosexuality are adaptations - or at least that they were adaptations in our EEA. The problem with these and other evolutionary explanations of homosexuality is that they take present day homosexuality to be the 'natural phenotype' of homosexuality. I will argue that the history of homosexuality proves this assumption to be incorrect. Indeed, homosexuality is to a large extent 'socially constructed'. However, this does not imply that evolutionary explanations of homosexuality are impossible. Yet, such explanations will have to take into account the importance of cultural niches and their effect on our evolved behavioral patterns and/or modules.

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SA 4:20PM

*A Darwinian Feminist Perspective on Gender.*

**Vandermassen G**

As a philosopher, a focus of my research is on the (in)compatibility of the ways in which the concept of gender is used in feminist discourse, and the ways it figures in and is interpreted by the natural and life sciences. While being fully aware of the history of male bias in science, I am also convinced that feminist theory has a lot to gain from taking into account well-established scientific findings on sex and gender. In my view, one of the big challenges for a 21st-century feminism will be to enter into a genuine dialogue with science. Based on a comparative study of feminist and scientific literature, my work is informed by a Darwinian feminist perspective. In my presentation I will propose a multidisciplinary way of looking at gender, one that takes our evolved bodies seriously. I will address the concept of gender at two levels. First, the ways in which gender has served as a source of bias in the history of evolutionary biology. Second, the question to what extent the biological sciences can be of use to feminists. I argue that a Darwinian perspective need not necessarily conflict with feminist aims, but that it can offer us a dynamical view of the interaction between history and biology.

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SA 4:40PM

*Relationship Experience as a Predictor of Jealousy.*

**Murphy SM, Vallacher RR, Shackelford TK, Bjorklund DF, Yunger JL**

A study of 263 participants was conducted using a self-report survey assessing differences in jealousy between and within the sexes. This study was interested in replicating Buss et al. (1992, 1999), testing the double-shot hypothesis, and investigating a potential trigger for within-sex differences in jealousy. It was hypothesized that males will be more distressed by sexual infidelity and females will be more distressed by emotional infidelity, that there will still be a sex difference between males and females even when both types of infidelity are present, and that relationship experience will trigger males and females to respond in predictable ways. This study replicated the Buss et al. original findings, disproved the double shot hypothesis, and found that relationship experience plays a partial role in upset over infidelity.

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**Session 12.3: Culture II: Chair, P. Richerson****Hill Country A & B**

SA 3:40PM

*Dissecting the Environmentalist Attitude: What Kind of People Call Themselves Environmentalist?***Mize KD, Pratarelli ME, Browne BL**

Environmentalist attitudes are increasing, however, the rate of environmental destruction continues to escalate. The purpose of our study was to assess why there remains a rift between environmental attitudes and behavior. A survey completed by 1047 participants, was used to extract three principal component factors of environmental attitudes. These factors isolated a politically correct environmentalist attitude, a deep ecologist attitude, and a politically conservative-religious attitude. In view of the present data and the extant data on consumption trends, the comparatively high weighting of Factor 1 begins to explain why people's stated attitudes and values regarding the environment are generally inconsistent with their behavior. Furthermore, evolutionary theory predicts that individuals will continue to hold a predominantly egoistic value system that is not likely to encompass much more than the well-being of their immediate kin system and their local community. Taken together with this, the above factors provide an explanation for people's façade of environmental concern despite the ongoing global destruction of the environment.

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SA 4:00PM

*The 'Duh' Factor: Why History Appears to Repeat Itself.***Pratarelli M**

Many writers rely on the notion that history repeats itself. It is more than just metaphor or coincidence. Some have taken a historical-cultural approach to explaining the apparent rise and fall of human civilizations. Their logic is often a fusion of geologic and cultural conditions that arguably have precipitated several "collapses." Instead, this paper argues that the strongest causal factor is found in (1) biological predispositions to accumulate resources, (2) aggression invoked to secure them, and (3) deception to insulate 1 and 2. Thus, geologic and cultural factors must be considered secondary factors. I conclude that history repeats itself because the actors in these historical events act on the same urges and motivations, worries and needs as their ancestors before them; one homosapien genome - one generic brain architecture. This approach has very profound ramifications for the future of the human species; in short, the best predictor of future behavior, is past behavior.

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SA 4:20

*The Shock and Awe of Religion as Memetic Equilibrium.***diCarlo CW**

In this paper, I examine the origin and development of religious belief in light of varying constraints on human cognitive evolution. Since religions appear to be relatively recent cultural inventions, I examine some of the most influential factors of the EEA of the Upper Paleolithic. I then consider the evidence for the emergence of consciousness and language, the use of human reasoning skills, and specific neurobiological factors, in an effort to develop a hypothesis maintaining that religiosity developed as a memetic response to natural occurrences. As human consciousness evolved, so too did our ancestors' capacity to consider and attempt to solve more environmental problems. Problem solving, when considered satisfactory, produces a feeling of environmental control, stability, in short - memetic equilibrium. But the pay-off is not merely practical, providing purely functional utility (or Survival-Reproductive Value) - it is biochemical - and it comes in the form of endorphins.

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SA 5:00PM

*Biological Origins of Religiosity: The Shamanic Paradigm.*

**Winkelman M**

Biological origins of the religious impulse are revealed in the cross-cultural distribution of shamanism. The biological bases of shamanism involve elicitation of neurognostic structures, innate brain modules, and fundamental structures and functions of consciousness. Shamans' experiences (e.g., soul flight, guardian spirit quest, death and rebirth) involve fundamental structures of social cognition and representations of psyche, self and other. Shamanism involves social adaptations that utilize biological potentials provided by community bonding rituals, self and other representations and integrative altered states of consciousness (ASC) to facilitate community integration, personal development and healing. These biological bases of shamanism have both continuity with mammalian and hominoid rituals and uniquely human features that enabled shamanism to contribute to human cognitive evolution. Shamanic practices build out of ancient phylogenetic roots involving the use of ritual to communicate and coordinate social activity through intensifying connections of the limbic and lower brain structures with the frontal brain. The biological basis of the shamanism reflects an evolved psychology and a natural and grounded paradigm for theories of religious experience.

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### **Session 12.4: Anxiety, Stress, and Depression: Chair, D. Arigo**

**Hill Country C & D**

SA 3:40PM

*Exploring Anxiety and Self-Esteem from an Evolutionary Perspective.*

**Arigo D, Rodak K, Sackawicz M, Patel S, Platek SM**

Gaps in the current understanding of clinical conditions such as anxiety and psychological traits such as self-esteem provide an opportunity to apply evolutionary principles, in an effort to understand and treat behavior that is considered "abnormal". From an evolutionary perspective, certain clinical conditions may be represented as exaggerations of "normal" and adaptive traits that maximized fitness during human evolutionary history. The results of two surveys are presented in order to provide evidence for relationships between fitness maximization strategies and self-report ratings of self-esteem and anxiety. Consistent across studies, anxiety and self-esteem were highly correlated with number of sexual partners and frequency of sexual intercourse. In addition, these studies reveal significant gender differences in anxiety, self-esteem, and sexual behavior. These data add to a growing literature suggesting the use of evolutionary perspective in understanding "abnormal" behavior that may serve to drive clinical and therapeutic treatments. By approaching therapy from an evolutionary perspective, clinicians have the potential to improve the quality of treatment and outcomes for such conditions.

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SA 4:00PM

*Biological Sensitivity to Context: An Evolutionary-Developmental Theory of the Origins and Functions of Stress Reactivity.*

**Ellis BJ, Boyce WT**

Biological reactivity to psychological stressors comprises a set of neuroendocrine responses designed to prepare the organism for threat. Conventional views of heightened stress reactivity suggest that it is an atavistic legacy of an evolutionary past in which threats to survival were more severe. Recent evidence, however, indicates that the impact of high reactivity phenotypes on health and survival are bivalent, rather than univalent, exerting both risk-augmenting and risk-protective effects in a context-dependent manner. From an evolutionary perspective, the

developmental plasticity of the stress response systems, along with their structured, context-dependent effects, suggests that these systems may constitute conditional adaptations: evolved psychobiological mechanisms that monitor specific features of childhood environments as a basis for calibrating the development of stress response systems to adaptively match those environments. Taken together, these theoretical perspectives generate a novel hypothesis: that there is a curvilinear, U-shaped relation between early exposures to adversity and the development of stress-reactive profiles, with high reactivity phenotypes disproportionately emerging within both highly stressful and highly protected early social environments.

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SA 4:20PM

*The Relationship of Psychological Symptoms (Anxiety, Depression, and Eating Concerns), and Mating Strategies and Current Relationship Attachment.*

**Allen JS**

Evolutionary approaches propose that depressive and anxiety symptoms result from adaptive mechanisms facilitating survival. Eating disordered symptoms are viewed as adaptive mechanisms maladaptively triggered by sociocultural contexts idealizing a biologically inappropriate female form. The current study explored symptoms of anxiety, depression, eating disorders and mating strategies and current relationship attachment (N=274). After controlling for age, romantic relationship status, and virginity status, eating concerns were strongly and specifically associated with less restrictive sociosexual styles and greater lifetime number of sexual partners. Within romantic and non-romantic relationships, increases in both eating concerns and depressive symptoms were associated with increased fears of rejection and abandonment. Independent of the experience of psychological symptoms, greater levels of discomfort with closeness and depending upon others in both romantic and non-romantic relationships were associated with a less restrictive sociosexual style. Anxiety was correlated with eating concerns and depressive symptoms, but not significantly associated with other variables measured.

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SA 4:40PM

*The Chemistry of Seminal Fluid and Implications for Sexual Behavior.*

**Burch RL**

Human seminal fluid contains dozens of hormones, neurotransmitters, immunosuppressants and other compounds that have been shown to both impact human behavior and readily absorb into the bloodstream. In a sample of sexually active college females, condom use, as an indirect measure of the presence of semen in the reproductive tract, was correlated with scores on the Beck Depression Inventory. In particular, somatic symptoms worsened as semen exposure decreased. For females who did not use condoms, the amount of time since their last sexual encounter was also correlated with depression scores. Other variables such as relationship quality, hormonal contraceptive use, and frequency of intercourse had no effect on depressive symptoms. Results are discussed with particular attention to which seminal compounds may be affecting reproductive behaviors, conception and depressive symptoms.

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SA 5:00PM

*Kindling and Concentration in Depression.*

**Andrews PW, Kuhn JW, Gardner CO, Miller GF, Neale MC, Aggen S, Radi C, Dencoff J, Prescott CA, Kendler KS**

One reason why major depression (MD) is considered maladaptive is because it is thought to increase the likelihood of developing recurrent MD by sensitizing the nervous system to stressful life events (SLEs). A key test is to discern how responsiveness to SLEs changes as a function of depression history. We tested this with an epidemiological sample of twins (4,557 males, 6,038 females) for which we had data on the timing of SLEs and onsets of MD. Survival analyses indicated that a history of MD positively predicted onsets of MD. This was attributable to an increasing risk of developing MD in the absence of reported SLEs. Responsiveness to SLEs also changed, but the results suggest habituation, not sensitization. A history of MD reduced the depressogenic effects of SLEs by 59% in males and 55% in females. This effect was dose-dependent: the more prior episodes of MD, the weaker the depressogenic effects of SLEs. People who get MD may learn something that helps them cope with future stressors. Growing evidence indicates that depression promotes an analytical processing style that may facilitate learning. Implications for understanding the evolution of depression will be discussed.

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**Keynote Address 6:30 p.m.**  
**Steven Pinker – *The Blank Slate***

**Texas 1-3**

Why does talk of human nature inspire such fear and loathing in so many people, both on the left and the right? I suggest that it challenges three deeply held beliefs: the blank slate (the mind has no innate structure), the noble savage (people are naturally good), and the ghost in the machine (behavior is not caused by physical events). The beliefs are thought to undergird moral values, and challenges to the beliefs are feared as challenging those values. I show that the fears are based on non-sequiturs.

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**SUNDAY, JUNE 5**

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**Early Morning Paper Sessions**

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**Session 13.1:**  
***Experimental Studies of Cultural Evolution*, Chair, C. Efferson**

**Texas 5 & 6**

In the early years following the initial development of cultural evolutionary theory, the question of how to develop an associated empirical research program remained largely unaddressed. Recently, however, a fruitful union with experimental economics has yielded several studies in controlled settings relevant to cultural evolutionary theory. This symposium presents four such studies. Together, they present experimental results that document the macroevolutionary consequences of cultural transmission, the evolution of social institutions in the laboratory, and the microevolutionary processes that structure social learning.

SU 9:00AM

*Cultural Transmission Experiments Among Bolivian Pastoralists.*

**Efferson C**

Theories of cultural transmission draw a distinction between linear and nonlinear social learning. This is critical in that, if linear, transmission produces no effect at the aggregate level. If nonlinear, however, social learning produces a pure effect via dynamical feedbacks and can influence aggregate dynamics apart from characteristics

intrinsic to the behaviors in question. Nonlinear social learning requires only two weak assumptions: people learn from other people in ways that affect behavior, and they do not do so indiscriminately. Nonetheless, the structure of transmission is properly an empirical question, as is the specific nature of any documented nonlinearities. This study presents an economic experiment designed specifically to identify the linear or nonlinear structure of social learning. This experiment was conducted among a group of subsistence pastoralists in southern Bolivia. Treatments were designed to test for two widely discussed forms of nonlinear social learning: a tendency to imitate successful individuals and a tendency to adopt the most common behavior in the social group. The analysis, which fit dynamical models to the data using maximum likelihood, produced no evidence for a tendency to imitate success and partial evidence for conformity.

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SU 9:20AM

*A Laboratory Model of the Evolution of Complex Social Traditions.*

**Richerson PJ, Baum W, Paciotti B, Waring T, Sasaki T, McElreath R, Lubell M, Efferson C, Edsten E**

Human social institutions are quite complex and evolve in the course of many generations. Our laboratory model of social evolution involves student participants faced with solving a public goods game in which all participants are tempted to defect. They have three anonymous tools to solve the collective action problem: communication, rewarding, and punishing. Each generation plays the game for 10 rounds. At the end of each generation, participants write their advice to the next generation. Thus, each generation after the first receives the accumulated wisdom of previous generations about how to solve the public goods dilemma before beginning their own play. Most model societies first solve the dilemma mainly by using anonymous communication to explain the game to each other and to exhort others to cooperate. Note that individual selection and selfish rationality predict that such "cheap talk" should be useless. However, cheap talk solutions are vulnerable to the relatively rare deceptive defectors who encourage cooperation but practice defection. A successful tradition must transmit information about how to use punishment to deter deceptive defectors.

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SU 9:40AM

*Evaluation the Effect of Religion and Personality on Altruistic Behavior.*

**Paciotti B, Richerson PJ, Waring T, McElreath R, Lubell M, Baum W, Efferson C, Edsten E, Sasaki T**

Our research explores macroevolutionary consequences of cultural transmission. We are specifically interested in the degree to which religious beliefs and institutions influence altruistic behavior. To measure altruism, we used the Dictator Game developed by experimental economists. Unlike many studies conducted by social psychologists, this game involves real payoffs and does not involve deception. The Dictator Game involves two players. The first-mover is given the opportunity to send some, part, or all of \$10 to an anonymous second-mover. The second-mover is later given any money that was sent to them. After participating in the game, participants completed a detailed survey that included demographic information and numerous scales designed to measure various dimensions of religiosity and personality. Our sample of over 200 subjects includes university students and non-students from various religious and secular organizations. We report on the degree to which religiosity variables and organization membership correlate with Dictator game play. For example, the Machiavellian personality scale is a reliable predictor of the amount a person sends.

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SU 10:00AM

*Wheat and Potatoes: Estimating the Importance of Social Learning.*

**McElreath R, Lubell M, Richerson P, Waring T, Baum W, Edsten E, Efferson C, Paciotti B**

People often use the behavior of peers as a guide in determining their own actions. Theory suggests that individuals should rely on social learning more when the relevant task becomes more difficult. Similarly, models predict that the use of social information should decrease as environmental change becomes more frequent. We designed a series of micro-society experiments to test these predictions. The experimental environment consisted of a two-armed bandit with variation in task difficulty and temporal fluctuation in payoffs. As a baseline, we measured individual learning strategies in the absence of social information. Our second treatment allowed individuals observe to minimal social information - the past actions of a single peer. Our third treatment allowed individuals observe the past behavior of several others, permitting conformity and other frequency dependent strategies. Since direct observation of strategies is not possible, we compared a range of candidate strategy models to actual behavior, and used model-selection techniques to estimate social learning strategies. Our results show substantial evidence of both conformist and non-conformist social learning.

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SU 10:20AM

*Why Bad Reproductive Decisions are the Norm Nowadays.*

**Newsom L**

Buss et al (2001) tracked the cultural evolution of values with regard to mate choice and called for the development of theories to explain the observed changes. It may be due to the change in the composition of social networks that occurs when societies modernize. In modern networks, a high proportion of interaction occurs between non-kin. This is an evolutionary novelty. Evolved mechanisms may influence discourse so that advice given to kin and non-kin is different. We asked participants to supply reproductive advice that would be given in a conversation, manipulating the situation and the genetic relationship between the giver and recipient of the advice. In "close relative" conditions, participants advised behaviour more likely to lead to reproductive success, whether this involved hastening or delaying reproduction. The difference is unlikely to have an immediate effect on behaviour but if the change in social networks that accompanies modernization causes a change in the content of social influence, it is likely to cause progressive change in reproductive norms so that they encourage behaviour which is increasingly inconsistent with the pursuit of reproductive success.

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## Session 13.2:

**Texas 7**

***Evolution of self-awareness and theory of mind: Chairs, F. Focquaert, & S. M. Platek***

A lot of controversy exists about the mind-reading abilities of human and non-human primates. A lively debate has been going on for decades about the evolutionary history and possible adaptive functions of these skills on the one hand and the actual capabilities different species possess on the other. Pivotal in the latter debate is the question whether humans possess unique mind-reading abilities. It is generally accepted that non-human great apes do possess mind-reading skills. However, are these similar to the ones found in humans?

It has been postulated that chimpanzee theory of mind skills are adaptations to competitive social life. Most theorizing on human self-awareness and mind-reading has equally placed a premium on the understanding of others, both in terms of competitive and cooperative social interaction. This symposium addresses these issues, providing experimental data on humans, chimpanzees and monkeys.

SU 9:00AM

*The Evolution of Self-Awareness and Theory of Mind.*

**Santos L, Flombaum J, Lyons D**

Do monkeys reason about the minds of others? We present the results of nonverbal theory of mind (ToM) tasks aimed at exploring what capuchins (*Cebus apella*) and rhesus monkeys (*Macaca mulatta*) know about the minds of human experimenters. The first studies demonstrate that rhesus monkeys take into account the perceptions and knowledge of human competitors when determining which food to steal; like chimpanzees, rhesus monkeys prefer competing with humans that cannot see and do not know about contested food. Our second set of studies explores what capuchins know about the intentions of others. Using an exploration task, we found that capuchins recognize the difference between intended and accidental actions; capuchins reliably examine objects that humans act on intentionally, but not ones that humans act on accidentally. These results suggest that two monkey species understand both the intentions and perceptions of others. We discuss these findings in light of similar successes in apes.

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SW 9:20AM

*Theory of Mind in Non-Human Primates: An Empirical Challenge.*

**Vonk J, Povinelli DJ**

Non-human primates undoubtedly share with humans many cognitive systems for coping with their social environments, but we have recently argued that they may not share our ability to represent and reason about unobservable theoretical constructs, one class of which is comprised of mental states. We argue that the type of experiments currently being applied to this question can not be diagnostic. We propose a shift to paradigms in which participants can not rely upon behavioral or perceptual cues to make predictions about another's behavior. Here, we present data from a small set of human-reared chimpanzees who participated in a novel test of their ability to reason about others' ability to see. The chimpanzees were required to make an inference about another's mental state based on their own visual experiences. Both participants responded randomly on the first block of trials. Future work with these human-reared apes will help resolve important questions regarding the ontogeny of the ability to reason about mental states in humans, and the plasticity of cognitive development in both our own and other closely related species.

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SU 9:40AM

*First-Person Experience and Understanding Others: Developing Agency Fosters Infants' Action Analysis.*

**Sommerville JA**

Many theorists have argued that agentive experience may yield rich information about the intentional structure of others' behavior. Over the first year of life infants' actions become increasingly goal-directed, and infants develop the ability to perceive the actions of others as organized toward goals. I discuss recent work that documents linkages in infants' developing action production and perception, and indicates an impact of enriching infants' action experience on their subsequent action perception. In one line of studies, 10- to 12-month-old infants' ability to produce simple action sequences directed toward an overarching goal predicted their ability to detect the goal of similar sequences in the actions of others. In another line of studies, an intervention enhanced 3-month-old infants' ability to produce goal-directed reaches and also facilitated their ability to construe the reach and grasp of another person as object-directed. These findings suggest that developing agency fosters the ability to construct goal-centered action representations, an aspect of action analysis that may serve as a precursor to developing a theory of mind.

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SU 10:00AM

*Introspective Awareness: Dual Benefits in Terms of Third-Person Mind-Reading.*

**Focquaert F**

Whereas chimpanzees' overt mind-reading skills have been described as adaptations to competitive problem situations, a different picture seems to emerge when looking at human mind-reading skills. I will argue that the covert mind-reading skills humans possess evolved because of the benefits this brought in terms of competitive & cooperative social life. First-person mind-reading in humans has often been linked to third-person mind-reading, indicating that the possible adaptive benefits of human self-awareness or introspective awareness lie in third-person mind-reading. Basically, this theory advocates that simulation lies at the heart of human mind-reading skills, not only in terms of understanding others' thoughts, but equally in terms of understanding others' emotions. I will defend the hypothesis that introspective awareness, as in understanding one's own thoughts and emotions, provides benefits both in terms of cooperative and competitive social behavior.

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SU 10:20AM

*Planet of the Joint Attenders.*

**Terrace HS**

How could phenomena as complex as language and consciousness develop in the short interval of evolutionary time that occurred between the appearance of Australopithecus and Homo sapiens? I will argue that this question has been framed too broadly. Instead of viewing the differences between chimpanzees and Homo sapiens as an example of an evolutionary saltation, they may be better understood in terms of variation in a number of basic cognitive and social skills that are shared among specific primate lineages. Language is fundamentally a social skill that can only develop in children that have the non-verbal ability to share their knowledge with their caretakers. Those skills, which are uniquely human, must have evolved before language. Why learn words if their meaning can be shared? Recent studies of primate and infant cognition provide important phylogenetic and ontogenetic clues regarding the social origins of language, e.g., the ability of an infant and her caretaker to attend jointly to an arbitrary object. From there, it is a small step to attach a name to that object. Understanding the non-verbal precursors of joint attention, defines a research agenda that has the promise of identifying what cognitive abilities had to evolve for language to develop in homo sapiens.

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### **Session 13.3: Race and Ethnicity: Chair, D. Jones**

**Hill Country A & B**

SU 9:00AM

*Variation in Cognitive Abilities Between Hindu Castes.*

**Palmer JA, Meenakshi P, Mangala P, McCown W**

The ancient endogamous practices of Hindu society have produced consistent genetic distinctions between castes. It was hypothesized that the behavioral phenotypes of the predominant castes also would differ in predictable ways from each other. Psychometric instruments assessing General Intelligence, Personality and Values (Wonderlic Personnel Test, IPIP and Swartz Values Inventory respectively) were administered to 87 Hindu

participants (32 female and 55 male, age 16-18 years) enrolled in a college in Mysore, India. The participants were assigned to one of five castes based on their self-reports of three generations of family caste membership. As hypothesized, the cognitive scores of the traditionally priest caste, Brahmin (N = 25, M = 23.64, SD = 6.07) and the traditionally warrior/ruler caste, Kshatriya (N = 9, M = 24.33, SD = 7.43) were significantly higher than the traditionally untouchable caste, Asprushya (N = 13, M = 15.62, SD = 8.32) at the  $p < .01$  level. The cognitive scores of the traditionally merchant caste, Vyshya (N = 15, M = 21.86, SD = 4.21) and the traditionally laborer caste, Shudra (N = 25, M = 20.20, SD = 6.76) did not differ significantly from the other castes. No significant differences were found between castes with regard to personality or values.

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SW 9:20AM

*Do People Find Members of Their Own Race More Attractive (and if so, why)?*

**Burke D, Nolan C, Hayward WG**

Even in modern, multicultural societies, rates of inter-racial dating and marriage are much lower than would be predicted if race-membership was an irrelevant variable in such choices. One possible explanation for this is that people find members of their own race more attractive than members of other races. If so, this could be a consequence of greater familiarity with members of one's own race, or it could be a consequence of past sexual selection operating within races favouring particular facial characteristics. To examine this question Australians of European or North-East Asian ancestry and North-East Asian subjects from Hong-Kong rated the attractiveness of opposite-sex faces of European, North-East Asian or African ancestry, using both individual faces and multi-face composites. Clear preferences for faces of particular races emerged, but the pattern (which was different for male and female subjects) was not entirely consistent with either of the theoretical perspectives.

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SU 9:40AM

*Thinking Race in Brazil: Looks, Groups, and Living Kinds.*

**Jones D**

Some researchers in cognitive and developmental psychology propose that racial categorization is a product of coalitional, or ingroup/outgroup thinking. According to others, concepts of race are rooted in an "essentialist" notion of races as distinct "human kinds," analogous to living kinds. Finally, some historians and anthropologists argue that concepts of race are culturally specific, pointing (for example) to contrasts between Brazil and the United States: Brazilians seem to use a large number racial terms that denote shades of variation along a somatic continuum, and to be quite tolerant of ambiguity in racial classification. I report here on fieldwork recently carried out in a mixed-race population in Bahia, Brazil on concepts of race, race mixture, and racial inheritance. This research addresses these alternative theories, and considers how evolved features of the human mind contribute to folk concepts of race.

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SU 10:00AM

*Is Conflict Necessary to Erase Race? Coalition Computation in the Absence of Competition.*

**Pietraszewski D**

Recent evidence suggests that the human mind is equipped with a coalitional psychology that includes alliance-tracking machinery: computational procedures that infer who is allied with whom from patterns of cooperation and competition. Kurzban et al (2001) showed that race encoding - the tendency to notice and remember people's race - is an easily reversible byproduct of this coalition encoding machinery. Using a context in which two coalitions were in conflict with one another, they showed that the mind automatically encodes people's coalition membership, and down-regulates race encoding when coalition membership is not predicted by race. But do coalitions have to be in conflict to activate coalition encoding and decrease race encoding? No. The present study found automatic coalition encoding and a large decrease in race encoding when subjects viewed two coalitions (charity groups) interacting without any conflict. The studies reported here represent the second experimental decrease in race encoding, and the first using purely cooperative social relationships.

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SU 10:20AM

*Race Predicts Behavior in Cross-Cultural and Cross-National Data.*

**Sanderson SK**

In a recent article in EHB, Peregrine, Ember, and Ember show that, using the Standard Cross-Cultural Sample, race is a poor predictor of a range of behaviors. However, alternative analyses using the Standard sample, the Ethnographic Atlas, and cross-national data show that race is a good to excellent predictor of a wide range of behaviors. In the Standard sample, race predicts mating behavior, sexual attitudes and practices, child-rearing and parenting practices, wife beating, rates of socially organized homicide, technological innovativeness, and the use of money. In the Ethnographic Atlas, race predicts mating behavior, parenting practices, and family structure. In cross-national data, race is a strong predictor of levels of economic development, literacy rates, infant and child mortality rates, educational attainment, levels of sexual activity, number of sexual partners, family stability, and technological innovativeness. Race does predict behavior in a wide range of societies.

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### Session 13.4: *Parental Investment I*: Chair, R. Mace

Hill Country C & D

SU 9:00AM

*The Optimal Allocation of Parental Investment Among Different-Aged Sons and Daughters.*

**Jeon J.**

Darwinian evolution suggests that parents are selected to allocate limited resources among their offspring in a way that maximizes parental fitness. Offspring sex and age are among the most fundamental states leading parents to adaptively bias their expenditure. Unfortunately, there has been a lack of formal models that appropriately incorporate the joint effects of offspring sex and age in a single framework. Here I present a state-dependent life-history model that addresses how a female parent should allocate her resources among different-aged sons and daughters. I show that, at evolutionary equilibrium, 1) the relative marginal returns from investing different-aged daughters should be the same and 2) they also should be equal to the relative marginal returns from investing different-aged sons, which are weighted by female-to-male birth sex ratio. With an assumption that female fitness-gain curves nonlinearly increase with resources more rapidly than male ones, I provide specific predictions on how, in human species, a mother should differently treat her children according to children's sex and birth order.

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SU 9:20AM

*Parental Progeny Olfactory Recognition and Kin Investment.*

**Dubas JS, Marianne Heijkoop M, van Aken M**

Although the role of olfaction in kin recognition has been documented in many mammalian species, research on humans has primarily focused on whether parents are able to recognize their children by smell. The present study extends this work by examining what significance olfactory recognition plays in the degree of investment parents make in their children. Specifically we examined whether parents who are able to recognize their children by smell exhibit more affection and attachment, less punishment and more time investment to their children compared to parents who are not able to recognize their children's odor. We compared these associations separately for mothers (N=64) and fathers (N=36) and one or two of their children (4-11 yrs). Consistent with parental investment and sexual selection theories, fathers who were above chance levels in identifying their children showed higher levels of affection and attachment to their children than fathers who were below chance in identifying their children. Mothers' investment was not related to olfactory recognition skills. These results provide the first evidence that olfactory cues may aid fathers in the allocation of parental care.

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SU 9:40AM

*Investigating the Cinderella Effect in Cases Unintentional Childhood Fatalities.*

**Tooley GA, Karakis M, Stokes M, Ozanne-Smith J**

A body of evidence indicates that step-children are at substantially greater risk of abuse related fatalities than children who live with two biological parents. We examined whether this phenomenon, often referred to as the 'Cinderella Effect,' generalized to cases of unintentional childhood fatal injury, the most common cause of death in children across the developed world. Reports were drawn from the Australian National Coroners' Information System on all cases of intentionally (n=69) and unintentionally (n=837) produced fatal injury in children aged 0-17 years since 2000. Even by the most conservative criteria, step-children under five years of age were found to be at significantly increased risk of both intentional and unintentional fatal injury of any type. Children from single-parent families were found to be only at marginally increased risk of drowning, while children who lived with neither of their biological parents were at highest risk overall for fatal injuries of all types.

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SU 10:00AM

*The Evolution of Adult Attachment: A Comparative and Phylogenetic Analysis.*

**Brumbaugh CC, Fraley RC**

Although the evolutionary functions of attachment in infant-caregiver relationships are undisputed, it is unclear what functions attachment serves in adulthood. The objective of this research was to examine the evolution of adult attachment by applying comparative and phylogenetic methods to archival data for a sample of primates. We found that species exhibiting adult attachment were characterized by paternal care, neoteny, small social groups, and small body sizes. Our additional phylogenetic analyses suggest that the relationship between paternal care and attachment may be due to convergent evolution, but that the relationship between neoteny and attachment may be due to shared ancestry.

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SU 10:20AM

*Helpful Grandmothers in Rural Ethiopia: A Study of the Effect of Kin on Child Survival and Growth.*

**Mace R, Gibson M**

In highly social species such as humans, individuals can increase their inclusive fitness by extending support to their relatives. Here we document patterns of kin support in a rural Ethiopian community where post-marital residence practices provide differential access to relatives. Using demographic, anthropometric and behavioral data collected from four villages we are able to identify effects of presence of kin on child mortality and growth patterns and provide detailed information on the role of relatives within the household.

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## Sunday Late Morning Paper Sessions

**Session 14.1: Darwinian Medicine: Chair, M. C. Keller**

**Texas 5 & 6**

SU 11:00AM

*Vaginismus as an Adaptive Anti-Copulation Defense.*

**Miller G**

Vaginismus prevents intercourse by sustained contraction of the pelvic floor muscles (e.g. pubococcygeal, bulbocavernosus) around the vagina. Traditionally considered a neurotic, penetration-phobic 'sexual pain disorder' (e.g. in DSM-IV-TR), I argue instead that vaginismus reflects an adaptive anti-copulation defense that often errs on the side of caution (as in Nesse's 'fire alarm principle'). A review of 200+ recent papers supports this view, since vaginismus: (1) can effectively prevent intercourse, even attempted rape, (2) often includes active physical resistance to intercourse (e.g. strong adductor contraction), (3) is often precipitated by sexual coercion, trauma, or coital pain (e.g. vulvar vestibulitis), (4) shows a 10-30% lifetime prevalence in women across all cultures studied, (5) is much more common than pelvic floor dyssynergias (spasmic closures) around the anus or urethra, and (6) is exacerbated by relationship conflict, ambivalence about partner, and other cues that pregnancy would be a bad idea. A co-evolutionary arms race may explain both female human vaginismus and the elongated male human foreskin as an intromission mechanism.

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SU 11:20AM

*The Body's Borders and Their Functional Bouncer.*

**Tybur J**

Sociologists and psychologists have long recognized that unwanted intrusions through the body's borders (e.g., eyes, mouth, nostrils) evoke intensely negative emotional responses. Previous explanations for Aversion to Bodily Penetration (ABP) have been somewhat circular and unsatisfactory: ABP implies that body borders are fundamental aspects of the self, which in turn explains ABP's existence. I argue instead that ABP results from a functional adaptation for avoiding infection. Although our body borders are essential input-output gateways for information, resources, and wastes, they are also vulnerable entry points through which infectious microorganisms can enter our bodies and severely impair fitness. In the current study, 106 participants self-reported their attitudes toward several penetrating and nonpenetrating acts, and then completed a scale measuring perceived vulnerability to disease (PVD). Results confirmed the current hypothesis: individual

differences in wariness toward pathogens positively predicted ABP ( $r = .28, p < .01$ ), but no relation was observed between PVD and aversion to nonpenetrating acts ( $r = .069, p = .479$ ).

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SU 11:40AM

*Borna Disease Virus and Human Mental Illness.*

**Smith LC**

The Borna Disease Virus (BDV) is a unique virus infecting the central nervous system, especially the limbic structures, of various animal species and man, causing changes of mood and behavior. It is increasingly accepted that BDV is associated with human mental illness, including depression and bipolar disorder. Should even a small fraction of mental illness be attributable to infection with BDV, this would be an important finding, not least because illness in that sub-population could in principle be prevented. This paper reviews the current state of BDV research and makes suggestions for further studies.

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SU 12:00PM

*The Evolution of Adrenarche in Humans.*

**Campbell B**

Dehydroepiandrosterone (DHEAS) has attracted much attention as an aging hormone. However, findings that DHEAS supplementation has little effect on mood or memory among the elderly suggests that DHEAS may be unimportant in humans. Such a conclusion ignores the fact that adrenarche (the onset of DHEAS production prior to puberty) is a distinctive feature of human life history, shared only with chimps, and as such requires evolutionary explanation. Here I argue that adrenarche represents an adaptation to help support brain plasticity and continued brain maturation from middle childhood through adolescence and into young adulthood. I present four lines of evidence in support of this theory; 1) increases in DHEAS with adrenarche are the result of histological processes that strongly suggest selection; 2) DHEAS is a neurosteroid with effects on both synaptic transmission and neural cell growth, suggesting that the brain is the primary target of DHEAS; 3) DHEAS has demonstrable effects on mood and behavior consistent with its neurological effects; 4) the age-pattern of changes in DHEAS parallel those of brain maturation, suggesting that whatever other factors may be involved, DHEAS plays a unique role in brain maturation.

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SU 12:20PM

*The Role of Mutation in Human Mental Disorders.*

**Keller MC**

The persistence of alleles that contribute to mental disorders is evolutionarily puzzling. One possible answer to this paradox is that a) normal adaptive mechanisms, when dysfunctional, cause (generally fitness reducing) behavioral syndromes classified as mental disorders, b) these normal mechanisms are highly polygenic, and c) polygenic traits are highly susceptible to disruption due to recurrent germline mutations. I present new evidence from evolutionary genetics, inbreeding studies, behavior genetics, and gene mapping that shows that mutation-selection may go a long way towards resolving the paradox of common and heritable mental disorders. Such research avenues have the potential to unite evolutionary psychology with behavioral and psychiatric genetics.

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**Session 14.2: Communication: Chair, T. Ketelaar****Texas 7**

SU 11:00AM

*Look Who's Talking: Developmental Trends in the Size of Conversational Cliques.***Barrett L, Henzi P**

Work on adult humans has revealed a limit on the size of freely forming conversational groups that has been attributed to the mechanical constraints on human speech production. However, it is also possible that cognitive constraints limit the number of individuals with which it is possible to interact. Data from South African and British children were used to test the hypothesis that the size of children's conversational groups is limited by developmental constraints on children's cognitive skills. Results revealed a significant developmental trend in both clique and group sizes, which mapped onto the developmental trend for metacognitive skills. This cognitive constraint was more pronounced with respect to group size than clique size, suggesting that the inability to monitor more than one conversation prevents children maintaining large groups. A second study on adult conversational cliques revealed that being embedded within a larger group reduced the ability of individuals to sustain conversations over time, providing partial support for our hypothesis.

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SU 11:20AM

*Vocal Emotion Recognition Across Disparate Cultures.***Bryant G, Barrett C**

Research has demonstrated that basic affective information can be conveyed by the voice independent of the language spoken, but very little research has examined emotion judgments of vocal stimuli across radically different cultures. In the present study, vocal emotion recognition by adults was compared across two disparate cultures: the Shuar of Amazonian Ecuador, and California college students. Shuar and Californian participants reliably identified the intended affect in English sentences produced by native English speakers. Semantically neutral sentences were recorded by speakers while viewing one of five basic emotional faces (angry, happy, sad, fear, and disgust) with the intent to imitate vocally the expression portrayed in the picture being viewed. Participants listened to the sentences of emotional speech and were asked to match individual utterances to the correct emotional face. Shuar performance is compared to California college student performance in the same task, as well as Californian participants in a content-filtered condition. These data suggest that basic affect in the voice contains universal features distinguishable across quite different cultural groups.

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SU 11:40AM

*Horns on Display – Human Male Appropriation of an Animal Signal.***Goldberg R**

The need by communicating organisms for signal reliability has produced theoretical approaches applicable to a wide range of animal communication. In many ungulate species, males grow paired horns that function as both armament and ornament. Human males have traditionally displayed animal horns and pseudo-horns as head ornaments to enhance the user's stature or degrade the stature of rivals. Cuckoldry and paternal uncertainty have

cross-culturally been associated with the sprouting of horns. Referencing horns has been used to elevate, trivialize and even demonize the prestige of targeted individuals or groups. According to animal signaling theory, signal amplifiers may be used to make it easier for signal-receivers to judge the quality of the signaler. This paper concludes that conspicuous display of animal horns serves as an index amplifier to either embellish the reproductive value of high-quality males or denigrate that of lesser-quality males.

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SU 12:00PM

*Interring Personality Traits and Physical Characteristics From Facial Displays of Emotion.*

**Ketelaar T, Tost J, Davis M, Russell D**

Facial displays of emotion are often assumed to convey information that is limited to providing a readout of the signaler's transitory affective states. By contrast, the current studies examine an alternative view that assumes that emotional displays can provide reliable advertisements of stable individual differences in behavioral intentions. Across a series of experiments participants viewed brief digital movies of the same actors displaying several different social emotions including contempt, anger, disgust, embarrassment and happiness. Rather than simply inferring transient emotional states from these displays, participants routinely inferred stable dispositional traits ranging from aggressive or friendly intentions to low or high muscle mass. For example, the same individual was rated as taller and more muscular when they displayed anger as compared to when they displayed embarrassment. Moreover, embarrassment displays activated attributions of cooperativeness and trustworthiness; whereas anger expressions triggered attributions of uncooperativeness and untrustworthiness. These results are discussed in terms of their implications for understanding emotional displays as costly signals of strategic commitments.

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SU 12:20PM

*Children's Whining: The Adaptive Pleas of an Attachment Vocalization.*

**Sokol RI, Thompson NS**

Like other attachment vocalizations, whining produces distinctive responses in those that hear it. Whining, like motherese, is characterized by increased pitch, slowed production, and exaggerated pitch contours. This form of speech is more distracting to parent and non-parent listeners than neutral speech and even machine noise (Sokol et al., submitted). In this presentation, a whining bout of a young child will be reviewed using a functional-linguistic and acoustic analysis, looking also at the caregiver-child interaction. Fernald (1992) has speculated that motherese functions to accommodate an auditory sensitivity among infants. We further that whining speech, sharing the same salient characteristics, appears well suited to an auditory sensitivity common to all humans, and thus is best suited for getting attention and resources from a caregiver who is engaged in other tasks. We infer that whining is integral to the attachment relation in humans.

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**Session 14.3: Parental Investment II: Chair, R. Quinlan**

**Hill Country A & B**

SU 11:00AM

*Fathering Among the Tsimane' of Bolivia: Are They Simply Showing Off?*

**Winking J**

Recently, some researchers have begun to doubt the efficacy of men's familial investment, and have downplayed the importance of increasing offspring quality as a factor leading to the evolution of pair-bonds and bi-parental care. Furthermore, some have postulated that the main benefit of the paternal care that is observed may simply be to increase the chances of winning and maintaining a wife. According to this hypothesis, men would be expected to bias their care when it most effectively accomplishes this goal: when it has a greater negative impact on the probability of a wife's desertion, and when this reduction results in maintaining access to greater fertility. I tested these predictions among the Tsimane' men of central Bolivia. Specifically, I explored whether men were more likely to provide direct care when their wives were present to observe them and if wife's age was negatively correlated with the probability of men having affairs. No such effects were found.

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SU 11:20AM

*An Interactional Model of Parental Investment.*

**Beaulieu D, Bugenthal D**

A child's reproductive value is viewed as the child's ability to convert parental investment into reproductive success. Whereas evidence exists supporting a greater tendency to invest in high reproductive value children (e.g., Daly & Wilson, 1988), this is only half the picture. Decisions concerning parental investment take into account not only the child's reproductive value, but also the parent's access to resources. Under low resources, parents are expected to invest more in their high reproductive value children and less in their low reproductive value children. However under high resources, this pattern of investment is expected to switch with greater investment allocated to their low reproductive value children (because parents can "afford" to do so without neglecting their other children). Evidence supporting the interactional model of parental investment is primarily from the investment patterns of nonhuman parents. However, recently this model of parental investment has been tested and supported among humans as well (e.g., Bugental & Beaulieu, 2003). Further evidence supporting the interactional nature of parental investment among humans will be presented.

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SU 11:40AM

*The Preferential Investment Hypothesis: An Evolutionary Perspective on Kin Investment.*

**Laham SM, Gonsalkorale K. von Hippel W**

Evolutionary theorizing about kin relations suggests that genetic certainty can influence kin investment. Research on grandparental investment, shows that mothers' fathers are emotionally closer to grandchildren than fathers' mothers. It was hypothesized that this effect is caused by the fact that fathers' mothers often have the potential to invest in genetically more certain kin (children through their daughters). Participants rated their emotional closeness and exposure to their grandparents and reported whether they had cousins through paternal and maternal aunts and uncles. Participants felt closer to mothers' fathers than fathers' mothers only when alternative investment outlets for fathers' mothers were available. Emotional closeness to fathers' fathers was also reduced when they had grandchildren through their daughters. Participants' exposure to grandparents showed a similar pattern of results, but did not display the same level of sensitivity to the presence of alternative investment outlets and did not account for the closeness ratings. The preferential investment hypothesis is also applied to selective investment by aunts and uncles. The results are discussed with an emphasis on the importance of evolutionary theorizing for kinship research in social psychology.

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SU 12:00PM

*How Much Gold Will You Put on Your Daughter? A Behavioral Ecology Perspective on Dowry and Dowry Inflation.*

**Shenk MK**

This paper presents and evaluates a model of South Asian marriage costs based on the logic of Embodied Capital theory. The model links both cross-sectional and temporal trends in marriage expenditures to an increase in per-child parental investment related to increasing participation in a wage-labor economy. Patterns are predicted to differ based on (a) the function of marriage costs as either property transfers or displays of wealth, and (b) the gender of the child that marriage costs are paid for. Trends in three types of marriage costs are examined, including costs of gold, costs of wedding functions, and total marriage costs. The model is tested using retrospective data on 1,100 marriages spanning the period from 1940-2002. Confirming the value of the Embodied Capital approach, it is found that dowry marriages are more common among wealthier and better educated families and more recently in time, that educational characteristics are better predictors of transfer elements of marriage costs while wealth characteristics better predict display elements, and that only transfer elements of marriage costs show evidence of inflation over time. Finally, the implications of these findings for evolutionary studies of cultural behavior are briefly discussed.

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#### **Session 14.4: Social Networks: Chair, W. Jankowiak**

**Hill Country C & D**

SU 11:00AM

*Selective Incentives for Cooperation: Second-Order Punishment vs. Second-Order Reward.*

**Kiyonari T, Barclay P**

Some models describing the evolution of altruism suggest that punishment maintains group cooperation (e.g. provision of public goods), and punishment is itself maintained by second-order punishment (punishing those who do not punish free-riders). While second-order punishment requires some group-level advantages or conformist transmission to maintain its existence, second-order rewarding (rewarding those who reward cooperators) does not. Higher-order rewards are essentially a system of indirect reciprocity, and Panchanathan & Boyd (2004) have shown that rewards can stabilize cooperation in collective action projects. Furthermore, the reciprocation induced by rewards is more favourable to the rewarder than the retaliation provoked by punishment, so we propose that people will be more willing to pay a personal cost to impose second-order rewards than second-order punishment. This prediction was supported by an experiment in which 97 Canadian subjects did a cooperative group task and were given two opportunities to punish or reward other participants. Additional data from Japanese subjects indicate that second-order punishment is rare among either Canadian or Japanese participants.

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SU 11:20AM

*From Darwin to Churchill: Evolutionary Origins of Leadership.*

**Van Vugt M**

Drawing upon evolutionary logic, leadership and followership are reconceptualised in terms of two alternative, yet complimentary decision rules aimed at solving coordination problems between two or more individuals. The current paper uses the vast psychological literature on leadership as a database to test evolutionary hypotheses about the adaptive advantages of taking on leader or follower roles. Consistent with hypotheses, leadership correlates with initiative taking, with trait measures of (social) intelligence, with specific task competencies, and

with generosity. Our review finds no link between leadership and dominance. Our evolutionary analysis also accounts for reliable age and sex differences in leadership emergence and style. In general, evolutionary theory provides a useful framework for studying leader-follower relations in humans.

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SU 11:40AM

*Co-Wife Conflict and Cooperation: Implications for the Universality of the Human Pair Bond.*

**Jankowiak W**

Conventional wisdom holds that the polygynous family system is as sexually and emotionally satisfying as any other. A close reading of ethnographic accounts of 69 polygynous societies around the world provides compelling evidence that, all else being equal, the majority of co-wives in a polygynous family prefer to enter into pragmatic cooperation while maintaining a respectful distance from one another. Moreover, there is often a deep-seated feeling of angst that arises over competing for access of their mutual husband. Co-wife conflict in the early years of marriage is particularly pervasive, and is often marked by outbursts of verbal or physical violence. We also found that co-wife conflict may be mitigated by a number of social institutions, such as sororal polygyny and the need to establish some form of "social security" or health care relationship. In spite of real occasions to cooperate, the central fact remains: Material wealth may be divided more or less equally, but a husband's sexual attention (and thus source for increased fertility) and oftentimes his affection cannot be equitably distributed, thereby generating ongoing and contentious rivalry amongst co-wives.

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SU 12:00PM

*Women's Social Dynamics and Demographic Outcomes Among the Tsimane of Bolivia.*

**Rucas S**

The dynamics of women's social interactions across the life course were investigated from an evolutionary perspective among the Tsimane of Bolivia. The Tsimane are a forager-horticulturalist group of lowland South American Indians. Previous research among this group indicates that social resources are a significant source of competition causing conflict among women and girls. Tsimane women participated in questionnaires to assess information on individual reputational characteristics, social relationships with others, and demographic factors, including health and reproductive outcomes relating to their friendships, partnerships, and rivalships. Women also participated in a bead game intended to simulate resource competition within the group. Data from these methods were utilized to explore the demographic consequences of sociality among Tsimane women. Results indicate that several demographic factors are associated with female social dynamics, resource competition, and social networking behaviors among Tsimane women and girls.

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SU 12:20PM

*Characterizing Reciprocity in Groups: Information-Seeking in a Public Goods Game.*

**DeScioli P, Kurzban R**

Questions remain about the details of the reciprocal strategies people use in the context of group cooperation. We report an experiment in which participants in public goods games could access information about the lowest, median, or highest contribution to the public good before making their own contribution decisions. We found evidence for the hypothesis that adding a cost to view information decreases aggregate contributions, probably

because the motivation to induce others' reciprocal contributions diminishes under these conditions. Further, we found that people are willing to endure costs to acquire information, that they have clear preferences for particular pieces of information, and that information preferences vary systematically across individuals according to their contribution strategies. Specifically, participants playing reciprocal strategies sought information about the median contribution and were most willing to pay for information. Free riders, in contrast, preferred to view the highest contribution, while preferences were not consistent across altruists.

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SU 12:40PM

*How Men and Women Live in Groups: Intragroup Cooperation and/or Intergroup Competition.*

**Yuki M, Yokota K**

In many societies, both men and women live in a within-group context where intragroup cooperation and negotiation is important, men also tend to find themselves in settings that emphasize between-group relations more often than women. This is especially the case when ingroup's survival is at stake in intergroup conflict/competition, where men take the role of soldiers to defend it. Thus, we hypothesized that, first, in group situations, both men and women's ingroup favoritism will be based on a consideration for interdependence within the ingroup. Second, men's ingroup favoritism will be also based on their proneness for intergroup competition. In an experiment with 90 male and 53 female students, we manipulated 1) existence/absence of generalized intragroup exchange structure and 2) priming of outgroup threat, and observed how they would affect ingroup favoritism in reward allocation in a minimal group paradigm. The results showed, as predicted, that both intragroup dependence and outgroup threat affected men's ingroup favoritism, whereas women's ingroup favoritism was influenced only by the intragroup dependence.

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## Poster Abstracts

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*Adults' visual preferences for toys: New evidence for a 'bent twig' theory of sex-linked spatial ability*

*\*Poster session II*

**Gerianne M. Alexander**

Eye-movements were monitored in sixty-four young adults during simultaneous presentation of "masculine" and "feminine" toys. It was hypothesized that visual fixations on sex-linked toys would indicate visual preferences in adults similar to those documented previously in infants, and that these measures of preference or bias would be related to spatial competency and levels of prenatal androgens. Consistent with this hypothesis, women and men showing more visual fixations on male-typical toys compared to female-typical toys had better spatial ability (as measured by mental rotation and targeting ability) and smaller (i.e., more masculine) digit ratios, a putative marker of prenatal androgen levels. These findings support the hypothesis that male-typical toys provide experiences that contribute to the male advantage in spatial ability and suggest further that prenatal androgens may facilitate the acquisition of spatial abilities by promoting enduring preferences for such objects.

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*Parent-Child Phenotypic Similarity: Evolution's Paternity Test or Experimental Artifact*

*\*Poster session II*

**Christina Almstrom, Mike Knight, Kelli Vaughn-Blount & Terra Blackwell**

Because the human infant is born altricial it seems logical to conclude that human fathers would be sensitive to phenotypic similarity. Christenfeld and Hill (1995) reported experimental results using a guessing procedure supporting this prediction. French, et al. (2000) failed to replicate these results using a ratings procedure. In both of these studies it was argued that mothers provided an adequate comparison group. Bressan and Gassi (2004) compared both guessing and ratings procedures finding no difference between mothers and fathers and accuracy better than chance. The present experiments used a procedure modeled after a verbal leaning experiment. The basic idea is that it should be easier to learn to match up a list of related parents and their children than a list of randomly constructed pairings. The first experiment used single frontal view photographs while the second experiment used three views of each person; frontal, profile, and oblique. The data revealed significant main effects for familial similarity and for sex, emphasizing the importance of using adequate control groups and suggesting that greater paternal resemblance is not the result of uncertain paternity.

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*Delay Discounting, Mood and Risk Taking*

*\*Poster session I*

**Jeremy Atkinson**

DDR (delay-discounting rate) is the rate at which a person devalues a reward as the time to the reward is increased. A high DDR means a greater preference for smaller immediate rewards over larger delayed rewards. Daly and Wilson (2003) have successfully shifted DDR in humans using evolutionary salient stimuli. This experiment attempted to i.shift subjects' DDR by inducing either a positive or negative mood, ii.determine how risk taking and DDR were related. Risk taking was assessed in 2 ways; i.D-RT: a 6 domain risk taking quiz (Weber et al 2002), ii.G-RT: A probabilistic gambling game. Induced mood had no effect upon DDR. Recreational risk taking was negatively correlated with DDR for males. Health and ethical risk taking were positively correlated with DDR for females. G-RT was positively correlated with D-RT in males, but negatively correlated with DDR in females. These results suggest that the relationship between DDR and risk taking depends both upon gender and type of risk. As different neural pathways have been found to be activated when comparing immediate vs. delayed rewards (McClure et al, 2004), there is the possibility that there are separate and distinct neural pathways associated with different kinds of risk taking.

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*Sociosexuality, Sexual Arousal, and Risky Decision Making: A Domain Specific Perspective*

*\*Poster session I*

**Michael D. Baker & Jon K. Maner**

An evolutionary approach implies that evolved motives should guide basic decision making processes. This research investigated the link between mate-search motivation and various forms of risk decision making. In Study 1, we examined the link between sociosexual orientation -- an individual difference intrinsically tied to mate-search motivation -- and willingness to engage in various forms of risky behavior. Results showed that sociosexual orientation was linked to mating related risk-taking, with unrestricted individuals reporting greater risk-taking. Sociosexuality was unrelated to other types of risk-taking, suggesting that the link between mate search motivation and risk decision making is domain specific. Study 2 examined interactive effects of sociosexual orientation and sexual arousal on risk decisions. We expected that sexual arousal would increase willingness to take mating related risks, with stronger effects among sexually unrestricted individuals. Results showed that sexual arousal increased willingness to take mating related risks among unrestricted participants but not among restricted participants. Again, this effect was specific to mating risks; no effects were observed for other types of risks.

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*Second-to-fourth digit ratio (2D:4D) and musical ability*

*\*Poster session II*

**J. Barker, M.J.T. Sergeant & M.N.O. Davies**

The second-to-fourth digit ratio (2D:4D) is a sexually dimorphic trait thought to be determined in utero, with indirect evidence that 2D:4D is negatively related to prenatal testosterone exposure (Manning, Scutt, Wilson, & Lewis-Jones, 1998). Exposure to high levels of prenatal testosterone is reported to facilitate right hemisphere development, which is suggested to enhance musical ability (Geschwind & Galaburda, 1985). While research has compared the digit ratios of musicians and non-musicians (Sluming & Manning, 2000), the relationship between 2D:4D and musical ability within a group of musicians has yet to be investigated. Within a sample of musicians (N=50) the association between a range of 2D:4D measures (left hand ratio, right hand ratio, average ratio, and difference between hands; Dr-I) and musical ability was assessed. Musical ability was evaluated using a cognitive test designed exclusively for this study. Test scores correlated significantly with males' (N = 22) right hand and average 2D:4D, and female's (N = 28) left hand and Dr-I 2D:4D. The implications of these findings for our understanding of the influence of prenatal androgens on neural development are discussed, as are the sex differences that emerged.

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*Beyond modularity: A self-correcting model of cognitive architecture*

*\*Poster session I*

**Elizabeth N. Bartmess**

Much of evolutionary psychology is grounded in the notion of cognitive modularity (Cosmides & Tooby, 1991). Practitioners often implicitly assume that modules have been well-studied and clearly defined. Many would be surprised to learn that there are multiple substantially different definitions of cognitive modules (Sperber, 1994; Fodor, 2000), without a clear 'winner.' To reconcile definitions, theorists have proposed typologies of modules, which has led to multiple substantially different typologies (e.g., Sperber, 1996; Segal, 1994). I set forth a model of cognitive architecture based on three continua: environmental responsiveness, encapsulation, and physical localization. Various definitions of modules, and module typologies, can be simultaneously mapped onto the model and compared, as can faculties not considered modular. I also describe abstract outlines for testing where faculties fall on each continuum. This provides more descriptive criteria for discussing characteristics of faculties, and helps the model evolve into an empirically supported map of cognitive architecture.

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*Teaching Evolutionary Psychology through a Novel of an Upper Paleolithic Society*

*\*Poster session I*

**Gordon Bear**

A novel set in Siberia 20,000 years ago vividly illustrates problems and principles of evolutionary psychology. *Reindeer Moon* (Houghton Mifflin, 1987) is a coming-of-age tale whose central character is a girl living in a small band of foragers. The author, Elizabeth Marshall Thomas, is well qualified to imagine this tribal society, for she lived with the San of the Kalahari Desert as a young woman, the daughter of the anthropologist Lorna Marshall. The plants and animals, tools, clothing, and climate of the novel are also authentic, closely based on the author's reading of the archeological record. Fish will be the last to discover water, and it is difficult to show students what evolutionary thinking has discovered about the human condition. The novel takes students out of the water of their mundane lives and into a different medium, a society populated by characters whom we can understand but who lived closer to nature and closer to death in the environment of our evolutionary adaptedness.

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*Sex Differences in Jealousy: A Test of The Forced Choice Method*

*\*Poster session I*

**Chawki A. Belhadi & Roger L. Mellgren**

A type of self-report measure called the forced-choice question (Buss, Larsen, Westen, & Semmelroth, 1992) is frequently cited in support of the view that there are sex differences in jealousy. The measure forces participants, under a hypothetical infidelity scenario, to choose which type of infidelity, emotional and sexual, they consider more distressing. Results typically show that women tend to be distressed by emotional infidelity, while men tend to be more distressed by sexual infidelity. The purpose of the study was to provide a stringent test of the finding through the asymmetrical "loading" of the language used across infidelity options. A total of 116 participants were tested, 85 men and 85 women. Two forced choice questions were administered within-subject. Across infidelity options, each infidelity option alternated as loaded or unloaded across question. Loading the language only had an effect on women McNemar test,  $X^2 = 6.26$ ,  $df = 1$ ,  $p < .05$ . Despite this asymmetrical effect, the sex difference finding still replicated in both scenarios: Scenario #1:  $X^2 = 17.16$ ,  $df = 1$ ,  $p < .001$ ; Scenario #2:  $X^2 = 9.97$ ,  $df = 1$ ,  $p < .002$ . The forced choice method therefore appears to be a robust effect. In this context, alternative explanations were also discussed.

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*Individual Differences in Romantic Relationships: Attachment Styles or Mating Strategies?*

*\*Poster session II*

**Emily K. Bell & Lee A. Kirkpatrick**

Attachment theory has emerged as a dominant approach to the study of romantic relationships within social psychology over the last 15 years. However, Kirkpatrick (1998) has argued that an evolutionary perspective raises important theoretical questions about this application of the theory, and suggested that individual differences in attachment styles -- particularly the avoidant-vs-secure dimension -- may reflect individual differences in short-term/long-term mating orientations rather than attachment per se. In the present study ( $N = 130$ ), participants completed two standard attachment scales, two new measures of long- and short-term mating orientations (James & Kirkpatrick, this conference), and several other scales (dyadic trust, relationship satisfaction, attitudes about love) previously shown to correlate with (and validate) attachment scales. Multiple regression analyses reveal that in most cases, the predictive power of the attachment scales disappears when mating strategy is statistically controlled.

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*Thinking About Being Unfaithful? Guilt Patterns in Romantic Relationships***Kevin L. Bennett**

Sex differences in romantic guilt are real, but depend on "relationship commitment experience." Using a forced-choice format, participants (N=179) were asked to think about committing an infidelity and answer what they would feel most guilty about: The sexual or the emotional aspects of the infidelity. Women and men differ in guilt as a function of romantic commitment experience. Low commitment experience is a category of "current relationship status" that includes romantically single individuals, currently dating one person, or currently dating multiple persons. High commitment experience includes married, engaged, living with someone, and divorced. In the low relationship commitment experience group women, more than men, express guilt over the sexual aspects of infidelity. The pattern reverses in the high relationship commitment experience group. Men, more than women, express guilt over the sexual aspects of infidelity.

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*The Assessment of Individual Motives Questionnaire [AIM-Q]: Reliability and Preliminary Validity**\*Poster session I***Larry C. Bernard, Michael Mills, Leland Swenson & R. Patricia Walsh**

We introduce AIM-Q, a new multidimensional instrument that measures 15 putative human motives derived from evolutionary theory. Results from a series of studies to establish the reliability and preliminary validity of AIM-Q are reported. Data supporting the unidimensionality (principle components factor analysis), homogeneity (internal consistency reliability), dependability (one week test-retest of measurement error), and stability (two month test-retest correlations) of the motive scales are reported. Additional data on the convergent and divergent relationships among the motive scales are also reported and support the constructs on which the instrument is based as well as an evolutionary theory of human motivation.

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*TERRORISM, HEROISM, AND ALTRUISM: Status perceptions, religious-belief mediated cost scaling, and kin selection in Palestinian suicide attack**\*Poster session I***Aaron D. Blackwell**

Popular lore holds that suicide attack is motivated by poverty, fanaticism, and lack of education. Recent studies have challenged these ideas, suggesting that suicide attackers are neither desperate, pathological, nor uneducated. Selectionist thinking questions why individuals should pay high costs when the benefits are public goods. I argue that the costs and benefits of attack are largely balanced by kin selection. Suicide attackers often have large families which receive both honor and money following the attacker's death, translating into economic gains and improved mating opportunities. However, the perceived costs and benefits of suicide attack are not rated evenly by members of all social strata. Lower status families are expected to compare themselves to higher status Palestinians, while mid-high status families compare themselves to both Palestinians and equivalent status Israelis. Thus, overeducated but underemployed Palestinians are more aware of restricted opportunities and place greater value on punishing Israelis. Religious belief further attenuates perceived cost/benefit decision making by lowering the perceived costs of self-sacrifice.

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*The Scarlet Letter of Body Modifications: The Implications of Tattoos and Body Piercings as Signs of Female Promiscuity.**\*Poster session II***Melanie Bromley & Jacqué S. Hodge**

We are interested in a potential signaling function of body-modifications (tattoos and piercings) to short-term mating strategies in the context of sexual selection and hypothesize that body-modifications could act as a signal of female sexual receptivity to short-term mating. By exploring the associations of body-modifications, marital status, and sociosexual orientation (SOI) we found a significant relationship between the SOI and the total amount of body piercings but not for the total amount of tattoos. There was also a significant relationship between the SOI and the placement of body-modifications particularly in women who had ankle, lower-back, or hip tattoos, and nipple piercings. Additionally, body-modifications were also associated with being single even when controlling for age. These results suggest that by selectively highlighting those physical attributes which are normally attended to by potential mates, females can increase their chances of being identified (as having greater sex appeal) by short term mating partners but the association of other attributes makes the wearer an unlikely candidate for long term mating.

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### *Homicidal Fantasies in Russia and the United States*

*\*Poster session I*

#### **Piotr Burchard, Virgil Sheets, Felix Thoemmes & Robyn Lugar**

Prior research has suggested that homicidal fantasies can provide insight into aggressive reactions among "normal" people (i.e., who do not follow through and commit a homicide). Samples of college students in Russia and the United States were surveyed regarding their frequency and characteristics of homicidal thoughts. Smaller proportions of these samples reported homicidal thoughts relative to prior research. Nonetheless, there were numerous gender differences (e.g., in frequency of thoughts, categories of targets, and triggering causes) that were consistent with prior research in the U.S., and relatively few differences between the Russian and U.S. samples. Also consistent with theory and previous research, very few participants thought about killing family members versus stepfamily members. Gender and cultural differences in aggressive histories were observed, and small (but significant) correlations between homicidal thoughts and actual aggressive behavior were observed for men. These patterns are discussed with regard to cultural and evolutionary factors that may impact rates of aggression and reporting of aggressive thoughts.

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### *What is Intolerable in a Mate?*

*\*Poster session II*

#### **Brandy N. Burkett & Leda Cosmides**

Research has shown that men and women have computational mechanisms designed to assess preferred characteristics of potential mates, and assign mate values accordingly (Buss, 1989; Li et al., 2002). But positive preferences are only part of the puzzle. However many positive characteristics a individual may have, that person may have some negative ones that are "deal breakers". Thus, humans should have evolved computational mechanisms designed to cue into negative characteristics and avoid mates with negative characteristics that could pose large fitness costs. This research used a modified version of Li et al.'s (2002) budget paradigm to examine what characteristics individuals find intolerable in a potential mate. Data are currently being collected.

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### *Status, Dominance, or Prestige? Domains of Self-Esteem as Moderators of Reactions to an Embarrassing Situation*

*\*Poster session I*

#### **Nicole R. Buttermore & Lee A. Kirkpatrick**

Kirkpatrick and Ellis (2001) posited that within various evolutionarily relevant domains, distinct self-esteem (SE) mechanisms function as gauges that monitor the success of social interactions within that domain and guide adaptive responding. One class of such domains relates to competition within groups for status. Henrich and Gil-White (2001) recently proposed that dominance (the use or threat of force) and prestige (freely conferred

deference) represent two distinct strategies for attaining status. We developed separate measures of self-perceived dominance and prestige, and used these and other domain-specific SE measures to predict individual differences in embarrassment in a laboratory paradigm adapted from previous research (Leary, Landel, & Patton, 1996). Participants performed an embarrassing singing task, then some were given the opportunity to convey their feelings to the researcher and others were not. The amount of embarrassment reported subsequently by those participants who had the chance to express their emotions publicly was related to self-reported levels of dominance, but not prestige. These results suggest that prestige and dominance are theoretically and empirically distinct domains of SE.

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*Cuckoldry risk predicts correlates of sexual coercion in romantic relationships*

*\*Poster session II*

**J.A. Camilleri**

Under the cuckoldry risk hypothesis, men are more likely to sexually coerce their romantic partners when the risk of cuckoldry is high. Sexually active men and women in heterosexual relationships were sampled to evaluate this hypothesis. Cuckoldry risk was assessed using the time since last having intercourse with one's partner (TIME) and the proportion of time away from one's partner since last intercourse (PROP). Correlates of sexual coercion were measures of verbal and physical persuasion, as well as rape-supportive thoughts, attitudes, and arousal. A TIME x PROP interaction accounted for a significant proportion of the variance in verbal and physical persuasion among men, and significantly predicted other correlates of sexual coercion. As expected, men with longer periods since last having intercourse with their partner were most likely to score highly on correlates of sexual coercion only when the proportion of time away from their partner was also high. The relationship between cuckoldry risk and rape-supportive thoughts, attitudes, and arousal provides evidence for a male-specific facultative strategy of coercive sex with one's romantic partner.

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*Ovulation may not be Totally Concealed: Especially from Pair-Bonded Males*

*\*Poster session II*

**Hakan Cetinkaya**

With three studies, possible adaptive value of concealed ovulation were examined. In the 1st study, cyclic menstrual changes in the facial symmetry in regularly ovulating women were investigated. The findings showed predictable fluctuations on facial symmetry across menstrual phases. To determine if the changes were detectable by males, in the second study, males evaluated the facial-menstrual pictures for attractiveness. They rated the pictures ovulatory pictures as the most attractive the menstrual pictures least attractive. In the third study, half of the male participants (familiar males) rated four pictures obtained from the same females, the other half of them (unfamiliar males) rated four pictures, but this time each of which obtained from different females. The males in the latter group were not able to distinguish attractiveness of the pictures of different females. The results indicate that although there is some extent of concealment of ovulation in women as an adaptation, it is not completely concealed, especially from the familiar (or pair-bonded) males. Thus, men might have equipped with a counter-adapt through their evolutionary history to cope with the problem of concealment of ovulation.

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*Manipulation of the Waist-to-Hip Ratio: Effect on attractiveness*

*\*Poster session II*

**Steven Chalet, Dana Salotti & Julian Paul Keenan**

It has been speculated that Waist-to-Hip Ratio (WHR) is an indicator of reproductive fitness. Further, it has been found that a WHR of .7 is rated as being highly attractive when compared to other ratios. We previously found that self-manipulated ratios tended towards .7. That is, when participants were allowed to manipulate their own bodies, they tended towards a .7. In the current study, we allowed participants to manipulate their own images.

We then presented the original and the altered body images to a separate group of participants. It was found that there were significant differences in the attractiveness ratings of the original and the altered images. Interestingly, we found support for the .7 'ideal', such that one of the determining factors in attractiveness was a WHR of .7. These data are discussed in terms of recent WHR research and the suggestion that WHR may be an indicator of reproductive health. Higher-order tasks is examined in terms of the reproductive advantages that it may add. It is speculated that perspective taking in terms of both deception and deception detection may be key to the increased mass of the cortex, as speculated by Byrne & Corp (2004). Our recent data in humans support such a hypothesis.

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*Sex dependent patterns of 2D:4D digit ratio and personality traits*

*\*Poster session II*

**PengKwei Chang, Judith A. Eston & Lauren Glennon**

Prenatal sex hormones have been widely implicated in their effect of brain differentiation, subsequently, affecting the development of sexually dependent traits, such as, hand preferences, aggression, mate preference, and etc. Direct measures of uterine sex steroid in human are difficult. It has been suggested that testosterone stimulate prenatal growth of the 4th finger while estrogens promote the growth of the 2nd finger. Variations in 2D:4D ratio could thus serve as an index for individuals' uterine sex steroid profile. We investigated 2D:4D digit ratio and a set of sex dependent personality measures on aggression; sociosexuality; mate preference; and self-monitoring in 83 (41 male and 42 female) college students. We found that 2D:4D and personality traits are differentially associated with sexes. In males, 2D:4D was correlated negatively with physical aggression, sociosexuality, and positively with self-monitoring. In females, 2D:4D correlate positively with verbal aggression and sociosexuality, and low self-monitoring. Recent finding on sexual dimorphic androgen receptor gene coding for receptor activity and levels of sex hormones will be used to explain our finding on sexual dependent patterns of 2D:4D and personality.

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*Does natural selection favor sex differences in alcohol consumption?*

*\*Poster session II*

**Greg Chapman**

Research indicates cross-cultural patterns of alcohol consumption in which females consume markedly lower than males. In some cultures this behavior is reinforced by restrictions or norms; however, lower use of alcohol exhibited by females in cultures with more permissive attitudes toward female alcohol use suggests a possible physiological basis for this behavior. This study will investigate the hypothesis that natural selection has favored a physiological mechanism in females that reduces the psychological urge to consume alcohol near ovulation for enhanced reproductive success. This hypothesis will be tested by tracking female alcohol consumption in female undergraduates throughout the course of each subjects monthly cycle.

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*The roles of object identity and verbal memory on object location memory*

*\*Poster session I*

**Jean Choi & Jolyn D'Andrea**

Object location memory is a unique spatial ability; it is the only spatial ability that yields a female advantage. Recent work, however, suggests that other factors may influence this sex difference. We tested two of these factors, namely, object identity and verbal memory, on one aspect of object location memory. Findings suggest that females, but not males, use both factors to facilitate memory for locations of specific objects. Evolutionary implications will be discussed.

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*The Birkbeck Mating Questionnaire*

*\*Poster session II*

**Danielle Cohen & Jay Belsky**

Research examining mate preferences (MP) is typically focused on sex differences and temporal context (i.e., short- vs. long-term). Because the availability-predictability of physical and social resources in the environment within which individuals reside may also affect variation in MP, as a necessary first step toward examining this issue empirically, we created a new MP questionnaire and determined whether (a) its factor structure was stable across (hypothetical) contextual situations; (b) it was sensitive to sex differences; (c) responses were stable over a 3-month period; and (d) order effects proved problematical. 433 US and UK respondents completed the 35-item questionnaire under three hypothetical contextual conditions. Analyses revealed that the same 7 subscales proved internally consistent across conditions; the subscales were sensitive to sex differences; test-retest reliability was good; and order effects were absent. These findings indicate that the instrument can be used to assess ecological variation in MP.

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*The Effects of Estrogen on Cognition in Women*

*\*Poster session I*

**Melody Combs, Valerie E. Stone & Anne P. DePrince**

Research shows that women's performance on some cognitive tasks varies with fluctuations in estrogen. Higher estrogen is linked to higher dopamine, a crucial neurotransmitter in frontal lobe activity. If relatively higher levels of estrogen aid performance on tasks that primarily engage the prefrontal cortex, but not the hippocampus, it would suggest that frontal cortex is the primary mediator of estrogen's effects on cognition in women. Female participants (N=47) between ages 18-34 were tested on several tests of working memory and fluency (frontal tasks), and memory for paired associates (hippocampal tasks) during menstruation (days 1-3 of the cycle) and mid-cycle (days 13-15 of the cycle). Participants not on the pill performed marginally better during mid-cycle on the most difficult working memory task (the PASAT), compared to menstruation, while no effect was found on the paired associates tasks. There is also some evidence for practice effects between sessions.

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*Social support and addictive behaviors in Portuguese college students*

*\*Poster session II*

**Raul Cordeiro, João Claudino & Miguel Arriaga**

A total of 370 students, with an average of 17,71 years old, enrolled in the 12th year, during the 2004/2005 school year, in two secondary schools was questioned by a direct application questionnaire including: ESPAD (European school Survey on alcohol and other drugs) adapted from the original scale and the ESSS (satisfaction scale with the social support). (Ribeiro, 1999), and 262 students answered, being (45%; n=118) masculine and (55%; n=144) feminine. Some characterization questions were introduced: Sex, Age, Residence place, Number of years enrolled in the 12th year of education, Current lecture and respective scientific area of study in which the student is enrolled. Descriptive statistic and the Spearman's correlation coefficient were used to verify the statistic significance of the relation between variables, was used for data treatment. The results showed a bigger addiction of spirit/white drinks and beers. Bars and pubs are the most chosen places for this kind of behaviors. Social Support results suggests that teenagers are satisfied with their social support, feeling more satisfied with friendship and family.

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*The Evolutionary Origins of Belief in Supernatural Agents: How Theory of Mind Produces Gods, Demons and Spirits*

*\*Poster session I*

**Christopher A. Cormier & David F. Bjorklund**

Boyer (2001) claims that supernatural agent concepts (e.g., ancestor spirits, gods, demons) arise in the course of deliberate human speculations "on the possible." In contrast, Bering & Bjorklund (2001) demonstrate that a large percentage of both children and adults attribute continuity of various mental states to recently deceased agents (especially emotion, desire, and epistemic contents) and suggest that this proclivity directly and implicitly promotes attributions of supernatural agency. The current study replicates their procedure and the results demonstrate highly similar developmental patterns of mental state attributions for a sleeping agent. The results of analysis of the combined data sets strongly suggest that unique features associated with implicit theoretical representations (i.e., theory of mind) of emotion, desire and epistemic states underlie these findings. Such attributions may represent an adaptation designed to maintain vigilance in the presence of organisms whose agency status is ambiguous (e.g., motionless, eyes closed). If so, the implication for scholars of religion is that supernatural agent concepts likely arise as a naturally generated byproduct of this system.

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*Pretty mothers: happy marriages and happy daughters?*

*\*Poster session II*

**R.E. Cornwell & L.G. Boothroyd**

It has previously been reported (Boothroyd, HBES 2004) that parental separation or difficult parent-parent relationships are associated with facial masculinity in sons and daughters, and larger waists and reduced facial attractiveness in daughters. This research went on to look at parents' faces. A sample of female undergraduate students provided snapshots of their parents' faces which were then rated for masculinity/femininity, health and attractiveness by a panel of judges. The quality of the parents' relationship and the warmth with which the students remembered each parent, were positively associated to the attractiveness and femininity of mothers' faces. There were no relationships with fathers' appearance, and no relationships with facial health of either parent. These results suggest that the association between parental relationships and daughters' appearance may be the result of inherited maternal characteristics, rather than any causal effect of early social environment.

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*Child Mortality among Gypsies in Serbia*

*\*Poster session II*

**Jelena Cvorovic**

In the present study we analyze a wide range of biological, socio-economic and behavioral determinants of child mortality among three different Gypsy groups in Serbia, with special emphasis on behavioral issues. We argue that death clustering of infants can be explained to a very large extent by the basic abilities and personal characteristics of the mother, independently of occupation, education and wealth. Gypsies have their own rather isolated traditions. These traditions do not require much parental investment nor exceptional IQ. This does not select for high IQs, but does select for high birth rates and, in the absence of medicine, high death rate.

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*Within-Sex Differences in Jealousy: The Role of Prenatal Testosterone and Developmental Instability*

*\*Poster session II*

**Laura Dane**

Sex differences in mental rotation have been hypothesized to be related, in part, to the organizational effects of hormones during critical periods in development. Little conclusive evidence has been provided regarding prenatal exposure to testosterone and other sex-differentiated tasks. With respect to jealousy, men are found to be more

distressed when imagining sexual versus emotional infidelity and the reverse has been found for women. In the present study, relations among prenatal exposure to sex-differentiated hormones, developmental instability (measured by fluctuating asymmetry) and within-sex variation in jealousy and other sex-differentiated domains were explored in male and female undergraduates. In contrast to past research, both second to fourth digit (2D:4D) ratio and dermatoglyphic ridge counts were used as measures of prenatal hormone exposure. Predictions are that individuals with higher finger-ridge counts and lower 2D:4D finger ratios will score more male-typical on measures of sexual and emotional jealousy (i.e., should show greater upset over sexual infidelities). Results show support for this prediction and discussion focuses on the relationship between 2D:4D, dermatoglyphic ridge counts and how they interact with FA.

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*Maternal personality and reproductive ambition in women is associated with salivary testosterone levels*  
*\*Poster session II*

**D. K. Deady, M.J. Law Smith, M.A. Sharp & F.A.S. Al-Dujaili**

Previous research has linked testosterone levels with sex-specific personality traits within women. The present study investigates the relation between salivary testosterone levels and specifically maternal personality traits in healthy adult women. Twenty-seven young women completed the Bem Sex Role Inventory (BSRI). Additional questions were asked about maternal personality (importance of having children, self-rated maternal/broodiness), reproductive ambition (ideal number of children, ideal own age at first child) and career orientation (importance of having career). Higher circulating testosterone levels were associated with lower scores on measures of maternal personality and reproductive ambition. There was no relation of career orientation with testosterone. A median split on BSRI masculinity revealed high scorers had higher testosterone levels than low scorers. There was no relation of BSRI femininity with testosterone. Results suggest maternal tendencies may be partly androgen driven.

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*Spying on your mate as a mate retention tactic*  
*\*Poster session II*

**Jack Demarest, Brandi Shroyer & Jennifer Sittner**

Mate retention tactics like calling a partner unexpectedly and spying on him help verify the person's location and reduce anxiety in suspicious partners. Two studies examined the incidence of spying as a mate retention tactic. Study 1: College students rated the likelihood of using 7 tactics for spying on their mate. Results showed that females were more likely to spy on their mate if fidelity was threatened. Subjects also rated how likely they would spy on their mate for each of 11 cues of infidelity. In almost every case, females were more likely to spy on their mate. Study 2: was a replication with additional spying tactics and cues of infidelity. Female participants were further identified as ovulating or not ovulating at the time of the survey. Results confirmed the finding that females were more likely to spy on their mate, and hormonal factors made a difference. Non-ovulating females were more likely to spy on their mate than were males or ovulating females. It is suggested that ovulating females, who have a greater tendency to cheat on a mate, are less vigilant of their own mate at this time as they turn their attention to securing extrapair copulations.

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*Mate poaching: The cuckolded victim's reactions*  
*\*Poster session II*

**Jack Demarest & Suraya Kornegay**

This study explored the consequences on the cuckolded victim of luring someone away from an established, romantic relationship (mate poaching). Participants (M=40; F=39) were presented with a scenario involving either a long-term or short-term relationship in which a stranger engaged in mate poaching. They were asked to imagine how the victim might feel. Five hypotheses were tested to determine if the length of the relationship, sex of the

participant, or his/her sociosexual orientation influenced their belief that the victim would break-up, stay committed, forgive, trust, worry about being cheated on, become more sensitive to cues of infidelity, spy, or worry about satisfying their mate in the future. Results showed that females were more likely than males to spy on their mate in the future. Males and females exposed to the long-term relationship scenario were more likely than those exposed to the short-term scenario to worry about being cheated on by their mate in the future. In contrast to previous research, sexually unrestrictive males and females were more likely to worry about satisfying their mate in the future.

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*Mate poaching: The poacher's attitude*

*\*Poster session II*

**Jack Demarest & Stacie Ruloff**

This study examined the attitudes that might typify someone who tries to lure a person away from an established, romantic relationship (mate poaching). Participants (M=19; F=31) were given a set of 4 mate poaching scenarios in which the cuckolded victim was either a friend, a known person, a stranger, or an enemy and asked five questions about mate poaching for each scenario. Questions ranged from how you would feel about breaking up this relationship to having various relationships with the victim's mate. For both men and women, not liking the victim resulted in the greatest likelihood of mate poaching, and the more familiarity with the victim, the less likely the participants were to engage in mate poaching tactics. Sexually unrestricted participants were also more likely to mate poach than those who were sexually exclusive.

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*Sex differences in jealous reactions to infidelity are not leveled by priming of HIV/AIDS perils: A rebuttal of Bohner and Wänke (2004)*

*\*Poster session I*

**Stefan G. Dressler & Martin Voracek**

The discovery of sex differences in jealousy (SDJ) is one of evolutionary psychology's most prominent contributions to the psychology of emotions. The initial account (Buss et al., 1992) is a highly cited paper (>150 citations) and has inspired a flourishing research program (>50 papers). At the same time, this field has recurrently faced attempts of refutation. Here, we tackle the most recent assertion: Bohner and Wänke (2004) reported SDJ to disappear through experimental priming of HIV/AIDS perils. Our conceptual replication of their approach used a sex-balanced community sample of 400 heterosexual Austrian adults. By random allocation, participants either completed the HIV Knowledge Questionnaire (Carey et al., 1997) first and then the Sexual Jealousy Scale (SJS; Ward & Voracek, 2004) [priming condition] or vice versa [control condition]. SDJ in the priming and control conditions were of comparable size ( $d=0.61$  and  $0.73$ , respectively), and priming condition SJS scores were unrelated to participant ratings of priming influence. We conclude that the Bohner/Wänke finding most likely is due to factors unique to their (small-sample) experiment.

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*Alternative measures of female facial masculinity and their associations with sociosexuality*

*\*Poster session II*

**Bria Dunham, Lorne Campbell, Lee Cronk, Amy Jacobsen, Jeffrey A. Simpson & Alison Milroy**

Androgen exposure may have mediating effects on both the facial appearance and sexual behavior of individuals. Higher levels of testosterone in women have been associated with increased sexual desire and a more unrestricted sociosexual orientation. This study calculates measurements of female facial masculinity based on proportions of specific facial features known to vary with testosterone level. By objectively measuring facial masculinity, the associations between behaviors and testosterone can be investigated more fully. This study provides evidence that both women's SOI scores and observers' perceptions of masculinity are related to specific facial features indicative of masculinity.

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*Ovulatory effects on female sexuality, romantic relationships and clothing preferences across the menstrual cycle*  
*\*Poster session II*

**Kristina Durante & Norman Li**

Because the costs of pregnancy and nursing are high for women, and offspring require significant resources, a long-term mating strategy is generally more reproductively beneficial for women than a short-term strategy (i.e., sex with no commitment) is (e.g., Buss & Schmitt, 1993). However, there may be specific conditions or situations in which the reproductive benefits of short-term mating outweigh the costs. Obtaining better genes is a viable strategy when conception is likely. Because conception is most likely to occur around the time of ovulation, the point at which a woman is in her menstrual cycle may be a relevant factor in determining the potential reproductive benefits of a short-term mating strategy. One way to signal short-term availability may be to wear more revealing clothing (Grammer, 1996). The current study sheds light on whether women's sexual desire, relationship status and clothing preferences are influenced by menstrual cycle phase as well as other variables that may interact with the menstrual cycle.

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*Explaining individual differences in experimental economics games*  
*\*Poster session I*

**Omar Tonsi Eldakar & David Sloan Wilson**

Experimental economics games typically reveal individual differences in the propensity to cooperate and exert social control, but these results have seldom been related to individual differences in everyday life. In this study, participants in an experimental economics game also completed a large number of personality questionnaires and reported their everyday experience over a period of four weeks using the experience sampling method. The study enables us to integrate psychological, experimental economic, and naturalistic approaches to the study of individual differences.

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*Evolution of social contracts -- simulation and experiments*  
*\*Poster session I*

**Kimmo Eriksson & Pontus Strimling**

We suggest how cooperation can follow as a consequence of the evolution of a social contract among utility-maximizers. Our model is a public goods game where players face two independent choices: whether to contribute and whether to make the effort to search out and punish players who do not contribute. (Cf. Bowles, Boyd, Gintis and Richerson [PNAS, 2003] where all punishers are also contributors.) Players have bounded rationality in terms of ability to change their mind, ability to think several steps ahead, sensitivity (the ability to discriminate between almost equally good outcomes) and dispositions regarding punishing and contributing. An explicit social contract governs penalties of punished shirkers and rewards of punishers. This social contract can evolve (e.g. increasing penalties) if a majority supports change. In simulations we find that contributions usually remain at very low levels, but at times good social contracts do evolve. Such contracts would then be favored by group selection. Interestingly, low sensitivity of players increases the probability of good contracts evolving. Lab experiments are used to validate the model.

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*Sexual Trauma Affects Precautionary Reasoning**\*Poster session I***Nicole Erlich & Valerie E. Stone**

This study examined the impact of sexual trauma on reasoning ability. Specifically, it investigated whether previous sexual trauma in women would lead to inaccurate reasoning about what measures other women need to take to protect themselves from risk of sexual assault. Seventy female undergraduates were recruited from the University of Denver (mean age = 20, SD = .3). Reasoning was measured using the Wason Selection Task. Participants solved two tasks with a precaution rule pertaining to potential risk of sexual assault (e.g., "If you are walking around the city at night, you must take at least two tourmates with you"), and two tasks with non-sexual risks (e.g., "If you are going kayacking, you must wear a helmet."). Participants were given the Brief Trauma Survey asking whether they had been forced into some form of sexual contact by someone close to them, or by a stranger. Twenty participants answered affirmatively to at least one of these items. It was found that participants who had experienced sexual coercion did significantly worse on sexual risk tasks than participants who had not experienced sexual coercion. No group differences were found on non-sexual risk tasks.

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*Does the female orgasm inform reproductively strategic choices?**\*Poster session II***Lara Eschler**

Previous research has shown that females are more cautious about consenting to sex than males (e.g. Clarke and Hatefield, 1989; Oliver and Hyde, 1993). However, insufficient attention has been paid to the proximal factors which allow females to enjoy sex while remaining more discriminative in their sexual choices compared to males. Specifically, the role of the dynamics of the female orgasm in motivating sexual behaviour in a discriminative manner has not been previously considered. A study of more than 200 Western women investigating their sexual behaviour, attitudes toward and contextual experience of orgasm is presented. Individual differences in orgasmic capabilities and possible consequences for sexual strategies are addressed. Findings suggest that females perceive orgasm as a benefit to be gained from sexual interactions, but, orgasm was not likely to be the outcome of one night stands; only of longer relationships. The discussion focuses on how the female orgasm might aid in the choice of a long-term mating strategy.

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*Olfactory Comfort: Cross Cultural Replication with Partners and Extension to Family Members**\*Poster session II***Harald Euler, Melanie Shoup, Sybil A. Streeter & Donald H. McBurney**

We recently demonstrated that most women, and some men, smell their partner's clothing during periods of separation. We replicate that study in a German sample. More women than men slept in their partner's clothing, and intentionally smelled the clothing. In contrast to the original Pittsburgh study, more women than men noticed their partner's smell, and associated the smell with an applied fragrance. In a new Pgh sample we find that olfactory comfort smelling is common between people who are not sexual partners, for example: mom gives her shirt to baby to sleep with, mom sleeps in daughter's pajamas, woman is reluctant to part with deceased mom's clothing, daughter smells dad's clothing when he is away. Olfactory comfort smelling is more common in girls and women than boys and men. We discuss these differences in terms of sex differences in mating vs. parenting effort, and differences in vulnerability to predation and hostile others.

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*The 2D:4D Finger-Length Ratio and Spatial Abilities Showing a Male or Female Advantage**\*Poster session II***Milagros Evardone & Gerianne M. Alexander**

Higher prenatal androgens are thought to enhance spatial abilities that show a male advantage (i.e., mental rotation). However, the specificity of any androgen effects on male-typical spatial abilities is not well established. For that reason, in this research 80 participants (40 male and 40 female; 18-24 years) completed a battery of sex-linked tasks, including two spatial tasks showing a female advantage (i.e., location memory and spatial working memory) and two spatial tasks showing a male advantage (i.e., mental rotation and targeting). Participants' hands were scanned and measured for 2D:4D ratio. The results are discussed in terms of the expected sex differences in spatial ability and the organizing effects of androgens on their development.

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*Social comparison and decision making with respect to income**\*Poster session I***Rachael G. Falcon**

Research has shown that people make decisions about income in relation to the income of others around them. Indeed, people may sacrifice absolute gains in order to do well relative to others (Frank, 1985; Kurzban et al., 2001). From an evolutionary perspective, this strategy makes sense in many contexts because selection operates on relative outcomes. Prior research has not established whether people sacrifice to be better off than others or simply to prevent others from being better off than them. This study examined this issue. Participants could take a sure outcome (a set amount of 4, 5, or 6 dollars) or risk an uncertain outcome by rolling a die (with outcomes averaging \$5.50). Half learned that another participant was receiving an amount equal to the sure outcome; no social context was provided to the other half. If people seek outcomes better than others', they should take the risk in the social comparison condition. If people try to prevent others from getting outcomes better than their own, they should avoid risks in the social condition, particularly when their chances of doing better are low. Results will be discussed in relation to ideas about relative income.

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*Law and Evolution: Human nature and the adaptive function of normative behavior**\*Poster session I***Atahualpa Fernandez**

The objective is to offer a critical (re)interpretation of genesis and evolution, object and purpose, as well as useful qualified methods for interpreting, justifying and applying modern practical law, all with the intention of putting philosophic thought and contemporary formal theory of reason at the service of hermetics and juridical argumentation. Law is no more and no less than an adaptive strategy, evermore complex, but always noticeably deficient, used to articulate argumentatively -- in fact, not always with justice -- by virtue of prudence, elementary relational social ties through which men construct approved styles of interaction and social structure, i.e., to organize and ethically improve political and social life in such a way as to permit that no free citizen -- rich or poor -- should fear the arbitrary interference of other social actors in his life plan.

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*From crisis to growth ... race, culture, ethnicity, conflict and change**\*Poster session I***Michael L. Fischler**

Academic institutions, long idealized as sanctuaries from the more pernicious forms of racial, ethnic and intercultural conflict, provide no sanctuary at all. The author explores how conflict can provide institutions with

precious opportunities to both recognize and institute procedures that will lead toward adaptive evolutionary change. A model designed to effectively process conflict and facilitate social change is presented.

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*Male muscularity as a good-genes indicator: Evidence from men's self-reported sexual behaviors and women's preferences for muscularity*

*\*Poster session II*

**David A. Frederick & Martie G. Haselton**

Hypothesized indicators of good genes (e.g., facial masculinity, symmetry) are associated with higher numbers of past sex partners in men, and they are preferred more by women for sexual affairs and when ovulating. We propose that muscularity may also be a good genes indicator. Study 1 examined the relationship between muscularity, attractiveness, and number of sex partners in 196 men. Muscularity was correlated with past number of short-term partners, lifetime partner number, and self-assessed attractiveness as a short-term mate more than as a long-term mate. These effects remained after controlling for height, age, and body fat. Study 2 investigated women's preference for muscularity using a new set of realistic computer-generated images varying in muscularity and body fat. Women preferred men who were more muscular than the average man in their peer group. In sum, both data sources converge to suggest that muscularity is sexually attractive and may be a good genes indicator.

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*The effects of odor on female - endocrinological and psychological study*

*\*Poster session II*

**Hajime Fukui, Ryoichi Komaki, Miho Okui, Kumiko Toyoshima & Kiyoto Kuda**

The purpose of this study is to investigate the effects of odor on human female. Thirty female subjects were assigned randomly to four groups and they were given one of three odor (musk, rose and 4-methoxy styrene) or control. Each subjects applied it on their body three times in every day for two months. During the experiment period, five saliva samples were submitted and testosterone (T), 17-E beta estoradiol(E) and DHEA levels were assayed by EIA and at the same time, their skin samples were taken and keratin were analyzed. The photograph of subject that were taken before and after the experiment was evaluated by the third party. Also psychological tests were performed. As a result, musk and rose significantly decreased T and E in the subjects with high hormone value, while they increased significantly in the subjects with low hormone value. 4-methoxy styrene and control caused no change. The change of DHEA was the same as T and E though it was not significant. It was clarified also that odors influences the subjects psychologically and physiologically. Musk and rose significantly improved psychological condition of subjects, for instance their stress was reduced. In addition in musk and rose, the skin condition has improved and the evaluation score in the photograph went up.

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*Relatedness and Investment in Adoptive Households*

*\*Poster session II*

**Kyle Gibson**

Surveys from 126 parents who raised both biological and non-genetically related adopted children were analyzed. Parents were asked to detail the types and amounts of monetary and temporal investments they made in their children. Investments in biological and adopted children were then compared. According to kin selection theory, parents should invest in their biological children under a wider range of circumstances than their adopted children. It was therefore predicted that parents would bias their investments toward biological children. The data failed to support this prediction. Parents invested more, in terms of total time and resources, in their unrelated adopted children than their biological children. This finding was largely unexpected and runs contra predictions from kin

selection theory. It suggests that, under certain circumstances, fictive kinship ties can be as strong or stronger than biological ones.

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*Evolution, Income Inequality, and Crime: An Analysis of New York State Counties*

*\*Poster session I*

**Tiffani Gottschall**

Some evolutionary theorists suggest that poorer men will be over-represented as rapists due to their inability to attract consenting mates (Thornhill and Thornhill 1983). And, indeed, some research indicates that such men are over-represented as rapists and that rape rates are highest in low-income areas. However, recent research indicates that income inequality is a better predictor of criminal behavior than median income level. Daly and Wilson's (2001) research on Canadian homicides suggests that rates will be higher in environments with high income inequality because those at the bottom of the social hierarchy will have little to lose through intense and risky social competition. On the other hand, in areas with more equitable resource division, even when average resource levels are low, the benefits of risky competition drop while the costs rise. Using crime and census data from New York State Counties, this research finds support for Daly and Wilson (2001) with respect to homicide rates. But, contrary to predictions derived from the mate deprivation hypothesis" of rape income inequality is not a better predictor of rape rates than median income.

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*Cueing creativity for courtship: When mere romantic goals increase private creativity in males and females*

*\*Poster session II*

**V. Griskevicius, R.B. Cialdini, & D.T. Kenrick**

Some researchers (e.g., Miller, 2000) have proposed that some uniquely human traits, such as creativity, have evolved at least in part because of their adaptive function in courtship. In concert with this idea, the current experiment tested whether merely activating a romantic goal for males and females would change performance on a test of creativity--the Remote Associates Test (RAT). To activate a romantic goal, Ps imagined themselves either (1) going out on a 1st date with a potential L-T mate, (2) going out on a 5th date with a potential L-T mate after being assured of their trustworthiness, or (3) pursuing a S-T mating encounter. Compared to the control conditions, the 3 romantic primes produced a different pattern of results for males and females. For males, all 3 primes significantly increased creativity. However, females only increased when imagining a 5th date with a potential L-T mate who had shown an indication of being trustworthy; female creativity did not change when imagining a S-T romantic encounter or a 1st date with a nice guy. Additional testing also showed that the current pattern of results cannot be explained solely by changes in mood or arousal.

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*Fending Off Competition and Preventing Infidelity: A Proposed Experimental Study on Human Mate Guarding*

*\*Poster session II*

**Faith E. Guta, Aaron T. Goetz, Judith A. Easton & Todd K. Shackelford**

A key threat to an intimate relationship is infidelity. An important part of maintaining a relationship, therefore, is fending off intrasexual competition and preventing a partner's infidelity. Previous research indicates that jealousy can manifest in the form of mate guarding behaviors -- behaviors aimed at fending off rivals and preventing infidelity. Most research has analyzed mate guarding behaviors using survey measures, asking participants to report how often they or their partners perform mate guarding behaviors. Dijkstra and Buunk found that rivals with a low waist-to-hip (WHR) ratio evoked greater jealousy in women, and those with a high shoulder-to-hip ratio (SHR) evoked more jealousy in men when participants were asked to evaluate pictures of rivals. Although this methodology has proven useful, other methodologies might clarify some issues and contribute insight into human mate guarding. We present an experimental method to examine mate guarding that allows investigators to observe the mate guarding behaviors of participants in response to a rival with differing WHR and SHR.

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*Ecological Release and the Flood of Enhanced Arousers: The Exodus, Religion, and Ascriptive Inequality*  
*\*Poster session I*

**Michael Hammond**

In our evolutionary context of origin, there were selective advantages to adjusting preconscious emotion release rules to trigger the creation of certain kinds of enhanced arousers as a means to extend network size and reliability. Enhancements offer a special ratio of attractive contrasts to access costs. They piggyback on reward systems originally evolved for somewhat different types of arousers. As I have demonstrated elsewhere (2003, 2004), the emergence of religion and ascriptive inequality is tied to this piggybacking. With the historical exodus from our context of origin, the demographic and technological constraints of that context were eroded. One consequence was a flood of enhanced arousers. These additions transformed religion and inequality, as well as other aspects of the social world. However, these transformations followed a pattern rooted in the original dynamics of preconscious emotion release rules. We are still feeling the effects of these dynamics in our contemporary world.

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*Waist hip ratio is a significant predictor of body attractiveness in walking women*  
*\*Poster session II*

**Peter Hancock, Anna Leslie & Jennifer Howdle**

Many previous studies have suggested an ideal female waist hip ratio (WHR) of 0.7. With evidence that women with these lower WHRs have higher fecundity, it seems possible that a male preference for low WHR would have a selective advantage. However studies using unaltered pictures of typical women have failed to find a significant effect on rated attractiveness, with body mass index (BMI) dominating ratings. A possible reason is that previous work has used static images, that may not display shape well. We used video clips of women walking and found that while weight still predicted most of the variance, WHR remained significant even after partialling out the effects of weight, when walking towards, but not away from, the viewer. In another study using static images, African viewers preferred higher BMI to British viewers, but there was no difference in WHR preference.

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*What predicts male commitment?*  
*\*Poster session II*

**Daniel Hipp & Rebecca L. Burch**

In a sample of over 650 undergraduates, we examined the romantic and sexual factors that may influence commitment of males and females to the relationship. Although relationship length did not differ by gender, females reported that their relationships had progressed significantly farther than males. Males also rated their commitment to the relationship as significantly less than females. While almost all relationship factors (length, strength, seriousness) had a huge impact on female commitment, no relationship factors predicted male commitment. When the effect of the relationship on depression was examined, relationship factors negatively correlated with depression for females, while a few correlated positively with depression for males.

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*Reactive Heritability among Trust and Personalities: Testing Evolutionary Psychological Hypotheses with Behavior Genetics Methodology*  
*\*Poster session I*

**Kai Hiraishi, Chizuru Shikishima & Juko Ando**

From an evolutionary point of view, adaptively important traits would have small or zero heritability. However, personality, which seems to be important, is known to be heritable. Using twin data, we extend and test the reactive heritability hypothesis proposed by Tooby and Cosmides (1990) to explain the paradox. Yamagishi (1998) argued that one's default trust level towards others in general (general trust) should be dependent on his social environment and should not (and would not) be genetically influenced. We propose, however, that general trust should be tuned to one's genetic background, specifically one's personality, as well, and it makes general trust seemingly heritable. Data from 328 identical and 138 fraternal twin pairs supported our prediction; general trust was estimated to be 36% heritable. However, a multivariate genetic analysis among general trust and personality traits showed that all the genetic factors contributing to general trust were shared by other personality traits. This supports the idea that the heritability observed on general trust was reactive heritability from other personalities. We will discuss why humans have such relatively large genetic variation on personality traits.

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*Predicting strategies of aggression in males and females using an evolutionary, domain-specific model of self-esteem*

*\*Poster session II*

**Carolyn R. Hodges & Lee A. Kirkpatrick**

The relationship between self-esteem (SE) and aggression has been a long-standing question in psychological research. Ambiguities in this area of research are likely due to the widespread assumption that SE is a global measure of self-evaluation. In comparison, Kirkpatrick and Ellis (2001) have proposed an evolutionary theory of domain-specific SE that characterizes SE as a "socio-meter" designed by natural selection to monitor an individual's functioning in different domains of social life. Using this model, Kirkpatrick et al. (2004) showed that the relationship between aggression and SE depends upon the domain which is being assessed; in particular, self-perceived superiority predicted aggression positively whereas social inclusion predicted inversely. The present study was designed to replicate and extend this finding to another form of aggression. "Indirect" aggression is that which is delivered circuitously (versus "direct" which is delivered face-to-face) and typically includes behaviors such as social ostracism and malicious gossiping. Indirect aggression is predicted to be more common among females because it avoids the costs of physical aggression (e.g., bodily harm) while gaining the benefits of competition. Analyses are in progress.

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*The function of self-deception in conformists*

*\*Poster session I*

**Josip Hrgovic & Ivana Hromatko**

Self-deception is one of the most complex cognitive-behavioral mechanisms resulting from an interaction of individuals within a group. Previous studies of self-deception as an adaptive phenomenon (whether conducted from ultimate, evolutionary perspective or distal and proximate, psychological/psychiatric/social perspectives) gave inconsistent results. According to a social-brain hypothesis, the growth of social complexity influenced the evolution of more and more complex cognitive-behavioral patterns in social animals. Accordingly, anxiety, depression and self-deception should be a consequence of individuals' status within a group. The aim of this experiment was to test whether persons with discrepancy in their publicly vs. privately stated opinions differ from the rest of the population in levels of self-deception, anxiety and depression. The results show that a change in opinion which occurs after the group pressure has ceased is related to greater levels of self-deception as well as depression. Theoretical implications of results are discussed in terms of evolutionary adaptiveness of self-deception.

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*Jealousy and mate preferences in heterosexuals, bisexuals and homosexuals**\*Poster session II***Ivana Hromatko & Meri Tadinac**

The aim of this study was to compare mate preferences and types of jealous reactions among groups of heterosexual (n=302), bisexual (n=183) and homosexual (n=133) participants. We examined the characteristics which usually show the greatest sex differences regarding their desirability in a potential mate and compared the ratings of their importance among those groups. ANOVA showed no differences between males of different sexual orientations, but there was a trend for females, with highest ratings for importance of partner's financial and social status among heterosexual, followed by bisexual and homosexual women. As for preferred age of a partner, MANOVA showed significant main effects of both age and sexual orientation in males, but only the significant effect of age in females. Contrary to some previous reports, we found no differences between males of different sexual orientations in the type of infidelity (emotional vs. sexual) they found more upsetting, but there were differences among females, with homosexual women having the highest rate of sexual jealousy responses, followed by bisexual and heterosexual women. These results suggest that men of different sexual orientations might not be so very different in their preferences, but that women are.

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*General trust and social perception in Japan and the US**\*Poster session I***Keiko Ishii**

General trust, which can be defined as the default expectation of benign or cooperative behavior based on the goodwill of the partner (Yamagishi & Yamagishi, 1994), plays a crucial role in mutually beneficial exchanges. They argued that high trusters are more sensitive than low trusters to information about a person's trustworthiness. I tested this possibility in Japan and the US. High and low trusters in both cultures were asked to read a description of six people who engaged in either pro-social or deviant behaviors. For each description, participants evaluated personality traits of the person, indicated to what extent dispositional features influenced the person's behavior, and inferred behavioral consistency of the person across situations. As predicted, regardless of cultures, the degree of inferences of personality traits was more extreme among high trusters than among low trusters. Moreover, high trusters showed more dispositional attribution, focused on traits, and expected consistency of their behaviors between situations. Implications for general trust and social perception are discussed.

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*The Structure and Measurement of Human Mating Strategies***Jenee James Jackson & Lee A. Kirkpatrick**

Despite recent theoretical developments that focus on the importance of mixed mating strategies, the measurement of individual differences in this domain has continued to employ unidimensional scales that anchor long- and short-term mating at opposite ends of a bipolar continuum. Along these lines, the Sociosexual Orientation Inventory (SOI), which assesses a single dimension of restricted vs. unrestricted sociosexuality, has become the leading empirical measure of individual differences in mating strategy. We argue that unidimensional scales like the SOI fail to capture crucial variability in mating strategies and suggest that a multidimensional scale is needed. To develop and validate such a measure, we expanded the SOI to include attitudinal items measuring both long-term and short-term mating orientations. Principal components analysis distinguished between these two attitudinal factors, as well as a third distinct factor reflecting previous sexual behaviors. We also present data demonstrating that these long-term and short-term attitudinal dimensions are only moderately intercorrelated and are differentially predictive of other theoretically relevant variables.

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*Perceiving vertical environments and Evolved Fall Avoidance Theory**\*Poster session I***Russell E. Jackson**

The Vertical-horizontal illusion (VHI) is the tendency to perceive vertical distances as longer than equal horizontal distances. Contrary to current theories, I suggest a mechanism by which the VHI evolved: in response to costs from falling. Falling is costly, but vertical surfaces persisted over our evolution and offered benefits via successful navigation. Evolved Fall Avoidance Theory (EFAT) suggests the importance of such navigational pressures in shaping many perceptual mechanisms. One unique prediction derived from EFAT specific to the VHI suggests that vertical length should appear greater from the top of a vertical surface than the bottom. Descending more often results in falls and falls during descent are usually costlier than falls during ascent. Subjects changed the length of a vertical to appear equal to a fixed horizontal from the top and bottom of a 15.90 m vertical surface. Consistent with EFAT, subjects perceived greater vertical distance from the top of the vertical surface than from the bottom. Additional data and EFAT implications for perception and navigation will be discussed.

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*Sex differences in Counterfactual Thinking: Romantic vs. Academic Regrets**\*Poster session I***Maria G. Janicki & Neal Roese**

Counterfactual thinking refers to the contemplation of alternative outcomes to factual events. Often people consider how changed actions (their own or others') could have led to a better outcome. The prevalence of counterfactual thinking makes it a likely feature of our evolved psychology. Even so, there has been little, if any, evolutionary analysis applied to this area. There has also been limited examination of sex differences in counterfactuals. In our research we addressed both of these issues by comparing the content of men's and women's counterfactuals in two domains: academic achievements and love lives. Drawing on evolutionary theories, we expected that there would be sex differences in the latter, but not in the former domain. Participants were asked to generate regrets and alternative outcomes in the form of "if only..." and "then..." statements. Considering sex differences in reproductive strategies, we predicted women should have more regrets than men about wasted time and effort, and that men should have more regrets than women about missed opportunities. Content analyses supported these predictions, and also found no sex differences in the academic regrets.

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*Anthropocybernetic Models and Integrity of Anthropology**\*Poster session I***Tomislav Janovic, Vladimir Ivkovic, Nikica Vilicic & Veljko Jovanovic**

Despite the popularity of the "holistic approach", what is conspicuously lacking in anthropology is a general theory applicable both to genetically and culturally transmitted traits. Some respectable attempts to meet this challenge are: Campbell's (1974), Cavalli-Sforza's and Feldman's (1981), Dawkins' (1982), Boyd's and Richerson's (1985), Durham's (1991), Sperber's (1996). In our contribution, we want to assess the usefulness of this general approach for the actual research practice. The model serving as our test case is one developed and applied as part of the research project "Population Structure of Croatia - Anthropocybernetic Models", carried out at the Institute for Anthropological Research in Zagreb, Croatia ([www.inantro.hr](http://www.inantro.hr)). The model gives interesting insights into the population dynamics (on the phenotypic level) and enables certain predictions. However, when it comes to the interpretation of the model, the researcher is left without the kind of theoretical guidance available in population genetics. We want to evaluate the prospects for making up for this deficit and draw some general conclusions touching on the issue of anthropology's methodological integrity.

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*Overconfidence and War**\*Poster session I***Dominic Johnson**

International conflict is often characterized by two opponents sharing the belief they will win. And usually, of course, one of them is wrong. This problem has been labelled the "War Puzzle" by political scientists -- states led by rational decision-makers should not fight because both sides can avoid the costs and risks of war by negotiating a pre-war bargain reflecting their relative power. Since wars do occur, it appears that states are overconfident about their relative power. A novel solution to the war puzzle is suggested to derive from "positive illusions": the phenomenon that people are prone to exaggerated ideas of their capabilities, their ability to control events, and the future. As Richard Wrangham originally argued (1999; *Evolution and Human Behaviour* 20: 3-17; see also 23: 245-264), positive illusions may have been favoured by natural selection throughout our evolutionary history because they improved (1) military effectiveness and (2) the ability to bluff an opponent. Today, however, positive illusions isolated from the battlefield can lead to military disasters and protracted wars that no one wanted.

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*Tools Don't Make the Man**\*Poster session I***Steven C. Josephson**

The development of stone tool technology is often seen as reflecting increasing capacity in our genus. Although the complexity of lithic assemblages is broadly correlated with increasing brain size and archaeological density, this may not be a simple mirror of cognitive ability. The Tjimba of Northwestern Namibia used stone tools well into the 1970s, yet their lithic work was very uncomplicated by most any measure. Interviews indicate that they used minimal core preparation, little retouch, and apparently lacked an elaborate tool typology. An absence of evidence for 'modern human' capacity is not necessarily evidence of absence.

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*Evolutionary motivations for the inclusion of organic form in architectural design**\*Poster session I***Yannick Joye**

Different psychological study fields suggest that evolution in a natural environment has gifted humans with a set of mental modules specialized in perceptual and conceptual information about natural things. Culturally, the existence of such a natural intelligence leads to a tendency to create cultural objects that answer the input-conditions of these modules. During the history of architectural design, this translated in the creation of designs that have remarkable formal similarities with natural elements. Yet, today nature is increasingly pushed back, which leads this natural intelligence to become underdeveloped. An important effect of this understimulation is that people become less interested in creating architectural designs that fulfil the input-conditions of these modules. It is argued that this trend can lead to three interrelated impoverishments. (1) A broad range of architectural formal grammars becomes neglected. (2) The emotional relation towards architectural design becomes poorer. (3) There is a shift towards a relative dominance of functional thinking. In this presentation it is argued that organic designs can provide a counterweight against these impoverishments.

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*Male and Female Brain on Judgments and Cognitions**\*Poster session I***Mai Kataoka, Atsushi Senju, Akio Wakabayashi & Toshikazu Hasegawa**

The empathizing-systemizing theory (Baron-Cohen et al., 2003, 2004) argued that the female brain is hard-wired for empathizing, the drive to identify another person's emotions and thoughts, and the male brain is hard-wired for systemizing, the drive to analyze or construct systems. In this study, 471 Japanese undergraduates (247 males,

224 females) completed the S-EQ, which measured systemizing and empathizing, reasoning tasks (Tversky & Kahneman, 1982) and moral judgment tasks (Green et al., 2001). As was predicted, females scored significantly higher than males on the EQ, and significantly lower on the SQ. In reasoning and moral judgment tasks, high SQ scorers tended to make judgments which independent of pragmatic or affective contexts of the problems, while high EQ scorers tended to be influenced by these contexts. These results imply that empathizing and systemizing affect social judgments and cognitions.

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*Media Richness vs. Media Naturalness: An Evolutionary View of E-Communication*

*\*Poster session I*

**Ned Kock**

Among the theoretical hypotheses that have informed research on electronic communication (e-communication) is the media richness hypothesis -- perhaps the most influential hypothesis in e-communication research to date. It is argued in this presentation that the media richness hypothesis is not only wrong but also build on a theoretical "vacuum." This presentation will also discuss an alternative to the media richness hypothesis, referred to here as media naturalness hypothesis, which is developed based on a Darwinian view of behavior toward communication media. The media naturalness hypothesis argues that, other things being equal, a decrease in the degree of naturalness of a communication medium (or its degree of similarity to the face-to-face medium) leads to the following effects in connection with a communication interaction: (a) increased cognitive effort, (b) increased communication ambiguity, and (c) decreased physiological arousal.

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*Misperceptions of Romantic and Sexual Interest in Opposite-sex Friendships*

*\*Poster session I*

**Bryan L Koenig & Lee A Kirkpatrick**

Research has long shown that males overperceive the sexual interest of others. Two competing explanations for these findings are the default-model hypothesis, which argues that people use their own desires to gauge the desires of others, and error management theory, which argues that misperceptions are predictable when costs of different types of errors were asymmetrical over evolutionary history (Haselton & Buss, 2000). Previous studies of misperception of sexual and romantic interest have used strangers as targets. The current project evaluated these cognitive biases in an ongoing relationship: opposite-sex friendship. Participants and their opposite-sex friends indicated their own sexual and romantic interest in the other, their perceptions of the other's romantic and sexual interest in them, and completed mate value measures. Data collection is ongoing. Initial results suggest a sex difference for the misperception of sexual, but not romantic, interest. No variables predicted misperception of other's romantic interest. Sex and one's sexual interest predicted misperception of other's sexual interest. Overall, both theories were partially supported.

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*Parsing the Silverman & Eals task: Correlations with spatial orientation, navigation, and foraging-scale object location memory*

*\*Poster session I*

**Max M. Krasnow, Danielle Truxaw, Joshua New & Steven Gaulin**

The division-of-labor hypothesis (Silverman & Eals 1992) predicts a female advantage on remembering the location of objects (S&E task). The mental processes that subserve S&E task performance are as yet unclear. We will better understand the architecture of spatial cognition when we know how particular tasks relate to more basic spatial competences, and intertask correlations provide one useful approach. We implemented an outdoor foraging-analogue task. S's were lead circuitously to 4 food items (tasted) and 4 non-food items (heard) and then asked to point to each from an obscured central location. Vector error on the pointing task was compared with performance on other spatial tasks: the S&E task, two paper-and-pencil spatial orientation tasks, and a small-scale blindfolded navigation task. S&E task performance was significantly positively correlated with both spatial

orientation and spatial navigation measures. Moreover, S&E task performance was only correlated with accuracy of food-location memory and not with nonfood-location memory. This suggests that the processes underlying the S&E task may be designed for foraging, as predicted by division-of-labor hypothesis.

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*Male facial masculinity influences attributions of personality and reproductive strategy*

*\*Poster session II*

**Daniel J. Kruger**

Two studies examine perceptions of masculinized and feminized male facial composites and uncover attributions that may underlie conditional female mating strategies. Study 1 indicated that perceptions of facial composites depend in part on the properties of the original composite image. Some masculinized faces were seen as more feminine than other facial composites that were feminized and vice versa. There was also considerable variation in the effect sizes of the differences between the masculinized and feminized versions of each facial composite in estimates of age, attractiveness, masculinity, and femininity. Study 2 indicated that both men and women made personality, behavioral, and mating strategy attributions consistent with predictions derived from the good genes and mating trade-off hypotheses. Participants predicted that a masculinized composite would be higher in mating effort and success, high-risk behaviors, and status competition; and that a feminized composite was more likely to have a strong work ethic, future-oriented time perspective, be higher in paternal investment, and make a better long-term relationship partner. Female and male participants showed preferences for composites in ways that would presumably benefit their own reproductive success.

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*Should I Stay or Should I Go? Cues to a Dating Partner's Level of Commitment*

*\*Poster session II*

**Barry X. Kühle**

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

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*Predicting Physical and Psychological Abuse in Dating Couples: Global vs. Domain-Specific Self-Esteem*

*\*Poster session II*

**Jonathon G. LaPaglia & Lee A. Kirkpatrick**

Empirical research on the relationship between self-esteem and aggression has long yielded inconsistent or null results. However, recent research based on an evolutionary conceptualization of self-esteem as a collection of functionally distinct, domain-specific mechanisms (Kirkpatrick & Ellis, 2000) has shown that different domains of self-esteem are differentially predictive of aggression; for example, self-perceived superiority and social inclusion predict aggression in opposite directions, whereas global self-esteem is unrelated to aggression (Kirkpatrick, Waugh, Valencia, & Webster, 2000). The current study aims to similarly identify those domains of self-esteem that are predictive of physical and psychological aggression within romantic relationships. In data collection currently

in progress, both members of dating couples are completing self-report and partner-report measures of self-esteem and aggression/abuse. Multiple regression analysis will be used to evaluate the differential predictive value of domain-specific versus global self-esteem measures.

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*Facial appearance signals reproductive hormone levels in adult females*

*\*Poster session II*

**M.J. Law Smith, B.C. Jones, R.E. Cornwell, F.R. Moore, D.R. Feinberg, L.G. Boothroyd, S.G. Hillier & D.I. Perrett**

Although many accounts of facial attractiveness propose that femininity in adult female faces signals high levels of reproductive hormones there is little empirical evidence in support of this assumption. Here, we used urinary metabolites of oestrogen and progesterone assays to investigate the relationship between circulating gonadal hormones and ratings of the femininity, health and attractiveness of female faces. Positive correlations were observed between both oestrogen and progesterone, and ratings of femininity, apparent health and attractiveness. Using linear regression, both oestrogen and progesterone are shown to independently predict facial appearance. No associations were seen in females who were wearing makeup when photographed. There was no effect of sex of rater on the relationships among gonadal hormones and ratings of facial appearance. These findings demonstrate that female facial appearance holds detectable cues to reproductive health that are considered attractive by other people.

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*Common Ground for Spatial Cognition: Behavioral and Neural Perspectives*

*\*Poster session I*

**Sarah L. Levin, Feroze B. Mohamed & Steven M. Platek**

We investigated behavioral and neural sex differences in spatial abilities. Experiment 1 shows a performance by sex advantage and Experiment 2, using fMRI shows unique neural activation for sex specific spatial cognitive processing. Activation in Left parahippocampal gyrus and right inferior frontal gyrus appears to be important for spatial cognition in both males and females. Additionally, activation in the left parahippocampal gyrus positively correlates with performance on mental rotation tasks. Females use left inferior frontal for encoding and right inferior frontal for retrieving consistent with the commonly known HE/RA model. These data extends claims for sex-specific spatial cognitive abilities by demonstrating both behavioral and neural sex differences while also shedding light on common ground for sex-specific spatial tasks. This is consistent with an evolutionary model which suggests sexual selection favored substrates that enabled each sex to excel at different spatial tasks.

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*Can we resist temptation? Game theory and sharing in university students*

*\*Poster session I*

**Fívia de Araújo Lopes & Maria Emília Yamamoto**

Cooperative interactions between individuals can be understood using game theory. We proposed a dictator game using a double-blind situation (neither the experimenters nor the subjects knew what any individual was doing) to undergraduated students. The participants were divided in two groups: both had the opportunity to share 4 candy bars either before or after being the recipient of sharing. Before this test, they were invited to answer the question: if you had 4 candy bars, how would you share them? This question gave us the information about the intentions of donation. We observed that the intentions of donation showed a strong cooperative tendency. In the actual test, subjects were less cooperative. They shared fewer candy bars than they suggested in the intentions in both situations, specially when they were the recipient of an unfair sharing. Nevertheless, some individuals showed equal sharing in both situations. Our results are in accordance with similar studies, and suggest that

cooperative tendencies decrease when our reputation is not at stake but also that our minds still tricks most of us into at least partially cooperating even when no one is acknowledging it.

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*Good genes or an unmistakable man? Predictors of attractiveness as a function of partner-type and fertility level*  
\*Poster session II

**Victor X. Luevano & Leslie A. Zebrowitz**

Research has found women's sexual preferences to vary with fertility-level, across the menstrual cycle, and with partner-type--short-term partner (STP) vs. long-term partner (LTP). This typically has been framed as an adaptive mechanism to obtain good genes. In the present study, women rated masculine men more attractive as a STP than a LTP, but there was no effect of fertility-level. Women showed a strong preference for men who looked healthier, but this preference did not vary with fertility-level or partner-type. Women in the high-fertility phase rating a STP compared with the three other conditions, preferred men who looked more dominant and less warm. However, the men preferred in this condition were lower in actual dominance. Women's preferences did not vary with men's actual health, or warmth. The effects of fertility-level and partner-type are discussed as attunements to discriminate men from women rather than to obtain good genes

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*Peer-to-peer file sharing as costly signaling*

\*Poster session I

**Henry Lyle III & Roger Sullivan**

Altruistic behavior in the form of asymmetrical resource exchange appears inconsistent with the theory of natural selection. A contemporary example of asymmetrical human reciprocity is peer-to-peer [P2P] file sharing. P2P networks such as Kazaa allow free downloading of music and other digital media from the computers of anonymous uploaders. Although there is little cost and great benefit to downloading, the reciprocal benefits to file-uploaders who risk prosecution and exposure to hackers are unclear. Recent research indicates that costly display theory can be a powerful tool for explicating incidents of non-kin altruism in human populations. A costly (honest) display provides information to an audience about a hidden quality in the displayer - such as the reliability of a potential ally or mate - and enhances the status of the signaler. We predict that uploading behavior is a costly signal that enhances peer status and test this hypothesis in an analysis of file sharing behavior in college undergraduates.

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*Etiological Factors in Children Diagnosed with Autism or Pervasive Developmental Disorder*

\*Poster session II

**Angie S. MacKewn, Sherry D Jones, Gary E. Brown & Esther J. Plank**

The purpose of the current study was to develop a predictive model of more frequently occurring pre and postnatal etiological factors in children diagnosed with autism. A survey of biological mothers of children diagnosed with autism or PDD and of children without developmental delays were matched on gender (n=134 males and 56 females) and age (M=6.54 years, SD=2.78 in autistic); (M=6.23 years, SD=2.90 in controls). The developmental survey asked several questions including, pregnancy food cravings and aversions, childhood ear infection, presence of tubes, vomiting and nausea patterns, and speech development. A logistic regression equation found that not vomiting in the first trimester, the mother having an infection while pregnant, and the child having over 7 ear infections, were significant predictors of whether a child was diagnosed with autism or not. Of mothers of autistic children, 40% vomited in the first trimester compared to 53% of the control mothers. The "embryo protection hypothesis" suggests that morning sickness has an evolutionary basis and protects the embryo from teratogens by causing pregnant women to purge (Profet, 1992).

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*Female physical attractiveness, intrasexual competition, and disordered eating*

*\*Poster session II*

**Jon K. Maner, Jill M. Denoma, Kimberly A. Van Orden, Matthew T. Gailliot, Kathryn H. Gordon & Thomas E. Joiner, Jr**

Theories of sexual selection suggest that women may compete with one another on the basis of physical attractiveness. Although much previous research indicates that in mating-related contexts emphasis is placed on female physical attractiveness, relatively few studies have explored the implications this emphasis may have for mental health. We present data suggesting that female vigilance to physically attractive intrasexual competitors may be linked to the development of eating disorders. A sample of undergraduate women performed a well-validated visual cueing task designed to assess biases in attention to a set of target faces, which varied in their sex and level of attractiveness. Women with relatively high levels of bulimia-related symptomatology tended to dwell on attractive female faces, but not other faces. Findings suggest a link between disordered eating and the perception of competitive threat in other attractive women.

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*Semen displacement behaviors during extra pair copulations*

*\*Poster session II*

**Natasha Mapes, Jeremy Bordador & Rebecca L. Burch**

Previous research has shown that males perform more semen displacement behaviors (altering speed, depth and vigor of thrust) when separated from their partners or suspicious of partner fidelity. Although some have argued that the increased thrusting could be the result of anger at female infidelity, this would not be expected to be the case when a male willingly has intercourse with a woman in a relationship. We then examined changes in thrusting behaviors when the male knowingly has sex with a female who has a partner. When asked if they knowingly had sex with someone in a relationship, 20.4 percent of females reported they had, compared to 14.8 percent of men. When in this situation, males reported thrusting quicker, deeper and with more vigor. Males also reported an easier and more intense orgasm when having sex with someone in a relationship and attempting to prolong intercourse for as long as possible. Females did not.

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*Linking Biobehavioral Research to Public Policy: Neurotoxins & Crime Prevention*

*\*Poster session II*

**Roger D. Masters**

As research accumulates on the role of neurotransmitters in behavioral regulation and emotional self-control, it also becomes evident that some neurotoxins target specific neurotransmitter systems with major effects on behavior. Among the best known are lead and manganese (whose effects on dopamine are associated with learning deficits and violent crime). The policy implications of findings linking environmental toxins and behavior can include saving millions of dollars in public expenditures or becoming an "expert witness" whose testimony might influence legislation or court decisions. Such practical consequences should NEVER influence the content of our scientific research but they surely indicate its potential importance.

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*Olfactory Comfort and Attachment Styles**\*Poster session II***Donald H. McBurney, Harald Euler, Sybil A. Streeter & Melanie Shoup**

This study examined the relations between olfactory comfort, number of photos on display in one's room, and attachment styles. We asked Pittsburgh students how frequently they smelled clothing of family members and lovers during periods of separation, how many photos of friends and family they had on display in their bedroom, and their attachment style. Frequency of smelling clothing correlated positively with number of photos. Smelling and photos correlated positively with Secure attachment, and negatively with Dismissive attachment. Patterns differed somewhat with sex. We asked Kassel students only about smelling of sexual partner's clothing and attachment style. Smelling correlated negatively with Dismissive attachment and positively with Preoccupied attachment. Women smelled clothing much more often than men in both samples, and had many more photos (Pgh subjects). We discuss reasons for the differences between sexes and between samples.

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*Testing the Ritual Healing Theory: Human Evolution and the Origin of Religion**\*Poster session II***James McClenon**

The Ritual Healing Theory specifies that repetitive rituals based on dissociation provided survival advantages to those more responsive to suggestion. Due to their therapeutic effectiveness, ritual practices over many millennia shaped and selected for dissociative/hypnotic genotypes, creating modern propensities for trance, anomalous experience, and religiosity. As frequencies of dissociative genotypes increased, anomalous experiences (apparitions, extrasensory perceptions, out-of-body experiences, paranormal dreams) became more prevalent, generating beliefs in spirits, souls, life after death, and magical abilities. These beliefs provided ideological foundations for shamanism, humankind's first religious form. The ritual healing theory explains why shamanism emerged among all hunter-gatherer societies. At present, hypotheses derived from the theory have been tested through cross-cultural surveys, content analysis of folklore data, and field observation.

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*Memory for cheaters and cooperators in social contract situations**\*Poster session I***Kelly McCulloch & Dan Chiappe**

Social contract theory (SCT) claims for social exchange to evolve, people must be good at identifying cheaters and exclude them from future exchange. We note it may be important for cooperators to be salient because people may want to approach them in future exchanges. We compared cheaters and cooperators to those opting out of exchange. In part 1, participants were given information about individuals from which they had to classify them as cooperators, cheaters, or opting out. It stated either that the person had accepted a benefit and paid a cost, accepted a benefit and not paid a cost, or they didn't enter into a social contract. After making a decision for a person, participants saw their picture. They pressed a button when they finished looking at it. In part 2, they had to identify those pictures and recall whether the person was a cheater, a cooperator, or opted out. Participants spent the same time viewing faces of cheaters and cooperators, and both were viewed longer than those who opted out. Cheaters and cooperators were also remembered equally, and both were better than those opting out. This suggests, counter to SCT, that cheaters and cooperators are equally salient.

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*The conceptual basis of emotional responding**\*Poster session I***Prasanna Meenakshi & Jack A. Palmer**

In this study, 64 Female and 24 Male participants were asked to evaluate Prototypical Emotional Elicitors (visual scenes) for the Basic Emotions (Anger (A), Disgust (D), Fear (F), Happiness (H), Melancholy (M), and Surprise (S)) across four conditions. In the first condition (Oral) the task was to verbally recognize the emotion in the scene. In the second (Facial) the task was to match one of six faces expressing basic emotions with the scene. The third (Word) was to match one of six basic emotion words with the scene. The fourth (Word List) involved matching one of six groups of words (each group containing two emotional and two distracter words) with the scene. The results showed that recognition latency for all emotional categories differed significantly between all the four conditions ( $p < .01$ ). Word produced the shortest latency of all the conditions. Females showed shorter latency for D ( $p < .01$ ), M ( $p < .05$ ) and H ( $p < .05$ ) than males. The percentage of correct responses between all the four conditions differed significantly ( $p < .05$ ) for all emotional categories except A and D which showed the same trend. Males gave higher percentages of correct responses for A ( $p < .05$ ) and S ( $p < .05$ ).

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*Tests of the Evolutionary Theory of Sex Differences in Jealousy*

*\*Poster session II*

**Roger L. Mellgren & Martha A. Mann**

Buss et al. (1992) reported that males are more distressed by sexual infidelity by their mate as compared to an emotional attachment formed by their mate to another male (paternity uncertainty), but females are more distressed by an emotional attachment formed by their mate to another female than by sexual infidelity (loss of support). To test the evolutionary hypothesis of the origins of jealousy, subjects were asked to choose which was more distressing to them, a sexual or an emotional infidelity by their partner with another person. Moreover, the "other person" was either of the opposite sex or the same sex as the partner. The results of three surveys showed that males were more upset with sexual infidelity (60-75%), but females were more upset with emotional infidelity (70-80%) when opposite sex persons were involved. When the other person was the same sex as the subject's partner, males were indifferent about whether sexual or emotional infidelity was most upsetting, but females shifted strongly to being more upset by sexual infidelity (72-85%) unlike results reported in a similar experiment by Sagarin, et al (2003).

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*Sex, Sex Orientation and Occupational Choice*

*\*Poster session II*

**Edward Miller**

It is well known that men and women chose different occupations. A prenatal hormonal hypothesis suggests homosexual males would have more feminine occupational patterns than other males, and Lesbians would have more masculine patterns than other females. Using an unique data set collected by Lee Ellis and others and containing over 10,000 people, the nature of sex differences in occupational interests, and interests relevant to occupations are examined. Not only are there sex differences, but for occupations such as beautician, dress designer, high school coach, electrician, and auto mechanic that the occupational preferences of Lesbians and homosexual men are different from their heterosexual counterparts. Other personality traits and interests for Lesbians and homosexuals appear to differ from those of heterosexuals. Reading and sports interests differ with sex and sexual orientation. For instance Lesbians have more interest in sports and homosexuals less. These differences in interest begin in childhood with homosexuals recalling less masculine interests than heterosexuals. These observations are more easily explained by a biological theory than a socialization theory.

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*The Big 5 Personality Factors (and Facets) and Sex Differences in Relationship Distress*

*\*Poster session I*

**Michael E. Mills & Aaron Lukaszewski**

Buss (1991) examined which personality traits of one relationship partner tended to cause the other partner distress. He found that some of the "Big 5" personality traits indeed correlated with specific types of relationship distress. Further, he found sex differences in which personality traits tended to cause specific types of relationship distress. Our study replicated his basic findings, and further found that some of the NEO "facet" scales of each of the big 5 factors correlate with certain types of relationship distress. We discuss these findings, and entertain some possible evolutionary hypotheses regarding the pattern of sex differences that were found.

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*Intimate Partner Homicide Methods in Heterosexual and Homosexual Relationships*

*\*Poster session II*

**Krystal D. Mize, Todd K. Shackelford, & Michelle Katz-Wasserman**

From 1976 to 2001 over 50,000 people were victims of intimate partner lethal violence. Men are more aggressive than are women, and thus would be expected to murder more brutally. In a study of intimate partner homicides in Chicago, Block and Christakos (1995) found that the weapon used varied based on the offender's gender. The current study seeks to reexamine this finding using a national-level database. In addition, the effect of sexual orientation of the offender on brutality of killing will be examined. Relative to heterosexual partners, homosexual partners experience added stress due to a lack of social support of their relationships. It is hypothesized that the brutality of the murders will vary as a function of the offender's sexual orientation and gender. Four predictions were derived from this hypothesis. The percentage of killings coded as brutal will be higher for (1) homosexual relations relative to heterosexual relations, (2) men relative to women regardless of sexual orientation, (3) homosexual men relative to heterosexual men, and (4) homosexual women relative to heterosexual women.

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*Post ejaculatory behavior*

*\*Poster session II*

**Regan Moloney & Rebecca L. Burch**

In a sample of over 250 male and female undergraduates, we examined changes in behavior after orgasm/ejaculation. Both genders agreed that thrusting decreased in speed, depth, and vigor rapidly after ejaculation. We discovered that 72% of the male respondents and 87% of the females reported that thrusting became noticeably shallower and less intense following ejaculation. Both genders also agreed that the male lost his erection within 2 minutes after ejaculation and withdrew his penis within one minute. While both genders reported that thrusting stopped within a minute of ejaculation, females reported that thrusting stopped faster than males. Although females reported a little more male affection after ejaculation, males did not share this opinion. In terms of specific postcopulatory behaviors, males reported that they engaged in negative behaviors (got up and left, pushed their partners away, criticized their partners) more and positive behaviors (talked, kissed, touched, and cuddled their partners) less.

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*Machiavellian intelligence - Which college student majors attract 'high machs'*

*\*Poster session I*

**Marilee Monnot & Charles L. Monnot, III**

Machiavellianism theorizes that living in groups sets up an environment favoring the use of social manipulation for personal gain, often against the self interest of others. Also, evolutionary game theory suggests social manipulation is adaptive in some situations but maladaptive in others. Machiavellianism can be measured as a quantitative trait using the Mach V questionnaire developed by R. Christie and F. Geis. We showed previously that there are differences in the degree of "Machiavellianism" across an organization. Recently, we hypothesized that this test score will vary significantly among college student by major. Data from an academic setting will be presented.

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*Disentangling ethnic and coalitional psychology*

*\*Poster session I*

**Cristina Moya**

Despite a recent surge in evolutionary approaches to social group categorization, it remains unclear whether different selective pressures have acted on human cognition to produce separate mechanisms for categorizing ethnic and coalitional groups. Although ethnic groups often serve as sources of coalitional support during conflict, membership in an ethnic group -- unlike coalition membership -- is seldom treated as contingent on an individual's cooperation. Detecting co-ethnics may have lowered coordination costs for both actors, whereas there would have been incentive to cheat and detect cheaters in a coalition. This project explores whether human evolved psychology distinguishes between such social groups. Following previous work on the subject, the "who-said-what" paradigm was used to measure the degree to which subjects encoded groups with coalitional and ethnic features. Results will be presented regarding the cues to group membership that subjects encode, and individual differences in performance on the task.

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*Different for Goils: an agent based model of parental investment and sexual motivation*

*\*Poster session II*

**Emily Nagoski**

Differential parental investment predicts that human females benefit more by being choosy about their sex partners than do human males. In parallel, female sexual response appears to be more contingent, more plastic, and have higher thresholds for arousal than male sexual response. It seems plausible that female sexual response would have evolved to have higher thresholds than male sexual response, due to the enormous cost of motherhood balanced against the pleasure reward associated with sex. To begin exploring a possible connection between these two concepts, I present a simple agent-based model of "goils" and "bois," agents with sexual motivation differentially "gendered" in accordance with the predictions of differential parental investment and with empirical research on gender differences in sexual inhibition and excitation. Agents are sexually proceptive and receptive according to their arousal thresholds. What happens when different sexual motivation profiles interact?

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*The effect of urbanization on patterns of child productive labor and educational investment among Indo-Fijians*

*\*Poster session II*

**Dawn B. Neill**

With rapid urbanization and migration, shifts in mode of subsistence and the value of wage-labor jobs can be dramatic. Internal migration from rural areas among Indians in Fiji has included both transitions into urban poverty and urban economic success. Changing work patterns for children often accompany these shifts. Parental investment decisions guide the actions parents take regarding the labor expenditures of their children and are shaped by the ecological contexts in which they occur. It is proposed that differing ecological conditions (rural vs. urban; poor urban vs. wealthy urban) will stimulate differential investment in children that results in different patterns of child productive labor. Using a framework of Kaplan's embodied capital theory, focal follow data on daily activities of 80 Indo-Fijian children, ages 7-16 years, along with other variables (parents' education and occupation, parents' occupational goals for children, children's educational performance and time commitments, household income, family size) are used to examine patterns of child productive labor within the context of educational investment in each ecological setting.

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*A Self-Soothing Theory of Substance Abuse and Addiction*

*\*Poster session II*

**David B. Newlin**

A new theory of substance abuse is advanced based on developmental neuroethology. It proposes that drug abuse is a maladaptive form of self-soothing, or behavior that in infancy -- such as self-touching and looking-away/distraction -- facilitates transitions in psychobiological states (e.g., waking-up, surprise, maternal separation); it is a precursor of emotional self-regulation and social attachments. Therefore people abuse drugs to facilitate or "soothe" state transitions and those at high genetic/environmental risk exhibit problematic state transitions. Drug states and craving falsely signal increased Darwinian fitness (Nesse & Berridge, 1997; Newlin, 2002). Thus, drugs facilitate/soothe because they pre-empt (displace) aversive states and synergize with positive states -- e.g., alcohol's stress dampening effects and nicotine's relaxing/alerting functions (Gilbert, 1979); inhibition of sedative drug effects by conditioned responses (CRs), and synergism of stimulant drug effects with CRs, producing drug tolerance and sensitization, respectively.

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*Hormonal bases of trait aggression, anger and BIS/BAS sensitivity among men*

*\*Poster session II*

**Mariko Oki, Kikue Sakaguchi, Toshikazu Hasegawa & Seiji Honma**

Though hormonal bases of trait aggression and anger have been much investigated, previous studies have not examined those of BIS/BAS orientation (the sensitivity to punishment/reward). We examined the relationships of salivary testosterone (T) and cortisol (C) levels with these behavioral traits. Participants were Japanese male students (18-35yrs, n=87). Saliva samples were taken twice a day (7:00-8:30, 20:00-22:00). Hormones were measured by liquid chromatography-tandem mass spectrometry (LC-MS/MS). Traits were assessed by self-report measures: BIS/BAS Scale (White & Carver, 1994), Aggression Questionnaire (AQ; Buss and Perry, 1992), Trait Anger Scale and Anger Expression Scale (Spielberger, 1988). As a result, several AQ subscales had significant positive correlations with C levels. As for T levels, no scales showed any significant associations. The findings suggest that interpersonal variations in basal C levels reflected trait aggression more directly than T levels. Furthermore, BIS scale and AQ subscales had significant positive relationships. These results suggest the possibility that men who are sensitive to punishment signals have stronger tendencies toward aggression.

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*Social categorization: Kinship as another primitive dimension encoded by the psychological architecture*

*\*Poster session I*

**Robert Oum & Debra Lieberman**

Evolution has shaped systems for categorization to take advantage of regularities that impacted survival and reproduction. Within the social domain, research has found primitive dimensions along which we automatically categorize others: sex, age, and coalition. Inclusion in a particular category would have been vital in generating adaptively meaningful inferences (e.g., is someone a potential mate or competitor for mates?). Another important dimension under ancestral conditions was kinship. Knowing who formed kin groups would have enabled important sets of inferences (e.g., who is likely to come to the aid of another? who is likely to avoid another as a mate?). To determine whether kinship is a separate primitive dimension, a study was designed employing the memory confusion paradigm. Conditions were run crossing kinship with sex, age, and coalition. Results indicate that kinship is indeed a unique, primitive dimension automatically encoded by the psychological architecture.

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*Gender differences in jealousy: The impact of social influence variables*

*\*Poster session II*

**Michele R. Parkhill**

The majority of past research on gender differences in jealousy has involved the presentation of a scenario that implies some type of infidelity has occurred. Participants are then asked to indicate which aspect of the infidelity is most upsetting to them. The present study attempted to determine if experimental manipulation of classic social influence variables (audience gender and privacy) would affect participants' responses. It was hypothesized that if these choices were shaped by our evolutionary past, social influence would have no effect. Participants were told their responses would be given to a new men's or women's health magazine and were told either to sign their names to their responses or to not include any identifying information. Results show a main effect for participant gender but not for audience gender or privacy condition. This study found support for evolutionary theory as only gender seemed to influence participants' choices.

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*Effect of partner age on sexual versus emotional jealousy*

*\*Poster session I*

**Jamie L. Parkin & M. Catherine DeSoto**

Participants (n=107) completed a forced choice query as well as continual choice measurements for sexual and emotional jealousy scenarios. Age of participants ranged from 18-52 (mean = 19, SD = 3.3). Using continuous choice measures of sexual versus emotional jealousy, it was found that partner's age (mean = 20, SD = 4.4) predicted emotional intensity in response to both imagined emotional and imagined sexual infidelity. Additionally, while the age of the participant best predicted intensity of "angry" responses; partner's age was the best predictor of how intense feelings of hurt would be. The pattern for males and females differed. For males, the effect of partner's age (signaling fertility) was a significant predictor of how hurt one would be about sexual infidelity: the older the partner, the more hurt one would be. The participant's own age was not related. The forced choice response of males was also influenced by partner's age, but again there was no trend for the participant's age to relate. For females, neither age of participant nor age of partner predicted the forced choice responses. These results support evolutionary predictions that female age is an honest clue to fertility, and thus would predict males' jealousy responses.

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*MazeMaker Suite: A new tool for investigating navigational and spatial abilities.*

*\*Poster session I*

**Shilpa Patel, Sarah L Levin, Hasan Ayaz & Steven M. Platek**

Studies in spatial and navigational processing have demonstrated the presence of reliable sex differences across several functional domains. Studying the relationship between spatial abilities and navigational abilities in an ecologically valid way can be difficult. There are several implementations of 3-D virtual maze programs, but these are often expensive and difficult to use. Our laboratory has developed the MazeMaker Suite, a program that allows users to create 3-D virtual mazes. Mazemaker comes standard with 3 modules: MazeMaker, MazeWalker, and MazeWatcher. MazeMaker is the core program that allows users to create customized mazes. MazeWalker runs the maze for the subject/patient. MazeWatcher is an interface program that allows researchers to watch a recreation of a subject's path in a specific maze after completion the maze. This allows analysis of time spent in area, time to completion, and number of errors. This program was developed in hopes of providing an easy-to-use means with which scientists can develop ecologically valid environments for study in the laboratory. Copies of MazeMaker will be made available for trial use.

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*Female-biased sex ratio during war: a test of Trivers-Willard hypothesis**\*Poster session II***Dario Pavic**

Trivers-Willard hypothesis states that the natural selection will favor female-biased sex ratio if parental condition is poor. In our study, we assumed that the war can induce such condition in humans i.e. the lack of food and medical care, the constant stress etc. can bias sex ratio at birth according to the TW hypothesis. We tested the hypothesis using the sex ratio at birth, sex ratio of still-born children and the number of miscarriages during the Croatian Homeland war years (1991., 1992.), and during the war exodus of the population of Bosnia and Hercegovina to Croatia (1994., 1995.) We found no difference in sex ratio of those years compared to pre-war and post-war years. We conclude that either war does not induce differences in sex ratio, or the whole population of Croatia is not suitable for testing TW hypothesis due to a different exposure of the population to the war threats.

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*Cognitive Behavioral Therapies and Evolutionary Psychology: How EP informs and abets CBT**\*Poster session II***Nando Pelusi**

One goal of psychotherapy is to help people understand why they have such powerful emotions and what these emotions were designed to accomplish. A basic tenet of CBT is that rigid thinking styles and demanding philosophies cause emotional disturbance. Rigidity may be an adaptation. The CBT technique of disputing "disturbance-creating ideas" can be enhanced when aligned with the insights of EP. For example, the CBT culprit "absolutist thinking" may be the result of finely tuned strategies solving problems of commitment, sexual success, dominance, and status. A client who understands these deeply held strategies is better able to properly frame problems. In this way, a paradigm emerges for empirical testing of therapeutic techniques. Several notions have helped my clients understand the nature of "disturbance." They include discussions of human adaptation to likely ancestral environments, commitment theory, natural and sexual selection, the handicap principle, and social exchange, among others. Conversely, academic researchers may misunderstand some aspects of CBT. Techniques for dealing with relationships, jealousy, anger, dieting, addiction, anxiety and depression are discussed. The naturalistic and the moralistic fallacy are discussed.

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*Romantic Rejection: Adaptive Problems and Strategic Solutions**\*Poster session II***Carin Perilloux & David M. Buss**

Romantic relationship termination, or "breaking up," inflicts costs on both the person ending the relationship, and the one who is being rejected. We hypothesized that men and women differ in their experiences of costs associated with breakups. Based on an evolutionary analysis of costs and benefits and sex-linked traits, we generated 15 hypotheses and 73 predictions about the prevalence and experienced costliness of adaptive problems and strategies associated with breaking up. For example, we hypothesized that loss of sexual access would be experienced as more costly by males than females, and that loss of protection would be experienced as more costly by females than males. Other predictions were based on the difference in experienced costliness of adaptive problems between the partner who was rejected and the partner who does the rejecting (e.g. reputational damage). Participants rated the prevalence and magnitude of numerous costs they actually experienced as a consequence of a past breakup and also reported how they solved those adaptive problems. We present empirical tests of the hypotheses and a discussion of the evolutionary psychology of breaking up.

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*What's sociosexuality got to do with it? Further tests of male sociosexuality and preferences for female FA and WHR.*

*\*Poster session II*

**Helen K. Perilloux & Gregory D. Webster**

Two components of female attractiveness, fluctuating asymmetry (FA) and waist-to-hip ratio (WHR), are alleged to represent genetic quality and fertility, respectively. Individual differences in male mating strategy, as measured by sociosexuality and parental investment attitudes, are predicted to correlate with differential valuation of female FA and WHR. The relationships among sociosexuality and parental investment, measured by three indices (Sociosexuality, Parental Investment, "Caditude"), and male preferences for females who varied in FA and WHR were examined in three studies in which participants (total  $n = 273$ ) completed sociosexuality questionnaires and rated visual stimuli of women who varied in FA, WHR, and condition-dependent cues (manipulated by head cropping). A mixed pattern of results suggests that symmetry is a correlate of other condition-dependent cues. Two related analyses are presented: (1) The assumption that FA and WHR are dissociable physical traits was tested in a sample of 63 women's images. (2) A correlational test of a subjective measure of FA versus an objective measure of FA was performed by having subjects rate similarity between left- and right-mirrored chimera pairs, the original of which had been measured for FA by the method above.

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*Why does the savant syndrome not spread in the population? A developmental constraint in a psychological context*

*\*Poster session II*

**Annemie Ploeger, Han L.J. van der Maas & Maartje E.J. Raijmakers**

The fact that we have five fingers per hand, and not more, is remarkable. Extra fingers can be advantageous for climbing, swimming or digging. To explain the absence of more fingers, we need the concept of developmental constraint (a limitation on phenotypic variability caused by the structure or dynamics of the developmental system). A developmental constraint prevents the evolution of extra fingers, because a mutation causing extra fingers also affects other phenotypic traits. These so-called pleiotropic effects usually have deleterious effects, e.g., Down syndrome. This is why having extra fingers is (indirectly) selected against. We show evidence, based on a literature study, for the existence of a developmental constraint in a psychological context. Why would the savant syndrome, characterized by highly developed abilities such as mechanical and spatial skills, which are advantageous for the individual, not be naturally selected? A developmental constraint prevents the evolution of the savant syndrome, because a mutation causing the advantageous abilities also has deleterious effects, e.g., autism. The negative pleiotropic effects serve as a developmental constraint that prevents the positive aspects of the savant syndrome to spread in the population.

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*Costly Signaling Theory and the Ritual Communication of Trust during Newfoundland Mumming*

*\*Poster session I*

**Christina Nicole Pomianek & Craig T. Palmer**

Cooperative relationships require trust. Hence, natural selection may favor actions that communicate both trust and trustworthiness. One way to identify trustworthy individuals is to identify those who are willing to participate in rituals that require sacrifice. Such rituals can serve as costly, hard to fake signals of commitment to cooperative relationships. We suggest that some rituals promote trust even more directly by requiring a specific type of risk: the risk of harm to the hands of other participants. Individuals who take this risk do not merely claim to trust other participants, they actively demonstrate their trust. Conversely, individuals who restrain themselves from inflicting harm on other participants do not merely proclaim their trustworthiness, they actively demonstrate their trustworthiness. We illustrate this version of costly signaling theory with the example of the ritual of mumming in Newfoundland fishing villages.

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*Responses to Sexual and Emotional Infidelity: Why Men Go One Way and Women Go Both*

**Johann Ponnampallam, Mark Stokes & Greg Tooley**

It is now well documented that men focus upon sexual infidelity and women focus upon emotional infidelity. These results are usually found with forced choice (FC) methodology. Other reports suggest that women and men focus equally upon sexual infidelity, and that both find this more disturbing than emotional infidelity. These results are typically found with Likert scales (Ls). We wished to establish if these contradictory results were artefacts, or indicated the inadequacy of an evolutionary model. We sampled 748 subjects across a broad age range, using both FC and Ls formats. Both sets of data supported previous results. FC data supported sex-differences in results, while Ls data showed no sex-difference. We undertook a factor analysis to understand how the same subjects could respond so differently to the same problem. Two factors were apparent in the data with Ls data loading exclusively to one factor, and the FC responses loading clearly upon another.

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*SHARE: An agent-based model of Plio-Pleistocene hominin food sharing*

*\*Poster session I*

**Luke Premo**

SHARE explores the dynamics of a unique formal model that treats fragmented patches of closed habitat as loci of hominin social evolution and investigates altruistic food sharing from a multilevel selection perspective. Population-genetic data collected from artificial societies of hominin foragers in a range of ecological settings demonstrate that specific levels of patchiness facilitate the evolution of food sharing traits due to the fitness benefits they bestow upon subsistence-related trait groups. Two relatively simple food sharing behaviors evolve to fixation in a "transitional" range of ecological patchiness. The evolution of a culturally-sophisticated sharing behavior that involves initial recognition/gossip is less constrained by ecological patchiness. These results begin to elucidate the relationship between two important variables in the hominin food sharing equation: Plio-Pleistocene patchiness and the social savvy of early food sharing strategies.

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*Mating Context Affects Women's Preferences for Male Voice Pitch during the Fertile Menstrual Phase*

*\*Poster session II*

**David Andrew Putz, Steven J.C. Gaulin & Alexandra Huttinger**

Several studies have shown that women prefer more masculine traits, such as faces and odors, in short-term mating contexts and during the fertile phase of the menstrual cycle. One previous study has examined menstrual phase and mating context effects on women's preferences for men's voices. In the present study, we used a within-subjects design to extend previous findings that women's preferences for male voice pitch depend on mating context and menstrual phase. Sixty normally-cycling heterosexual females attended separate rating sessions during a four-day high fertility window and during a five-day low fertility window in their menstrual cycles. Subjects heard recordings of men's voices and, for each voice, chose the most attractive for both short-term and long-term mating contexts among eight recordings differing only in pitch. Repeated-measures ANOVA revealed a significant main effect of mating context (women preferred lower voice pitches in short-term contexts) and a marginally significant interaction between mating context and menstrual phase. Specifically, mating context significantly affected women's preferences for male voice pitch only during the fertile menstrual phase.

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*On the Effects of Reading Erotic Literature: Manipulation of Men's and Women's Emotional and Sexual Relationship Satisfaction*

*\*Poster session I*

**Mark W. Remiker, Katie Ley & April Bleske-Rechek**

Research on contrast effects has documented various intriguing findings. Exposure to centerfolds, for example, has been shown to lower men's attraction to their partner. Evolutionary logic suggests that stimuli that highlight another couple's emotional connection may be detrimental to women's perceptions of their mateship. As part of this study, men and women read one of two literature excerpts detailing a sexual encounter between a committed couple. One excerpt depicted a high degree of sexual novelty in the relationship, and the other a high degree of emotional intimacy. We thus tested the hypothesis that men's sexual relationship satisfaction is more influenced than is women's by stimuli that highlight sexual novelty, and the hypothesis that women's emotional relationship satisfaction is more influenced by stimuli that emphasize emotional intimacy. Our results implicate a need for research on the effects of media consumption on people's relationship commitment and satisfaction.

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*Activation of Self-Protection Motivation Selectively Increases Perceptions of Anger in Outgroup Targets*

*\*Poster session I*

**Theresa E. Robertson, Douglas T. Kenrick & Jon K. Maner**

This study examined how fundamental social motives lead perceivers to attribute emotions to others in evolutionarily adaptive ways. Attributed emotions need not be the same as the emotions the perceiver is experiencing. For example, people experiencing fear -- a self-protective state -- should be particularly attuned to features of the environment that represent possible dangers. Members of a threatening outgroup are one such potential danger and individuals should be attentive to when they might pose an actual danger. By adopting a liberal criterion for perceiving anger -- an emotion associated with physical threat -- in the faces of outgroup members, one can take steps to avoid coming to harm. Consistent with this, we found previously that participants primed for self-protection were more likely to attribute anger to faces of male members of a threatening outgroup than control participants. This research extended previous findings by including an implicit measure of participants' outgroup-threat associations. Results indicated that participants with high implicit outgroup-threat associations were more likely to attribute anger to outgroup faces when primed with a self-protective goal.

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*Second to Fourth Digit Ratio and Dominance in Women*

*\*Poster session II*

**Amanda L. Robinson, Douglas A. Waring & Matthew P. Rowe**

Hormone levels during embryogenesis can affect secondary sexual characteristics, including behavior. 2nd to 4th digit ratio (2D:4D) is indicative of hormone levels during such development, and has been linked to personality characteristics such as assertiveness and aggression. The present study was designed to assess the relationship between fetal testosterone levels and dominance in women. 100 undergraduate students will complete the Dominance and Submissiveness Acts Reports, the Trait Dominance-Submissiveness Test, and 2 additional questionnaires to measure masculinity/femininity. Correlational analyses will be used to assess the relationship between 2D:4D ratio, dominance, and masculinity. 2D:4D ratios are expected to be negatively correlated with both dominance and masculinity.

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*Hot or Not? And why it matters to jealousy*

*\*Poster session I*

**Katie Rodak, Jaime W. Thomson, Sarah Levin, Shilpa Patel, Michele Sackawicz & Steven M. Platek**

It has been hypothesized that self-esteem has evolved as a means to assess your own value as a long term mate and to evaluate reproductive risks imposed by one's partner. It would be reasonable to expect an individual with a

higher self-esteem to perceive their self as having high mate value. Previous research has shown that males are primarily interested in attractiveness when choosing a mate whereas females value male status. Jealousy may serve as a defense mechanism to keep couples together. The purpose of this study was to investigate how one's self-perceived attractiveness as well as the assessment of one's partner's attractiveness as a mate would correlate with ratings of jealousy. Because males value physical attractiveness more than females, male's perception of their mates correlated positively with their level of jealousy; i.e. as the more a male rated his mate as attractive the more jealous he rated himself. On the other hand, females' level of jealousy correlated negatively with their perception of their own attractiveness, suggesting perhaps that highly attractive females do not feel the same pressures to obtain and maintain mates.

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*Relationship satisfaction and representations of partner's facial attractiveness*

*\*Poster session II*

**Angela Rowe & Ian Penton-Voak**

The majority of people successfully manage to maintain satisfying relationships in which to successfully raise offspring. Although there has been considerable research into factors that may encourage individuals to look outside the pair-bond for extra-pair or short-term partners, there is perhaps less research into the mechanisms that keep people together in successful relationships. Here, we investigated individuals' representations of their partners' facial attractiveness. Fifteen couples were recruited, completed measures assessing their satisfaction with their relationship and their attitude towards their partner (e.g. Murray, Holmes & Griffin's (1996) Positive Illusions Measure), and were photographed. Photographs of each individual were manipulated using established computer graphic techniques to increase or decrease facial attractiveness. Participants were then asked to select the veridical image of their partner from a selection of seven images (three less attractive than the original, the veridical image, and three more attractive than the original). Individuals who rated their relationships as highly satisfying selected images of their partners that had been made artificially more attractive as being the veridical images. Individuals dissatisfied with their relationship did not show this bias. Implications of these findings for the maintenance of relationships are discussed.

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*Biology as the Primary Paradigm*

*\*Poster session I*

**James H. Rutherford**

Biology rather than physics will become the primary paradigm of the next century. This is in part due to the genome project and the influence it will have on the direction of scientific research. It will also, however, be a result of a much broader understanding of co-evolution and our interaction with the world in which we live. It will be driven by very practical or pragmatic issues concerning life on earth and our need to live in what in many ways is becoming a global community. Biology will not become the new paradigm, however, until it develops a methodology and a multidimensional understanding of human nature that is broad enough to include not only the life sciences, but also the other basic sciences, the social sciences, and the humanities.

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*A Framework of Analysis for Moral and Political Philosophy*

*\*Poster session I*

**James H. Rutherford**

A major theme of this essay is that most of philosophy in the past 100 years has been like the blind men describing the elephant -- each perspective gives a reasonable description of a particular part, but none gives a coherent view of the "elephant." This essay presents a very useful way of describing the "elephant" and in doing so it brings some coherence to moral and political philosophy. A four-part framework, which encompasses the individual, social, natural, and metaphysical perspectives, is apparent in the evolutionary development of the brain

(MacLean and Eccles) and the similar progressive development of our mental capacities through experience (Piaget and Kohlberg).

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*Sex-Specific Triggers of Envy: An Evolutionary Perspective*

*\*Poster session I*

**Gad Saad & Tripat Gill**

In the same manner that sexual jealousy appears to be differentially triggered by sex-specific threats (emotional versus sexual infidelity, cf. Buss et al. 1992), we reasoned that many triggers of envy should also be domain-specific in their instantiations. We administered a survey (157 males; 68 females) consisting of both domain-specific items gauging the envy that would be felt towards a same-sex peer (e.g., their status, physical attractiveness, or sexual desirability, etc.), and domain-general items (e.g., dispositional envy, personality traits). While more than half of the domain-specific items yielded a sex effect, many of which were congruent with evolutionary-based predictions, very few domain-general items yielded a difference (e.g., no sex differences on any of the eight items of the dispositional envy scale). This provides strong preliminary support that envy yields sex-based differences congruent with a domain-specific calculus. In future research we hope to extend the current work to the consumption domain. Specifically, social comparison processes in the consumption domain are likely driven in part by feelings of envy, as triggered by domain-specific reasoning.

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*Quantifying the consilience of disciplines via scientometric techniques: An analysis of the intellectual structures of evolutionary psychology and consumer behavior*

*\*Poster session I*

**Gad Saad, Richard Sejean & Loet Leydesdorff**

Sociologists of science have provided several distinct reasons to explain the differential influence and prestige of the natural sciences as compared to that of the social sciences (see Saad, 2005 for a summary). Recently, Wilson (1998) has argued that Darwinian theory is the meta-framework that can yield consilience across a wide range of human endeavors (e.g., bridging the schism between the natural and social sciences). In the current work, we apply scientometric techniques to gauge the intellectual structure of two fields varying in their level of within-discipline consilience. While evolutionary psychology is rooted in a highly codified and consilient meta-framework, consumer behavior consists of disjointed, confused, and contradictory theoretical bases. Thus, the current work attempts to apply a quantitative approach (scientometrics) to gauge the epistemological status of disciplines (e.g., consilience).

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*Behavioral traits and sleeping hours as well as relationship status affect evening testosterone levels*

*\*Poster session II*

**Kikue Sakaguchi, Mariko Oki, Seijiro Honma & Toshikazu Hasegawa**

It has been reported that salivary testosterone levels of men in committed relationships ("paired" men) had lower testosterone (T) levels especially in evening samples. We investigated relative strength of relationship status, behavioral traits associated with reproductive strategy, and daily rhythm affecting evening T levels. Saliva samples were collected from Japanese university students (18-35 yrs, n = 87) two times a day (7:00-8:30, 20:00-22:00). Participants self-reported their relationship status, behavioral traits (Self-Monitoring: SM, associated with unrestricted sociosexuality; Type A personality), regularity of daily life rhythm, and sleeping hours in the night before sample collection. Paired men had lower salivary T levels only in evening samples ( $t(80) = -1.70, p = 0.09$ ). Some subscales of SM and Type A were lower among paired men. Lower SM and Type A scores associated with the sharper T decrease during the day. GLM analyses revealed that relationship status associated with evening T

levels and behavioral trait scores with diurnal T fluctuation respectively. However, the effect of sleeping hours was superior to these independent variables, though regularity of daily rhythm did not affect the variables.

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*The Effects of Sexualized Images and Stress on Body Image and Dieting: An Evolutionary Perspective*

*\*Poster session II*

**Catherine Salmon**

Research has shown that, since reproduction is costly for female mammals, those facing social or ecological conditions unfavorable for reproduction can sometimes increase her fitness by delaying reproduction until the situation improves. One way to do this is by adjusting body fat to alter the probability of conception. The reproductive suppression hypothesis suggests that the widespread desire for thinness among women and the resultant dieting undertaken to achieve it are the result of the activation of such a mechanism to temporarily delay reproduction in the face of cues indicating a poor environment for reproduction. In this study, the impact of sexualized images of women in the media and female-female competition on the inclination to diet were measured via the EDI (Eating Disorders Inventory). The attractiveness of the images had a greater impact on the EDI scores than the degree of sexualization.

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*IQ and the Wealth of Nations: A Reanalysis of Lynn and Vanhanen's Data*

*\*Poster session I*

**Stephen K. Sanderson**

In their book IQ AND THE WEALTH OF NATIONS, Lynn and Vanhanen show very high correlations between IQ and economic development in the world's societies between 1820 and 1992. They claim that IQ and, secondarily, markets, are the most important determinants of a society's level of economic development. However, their study does not use proper statistical controls. The present study attempted to overcome this deficiency. Regression analyses confirm Lynn and Vanhanen's original results. IQ remained the strongest determinant of economic development, and markets the second strongest determinant, even when levels of educational attainment were added to the regression equation. Although there are probably a number of factors that determine economic development, societies appear to have a developmental advantage if their members have high average intelligence and a developmental disadvantage if their members have low average intelligence.

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*Low waist-to-hip ratio grasps male attention*

*\*Poster session II*

**Petter Sannum, Ståle Pallesen & Rolf Reber**

Questionnaire and historical data show that women's waist to hip ratio (WHR) is a perceptual cue men use to assess a female's attractiveness; low WHR is preferred to high WHR. We've examined attentional consequences of this preference. In the present study we conducted two within-subjects experiments where we investigated consequences of briefly priming photos of women with low or high WHR. Only males participated. Reaction times and accuracies were used as dependent variable. Experiment 1 (N=20), an affective priming paradigm, found significant slower classification of first-names when WHR was low rather than high. In Experiment 2 (N=40), a Stroop-like paradigm, we found the same significant slower reaction time after low WHR priming. In neither experiment could participants report detecting varying WHR. We conclude that low WHR distracts male participants more than high WHR, bolstering former findings on declarative preference for low WHR.

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*Food Sharing Among the Meriam: A Social Network Analysis*

*\*Poster session I*

**Brooke Scelza & Rebecca Bliege Bird**

While classic biological models such as kin selection and reciprocal altruism have been able to use traditional statistical methods to test their hypotheses, finding the appropriate quantitative methodology for testing more complex social models has been problematic. This is mainly due to a historical lack of ability to deal with dependent, relational data -- key to any study of complex human sociality. New methods of social network analysis are applied here to a study of human food sharing among Meriam foragers. The data support conclusions previously drawn by Bliege Bird et al (2002) that food sharing does not appear to be reciprocal. The research also shows that neighborhood was a stronger predictor of food sharing than being a member of the same kin group. This is an important finding because traditional evolutionary models have put great weight on the importance of kin. The idea that people might favor those they are geographically closer to indicates that social structure is also dependent on cohesion between non-kin. Furthermore, the proximity predictor could provide an important starting point for more research on the importance of social sub-groups.

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*The Effect of Altruistically Goal-Oriented Appeals on Organ Donation Registration*

*\*Poster session I*

**Stephen H. Scott & Douglas A. Waring**

Seventeen people died today marooned on an organ recipient waiting list in the United States and the gap between those who are in need and those who donate is widening. Consequently, there is an urgent need for greater participation in organ donor registration programs. Existing research has shown a positive correlation between an individual's measured level of altruism and subsequent willingness to donate. Unfortunately, these findings have not been applied to the informational material designed to encourage participation in donor registration programs. The present study tested whether, one or all, of three current evolutionary explanations for altruism (Familial; Reciprocal; and Cultural) could improve the persuasive effectiveness of donation encouraging information. Each theory of altruistic behavior was used to design a goal-oriented appeal for organ donor registration. These appeals were manipulated within direct (facts and statistics) and indirect (emotional story) informational materials. Materials that orient individuals towards specific altruistic goals are expected to be more effective than non-directed messages. Data collection is currently in progress.

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*Social closeness of MZ and DZ twin parents toward their nieces and nephews*

*\*Poster session II*

**Nancy L. Segal, Jim Seghers, Rick Castillo, Alyssa Vanevery & Tawny Moreno**

Marriages of twins to non-twins yield an array of informative kinships. MZ twin parents become "genetic mothers and fathers" of their nieces and nephews; nieces and nephews become the twins' "genetic children." Children from the two marriages are first cousins, but because they have a genetically identical parent they become "genetic half-siblings." In contrast, the usual aunt/uncle-niece/nephew and cousin relationships remain in DZ twin families, because they share 50% of their genes, on average, like ordinary siblings. The twin-family design has never been used to study social relatedness. Hypotheses were based on Hamilton's inclusive fitness theory: MZ twin aunts/uncles will feel closer to their nieces/nephews than DZ twin aunts/uncles; female twins from same-sex pairs will feel closer to their nieces/nephews than male twins from same-sex pairs; male twins from opposite-sex pairs will feel closer to their nieces/nephews than female twins from opposite-sex pairs. The sample included 283 MZ and 76 DZ individual twins. This study contributes to growing interest in links between behavioral genetics and evolutionary psychology.

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*A Theory and Celebration of Male Sexual Arousal by Females: The Foundations of Male Heterosexuality*  
*\*Poster session II*

**Marvin Siegelman**

On the basis of evolutionary theory, the proposal is made that males are innately predisposed to respond with increasing levels of pleasurable sexual excitement when they see and/or have sexual relations with real, live, nude females presenting increasing levels of beauty. Male sexual delight in response to beautiful females is considered to be an emotional arousal involving neurochemical, autonomic, somatic, behavioral, and self-perception of excitement reactions (in this descending order of automaticity and unconsciousness), that prepares and orients males to continue, and to repeat, the enjoyable experiences (i.e., an approach orientation). This emotional response forms the foundation for male sexual desire for females. Research methodology will be outlined to test hypotheses concerning male sexual arousal by, and male sexual desire for, females, derived from evolutionary theory and emotion concepts, with special emphasis given to the construct validity of proposed arousal and desire measures.

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*The Interaction between Earning Potential and Phase of the Menstrual Cycle on Female Mate Preferences*  
*\*Poster session II*

**Christine E. Stanik & J. Timothy Cannon**

Much evidence documents that economic resources are a more important indicator of mate value for women than men, and Buss has further suggested that women's preference for a man a few years older allows assessment of earning potential while insuring against the loss of financial support due to death. This study investigates whether the same principles can also explain variations in female mate preference as a function of phase of the menstrual cycle and women's independent access to resources. A saliva sample provided data on their phase in the menstrual cycle. The results showed a significantly increased tolerance for age variation in a spouse as a woman's earning potential increased as measured by verbal SAT scores. Women in the fertile phase of the menstrual cycle showed significantly increased preferences for Dependable Character, Refinement, and Good Financial Prospect. There was a significant interaction between the effects of SAT scores and menstrual phase on preferences for traits signaling a good financial provider.

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*Metaphorical Kinship*

*\*Poster session I*

**Lyle Steadman**

The paper proposes a Darwinian explanation of metaphorical kinship behavior. In all human societies there is a tension between true kinship and false, or metaphorical, kinship. True kinship is where the degree of altruism is correlated with genealogical distance, and is explainable by Hamilton's work. False kinship is altruism not so correlated. In all human societies, leaders encourage followers to act as if they were close kinsmen when they are not. Various theories, including group selection, have been put forward to explain such behavior, but they don't fit the relevant facts. Because of marriage, individuals acquire all the identifiable kin of both parents, regardless of their group. Because of prohibitions on marriage between closer kin, individuals rarely marry within the same local group. In tribal societies, often great numbers of kin are encouraged to behave as if they were close kin, referring to each other as "father", "sister", "son", etc. In modern societies people are urged to treat even non-kin as if they were close kin. "Father" George Washington makes all Americans siblings. Ataturk means the father of the Turks. Every religion encourages family-like behavior among its followers, sometimes even toward outsiders.

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*Self-deception and the brain: Using Transcranial Magnetic Stimulation (TMS) to investigate the evolutionary origins of deception*

*\*Poster session I*

**Sean Stevens, Kevin Guise, Karen Kelly & Julian Paul Keenan**

There are few studies that have directly examined the cortical underpinnings of self-deception. In terms of evolutionary theory, a number of theorists have speculated about the origins, benefits, and costs of self-deception. In the current study, we examined the possibility that self-deception and non self-deception are related in terms of cognitive origin. Employing Transcranial Magnetic Stimulation, we investigated self- and other-deception in a normal population. It was found that both self- and other-deception occupied similar brain regions, though differences were noted. Further, on a behavioral level, both types of deception were related to other measures of higher-order cognition (i.e., self-awareness). These data are discussed in terms of current evolutionary theories of self-deception.

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*Male and Female Jealousy? Why Mating Strategy and Sociosexuality are Essential for Differences in Jealousy*

*\*Poster session II*

**Sarah L. Strout, Naomi Tyler & James D. Laird**

While previous research in jealousy has focused on differences between sexes, the current study investigated the relationship between sociosexuality and sex differences in jealousy. Participants filled out the Sociosexual Orientation Inventory (SOI), and the classic forced choice question regarding jealousy. Results show that in addition to expected sex differences for the classic forced choice question, participants who chose emotional infidelity as most upsetting scored higher on the SOI than participants who chose sexual infidelity as most upsetting. In addition, a sex difference was found for the SOI scores, with men scoring higher than women on the SOI. However, there was no interaction between sex and type of infidelity on the SOI scores. Previous research in our lab found that both women and men who preferred success, education, commitment and faithfulness in a mate (suggesting a long term strategy) compared to men and women who did not prefer these qualities (suggesting a short term strategy) were more likely to choose emotional infidelity as most upsetting. These results suggest that mating strategy and sociosexuality contribute to differences in jealousy.

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*Non-Darwinian processes in the evolution of morphology and behavior in humans and other animals: the role of genetic drift and neutral evolution.*

*\*Poster session I*

**Lixing Sun**

Genetic drift and selection (natural and sexual selection) are two major driving forces for biological evolution. However, there is a clear divide between biologists working at the molecular level (protein and DNA) and those working at higher levels (such as morphology or behavior) as for which mechanism is more important. The former tend to argue for genetic drift, whereas the latter lean to selection. Researchers in other fields including anthropology, psychology, and sociology are inclined to side with selectionists while dismissing the relevance of genetic drift. To reconcile the conflicting views, I show here that the critical differences between neutralists and selectionists lie in both semantics and perspective. By analyzing the evolution of eyes, hands, and mating systems in humans and other animals, I demonstrate the importance of genetic drift and neutral evolution, in addition to selection, in shaping behavioral and morphological traits.

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*Intentions to cooperate in Prisoner's Dilemma based vignettes: Relationships among self-deception, trust, and reputation management.*

*\*Poster session I*

**M.K. Surbey, E. Alvius & S. Biggs**

Self-deception may facilitate cooperation by relegating the selfish motives of oneself and others to the subconscious (Alexander, 1987; Nesse & Lloyd, 1992). Previous findings of a relationship between heightened levels of self-deception and intentions to cooperate (Surbey & McNally, 1997) were extended by testing the predictions that 1) high levels of trust relate to the ability to self-deceive and 2) reputation concerns would increase the level of cooperation when actions are made public. Participants completed the Self-Deception Questionnaire (SDQ), the Paulus Deception Scale (PDS), and two measures of trust. Cooperation was measured by responses to vignettes conforming to the payoff matrix of the PD Game presented in written or computer format, where participants believed they were playing against another person. The findings largely supported the predictions. Participants with high scores on the SDQ received high scores on the Interpersonal Trust Scale. High scores on the SDQ, PDS, and one measure of trust predicted heightened cooperation. In the computerized games, participants tended to cooperate more when they thought responses would be made public.

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*Error Management and Perception of Aggression*

*\*Poster session I*

**Felix Thoemmes & Virgil Sheets**

Error Management Theory is based on an assumption that evolution has shaped cognitive biases -- not to minimize cognitive effort involved in decisions -- but to minimize the fitness costs associated with judgmental errors. Using this framework, we predicted that people would overperceive aggressive tendencies in others. We also expected that this bias would be facultatively accentuated in the presence of one's children (for women) and/or the presence of a mating partner (for men). Several hundred students were presented vignettes describing a potentially violent situation and asked to indicate their expectations of the aggressive intent that would be displayed by another individual. A control group rated their own aggressive potential in such a situation. Results revealed evidence of a general overperception in the likelihood that others would become aggressive, but offered no support for a facultative accentuation of this bias in the hypothesized conditions. The implications of the findings for error management theory and their overlap with the hostile attribution bias are discussed.

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*Interpersonal Leveling, Independence, and Self-Enhancement: A Relational Practice Framework for Evolutionary and Cultural Psychology as Illustrated in Danish and North American Samples*

*\*Poster session I*

**Lotte Thomsen, Alan P. Fiske, Jim Sidanius & Carlos David Navarrete**

The capacity to coordinate social arrangements requires a set of evolved psychological potentials that have evolved in conjunction with a range of cultural norms that orient adaptive, status-relevant strategies allowing for the enactment of functional forms of sociality. Comparing North American and Danish samples, we demonstrate that self-enhancement is one such domain. We show that some cultural differences in self-enhancement may be accounted for by universal relational grammars. In Study 1 Danes self-enhanced considerably less than did Americans, although Danes described themselves as more independent. Explicit measures of independence predicted self-enhancement within the US, but not in Denmark. Interpersonal leveling strongly and inversely predicted self-enhancement within both cultures, and fully mediated Danish-American differences of self-enhancement. Study 2 replicated elements of these findings in all Scandinavian countries using data from national probability samples. Study 3 demonstrated that preferences for non-verbal and graphical depictions of socio-relational forms predict self-enhancement. These studies provide evidence for the notion that universal social grammars may underlie cultural differences in the expression of self-enhancement.

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*The Role of Facial Resemblance in Behavior Toward Others*

*\*Poster session II*

**Jaime W. Thomson, Sarah Levin & Steven M. Platek**

Facial resemblance may be a kin identification cue. Several recent papers have shown that perceptions of facial resemblance increase positive attitudes toward faces that share resemblance. Here we extend these investigations by conducting a multi-part study that investigates the role facial resemblance plays in a number of different social situations such as friendship, altruism, platonic and romantic attraction, as well as child care. Preliminary evidence suggests that the positive perceptions and reactions to facial resemblance emerge under specific social situations and individual differences exist. Additionally, facial analysis software was used to interpret how the degree of facial resemblance among genetic relatives impacts social interactions amongst family members.

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*Altruism and War: Divergence and convergence in group identity differentiation*

*\*Poster session I*

**Carmi Turchick**

War is inseparable from, and impossible without, altruism. Group commitment combined with negative bias oriented in-group/out-group differentiation, and a psychological defense mechanism capable of convincing even the worst of us that we are basically good, allows us to employ altruistic impulses for war. Humans universally commit to, and identify with, groups which differentiate themselves culturally and psychologically. In-group/out-group differentiations that view the out-group as not having inherently different behavior or desire attributes allow in-group commitment to out-group inclusive higher level groups; for example, humanity. Differentiations that ascribe inherent positive attributes to in-group and, oppositionally, inherent negative attributes to out-group, begin the psychological justification process for racism, aggressive war, and genocide. Commitment connects individual self-image to the group. We are good, therefore our group is good. Conformity and commitment are strengthened by perceived threat, which causes differentiation to become oppositional. We altruistically kill and die.

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*The impact of unprotected vaginal, oral and anal sex on depression*

*\*Poster session II*

**Jose Valdez & Rebecca Burch**

Unprotected vaginal intercourse has been shown to correlate negatively with depression, possibly due to the effects of seminal compounds in the female bloodstream. To determine whether other routes of administration also have effects, we surveyed over 150 undergraduates regarding frequency of unprotected vaginal intercourse, fellatio, and receptive anal intercourse. First of all, even in a predominantly heterosexual sample, the majority of participants had engaged in fellatio and roughly a third engaged in receptive anal sex. All three behaviors showed the same patterns; "receptive" partners who never used condoms reported the lowest levels of depression with depression increasing with more frequent condom use (and lower semen exposure). However, semen exposure scores (frequency of acts combined with frequency of condom use) for fellatio did not correlate as highly as vaginal intercourse. It is possible that the digestive process diminishes the impact of certain seminal compounds.

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*The effects of winning or losing a brief laboratory-based competition on testosterone in women and men*

*\*Poster session II*

**Sari M. van Anders & Neil V. Watson**

Following direct competition, winners sometimes show higher testosterone (T) levels than losers. We created a computer-based competitive vocabulary task in which win/loss status was highly salient to participants. We tested 39 women and 37 men individually in 30 min afternoon sessions. The session included a precompetition saliva sample, competition, questionnaires (competition parameters, mood, background), and post-competition sample. Precompetition T was negatively correlated with correct responses, and male winners had lower T pre- and post-competition, suggesting a high-T impairment on our task. In men only, losers had a larger decrease in T from pre to postcompetition, suggesting that winning attenuated a competition-related decline in T. Our competition task thus provides a novel and practical laboratory model for disentangling the possible contributing factors (e.g. effort, outcome, mood) to the competition effect on T in men. Implications for research with women are discussed.

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*Sex, gender and adolescent risk-taking: a biosocial extension of control theories*

*\*Poster session II*

**Hans Vermeersch**

Control theories are considered one of the leading paradigms for the understanding of adolescent risk-taking. It has been argued, however, that they do not fully explain - theoretically nor empirically - the gendergap in these phenomena. This is problematic as gender is one of the most important correlates of adolescent risk-taking and its explanation is sometimes seen as the 'litmus-test' for criminological theories. Some argue that the existing theories should be revised or extended to take more fully into account the potential biological basis of sex-differences, some of which are the result of hormones. This paper tries to assess the relevance of hormonal masculinisation for the field of adolescent crime and risk-taking in general and for social control theory in particular. Data are presented from a sample of 600 adolescents at the age of 14-15, including serum steroid hormone assays, measurement of hormone related physical characteristics and a questionnaire containing a range of adolescent crime/risk-taking indicators and social control variables. Implications for future research and theory in the field of sex, gender and adolescent crime/ risk-taking are suggested.

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*Men or babies, that is the question: Working memory as a function of menstrual cycle*

*\*Poster session I*

**Andrea Vranic & Ivana Hromatko**

It has been shown repeatedly that estrogen enhances various memory functions. The aim of this study was to explore the influences of task content and estrogen level on working memory performance. We hypothesized that a shift in attention toward evolutionary relevant stimuli in different phases of menstrual cycle might occur. Therefore, we used two sets of cards in a memory game, one with photographs of adult male faces, and the other one with photographs of babies. Two groups of women were tested: with regular menstrual cycles (n=56) and on oral contraceptives (n=16). The performance on the task had the same pattern in both groups: women were significantly more efficient in recognizing male faces during high-estrogen phases of the cycle than in low-estrogen phases, while the recognition of baby faces did not change during cycle. Results are discussed in terms of importance of shifts in attention toward evolutionary relevant stimuli.

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*Some Mikian Hypotheses to be Tested*

*\*Poster session II*

**Mikihiko Wada**

Hypothesis 1: Male group hunting was necessary, not only for getting a huge game but also to get all the men out on the field, to check if "nothing wrong" was happening (details at the conference, same with 2-8)?

Hypothesis 2: Human females' breasts that "stick out" evolved because that makes it easier to care for their

babies.

Hypothesis 3: Human kissing on lips evolved because it is an ESS: if they do it well, they can care better for the babies after nursing is over.

Hypothesis 4: How Multiple Sexual Relationship (MSR) moves to or finds an equilibrium of a Pair (bond) Sexual Relationship (PSR), especially with Homo sapiens.

Hypothesis 5: ""Do-it-in-my-sight (DIMS)"": Why many of humans, if not other primates, peep? ""Do-it-out-of-my-sight (DIOMS)"": Why do also many of them wish not to see what they see?

Hypothesis 6: Certain humans do things only when ""Right over the Deadline (RODL)"" and not before. Is this an ESS?

Hypothesis 7: ""Elevators' Dilemma"" - How would a person press a button for a elevator for the ""handicapped"" only to reach the destination floor quickly, in what situation?

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*Towards a valid evolutionary domain-specific risk-taking scale*

*\*Poster session I*

**X.T. Wang, Andreas Wilke & Daniel J. Kruger**

From an evolutionary viewpoint, human risk-taking behaviors should be viewed in the context of evolutionarily recurrent survival and reproductive problems. In response to recent calls for domain-specific measures of risk-taking, this study emphasized the need of evolutionarily valid domains. As part of a larger project on "evolutionary domains of risk and life-history", a total of 693 participants from the University of South Dakota (316 females, 132 males) and the University of Michigan (131 females, 114 males) responded on-line to a set of questionnaire items and rated them in terms of the likelihood of engaging in each risky behavior. Here, we report first results aiming to validate a short risk scale containing multiple evolutionary domains. An exploratory factor analysis identified five domains of risk-taking (i.e. within-group competition, between-group competition, survival and physical risks, mating, and reproduction) with three items in each domain. The total variance explained by these items was 55 percent. In all domains, men were significantly more risk-taking than women.

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*Environmental Uncertainty Influences Mate Preferences*

*\*Poster session II*

**Paul Arthur Wehr, Daisuke Nakama & Tatsuya Kameda**

Attractiveness can be conceptualized as a preference for phenotypes that tend to promote fitness. What constitutes a "high-quality" phenotype, however, can vary as a function of the environment. Environmental uncertainty, for instance, may influence mating preferences since successful phenotypes might be more difficult to predict. Japanese participants at Hokkaido University played a "Descendants Game" in which they were asked to choose between a certain-outcome-face and an uncertain-outcome-face as a potential mating partner in order to gain additional family members. The preference for three aspects of facial attractiveness (juvenilization, averageness, and symmetry) was tested under two conditions of uncertainty, during which the probability of success or failure associated with selecting the uncertain-outcome-face was either known (Outcome Uncertainty), or unknown (Outcome Uncertainty + Outcome Distribution Uncertainty). Results indicated that the degree of uncertainty had an effect on mating preference, whereby greater uncertainty led to a greater emphasis on physical attractiveness.

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*Women's claims of false pregnancy as a commitment detection device**\*Poster session II***Holly Ann Wilberger & Richard L. Michalski**

Women and men evaluate long-term mates on the basis of different characteristics (Buss, 2003). Women may tactically propose false pregnancies to partners to evaluate their reactions as a basis for maintaining or terminating relationships because the costs of parental investment are larger for women than for men (Trivers, 1972). The current study tested several hypotheses and predictions derived from the possibility that women use this strategy to assess a partner's commitment in the relationship. Results support several of the hypotheses and reveal that a partner's reaction to a proposed pregnancy predictably impacts various aspects of their relationships. Discussion situates this evidence within the research on women's evaluation of a partner's commitment and suggests several areas of future research. We suggest that women may benefit most by artificially triggering reactions by claiming false pregnancies early in relationships. Additionally, we suggest that the greater frequency of irregular menstrual cycles early in relationships may facilitate the use of this psychological strategy.

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*The Neglect of Cognitive Mechanisms in Evolutionary Psychology**\*Poster session I***Andreas Wilke & Rui Mata**

Cosmides and Tooby (1987) criticized a "widespread tendency to overlook a crucial link in the causal chain from evolution to behavior: the level of innate psychological mechanisms, described as information processing systems" and proposed guidelines for conducting adequate research in evolutionary psychology. Almost 20 years later, we investigate how the tendency to overlook psychological mechanisms in terms of process-models of human cognition developed in the past decades. In two bibliographic studies we quantify the prevalence of papers proposing detailed models of psychological mechanisms in both the evolutionary psychology and general psychology literatures. We additionally test the hypothesis that papers proposing process-models generate more testable predictions and interest by looking at citation records.

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*EvoS: Using evolutionary theory to change the culture of education and research at a campus-wide scale**\*Poster session I***David Sloan Wilson**

EvoS (<http://bingweb.binghamton.edu/~evos>) is a unique campus-wide program that strives to make evolutionary theory a common language for the study of all subjects relevant to human affairs in addition to the natural world. It is available to all undergraduate and graduate students, resulting in a certificate in evolutionary studies along with one's degree. Introductory courses teach the basis principles of evolution and their wide ranging applications, followed by a menu of courses that provide both depth in particular subject areas and breadth across subject areas. At the faculty level, EvoS began with core strengths in biology, anthropology, and psychology but quickly expanded to include over 50 faculty from 15 departments. The basic ingredients that have made EvoS a success can be emulated at most colleges and universities, suggesting that the future of transdisciplinary evolutionary studies can be different in the future than in the past.

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*Responding to a Hypothetical Extra-Pair Involvement: Sex Differences in the Nomination of Cues of Sexual Infidelity**\*Poster session I***Nalee Xiong, Carla Lagorio & April Bleske-Rechek**

In a novel test of the hypothesis that men's jealousy more than women's focuses on signals of sexual (vs emotional) infidelity, we asked 158 young adults to list pieces of evidence that would lead them to believe that

their partner was involved with someone else. The nature of the extra-pair involvement was intentionally ambiguous, under the expectation that if men more than women focus on cues of sexual infidelity, then men should be more likely than women to nominate sexual cues as evidence of extra-pair involvement. As predicted, men's first cue involved explicit sexual evidence (e.g., catching her having sex with someone else, finding used condoms) more frequently than did women's. Further, despite that men nominated fewer cues, on average, than did women, a greater proportion of men's cues referenced sexual behavior. Because this study did not rely on the forced choice method, the findings provide original support for the existence of an evolved sexual jealousy adaptation in men.

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*The effect of intergroup threat priming on ingroup cooperation in a different context: A view from coalitional psychology*

*\*Poster session I*

**Kunihiro Yokota & Masaki Yuki**

Prior studies have demonstrated that competition between ingroup and outgroup increases cooperation within the ingroup. Based on the theory and findings of coalitional and relational psychology (Hardin & Conley, 2001; Navarrete & Fessler, in press) we predict a generalization effect; that is, priming of intergroup threat in one context will increase cooperation within ingroup in different intergroup contexts, because the former should activate the generalized psychological mechanism to defend one's ingroup. One-hundred and one undergraduate students (52 males & 49 females) participated in an experiment, where half were first primed with an intergroup threat in an international context. Then, in an ostensibly "irrelevant" second experiment, all participants were divided into one of two groups based on their "administrative" artistic preference, and performed a one-shot social dilemma game within their ingroup. Results were, as predicted, participants in the primed condition cooperated more than in the non primed condition. In addition, the amount of ingroup cooperation was positively correlated with self-reported motivation to derogate the outgroup only in the primed condition.

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*Self-Reported Parental Investments in Children: An Examination of Family Type and Parental Respondent Effects*

*\*Poster session II*

**Keith Zvoch & Frank Lassus**

Data from the U.S. Early Childhood Longitudinal Study were examined to investigate self-reported parental time, monetary, and welfare investments in children. Consistent with hypotheses derived from the logic of inclusive fitness theory, contrasting children with two genetic parents with children from stepparent households on a multivariate composite of investment indicators revealed that stepchildren received relatively fewer resources from parents. To examine whether reported investments were associated with the parental respondent's relationship to the focal child, additional analyses contrasting the responses of stepfamily parents were performed. Analysis of stepfamily responses revealed that stepparents reported lower levels of investment in children when considered relative to the self-reported investments indicated by stepfamily genetic parents. These within family type reporting discrepancies imply that the effect of stepparent influence may be misestimated in results that are derived from the questionnaire responses of children's genetic parent.

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**A**

Ackerman, 8, 46  
 Aggen, 18, 96  
 Alcorta, 4, 28, 29  
 Al-Dujalli, 6, 36  
 Allen J, 18, 95  
 Allen W, 9, 48  
 Almstrom, 112  
 Alvard, 9, 15, 51, 82  
 Alvergne, 9, 51  
 Anderson, 11, 58  
 Ando, 129  
 Andrews, 12, 18, 36, 44, 66, 96, 120, 135  
 Apicella, 8, 45  
 Archer, 6, 37  
 Arigo, 18, 94  
 Atkinson, 112  
 Aunger, 13, 16, 68, 85

**B**

Bailey, 12, 66, 91  
 Baker, 113  
 Barclay, 9, 21, 51, 109  
 Barrett C, 11, 20, 57, 106  
 Barrett L, 20, 106  
 Bartmess, 113  
 Baum, 18, 97, 98, 145  
 Beahrs, 17, 90  
 Beasley, 11, 60  
 Beaulieu, 20, 108  
 Belhadi, 114  
 Bell, 7, 42, 114  
 Belsky, 11, 12, 58, 64, 119  
 Bering, 4, 28, 29, 120  
 Bernard, 16, 85, 115  
 Betzig, 9, 48  
 Bjorklund, 17, 92, 120  
 Blackwell, 112, 115  
 Bleske-Rechek, 14, 76, 147, 158  
 Blum, 15, 77, 78  
 Boothroyd, 24, 120, 135  
 Bordador, 137  
 Boyce, 18, 94  
 Boyd B, 4, 27  
 Boyd R, 15, 82  
 Brase, 4, 25, 26  
 Bromley, 115  
 Brosnan, 11, 57  
 Brown WM, 7, 17, 40, 88  
 Browne B, 18, 93  
 Browne K, 15, 78  
 Brumbach, 15, 79  
 Brumbaugh, 19, 103  
 Bryant, 20, 106  
 Bugental, 108  
 Burch, 18, 95, 128, 137, 140, 155  
 Burke, 19, 91, 101  
 Buss, i, ii, iii, 10, 11, 33, 45, 52, 54, 59, 61, 89, 92, 98, 114, 116, 122, 123, 133, 139, 140, 142, 144, 149, 152, 158  
 Buttermore, 116  
 Buunk, 10, 52, 127

**C**

Cacciapaglia, 11, 59  
 Camilleri, 117  
 Campbell B, 20, 105  
 Campbell L, 12, 65  
 Carroll, 4, 26, 27  
 Carruthers, 4, 25  
 Castelda, 16, 84  
 Cetinkaya, 117  
 Chacon, 15, 81  
 Chagnon, iv, v, 2, 9, 13, 14, 15, 16, 47, 48, 72, 80, 81, 86, 87  
 Chalet, 117  
 Charles, 14, 37, 73, 140  
 Chen, 8, 43  
 Choe, 11, 59  
 Choi, 12, 63, 118  
 Cialdini, 127  
 Clark, 14, 64, 76, 153, 157  
 Clarke, 8, 46, 124  
 Cohen, 12, 64, 119, 132  
 Colarelli, 12, 65  
 Coleman, 16, 84  
 Combs, 119  
 Conlan, ii, 8, 46  
 Cooper, 10, 55  
 Cordeiro de Sousa, 14, 77  
 Cormier, 120  
 Cornwell, 6, 36, 120, 135  
 Cosmides, iii, iv, 1, 3, 4, 6, 11, 23, 26, 38, 59, 113, 116, 129, 158  
 Coultas, 6, 17, 38, 88, 89  
 Court, 4, 26  
 Cox, 12, 58, 63  
 Cronk, 9, 17, 47, 88, 122  
 Cronk L, 9, 17, 47, 88  
 Currier, 13, 70  
 Curry, 3, 14, 23, 74, 75  
 Curtis, 13, 16, 68, 85  
 Cvorovic, 120

**D**

Daly, 3, 22  
 Dane, 6, 36, 120  
 Dane L, 6, 36  
 Davies A, 10, 52  
 Davis, 20, 57, 87, 97, 107  
 Dawood, 12, 66  
 de Alencar, 15, 83  
 De Backer, 7, 42, 43  
 De Block, 17, 92  
 De Graeve, 7, 42  
 Deady, 121  
 Deaner, 10, 54  
 DeBruine, 6, 8, 9, 10, 36, 43, 44, 50, 51, 55  
 Dechesne, 10, 52  
 Delton, 3, 22  
 Demarest, 121, 122  
 DePrince, 119  
 DeSoto, 143  
 Dewitte, 3, 12, 15, 24, 61, 82  
 diCarlo, 18, 93

Dickins, 11, 57  
 Dubas, 19, 103  
 Duntley, ii, 6, 34, 35  
 Durante, ii, 5, 33, 123

**E**

Easton, 6, 34, 35, 127  
 Edsten, 18, 97, 98  
 Efferson, 18, 96, 97, 98  
 Egan, 14, 73  
 Ellis, 18, 65, 91, 94, 116, 129, 134, 139  
 Eng, 13, 69  
 England, 6, 25, 36  
 Erlich, 124  
 Ermer, 4, 26  
 Eschler, 124  
 Euler, 124, 138  
 Evardone, 125

**F**

Falcon, 125  
 Faurie, 9, 50, 51  
 Feinberg, 6, 9, 36, 50, 135  
 Fernandez, 125  
 Fessler, 3, 9, 13, 22, 32, 50, 68, 69, 159  
 Figueredo, 14, 15, 73, 74, 79, 80  
 Fink, 3  
 Fischler, 125  
 Fisher, 7, 8, 10, 12, 43, 46, 53, 63  
 Fiske, 154  
 Flamson, 5, 30, 31  
 Fleischman, ii, 5, 32  
 Flinn, ii, iii, 6, 13, 36, 67, 80  
 Flombaum, 19, 99  
 Flowers, 11, 59  
 Focquaert, 19, 98, 100  
 Fraley, 19, 103  
 Franklin, 6, 36  
 Fukui, 126  
 Funayama, 5, 30

**G**

Gailliot, 10, 56, 137  
 Gangestad, 6, 8, 10, 33, 36, 44, 53  
 Gant, 5, 31  
 Garcia, 7, 42  
 Gardiner, 10, 56  
 Gardner, 18, 96  
 Garver, 6, 10, 36, 52, 53  
 Gaulin, 7, 12, 39, 62, 133, 146  
 Gerkey, 9, 47  
 Gibson M, 19, 104  
 Gill, 149  
 Glennon, 118  
 Goetz, 7, 40, 41, 127  
 Goldberg, 20, 106  
 Goldsmith, 13, 71  
 Gonsalkorale, 20, 108  
 Gonzaga, 11, 59  
 Gordon A, 11, 59  
 Gordon F, 10, 53  
 Gottschall J, 4, 10, 27, 56

Grady, 11, 57  
 Grant, 5, 32  
 Gray, 6, 37, 62  
 Griskevicius, 127  
 Grochow, 17, 88  
 Guerin, 4, 26  
 Guise, 16, 17, 85, 90, 153  
 Guta, 7, 41, 127

**H**

Hagen, 15, 81, 86  
 Haley, 3, 9, 22, 50  
 Hames, 15, 47, 81  
 Hammond, 128  
 Hancock, 128  
 Hardy, 14, 75  
 Hasegawa, iii, 132, 133, 142, 149  
 Haselton, 10, 11, 53, 59, 126, 133  
 Hatemi, 12, 62  
 Heath, 5, 31  
 Heijkoop, 19, 103  
 Henrich, 11, 56, 116  
 Henzi, 20, 106  
 Hewlett BL, 9, 48  
 Hewlett BS, 9, 48  
 Hill, 10, 54  
 Hiraishi, 129  
 Hoang, 17, 89  
 Honma, 142, 149  
 Howdle, 128  
 Hrgovic, 129  
 Hromatko, 129, 130, 156  
 Hutchinson, 13, 68  
 Hwang, 11, 59

**I**

Irons, iii, 14, 15, 72, 80  
 Ishii, 130  
 Ivkovic, 131

**J**

Jackson, 7, 17, 39, 89, 131  
 Jacobs, 15, 16, 80, 83  
 Jacobsen, 122  
 Jacobson, 7, 17, 40, 88  
 James Jackson, 130  
 Jang, 11, 59  
 Janicki, 131  
 Jankowiak, 21, 109, 110  
 Janovic, 131  
 Jenkins, 12, 62  
 Jeon, 19, 102  
 Johnson D, 4, 28  
 Johnson J, 4, 27  
 Jones BC, 6, 8, 9, 36, 44, 49, 50  
 Jones D, 16, 19, 83, 101  
 Jones DN, 16, 83  
 Jones O, 13, 71  
 Josephson, 132  
 Jovanovic, 131  
 Joye, 132  
 Judith A. Eston, 118

**K**

Kameda, 13, 68, 157  
 Kataoka, 132  
 Katz-Wasserman, 140  
 Keenan, 16, 17, 85, 90, 91, 117, 153  
 Keenoo, 17, 88  
 Keller, 20, 104, 105  
 Kelly, 16, 17, 85, 90, 138, 153  
 Kempe, 3, 23  
 Kandler, 18, 96  
 Kenrick, iii, 8, 46, 127, 147  
 Ketelaar, 20, 106, 107  
 Kirk, 12, 66  
 Kirkpatrick, 4, 7, 28, 39, 114, 116, 129, 130, 133, 134  
 Kiyonari, 21, 109  
 Klusmann, 7, 40  
 Knight, 112  
 Kock, 133  
 Koenig, 133  
 Komaki, 126  
 Kornegay, 121  
 Krasnow, 3, 12, 23, 62, 133  
 Kruger, 4, 10, 12, 27, 28, 54, 64, 134, 157  
 Krupp, 9, 51  
 Kuda, 126  
 Kuhle, 134  
 Kuhn, 18, 96  
 Kurzban, 14, 21, 77, 102, 110, 125

**L**

Lagorio, 158  
 Laham, 20, 108  
 Laird, 153  
 Lambeth, 11, 57  
 LaPaglia, 134  
 Larimer, 12, 62  
 Lassek, 7, 39  
 Lassus, 159  
 Le S, 15, 82  
 Lee, 114, 116, 122, 129, 130, 133, 134, 139  
 Leslie, 128, 136  
 Levin, 16, 17, 84, 90, 135, 143, 147, 155  
 Levin S, 16, 17, 84, 90  
 Lewis, 13, 71, 113  
 Ley, 147  
 Leydesdorff, 149  
 Li, i, ii, 5, 33, 45, 55, 116, 123  
 Lieberman, 9, 50, 142  
 Little, 9, 49, 50, 120  
 Litvay, 12, 62  
 Liu, 17, 88  
 Lopes, 135  
 Lubell, 18, 97, 98  
 Luevano, 136  
 Lugar, 116  
 Lummaa, 5, 31, 32  
 Lyons D, 19, 99  
 Lyons J, 3, 24  
 Lyons M, 12, 65

**M**

MacDonald, 15, 79

Mace, 19, 102, 104  
 MacKewn, 136  
 MacKillop, 16, 84  
 Maestriperri, 11, 58  
 Makagon, 5, 30  
 Maner, 10, 56, 113, 137, 147  
 Mangala, 19, 100  
 Mann, 139  
 Manning, 3, 113  
 Mapes, 137  
 Marlowe, 8, 45  
 Martin, 12, 66, 122, 137  
 Mashima, 13, 14, 69, 75  
 Massar, 10, 52  
 Masters, 137  
 Mata, 158  
 Maurer, 10, 55  
 McAndrew, 7, 42  
 McBride, 14, 73  
 McBurney, 124, 138  
 McClenon, 138  
 McCown, 19, 100  
 McCulloch, 138  
 McElreath, 11, 18, 56, 97, 98  
 McLeod, 4, 29  
 Meenakshi, 19, 100, 138  
 Mellgren, 3, 24, 114, 139  
 Michalski, 158  
 Miller G, 12, 15, 18, 20, 62, 80, 96, 104  
 Miller M, 4, 26  
 Miller R, 10, 53  
 Millet, 3, 24  
 Mills, 16, 85, 115, 139  
 Milroy, 122  
 Miyahara, 14, 75  
 Mize, 18, 93, 140  
 Mock, 1, 5, 34  
 Mohamed, 17, 90, 135  
 Moloney, 140  
 Moore R, 6, 36  
 Moya, 141

**N**

Nagoski, 141  
 Nakama, 157  
 Narayan, 13, 70  
 Navarrete, 13, 69, 154, 159  
 Neale, 18, 96  
 Neave, 3, 24  
 Nedelec, 11, 60  
 Nesse, iii, 10, 53, 54, 62, 86, 104, 142, 154  
 New, 12, 62, 133  
 Newlin, 16, 83, 84, 142  
 Newson, 18, 98  
 Nolin, 15, 82  
 Noseworthy, 7, 43

**O**

Oki, 142, 149  
 Okui, 126  
 Oliver, 15, 81, 124  
 Olp, 10, 53  
 Oum, 142  
 Owren, 5, 30

Ozanne-Smith, 19, 103

## P

Paciotti, 18, 97, 98  
 Pallesen, 150  
 Palmer J, 19, 100  
 Parkin, 143  
 Patel, 16, 18, 84, 94, 143, 147  
 Patton, 16, 87, 117  
 Pelusi, 144  
 PengKwei Chang, 118  
 Penton-Voak, 3, 23, 148  
 Perrett, 6, 8, 24, 36, 44, 135  
 Pettay, 5, 32  
 Pietraszewski, 19, 101  
 Pillsworth, 10, 53  
 Platek, 13, 16, 17, 18, 67, 84, 90, 94, 98, 135, 143, 147, 155  
 Ploeger, 145  
 Poels, 12, 61  
 Ponnampallam, 146  
 Poore, 11, 59  
 Pope, 6, 37  
 Popovic, 17, 88  
 Pound, 3, 7, 23, 40, 42  
 Povinelli, 19, 99  
 Pratarelli, 18, 93  
 Prescott, 18, 96  
 Price J, 3, 14, 23, 74, 75  
 Price ME, 3, 14, 23, 74, 75  
 Provost, 8, 44  
 Putz, 146

## Q

Qirko, 13, 71  
 Quinlan, 16, 87, 107  
 Quinsey, 8, 44  
 Quintus, 7, 41

## R

Radi, 18, 96  
 Raijmakers, 145  
 Reber, 150  
 Remiker, 14, 76, 147  
 Rhoads, 15, 77, 78  
 Richerson, iii, 18, 93, 97, 98, 123, 131  
 Robertson, 147  
 Robinson, 147  
 Rodak, 18, 94, 147  
 Roese, 131  
 Rohloff, 14, 76  
 Rohwer, 5, 32, 33  
 Roney, 5, 33  
 Rubio, 13, 68  
 Rucas, 21, 110  
 Ruloff, 122  
 Rushton, 12, 66, 80  
 Russell A, 5, 32  
 Russell D, 20, 107  
 Rutherford, 148

## S

Saad, 13, 70, 149  
 Sackawicz, 18, 94, 147  
 Sakaguchi, 142, 149  
 Salmon, 150  
 Salotti, 117  
 Sanderson, 19, 102, 150  
 Sannum, 150  
 Santos, 19, 99  
 Sautter, 12, 62  
 Scelza, 151  
 Scheyd, 5, 31  
 Schmitt, 7, 12, 33, 41, 52, 64, 123  
 Schneider, 15, 79  
 Schützwohl, 12, 61  
 Sefcek, 14, 15, 73, 74, 80  
 Segal, 113, 151  
 Seghers, 151  
 Sejean, 149  
 Senju, 132  
 Sergeant M, 17, 91  
 Shackelford, ii, 4, 6, 7, 10, 11, 13, 17, 29, 34, 35, 40, 41, 52, 60, 67, 92, 127, 140  
 Shapiro, 11, 57  
 Sharp, 121  
 Sharpe, 6, 36  
 Sheets, 116, 154  
 Shenk, 20, 109  
 Shikishima, 129  
 Shoup, 124, 138  
 Shroyer, 121  
 Sidanius, 154  
 Siegelman, 152  
 Silverman, 12, 62, 63, 133  
 Simpson, 122  
 Singh, 7, 38  
 Sittner, 121  
 Smith L, 20, 105  
 Soevegjarro, 3  
 Sokol, 20, 107  
 Sommerville, 19, 99  
 Sosis, 4, 29  
 Spinelli, 14, 77  
 Spink, 13, 70  
 Spohn, 17, 89  
 Spranger, 12, 65  
 Stanik, 152  
 Steadman, 152  
 Stevens, 17, 90, 153  
 Stokes, 19, 103, 146  
 Stone E, 6, 34, 35  
 Streeter, 124, 138  
 Strimling, 123  
 Strout, 153  
 Sugiyama L, 15, 81  
 Sullivan, 16, 86, 136  
 Sun, 153  
 Sundie, 8, 45  
 Surbey, 154  
 Swanson, 14, 76  
 Swenson, 16, 85, 115

## T

Tadinac, 130

Takahashi, 13, 14, 69, 75  
 Tamura, 13, 68  
 Terrace, 19, 100  
 Theile, 11, 57  
 Thoemmes, 116, 154  
 Thompson, 20, 86, 107  
 Thomson JA, 5, 30  
 Thomson JW, 13, 16, 17, 67, 84, 90  
 Thornhill, 6, 8, 10, 33, 36, 44, 53, 127  
 Todd, ii, 13, 68, 127, 140  
 Tooby, iv, 1, 3, 6, 11, 14, 23, 26, 38, 59, 62, 72, 113, 129, 158  
 Tooley, 19, 103, 146  
 Tost, 20, 107  
 Toyoshima, 126  
 Trivers, iv, 1, 7, 9, 17, 40, 47, 59, 72, 88, 89, 144, 158  
 Troje, 8, 44  
 Truxaw, 12, 62, 133  
 Turchick, 155  
 Tybur, 20, 104  
 Tyler, 153

## V

Valdez, 155  
 van Aken, 19, 103  
 van Anders, 155  
 van der Maas, 145  
 Van Vugt, 14, 21, 75, 109  
 Vandermassen, 17, 92  
 Vanevery, 151  
 Vasquez, 14, 15, 73, 74, 79  
 Vaughn-Blount, 112  
 Vermeersch, 156  
 Vilicic, 131  
 von Hippel, 11, 20, 59, 108  
 Vonk, 19, 99  
 Vranic, 156

## W

Wada, 156  
 Wagner, 4, 25  
 Wakabayashi, 132  
 Walker, ii, 4, 25  
 Walsh, 16, 85, 115  
 Wang, 12, 64, 157  
 Waring T, 18, 97, 98  
 Watson, 155  
 Webster, 12, 66, 134, 145  
 Wehr, 157  
 Wenner, 15, 16, 80, 83  
 Wigington, 65  
 Wilberger, 158  
 Wilke, 12, 13, 64, 68, 157, 158  
 Wilson, iii, iv, v, 1, 2, 3, 13, 14, 16, 22, 69, 72, 83, 108, 112, 113, 123, 127, 149, 158  
 Windhager, 3  
 Winkelman, 18, 94  
 Winking, 20, 107  
 Wolf, 14, 73, 74

## X

Xiong, 158

## Y

Yamamoto, 14, 15, 77, 83, 135  
 Yang, 6, 37  
 Yokota, 9, 21, 49, 111, 159  
 Yuki, 9, 21, 49, 111, 159

## Z

Zebrowitz, 136  
 Zeug, 14, 76  
 Ziker, 16, 87  
 Zvoch, 159