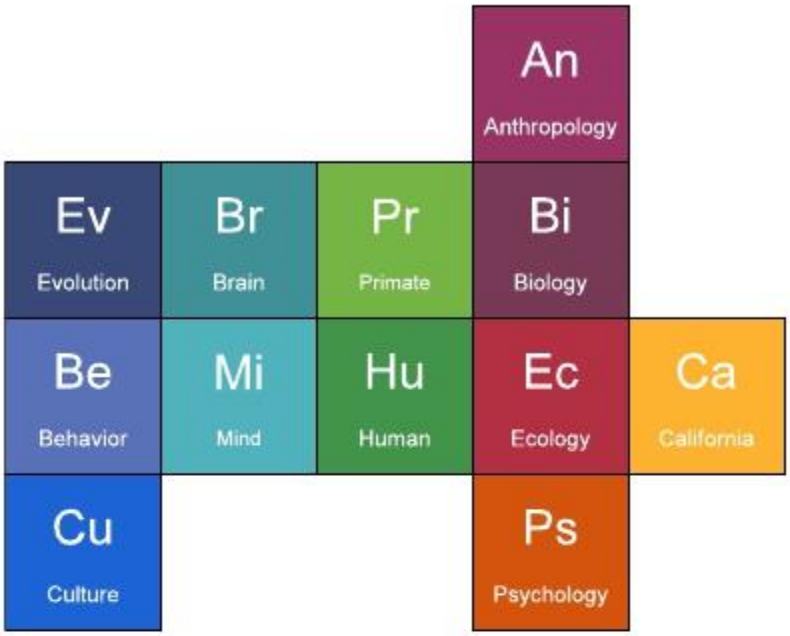
8th Annual

California Workshop on Evolutionary Social Science

May 2nd-4th, 2014

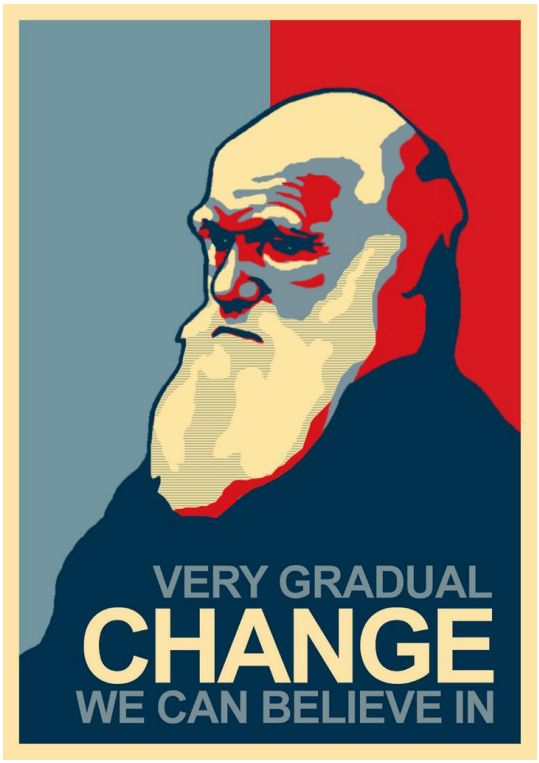


Aims & Scope

Since the inaugural meeting in 2007, this conference has been guided by a single, unifying goal; to maximize familiarity and opportunity for interaction among the greater California community investigating human behavior from an evolutionary perspective.

This small meeting emphasizes discussion and collegiality, and celebrates our points of convergence and divergence. Collectively, California is home to the largest community of scholars working in this area, and is characterized by a diversity of approaches and areas of expertise.

The program this year includes faculty, postdocs, and graduate students from UCD, UCLA, UCSB, Cal Poly SLO, CSU Fullerton, and Loyola Marymount, as well as guests from Stanford University and University of North Carolina Charlotte. We welcome both the familiar and new faces to the 2014 meeting.



Schedule of Events

Friday Evening May 2nd, 2014
(El Chorro Campground BBQ)

6:00pm-10:00pm
OPENING RECEPTION
El Chorro Campground

Saturday May 3rd, 2014
(Ludwick Community Center)

8:00-9:00am BREAKFAST

9:00-10:30 Welcome & Lightning Powerpoint Session

10:30-10:45 BREAK

10:45-11:25 Stacy Rosenbaum, UCLA Anthropology, "The development of male social partner preference in maturing mountain gorillas (*Gorilla beringei beringei*)"

11:25-12:05 Michael Mills, Loyola Marymount Psychology, "Evolutionary constructionism: Perceptions as evolved adaptive illusions"

12:05-1:35 LUNCH

1:35-2:15 John Tooby, UCSB Anthropology, "New tests of competing theories of human cooperation: What is the state of play?"

2:15-2:55 Cody Ross, UC Davis Anthropology, "Origins, maintenance, and transmission of a costly trait: The evolutionary dynamics of female genital modification"

2:55-3:10 COFFEE BREAK

3:10-4:40 EXPERT PANEL "New extensions and further directions in behavioral ecology"
Panel members: Aaron Blackwell, Richard McElreath, Brooke Scelza.
Moderator: Dan Fessler.

4:40-5:30 AFTERNOON BREAK

5:30-7:30 POSTER SESSION

7:30 DINNER

Sunday Morning May 4th, 2014
(Ludwick Community Center)

8:00-9:00AM BREAKFAST

9:00-9:40 Melanie Martin, UCSB Anthropology, "Optimal for whom? Using evolutionary logic to predict variation in Tsimane infant feeding practices"

9:40-10:20 Rosemary Hopcroft, UNC Charlotte Sociology, "Sex differences in the relationship between status and number of offspring in the contemporary U.S."

10:20-10:40 COFFEE BREAK

10:40-11:20 Kerri Johnson, UCLA Psychology, "Social categorizations as decisions made under uncertainty"

11:20-12:00 Dawn Neill, Cal Poly Anthropology, "Daughter preference in Fiji: Economic development and shifting preferences"

12:00-12:30 WORKSHOP STEERING MEETING

Organizational Team

Local Host Extraordinaire!
Stacey Rucas, Cal Poly

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Anne Pisor, UCSB
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Campus Reps
Curtis Atkisson, UCD
Angela Garcia, UCSB
Aaron Lukaszewski, Loyola Marymount
Stacy Rosenbaum, UCLA
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Conference Funding

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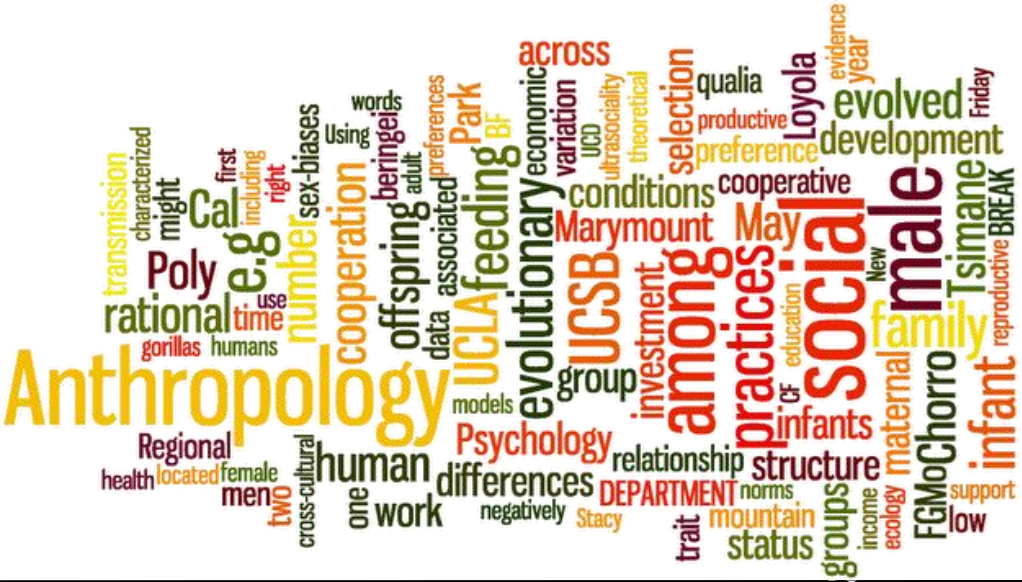

ACCOMODATIONS AND DIRECTIONS

CAMPING:

This year we will be camping at El Chorro Regional Park (http://www.slocountyparks.com/activities/el_chorro.htm). Camping is FREE, though extra vehicle charges apply.

The El Chorro Regional Park is about an 11 minute drive from the conference site. We have reserved campsites to accommodate 48 people Friday and Saturday night. Campers: we are limited to 12 cars, i.e., there should be four people in each car parked at the campground. For each car we go over the limit, we will collectively owe $13 to the Park.

If you wish to camp (again, FREE!), please let us know on the workshop registration website: http://doodle.com/7nzf35wz698pc3gz. We will be spread across adjacent campsites: Bishop 8, 10, 11, 12, 13, 14 (see red circle, above left). Check-in time on Friday, May 2 is 3pm.

Directions: *Heading South on 101:* Once you enter San Luis Obispo city limits take the Santa Rosa Street exit and turn left on Santa Rosa. Santa Rosa Street will turn into Highway 1. Follow Santa Rosa Street / Highway I for approximately 4 1/2 miles. El Chorro Regional Park will be located on the right side of the road. It is across the highway from Cuesta College. *Heading North on Highway 101:* Take the Highway 1 / Morro Bay Exit and follow signs to the stoplight at Santa Rosa Street. Turn right onto Santa Rosa Street. Santa Rosa Street will turn into Highway 1.Follow Sata Rosa Street / Highway 1 for approximately 5 miles. El Chorro Regional Park will be located on the right side of the road. It is across the highway from Cuesta College.

HOTEL ACCOMODATIONS:

Group rates ($69.95 + tax for 2 adults for one king or two queens, + $5 for each additional person, includes breakfast) are available at the Lexington Inn (formerly Days Inn) in San Luis Obispo. The hotel is located 0.9 miles (an 18 minute walk) from the conference. Call (805) 549-9911 to make reservations, and mention the "Annual Human Behavioral Evolution Conference at Cal Poly." *Hurry: only 12 rooms are available at this rate!*

Address: 2050 Garfield St., Garfield and Monterey St., San Luis Obispo, CA, 93401
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Saturday, May 3, 2014

The development of male social partner preference in maturing mountain gorillas (*Gorilla beringei beringei*)
Stacy Rosenbaum, UCLA Anthropology, 10:45-11:25

Social relationships between adult male mountain gorillas and the infants in their groups are quite remarkable, characterized by extreme tolerance, grooming, playing, and many hours of male "babysitting." This is true even in the 40% of groups that contain multiple adult males, where paternity certainty is low. My previous work demonstrated that 1) low-cost parenting is the most likely function of these relationships, and 2) preferences for individual male social partners persist across considerable time spans, even after social upheaval. This talk will examine the beginnings of such relationships, specifically the role maternal facilitation plays. Mothers in one-male groups modify their behavior after the birth of infants. They spend more time in close proximity to adult males, and resting in contact and grooming with them. Mothers in multi-male groups do not show these changes, and may be employing a subtle form of paternity confusion by spending more time with males they previously spent little time near. For a subsample of the population, male rank is a much better predictor of females' choice of male social partner than either paternity or mating history. I will discuss the implications these findings have for understanding paternal kin discrimination and the evolution of intra-species variability in social structure.

Evolutionary constructionism: Perceptions as evolved adaptive illusions
Michael Mills, Loyola Marymount Psychology, 11:25-12:05

This talk will present a theoretical argument to suggest that our fundamental perceptions (qualia) are best conceptualized as evolved adaptations. We intuitively believe that the perceptual qualities we perceive exist "out there," and that our senses bring them to us "in here." But outside of our heads there is nothing of the qualia that constitute our subjective reality. No sounds. No colors. No tastes or smells. No hot and cold. Instead, these qualia are constructed inside of our brains, their underlying neural modules evolved over phylogenetic time, and they are functional -- qualia are "adaptive illusions." This view suggests that we live in a perceptual "virtual reality" constructed by our evolved human nature. This way of thinking -- "evolutionary constructionism" -- can be used to help to dismantle some of the foundational assumptions of social constructionism.

New tests of competing theories of human cooperation: What is the state of play?
John Tooby, UCSB Anthropology, 1:35-2:15

Humans are far more cooperative than other species. Three families of theories have grown up to explain human cooperation. The first—easily falsified, and not widely defended—is that humans are rational, selfish individualists—homo economicus—except with fitness substituted for utility; i.e., self-interested, game-theory-like rational choice explains cooperative behavior. A second theoretical family—what might be called ultrasociality theory—is that the processes that generate and structure the great majority of human cooperation are group processes, such as group selection, cultural group selection, gene-culture coevolution—where typically the beneficiary of the feedback system is the welfare of the group through the maintenance of group cooperative norms. Drawing largely on observations taken from experimental economics, proponents of this theoretical family argue that humans display patterns of behavior, such as strong reciprocity, one-shot cooperation, group-based reputation-mediated norm enforcement, and cross-cultural variation that are inconsistent both with homo economicus models, and selectionist models of reciprocity, kin selection, etc. The third family is adaptationist cooperation theory, which proposes that strong basic selection pressures (kin selection, reciprocity-exchange, mutualism, coalitional competition, etc.) have fashioned adaptations whose information-processing designs are well-engineered to promote relative fitness given the social and information ecology (e.g., informative cues) of the ancestral world they evolved to operate in. That is, the decision-making architectures of humans are not economically rational, nor merely group-compliant, but are rather ecologically rational—rational assuming the existence of the statistical composite of conditions that prevailed during their evolution. A series of recent studies shows that interpretations of phenomena (e.g., one-shot cooperation, reputation, third party-punishment, etc.) that seemed to be pillars of ultrasociality theory collapse when, e.g., subjects are tested under conditions where adaptationist cooperative choices are permitted. The details of subject choice closely reflect the predictions of ecologically rational models, rather than ultrasociality models.

Samantha Kuri, Cal Poly undergraduate student, mapping Vuisiga village. Credit: Dawn Neill.

Origins, maintenance, and transmission of a costly trait: The evolutionary dynamics of female genital modification
Cody Ross, UC Davis Anthropology, 2:15-2:55

The analyses presented herein investigate the conditions underlying the emergence, persistence, and inter-group transmission of Female Genital Modification (FGMo). We first present a mathematical model which demonstrates the conditions under which FGMo might be expected to arise and be maintained. In particular, we model how wealth and/or status differences among social groups might select for the emergence of this potentially costly trait, and how subsequent frequency-dependent forces might keep the trait in the population, despite its costs. We then conduct two empirical analysis to test the predictions of our model: 1) we use empirical cross-cultural data from Africa to test whether status differences and social stratification are associated with the origins of FGMo, and 2) we use recently collected data on patterning of FGMo in the African Diaspora and indigenous populations Colombia to test hypotheses concerning the cultural evolutionary drivers of FGMo attenuation and inter-group transmission.

Bwe family.
Credit: Dian Fossey Gorilla Fund International.

Sunday, May 4, 2014

Optimal for whom? Using evolutionary logic to predict variation in Tsimane infant feeding practices
Melanie Martin, UCSB Anthropology, 9:00-9:40

International health recommendations for age-appropriate infant and young child feeding practices include exclusive breastfeeding (BF) from 0-5 months, and complementary feeding (CF) with continued BF from 6 to at least 23 months. These practices lower risks of various infectious and non-communicable diseases in infants and infants, and as suggested by anthropological and biological evidence, may be evolutionarily optimal for infant health. Globally however, 'suboptimal' feeding is common—including in many natural fertility populations that maintain intensive BF practices. I argue that, despite wide cross-cultural variability in BF norms and environmental circumstances, the logic of maternal investment and reproductive trade-offs can be applied to identify individual and population-specific risk factors for 'suboptimal' feeding practices. I evaluate evidence of maternal reproductive trade-offs influencing infant feeding practices among the Tsimane of Bolivia. Interviews and anthropometric data were collected from 156 Tsimane mother-infant dyads across 9 villages from 2012-2013. Maternal age and pregnancy negatively influenced weaning ages, while male sex and household alloparental support positively influenced total breastfeeding duration. I also examine the relationship between CF practices, infant growth, and changes in maternal energy balance in order to evaluate if early CF by Tsimane mothers is effective in reducing lactational costs and shifting investment to future reproduction. I discuss the practical implications of these findings for Tsimane maternal and infant health.

Sex differences in the relationship between status and number of offspring in the contemporary U.S.
Rosemary Hopcroft, UNC Charlotte Sociology, 9:40-10:20

Using data from the 1979 National Longitudinal Survey of Youth, we find that for men only, income is positively associated with number of offspring. This is true for men at all levels of education, and is due to increased childlessness among low income men. For women, income is negatively associated with number of offspring, and this is true for women at all levels of education. Other measures of status (intelligence and education) are negatively associated with number of offspring for men and women.

Social categorizations as decisions made under uncertainty

Kerri Johnson, UCLA Psychology, 10:40-11:20

Social categorization - the tendency to perceive others in terms of their social category memberships - has well known impacts on spontaneously formed impressions, expectations, and evaluations of others. Such categorization occur through the dynamic integration of visual cues in the faces and bodies of people who we observe. The outcome of these mechanisms, however, varies dramatically between dimensions of social categorizations, revealing notably divergent decision biases across categories. Some social categorizations (e.g., male, black) are biased to be "conservative and quick," insofar as they favor a minority percept and occur rapidly; other categorizations (e.g., gay, religious minority), in contrast, are biased to be "cautious and contemplative," insofar as they eschew a minority categorization and occur more deliberatively. In this talk, I characterize social categorizations as heuristic decisions that are made under varying degrees of uncertainty. As such, social categorizations constitute decisions that are corrected for perceived utility. Importantly, some utility concerns have self-relevant implications, but others have considerably more other-relevant implications, each which is likely to bias social categorizations in a predictable manner. I therefore argue that a decision making framework informs how motivated utility concerns bias social categorizations, guide social reasoning, and influence downstream evaluations.

Dawn and Jale making bilos for kava-drinking.
Credit: Dawn Neill.

Daughter preference in Fiji: Economic development and shifting preferences

Dawn Neill, Cal Poly Anthropology, 11:20-12:00

Many ecological conditions can affect sex-biases in investment, including local opportunity structure, family composition (e.g., birth order, number of siblings), the ability of offspring to offset investment costs (e.g., through productive work, alloparenting, old age support, or remittances), dispersal opportunities, and social structure (e.g., patri/matrilocality). An economics perspective conceptualizes sex-biases as one of two types of sex-biases: biases that are 'pure' reveal entrenched socio-cultural norms that favor one sex (e.g. religious norms) and those that are economic result from sex-based variation in economic opportunities (e.g. wage earning capability). Economic modernization is characterized by changes in family and social structure, including but not limited to, decreasing family sizes and changing economic opportunities for females. Here, I examine the relationship between child productive work and educational aspirations and performance among male and female children in two patrilineal, patrilocal Fijian groups with a history of son preference. Findings show that among Indo-Fijians, productive work is low only among girls with high scholastic achievement; whereas among indigenous Fijians, work is low only among urban boys with high scholastic achievement. Patterns of parental investment among both groups demonstrate that sex-biases respond to economic development, but that these responses are variable and conditioned not only by similarities in contemporary ecology, but also by the differences of culture and history.

Isa grooming Mus.
Credit: Dian Fossey Gorilla Fund International.

Cal Poly

Male-male aggression in chacma baboons (*Papio hamadyras ursinus*) in anthropogenic environments
Grace Davis

Socioecological theory stipulates that ecological variables have a direct influence on the behavior and collective interactions between individuals. While communal living is associated with a wide range of benefits, group living can also increase competition among group members for limiting resources such as food and mates. Such increased competition can instigate aggressive behaviors between individuals. This study seeks to understand how aggression correlates to differential resource access, particularly focusing on food resources. Using observational methods, the study investigates the behavior of sub-adult and adult males in a group of chacma baboons (*Papio hamadryas ursinus*) living on the Cape Peninsula of South Africa. These males have regular access to anthropogenic food sources, and raid these daily. The commensal food sources present in the Cape Town area tend to have distinct nutritional advantages over natural forage, creating a novel and valuable resource for the baboons. In order to analyze the impact of human food items on aggressive social interactions, this study compares the level of aggressive behaviors during and separate from raiding events. Ultimately, this research provides crucial information for understanding anthropogenic influences on the behavior of wild baboon populations.

Human instincts for concealment during sleep
A. Aitken, A. Hernandez, & Jason A. Williams

Child psychologists have argued that children become attached to blankets as "transitional objects," playing an intimate role in the construction of an external world. However, this attachments often extended far longer than such a theory would require, persisting into adulthood; anecdotally, adults often prefer the presence of a blanket no matter how hot the temperature may be, even if it's a simple sheet covering a single foot. We propose that the primary cause of these phenomena lies in an adaptation to conceal oneself during sleep. To test, we had participants outfit their gear for a proposed camping expedition by choosing among a number of visually presented alternatives; among these choices was that of deciding on a blanket. Half the participants had a transparent blanket as an alternative, the remainder a manipulated image of the blanket that rendered it opaque. P's were 14% more likely to choose the opaque blanket (p=.02), supporting the concealment hypothesis.

Do the bigger fall harder than they used to?
Jacob Lerner

In physical contest competition, is it better to fight a bigger opponent or a smaller one, and does this shift as a function of the ecology? For example, in past environments physically larger opponents would have experienced greater success in hand-to-hand combat due to longer reach and the overall mass advantages that protected the body from harm and delivered greater offensive force through harder blows. This would have resulted in the evolution of significant intimidation and fear of larger opponents on the battlefield that may have caused an overall avoidance of combat with physically superior individuals. But on the modern battlefield projectile weapons may have significantly decreased the relative importance of physical skill and strength that resulted from the hand-to-hand combat of the past, leading to the question of whether intimidation and fear of physically larger opponents still exists in the presence of projectile weapons, or instead whether individuals shift strategies in order to optimize outcomes by targeting larger opponents more readily since they offer bigger, and therefore easier targets. In order to test these questions, a study was designed using paintball matches as a natural experiment in order to approximate the environment of a modern battlefield. Individual size measurements were tested against match dynamics, outcomes and overall strategies of play in order to test hypotheses.

Male mating strategies and athletic risk
Matthew Reza

Evolutionary theory predicts that human males possess two main avenues for increasing reproductive success, either quantity mating effort or quality paternal investment. Risky behavior assists men in gaining rewards, but it also carries potential physical hazards, and thus it should be avoided more often by paternal investors whose reproductive costs are cumulative over many years of expensive offspring investment. For this reason, we predicted that men more inclined toward quantity mating effort strategies, such as greater interest in sex and multiple mates would also be willing to engage in riskier physical contest competition. To assess this prediction, data was gathered among male athletes at Cal Poly State University San Luis Obispo currently participating in competitive sports. We then tested for a relationship between men's mating effort strategies as operationalized by the Sociosexuality Orientation Inventory (SOI) and their participation in either contact or non-contact sports. As expected the results illustrated significantly higher SOI scores among those men participating in the risky activity of contact competitive sports and highlights their inclinations toward mating effort over paternal investment in achieving reproductive goals.

Sleep and life history theory among firefighters
Stacey L. Rucas & Alissa A. Miller

Tradeoffs between time allocated to sleeping versus waking result from variations in local ecologies and therefore should correlate to alterations in behavioral life history strategies. This work discusses psychological outcomes resulting from lowered sleep quantity and quality among firefighters in Riverside County. In particular, we predicted that sleep loss would result in greater impulsivity, external locus of control orientation and higher risk taking propensity due to alterations toward fast life history strategies that may result in the presence of resource poor, stressful environments that include impaired sleep patterns. Data outcomes support the notion that sleep acquisition may pose a mediating role in personality and psychology in ways predicted by life history and evolutionary ecological theories and underscores the need for more research investigating the role that sleep may play in life history and reproductive strategy patterning.

UC Davis

How cultural transmission facilitates a long juvenile learning period
Ryan Baldini

The evolution of the long, slow human life history is a major challenge to evolutionary biologists. A compelling theory states that our late age at maturity allows us to acquire the many skills needed to survive in the economically intensive human foraging niche. I extend this theory by arguing that cultural transmission may be a crucial part of this process, by exposing learners to a wealth of information and skills that they would otherwise not likely discover. I use mathematical models to show that whether cultural transmission allows a later age at maturity depends on the details of how population growth and regulation works. In particular, cultural transmission appears to readily allow a later age at maturity under density-dependent fertility, but may not under density-dependent mortality or density-independent population growth.

Long-distance acorn transport in Eastern California
Carly Whelan

The ethnographic Mono Lake Paiute of Eastern California regularly crossed the Sierra Nevada crest to procure acorns from Yosemite Valley; a total journey of fourteen days. These trips seem economically inefficient and are usually explained as social excursions to visit and trade with the Yosemite Me-Wuk, or as journeys of necessity in years with poor piñon pine nut harvests. An optimal foraging analysis of subsistence options in the Mono Basin reveals that acorn excursions to Yosemite produce more calories than local seed harvesting. This indicates that the long-distance transport of plant foods can be a viable subsistence strategy for hunter-gatherers.

Detecting patterns of intergroup violence in Prehistoric California
Gregory R. Burns, Susan D. Talcott, & Jelmer W. Eerkens

Overwhelming archaeological and ethnographic evidence suggests that low-level violence was endemic in Middle and Late Holocene California. Unlike many areas with mass burials suggesting warfare-level conflict between groups, indicators of violence in California cemetery populations are generally in the form of individual burials with traumatic injuries. Traditional osteological information is uninformative regarding whether these burials are victims of violence within or between groups. We use x-ray fluorescence sourcing of the obsidian projectile points embedded in human bone to determine the extent to which local and non-local obsidians were used. In combination with evidence from stable isotopes of oxygen and strontium, sourced projectile points have the potential to demonstrate both the presence of intergroup violence and the geography of prehistoric conflict. Patterns of trauma are also compared to ethnographic accounts elucidate the nature of violent conflict.

How climate variation in the Pleistocene favored our larger brains and culture
Lucia C. Neco & Peter J. Richerson

The evolution of the human species presents a hard problem for the science of evolution to solve. The evolution of our large brain and associated complex technology and large-scale social organization was a spectacularly successful adaptation, at least in the late Pleistocene and Holocene. Yet vertebrates with generically rather similar nervous and many other complex adaptations, like camera style eyes and internal skeletons, evolved 350 million years ago. One way to explain such a late evolution of the human adaptation is to assume that the evolution of complex features is a very slow process. However, many modern studies of evolution suggest that it is actually quite fast on the geological time scale. Another explanation is that the sorts of environments that might favor the human adaptation did not occur until quite recently, geologically speaking. The challenges of a highly variable environment might result in sufficiently strong selection pressure to favor the sort of problem solving that would require a large brain. The Pleistocene environment with its huge, rapid variation in climate is potentially the geologically unique environment that could favor our large brains and the culture it produces.

Stable isotope measures of childhood diet and foraging in prehistoric Central California
Alexandra M. Greenwald & Jelmer W. Eerkens

Ethnographic evidence demonstrates that hunter-gatherer children may forage effectively, where ecology and subsistence strategies are conducive to juvenile participation. We hypothesize that, in easily navigated environments with food items accessible to children, juveniles will engage in assistive or independent foraging after a period of exclusive

Alexandra M. Greenwald (continued)
post-weaning parental provisioning, and that differences in male and female diets will reflect the sexual division of labor among adults. We use stable isotope measures (δ15N and δ13C) from bone collagen and serial-samples of dentinal collagen extracted from first and third molars to examine childhood diet patterns and find potential evidence for independent child foraging in Late Holocene Central California. Our study includes 53 individuals from five San Francisco Bay Area archaeological sites.

UC Los Angeles

Evidence for a warning bias in social information transmission?
Ilya Altshteyn

Information about environmental dangers is valuable and the cost of transmitting such information to social partners is minimal. Furthermore, an information transmitter who helps a social partner to avoid harm can later reap the benefits of a continued social relationship, and does not have to pay the costs of helping an injured friend. This cost-benefit assymetry suggests there is a positive selective pressure on a propensity to socially transmit information about danger at especially high rates compared to information that is not about danger. We call this predicted propensity awarning bias. Here we report the results of a test for this bias using data from the social networking site Twitter. Two coders rated each of 14,251 tweets (publicly-shared 140 character utterances) for whether or not each tweet contained information about danger. The number of retweets for each tweet indexes that tweet's transmission rate, and was our outcome variable. Results of negative binomial regressions showed that tweets about danger have up to 3.13 times as many retweets as tweets that are not about danger. Implications for cultural evolution are discussed.

Domain specificity in prepared learning for foods and artifacts
Christopher Peterson

Learning information about environmental dangers is expected to be acquired faster in children than other information that is less fitness relevant. Previous work has shown that cross-culturally, children exhibit prepared learning effects for danger in the domain of animals. Shuar children as well as children in Los Angeles were shown to remember propositional information regarding whether animals were dangerous or not to a greater degree than otherpropositional information about those animals, including their diets and their names. Other fitness relevant domains for prepared learning for danger may exist. In the study presented here, U.S. and Shuar children were tested for prepared learning in the domains of dangerous foods and dangerous artifacts. We show that in these two cultures, there is an effect for learning what foods are dangerous to eat or not and can demonstrate the same effect in the U.S. for whether an artifact is dangerous to use or not.

UC Santa Barbara

"Meaning making" in the afterlife movement
Michael Barlev

Ongoing fieldwork at the Santa Barbara chapter of the International Association for Near-Death Studies (IANDS) has led to the identification of an emerging afterlife movement. A central tendency among participants in this movement is to present various experiences – particularly near-death experiences - as evidence for life after death and for a spiritual dimension to this world that, according to informants, transcends the constraints of institutionalized religions. This poster will present some preliminary experimental data on whether individual differences in several cognitive processes can explain some interpretive tendencies among participants in the afterlife movement, including reporting certain experiences and inferring particular meanings from certain experiences. In addition, this poster will present some preliminary experimental data on whether these cognitive processes change with continued participation. The more general goal of the interdisciplinary project of which the data reported here is a part is to explain the complex dynamics that link cognitive processes to experiences and beliefs in the formation of new religious movement.

A biological security motivation system (SMS) for potential threats
Henry Szechtman & Erik Z. Woody

Organisms must be able to cope with the possibility of events that occur relatively rarely and can be anticipated only with considerable uncertainty, but nonetheless have serious potential consequences, including death. These potential threats include, for example, the possibility that a predator may be near or that contagion may take place. Several researchers (including us) have posited the existence of a special motivation system, a module in the brain that evolved to manage the dedicated adaptive challenges of potential threats. We entitled it the "security motivation system" (SMS) and described the unique attributes of such a system, distinct from a system geared towards the actual presence of danger. These properties will be highlighted and supportive experimental evidence presented.

Attitudes regulate enduring relationships: Evidence from RICH economic games in Fiji
Matthew M. Gervais

The attitude construct is foundational to social psychology, yet it has received little attention from either evolutionary or cultural psychologists. Together these approaches motivate study of the structure and functions of attitudes beyond "liking," within enduring relationships, in non-WEIRD populations. The form of attitudes specifically suggests a "bookkeeping" function in representing the value of social relationships. Here I present data from the male social network of a Fijian village demonstrating the role of explicit

Matthew M. Gervais (continued)
attitudes in mediating relational behavior in an interdependent community. Male villagers rated feelings of "love," "respect," "liking," "contempt," "hate," and "fear" towards one another. Next all were both deciders and targets in three economic games measuring dyadic giving, taking, and spite within the network. Aggregate attitudes towards targets fully mediated the effects of target Chiefliness, Elderliness, and Hotheadedness on target outcomes, but did not mediate the receipt of spiteful income leveling. These data illuminate the structure and bookkeeping functions of attitudes within enduring human relationships, and suggest future directions for studying the psychological bases of population variation in social structure and relational strategies.

'Natural pedagogy' outside the laboratory: quantitative evidence from fieldwork in Fiji
Michelle Kline

Human cultural adaptation depends upon accurate means of transmitting information socially. One possible faithful transmission mechanism is teaching, which is functionally defined as behavior that evolved to facilitate learning in others. While some non-human species do teach, humans may be unique in their capacity for direct, active teaching. This kind of teaching is theorized to be a derived form of social learning, and of communication, in humans. Direct active teaching, often referred to in cognitive development as "natural pedagogy," is theorized to be marked by "ostensive cues." This study quantifies the use of ostensive cues in children's everyday interactions in villages in Yasawa, Fiji. The results illuminate the form and function of ostensive cues as they occur in naturalistic social learning contexts. While some cues function as predicted, others do not, which calls for rethinking the behavioral features of uniquely human types of teaching such as "direct active teaching" and "natural pedagogy."

Living with parasites: How parasitic infection affects fertility
Marilyne Tamayo

Parasites exert costs on their hosts, necessitating tradeoffs to accommodate for lost resources. As a consequence, parasitic infection in many species is associated with reductions in reproductive and somatic effort, with the potential for impacts on host fitness. Human offspring require substantial parental investment. However, few studies have examined the impact of parasitic infection on human reproduction. This project examines whether helminth infection is linked to fertility rates in women from a group of forager-horticulturalists in lowland Bolivia who experience a high prevalence of parasitic infection, through a life history theory framework. We examine conception rates in 280 women, 57.5% percent of whom were infected with hookworm, a common intestinal helminth. Data show that women infected with parasites have an odds-ratio of 0.49 of

Marilyne Tamayo (continued)
conceiving in a given year, relative to uninfected women. Our results suggest that helminths reduce conception rates in this natural fertility population, consistent with a significant cost of helminth infection on fertility.

Stanford

Costly Requirements and Signaling in Religious Groups: The American Congregational Giving Study
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The costly signaling theory of religion proposes that the costs associated with religious rituals and requirements bolster the commitment of group members and foster intragroup cooperation. Using data collected on religious practice and giving among American Christian congregations, this thesis provides an empirical test of this theory. Broad support was found for three hypotheses stemming from the costly signaling theory of religion and the related economic approach to religion: (1) the number of costly requirements imposed by a congregation had a significant effect on the amount of money donated by its members, (2) stricter congregations had more members of low socioeconomic status, and (3) the number of programs a congregation offered was significantly correlated with the number of costly requirements it imposed.

Photo: Stacey Rucas