

A Research and Project Presentation

Friday April 25, 2014
Goodwin Forum





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RESEARCH



PRESENTATIONS

2014 Humboldt County Consumer Price Index

Nathaniel Siegel, Dept. of Economics Undergraduate Student

College of Professional Studies

For our project, we continued a Consumer Price Index for Humboldt County. A Consumer Price Index (CPI) is a “basket” of goods and services that attempts to track changes in the cost of living in a given area. Our “basket” comes from a CPI created by graduating students last year and is a watered down version of the CPI used on a national level by the Bureau of Labor Statistics. The point of a CPI is to track changes in the cost of living for the “average” household. As a whole, the CPI for Humboldt County saw an increase of 2.76%, slightly better than the 1.43% increase experienced by the rest of the country.

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A Comparison of Terrestrial Invertebrate Communities of Invaded and Restored Salt Marsh in Humboldt Bay

Matthew Mitchell, Dept. of Environmental & Natural Resource Sciences Graduate Student

College of Natural Resources & Sciences

This graduate research project compared invertebrate communities in restored salt marsh with salt marsh that was invaded with *Spartina densiflora*. Results found higher invertebrate diversity in the restored compared to the invaded salt marsh. Additionally an invasive snail was found more often in the invaded salt marsh. These findings reinforce the importance of eradicating *Spartina densiflora* around Humboldt Bay.

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A Descending Resistance Training Program Produces Greater Exercise Volume than a Constant Resistance Training Program

Young Sub Kwon, Dept. of Kinesiology & Recreation Administration Assistant Professor

College of Professional Studies

Improvements in health benefits depend on the volume of exercise. We found a greater training volume is attained using a four-week Descending Resistance training method based on subject’s fatigue ratio than when using a four-week Constant Resistance training method.

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A Robust Tsunami Deposit Database For California

Eileen Hemphill-Haley, Dept. of Geology Research Associate

College of Natural Resources & Sciences

The California Geological Survey (CGS) has partnered with Humboldt State University (HSU) to produce a robust statewide tsunami deposit database to facilitate the evaluation of tsunami hazard products for both emergency response and land-use planning and development. These data provide an important observational benchmark for evaluating the results of tsunami inundation modeling. This database is being used to help CGS in the development and validation of updates to their existing inundation maps for emergency planning, and probabilistic tsunami hazard analyses (PTHA) of value to local land-use planning and coastal development.

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Age, Growth and Maturation of Pacific Halibut Landed off Northern California by Recreational Anglers

Elizabeth Perkins, Dept. of Fisheries Biology Graduate Student

College of Natural Resources & Sciences

Pacific halibut are a long-lived, demersal fish that are sought after by recreational fishermen off the coast of Humboldt County, Calif. Very little is known about the stock characteristics of Pacific halibut in northern California as minimal research has been conducted on this species south of the Oregon-California border. This collaborative research project aims to characterize the age, growth and maturation of Pacific halibut caught off northern California. A total of 270 whole Pacific halibut and Pacific halibut carcasses were collected from participating local anglers between May 8 and October 31, 2013. Fish were weighed (if whole when collected), fork length was measured to the nearest centimeter, otoliths were extracted, and sex and maturity were determined. Maturity was assessed using the International Pacific Halibut Commission protocol, with four defined maturity stages for females and two for males. Otoliths were aged using surface readings in conjunction with reading the cross section of the otoliths after a break and bake procedure. From the initial results, the length-weight relationship of Pacific halibut caught off northern California appears to be similar to that of Pacific halibut caught further north (British Columbia, Alaska), but some age-length differences appear to exist. This poster will detail preliminary results concerning the age, growth, and maturity of Pacific halibut off northern California.

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Ancient Roadways: Hinterland Causeways in the Maya Lowlands, Dos Hombres to Gran Cacao Archaeology Project

Erik Marinkovich, Dept. of Anthropology Undergraduate Student

College of Arts, Humanities & Social Sciences

The scope of this research is to provide preliminary analysis of an ancient Maya causeway associated with the Dos Hombres to Gran Cacao Archaeology Project (DH2GC). These features connected sites within a region, established sociopolitical connections, and facilitated trade. Post-processed data analysis displays spatial relationships between the causeway and nearby structural clusters. Interpretations of spatial relationships and labor estimates are hypothesized using statistical labor equations based on volumetric measurements of the feature. This data is compared to current population estimates of the immediate locale to determine the size and availability of the required work force.

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Assessing the Effects of Land Cover on Native Bee Diversity in Eastern North Dakota

Russ Bryant, Dept. of Wildlife Graduate Student

College of Natural Resources & Sciences

Native bees provide vital pollination services that are essential across agriculture and natural landscapes. To better estimate and model habitat quality for native bees, I modeled land cover on four common bee genera of North Dakota (*Agapostemon*, *Bombus*, *Lasioglossum*, and *Melissodes* spp.) using a GIS model. My results expose that land cover can be used as a potential indicator to accurately and rapidly assess a given land cover's effect on native bee populations.

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BPA Slows Down Medial and Lateral Giant Fiber Conduction Velocity and Disrupts Regeneration in *Lumbriculus variegatus*

Araik Sinanyan, Dept. of Biological Sciences Undergraduate Student

College of Natural Resources and Sciences

The ability of Bisphenol A to disrupt both neurological function and regeneration were examined in the freshwater oligochaete worm, *Lumbriculus variegatus*. Worms can avoid predator attacks via a rapid shortening response mediated by the medial and lateral giant nerve fibers. *Lumbriculus* also possesses an extraordinary ability to regenerate lost body parts, such as might occur after a partially successful predator attack. Electrophysiological testing showed that immersion in water containing BPA led to time-and

concentration-dependent reductions in the conduction velocities of the medial and lateral giant nerve fibers. To monitor regeneration, worms were cut into three equal parts and then exposed to various BPA concentrations. The regenerating ends were photographed and measured for growth. BPA exposure produced concentration-dependent reductions in the amount of re-generation present from cut surfaces.

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Circumcision: To Snip Or Not To Snip?

Kayla Masengale, Child Development Undergraduate Student

College of Professional Studies

This research explored the topic of male circumcision and analyzed three dimensions that are associated with the practice. These aspects included: the motivations that influenced circumcision, the benefits and risks correlated with circumcision, and the ethics behind such a procedure.

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Community Resilience

Yiyue "Kathy" Jiang, Child Development Undergraduate Student

College of Professional Studies

Working in a group with three undergraduate students and one department professor, we developed the questions surrounding the community resilience of Sikh people and its impact on adolescent and young children. By conducting interviews with both parents and the children in the families, we found that there are diversities in the goals that children set for themselves and the ones that parents set for their children. With the gap between aspiration and resources, we also revealed some risk and protective factors for community resilience among Sikh communities.

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Copulation Calls of *Cercopithecus mona* in the Wild

Marissa Ramsier, Dept. of Anthropology Lecturer

College of Arts, Humanities & Social Sciences

Characteristics of copulation calls were collected from Mona monkeys (*Cercopithecus mona*), a species of guenon, in Grenada and Cameroon. By analyzing the spectral characteristics of eight copulation calls, the authors were able to identify two different types of call components. This study is significant because copulation calls are especially rare among guenons.

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Diatoms in Historical Tsunami Deposits, Northern California, USA

Casey Loofbourrow, Dept. of Geology Graduate Student

College of Natural Resources & Sciences

By characterizing the diatom assemblages of historical distant-source tsunami deposits in Northern California (1946 in Half Moon Bay and 1964 in Crescent City), this research aims to enhance our ability to recognize and understand similar paleotsunami events in the sedimentary record.

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Effects of Data Quantity and Quality on Fish Passage Flow Criteria

Ryan Brown, Dept. of Environmental Resources Engineering Undergraduate Student

College of Natural Resources & Sciences

Accommodating fish passage within the design of in-stream structures requires creating hydraulic conditions for which targeted fish species may freely move through the structure. These hydraulic conditions are commonly defined using required water depths and maximum water velocities that must be maintained between a low fish passage design flow and a high fish passage design flow during the migration season. Selection of these criteria define a fish passage window for a particular site. This research evaluates the migration opportunity provided by different passage criteria by quantifying the influence of hydrologic data quality and quantity on the estimation of passage criteria and the duration of the fish passage window.

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Effects of Elevated Immersion and Emersion Temperature on Rate and Progress of Wasting Syndrome in *Pisaster ochraceus*

M.C. Hannon & Jana Hennessy, Dept. of Biological Sciences Undergraduate Students

College of Natural Resources & Sciences

The recent spread of sea star wasting syndrome in several asteroid species has led to considerable interest in causes of the disease process, and widespread efforts to monitor its incidence in nature. To investigate ecological drivers of the disease, we studied effects of increased immersion and emersion temperature on disease rate, progress, and mortality from specimens collected in Trinidad, California, USA. Our results suggest that a small increase in ambient seawater temperature will not trigger catastrophic wasting in *P. ochraceus*, even if the sea stars are infected with the disease agent.

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Effects of Water Availability on Soil Respiration in a Beech Dominated Stand in an Eastern Hardwood Forest

Michael L. Kennedy, Dept. of Forestry & Wildland Resources Undergraduate Student

College of Natural Resources & Sciences

This past summer I was lucky enough to have been awarded an REU position with The Smithsonian Environmental Research Center (SERC). Working under Dr. Geoffrey Parker in the Forest Ecology lab, I conducted research on soil respiration in an American Beech dominated stand in conjunction with a pioneering watering experiment my laboratory had conducted to test for variations in short-term tree growth.

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Experimental Determination of Pre-Eruptive Storage Conditions and Continuous Decompression of Rhyodacite Magma Erupted from Chaos Crags, Lassen Volcanic Center, California

Erin Quinn, Dept. of Geology Graduate Student

College of Natural Resources & Sciences

We performed series of hydrothermal (high-temperature and -pressure) phase equilibrium and continuous decompression experiments on a natural rhyodacite pumice erupted from the 1103413 years BP pyroclastic flow from Chaos Crags, Lassen Volcanic Center, California, to constrain pre-eruptive magma storage conditions and ascent rates. Experimental run products along with constraints from natural samples (melt inclusions, Fe-Ti oxides, and amphiboles for H₂O concentration, pressure, oxygen fugacity, and temperature) indicate the magma last equilibrated at pressure of 100-150 MPa (~3.8-5.8 km depth) and temperature of 750-775°C, and early eruptive products ascended at > 100 m/hr with later eruptive products ascending < 100 m/hr.

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Father Socialization in Sikh Families towards Ethno-Religious Identity Formation in their Sons

Meenal Rana, Child Development Assistant Professor

College of Professional Studies

The paper explores the socialization practices of Sikh immigrant fathers that they use to foster ethno-religious identity in their adolescent sons and the support that they receive from the community for these roles.

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Geomorphic LiDAR Mapping of Latest Pleistocene Deposits and the Western Extent of the Fickle Hill Fault, Arcata, California

Jessica Vermeer, Dept. of Geology Graduate Student

College of Natural Resources & Sciences

Using high-resolution elevation data produced from LiDAR it was possible to map the geomorphology of the Arcata area and identify multiple splays of the Fickle Hill fault. I identified five splays of the Fickle Hill fault in downtown Arcata, and three possible traces in the Arcata Bottoms. Although there are no large scarps in the Bottoms, there are geomorphic features that may indicate faulting. Correlation of geomorphic units to sea level history enabled me to constrain the age and amount of displacement of some fault splays.

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HSU OH SNAP! CalFresh Outreach and Food Security Study

Patty Chang, Dept. of Social Work Undergraduate Student

College of Professional Studies

Research demonstrates limited access to nutritious foods has implications for physical, mental, and social development. College student food insecurity recently emerged as a public concern and limited empirical evidence is available. We present early findings on the existence of college food insecurity for HSU students applying for CalFresh (Federal Supplemental Nutrition Assistance) through campus outreach events in spring 2014 and explore how it is related to self-reported health and academic performance.

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Launching a Bilingual Student Newspaper

Marcy Burstiner, Dept. of Journalism & Mass Communication Associate Professor

College of Arts, Humanities & Social Sciences

Seven students and two professors from the Journalism & Mass Communication and World Languages & Cultures Department, working as part of a faculty-student collaboration project, spent Fall 2012 studying models for Spanish language newspapers and bilingual journalism programs. In Spring 2013 they put their findings into practice by launching a pilot issue of *El Leñador*. In 2013-2014 they formed a staff and published *El Leñador* monthly within the pages of *The Lumberjack Newspaper*, creating a financial and staffing structure for continued publication.

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Marine Survival of Coho Salmon (*Oncorhynchus kisutch*) from Small Coastal Watersheds in Northern California

Sean Cochran, Dept. of Fisheries Biology Graduate Student

College of Natural Resources & Sciences

Used archived collections of scale samples collected from adult coho salmon from several intensively monitored watersheds to reconstruct the growth histories of these fish in a process known as scale back-calculation. Estimated ocean entry size and early ocean growth for these surviving fish. I compared the estimated ocean entry sizes of surviving adult fish to the observed lengths of smolts captured during their migration to the ocean in order to identify whether ocean survival was size-biased towards the largest smolts. I also assessed the relationships between year-to-year variability in ocean growth and smolt sizes to estimated ocean survival rates for study basins.

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Maya Codex Production

Spencer Mitchell, Dept. of Anthropology Undergraduate Student

College of Arts, Humanities & Social Sciences

Experimental archaeology has an important role to play in our understanding of the formation processes in the archaeological record. For the scope of this research, experimental archaeology enables targeted examination of codex manufacturing by the ancient Maya. Although the majority of surviving written material is found on ceramics, monuments, and altars; it is believed that the ancient Maya primarily documented their information on codices made from fig-tree bark paper. However, due to adverse environmental conditions in the Maya Lowlands and the devastation caused by Bishop Diego de Landa very little evidence of the codices has survived. This poster details ongoing experimental research focusing on the tools, raw material, and painting techniques utilized by ancient Maya scribes. I replicated pages twenty-four to twenty-seven of the Dresden Codex.

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Measuring What Matters

Michelle D. Lane, School of Business Assistant Professor

College of Professional Studies

This is a study examining the means of tracking success for social entrepreneurs. Qualitative data was gathered and summarized. Measurements of financial viability, activities and change actions were tabulated. These were then related to transparency and communication to their stakeholders.

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Modeling Consciousness in Archaeology: A Non-invasive Approach

Nikki Martensen, Dept. of Anthropology Undergraduate Student

College of Arts, Humanities & Social Sciences

Modeling the thoughts and beliefs on ancient persons is an arduous calling for archaeologists, as this data falls into the intangible realm. Often the most direct material link to the ancient mind is found in rock art. With resilience to the elements and time, rock surfaces presented an ideal canvas for the lasting expressions of past cultures. Many of these sites however, have been damaged or compromised due to invasive recording practices. Researchers and tourists continue to utilize outdated methods, as a result of misinformation or naivety on the subject. A non-invasive, conservation based approach to rock art recording is presented, with the intention of diminishing unintentional site vandalism. Symbols of headdresses, messengers, and lobed circles appear across differing chronological and regional rock art style categories. These elements are often interpreted in relation to altered states of consciousness and ceremony. Non-invasive field methods relating to field mapping, lighting and close-range photogrammetry can be used to produce visual models which can be analyzed in a laboratory setting without concern for panel damage. These visual models can expand access to immovable data such as rock art, allowing researchers a truly non-invasive approach.

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Observing Occupy

Cady Rutherford, Dept. of Anthropology Undergraduate Student

College of Arts, Humanities & Social Sciences

This project looks at how successful the Occupy Movement was and factors that have made making a clear determination of this difficult. It focuses on the differences between the intentions of those inside the movement and the expectations of those outside and the problems that arose from this disconnect.

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Overstory and Understory Douglas Fir Branch Analysis at L.W. Schatz Demonstration Tree Farm

Christopher Kirk, Dept. of Forestry & Wildland Resources Graduate Student

College of Natural Resources & Sciences

Branch diameter analysis of branches within the second log modeling the differences of overstory and understory Douglas fir. The project took place at Humboldt State's L.W. Schatz Tree Farm. The poster is a detailed visual representation of the two plot types using GIS and includes a short description of the project and a plot location map.

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Paradigm Shift: Turning Waste to Resource through a Novel FO-MD Treatment Process

Jairo Luque Villanueva, Dept. of Environmental Resources Engineering Undergraduate Student

College of Natural Resources & Sciences

It is estimated that \$298 billion will be required over the next 20 years to remodel aging wastewater infrastructure. Novel wastewater treatment techniques using membrane technologies present an alternative to rebuilding conventional treatment methods. A paradigm shift that utilizes water reuse strategies is necessary as water resources become more stringent. The purpose of this project is to investigate a novel hybrid system for wastewater treatment and reuse.

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Pinaceous Wood from the Early Cretaceous of California (Lower Chickabally Member, Budden Canyon Formation, Barremian—Early Aptian)

Jamie Burnett, Dept. of Biological Sciences Undergraduate Student

College of Natural Resources & Sciences

An attempt to identify a piece of fossilized coniferous wood, from the Cretaceous Chickabally Member of the Budden Canyon Formation, as close as possible to both a living and extinct genus. Through various steps it was determined that the wood does not match any known living or extinct genera, therefore it is expected to be a species new to science.

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Practically Brand New: An Experimental Ceramic Restoration Project

Jessica Chapman, Dept. of Anthropology Undergraduate Student

College of Arts, Humanities & Social Sciences

Starting in the fall 2013 semester at Humboldt State University, I undertook the process of experimental archaeology within the Archaeology Research Laboratory; my goal was to experiment with different types of adhesives along with trying different restoration techniques so I could better understand what was the most practical and ethical methods within ceramic restoration. My processes involved breaking ceramic plates, bowls, and cups so that I could find the best methods of restoring them back to their original configuration. With this process and the research that I have completed, I have formulated a conclusion that I have established to be the most ethical in keeping the integrity of the artifact at hand.

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Prior Concussion Injuries May Influence Neurocognitive Recovery Time in Collegiate Athletes

Jimmy Garcia, Dept. of Biological Sciences Undergraduate Student
& **Justus Ortega**, Dept. of Kinesiology Associate Professor

College of Natural Resources & Sciences, College of Professional Studies

The magnitude and duration of impaired brain and motor control function resulting from a concussion are not well understood. The purpose of this study was to investigate the relation between concussion history and recovery of neurocognitive function after a concussion. Sixty athletes with prior sports-related concussions participated in this study. A neurocognitive function test was used to assess verbal memory, visual memory, reaction time and processing speed during pre-season and throughout the recovery period of the concussion injury. The results support our hypothesis that the number of prior concussion experienced by athletes is related to the duration of their recovery.

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Running Improves the Economy of Walking Among Older Adults.

Justus Ortega, Dept. of Kinesiology Associate Professor

College of Professional Studies

Impaired walking performance is a key predictor of morbidity among older adults. A distinctive characteristic of impaired walking performance among older adults is a greater metabolic cost (worse economy) compared to young adults. However, older adults who consistently run have been shown to retain a similar running economy as young runners. Unfortunately, those running studies did not measure the metabolic cost of walking. Thus, it is unclear if running training can prevent the deterioration of walking economy. The purpose of this study was to determine if and how regular walking vs. running exercise affects the economy of locomotion in older adults.

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Sedimentological and Mineralogical Evaluation of Sand Deposits in Crescent City, California, to Estimate their Mode of Deposition: Paleotsunami or Storm

Michelle Robinson, Dept. of Geology Graduate Student

College of Natural Resources & Sciences

Differentiating storm from tsunami deposits in the geologic record is often difficult to do based on the visible characteristics exposed in outcrops or cores. Such is the case

for sandy deposits identified in the subsurface of a marsh north of Crescent City in coastal northwest California. In order to determine the mode of deposition of four unidentified sand units, 35 sand samples from the core and as well as eight samples from the modern beach adjacent to the marsh, were processed and tested for variations in particle size and sorting, as well as grain shape, dominate mineralogy, and microscopic textures on individual sand grains. The upper four sand units were likely emplaced by different hydrodynamic processes than the lowest deposit, and therefore not deposited by a tsunami, but rather washover from storm generated waves.

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Short Range Tests of Gravity

Holly Leopardi, Michael Ross, Dave Smith, Crystal Cardenas, Conrad Hartermcdon, Dept. of Physics & Astronomy Undergraduate Students

College of Natural Resources & Sciences

Gravity was the first force to be described mathematically, yet it is the only fundamental force not well understood. The Standard Model of quantum mechanics describes interactions between the fundamental strong, weak and electromagnetic forces while Einstein's theory of General Relativity (GR) describes the fundamental force of gravity. There is yet to be a theory that unifies inconsistencies between GR and quantum mechanics. Scenarios of String Theory predicting more than three spatial dimensions also predict physical effects of gravity at sub-millimeter levels that would alter the gravitational inverse-square law. The Weak Equivalence Principle (WEP), a central feature of GR, states that all objects are accelerated at the same rate in a gravitational field independent of their composition. A violation of the WEP at any length would be evidence that current models of gravity are incorrect. At the Humboldt State University Gravitational Research Laboratory, an experiment is being developed to observe gravitational interactions below the 50-micron distance scale. The experiment measures the twist of a parallel-plate torsion pendulum as an attractor mass is oscillated within 50 microns of the pendulum, providing time varying gravitational torque on the pendulum. The size and distance dependence of the torque amplitude provide means to determine deviations from accepted models of gravity on untested distance scales.

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The Development of Personal Relationships via Craigslist

John Gentry, Dept. of Anthropology Undergraduate Student

College of Arts, Humanities & Social Sciences

This research project explored the personal relationships that people develop through the online bulletin board known as Craigslist. I focused solely on personal relationships on the Humboldt County Craigslist page. I aimed to understand why people use Craigslist

as a tool to meet people as opposed to more conventional methods. In particular, I was interested in commonalities or patterns among participants, how relationships formed, and what types of relationships were sought most often. To address these topics, I interviewed and surveyed individuals that use this system, and I also analyzed personal ads that were placed online.

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The Effect of Age on the Cost of Supporting Body Weight During Walking

Andrew Felperin, Dept. of Kinesiology Graduate Student &
Justus Ortega, Dept. of Kinesiology Associate Professor

College of Professional Studies

Aging is associated with impaired walking performance. Specifically, older adults have been shown to consume 15-20% more metabolic energy to walk a given distance than young adults. The reasons for the increased costs of walking in older adults are still unclear. One factor that may contribute to a greater cost of walking is an increase cost of supporting body weight related to an increased fear of falling. Research suggests that older adults with a heightened fear of falling use greater muscle activation. The purpose of this study was to determine the metabolic cost for supporting body weight during walking in older adults and its relationship to fear of falling.

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The Influence of Grandmothers on Sustained Breastfeeding

Lauren Hennes, Dept. of Anthropology Undergraduate Student

College of Arts, Humanities & Social Sciences

In humans, there are known health risks of not being breastfed, such as decreased immune function, dental health, vision, hearing, digestion and intelligence and increased risk of heart disease and central nervous system disorders. Additionally, the implications of breastfeeding for less than twelve months impacts both maternal and infant health. Studies have shown that a mother's feelings of overall breastfeeding support from partners and grandmothers correlated with duration of exclusive breastfeeding. This project examined if grandmothers affect a mother's decision to breastfeed or the age that complimentary foods are introduced in the United States. Results showed that they are no statistically significant relationships between grandmothers and breastfeeding, though there were interesting trends.

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The Moral Bases of the Triple Bottom Line: Implications for Business Education

Jaroslav Fiser, School of Business Graduate Student
& **David Sleeth-Keppler**, School of Business Assistant Professor

College of Professional Studies

We examine whether students approach sustainability in business based on moral intuitions about what's right and wrong for people and the planet, rather than just following sustainability as a trend. We find that "harm" and "fairness" are central moral dimensions to engagement with sustainability, but these dimensions frame sustainability too narrowly for certain types of students. Findings can help business schools market sustainability more effectively to a broader range of students.

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The Utility of Reading and Math Clinics to Enhance Teaching Performance Outcomes of Credential Candidates

David Ellerd & Peggy Kirkpatrick, School of Education Faculty

College of Professional Studies

A reading clinic served as fieldwork experience in which pre-service teachers learned how to apply a sequential application of specific reading interventions. The purpose of the clinic was to provide a controlled learning experience for Special Education pre-service teachers and to facilitate support for students who were struggling in reading. The university-based clinic was developed as a partnership with four local public elementary schools. Results indicate the clinic instruction was more effective in preparing pre-service teachers to use specific literacy teaching practices in working with children with special needs when compared to traditional student-teaching experiences.

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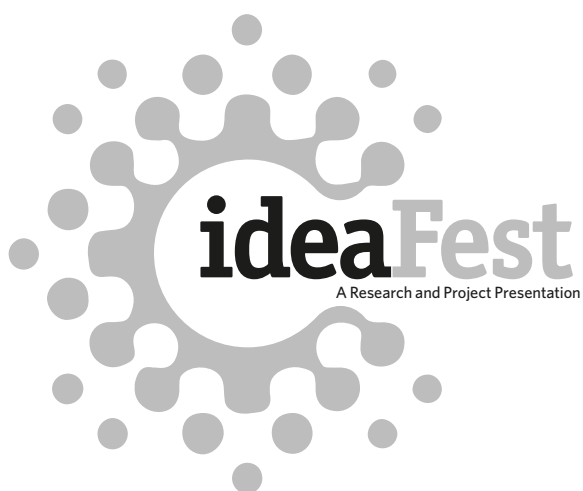
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