

Program and Abstracts

Wichita State University

10th Annual

Undergraduate Research and Creative Activity Forum—URCAF



April 23, 2010

Eugene Hughes Metropolitan Complex

Lawrence Whitman, URCAF 2010 Chair

2010 URCA FORUM

Organizing Committee

Chair: Lawrence Whitman, Associate Professor, Engineering
Jeremy Patterson, Assistant Professor, Education
Robert Bulp, Associate Professor, Fine Arts
Maria Torres Pillot, Associate Professor, Health Professions
Atul Rai, Assistant Professor, Business
Robin Henry, Assistant Professor, LAS Humanities
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Wichita State University
10th Annual Forum
Undergraduate Research and Creative Activity Forum—URCAF

Note: All Break/Poster Sessions are in Gymnasium

Opening Session in Lowe Auditorium	
8:00 – 8:30	Registration
8:30 – 8:45	Opening Remarks Dr. Gary L. Miller, Provost & Vice President for Academic Affairs and Research
Keynote Address 8:45 – 9:15	Niall Shanks, PhD Curtis D. Gridley Distinguished Professor of History and Philosophy of Science <i>Good Scientific Methodology</i> <i>Underlies Ethical Research and Professional Practice</i> What ethical dilemmas graduate students face during their studies and later in their professional lives?
9:15 – 9:30	Refreshments and Poster Viewing in Gymnasium

URCAF	
9:30 – 10:45	Natural Sci./Eng. Rm. 132
11:00 – 12:15	Exhibition/Performances Rm. 132
12:30 – 2:30	Social Sciences Rm. 132
10:00 – 12:00	Viewing Posters
3:15 – 4:00	Awards Room 132

URCAF ORAL PRESENTATIONS

URCAF Natural Sciences Session, Moderator - Jeremy Patterson, Education

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9:30	Josh Cheek	Evolving a Better Heuristic for a Game Playing Robot
9:45	Rachel Jacobs	Supramolecular Mg Phthalocyanine – Fullerene and Mg Naphthalocyanine – Fullerene
10:00	Ivy Lanning	Engineers at Play: Interdisciplinary Engineering Through Application Based Design and Construction of a Miniature Golf Hole
10:15	Andrew Niles	Development & Application of Time Standards: One-Off Aircraft
10:30	Shannon Ray	Measurements with the MIPP Experiment at Fermilab

URCAF Exhibition/Performance Session, Moderator, Jeri Carroll, Education

11:00	Joe Mikelait	Velocities
11:15	A.J. Pflumm	Our Infinite Capabilities
11:30	Megan St. Clair	Cathartic Effusions: An Exploration of Prints
11:45	Krystal Nelson	Macabre Reflections
12:00	Landon Taylor	Graphotism

URCAF Social Sciences Session, Moderator Atul Rai, Business

12:30	Andrew Blakemore	Homogeneous Group Formation in Student Organizations
12:45	Sheila Cabbage	Cumulative Binary Social Choice
1:00	Jillian Jacobelli	The Relationship Between Breast Cancer Treatment Choice & Decisional Difficulty
1:15	Ted Otieno	Calculus of Normality

1:30	Larry Prothro	Bereavement, Social Support, and Depression of Assisted Living Elders
1:45	Tatiana Sibbai	The Democratic Peace Theory: A Case Study of the Lebanon-Israeli Wars of 1982
2:00	Chai Fang Tan	Multilevel Growth Levels for Decision Confidence
2:15	Becca Tenbrook	How Bereavement and Social Support Affect the Physical Functioning of Assisted Living Facility Residents
2:30	Brandy Wallace	Racial Differences of Social Support, Depression, and Physical Functioning of Elderly
2:45	Talia Ivalu	Bereavement, Spirituality, and Depression of African American

URCAF Poster Presentations

UP1	James Crisler	Microbial Life at High Concentrations of Magnesium Sulfate
UP2	Aaron Mahoney	Effects of seed leachate from an invasive plant on germination of native species
UP3	Monica O'Hanlan	Histological Analysis of Disrupted Proteomics During Initiation and Promotion Stages of Estrogen Dependent Uterine Cancer
UP4	Jonathan Obrist	Petrographic Comparison and Contrast of 290 –Million-Year-Old Fluvial and Deltaic
UP5	Nathan Ofsthun	The Influence of Seed-Seed Interactions on Plant Emergence
UP6	Daniel Pankratz	Development of Biocompatible and PH Responsive Catatonic Vehicles for Drug Delivery
UP7	Abigail Pastore	Effects of Above Ground Herbivory Upon Root Systems in Lespedeza
UP8	Benjamin Stukey	Modeling Nickel Active Sites for Super Oxide Disumustase
UP 9	Julianne Burton	Calligrammes Composed in French After the Nineteenth Century Poet Apoll
UP10	Jamie Greene	The Effect of Short-Term Incentives on Investment Behavior
UP11	Jillian Jacobelli	Eating Behavior and Attitudes
UP12	Taylor Martin	Contemporary Letterpress Printing

UP13	Devin Naccarato	Sonnets in the Renaissance Style Written in French
UP14	Kari Nilsen	Risk Reduction: Self Efficacy and Condom Use in African American Adolescents
UP15	Fallon Parks	Gender Differences: Bereavement, Social Support, and Depression of Assisted Living Elders

Josh Cheek*, Bin Tang
Computer Science

Evolving a Better Heuristic for a Game Playing Robot

CS771, Artificial Intelligence, teaches algorithms that a robot can use to play a game. However, to implement them, the robot must have some heuristic, a way to determine how desirable a given game state is. The algorithms allow it to analyze several moves in the future, but looking that far ahead isn't helpful if it mis-evaluates it's goals. After fighting robots with different analysis techniques against each other, it became apparent that my intuition was not adequate to write an accurate heuristic. To resolve this, I extracted the variables of the heuristic into a database, and wrote a program to generate a full robot's source code from those variables. Then I generated a pool of robots with randomly assigned values. Three robots would be pulled from the pool, they would fight, the loser would be removed, and a new robot would be generated from the values of the two winners. The intent is to mimic evolution using the variables as DNA, so each child robot selects each of it's variables from a random parent, and adds a mutation in the process. At present, results are unknown as the robots are still evolving. However, I tested the active robot that had the most wins against another student's robot that has been dominating every game and it came to a draw, which implies an increased capacity to make intelligent moves.

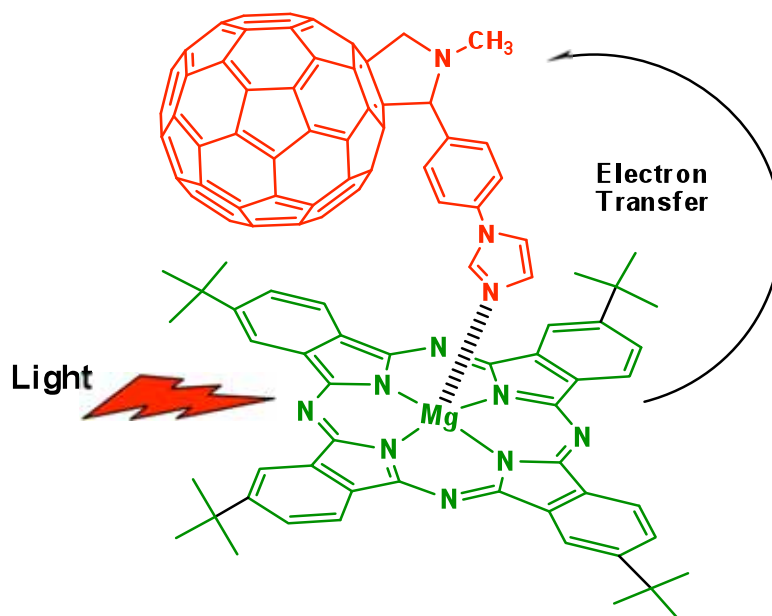
Rachel Jacobs*, Francis D'Souza
Chemistry

Supramolecular Mg Phthalocyanine – Fullerene and Mg Naphthalocyanine – Fullerene

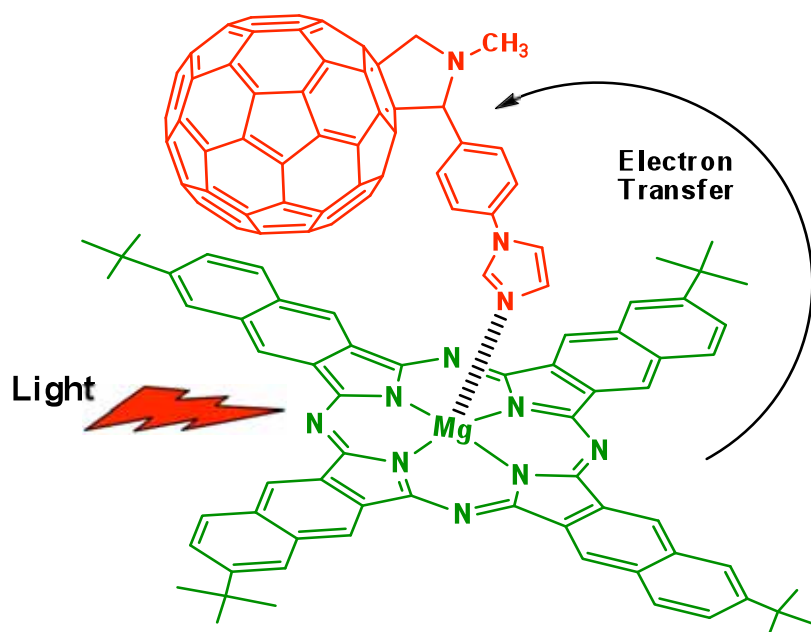
Photosynthesis, the process of converting light energy into chemical energy, involves two major steps, viz., absorption and transportation of light energy of appropriate wavelength by the antenna light harvesting molecules to the reaction center, and photoinduced electron transfer (PET) to generate charge separated entities by using the electronic excitation energy. In the reaction center, the excitation energy is converted into chemical energy in the form of transmembrane charge separation via a multistep electron-transfer reaction.

Mimicking the photosynthetic functions by using synthetic model compounds is important to further our understanding of the process of bioenergetics. Research in this area also holds promise for technological advances in solar energy conversion, and building molecular optoelectronics such as photonic wires and switches.

In the present study, self-assembled donor-acceptor photosynthetic reaction center model systems are built using Mg phthalocyanine and Mg naphthalocyanine as electron donors and an imidazole-appended fulleropyrrolidine as electron acceptor (see Schemes below). The presentation will focus on the synthesis of the donors and their characterization, donor-acceptor assembly formation, and photochemical studies revealing occurrence of photoinduced electron transfer from the donor to acceptor.



Scheme 1. Magnesium phthalocyanine - fullerene donor-acceptor dyad. . The arrows show the occurrence of photoinduced electron transfer.



Scheme 1. Magnesium naphthalocyanine - fullerene donor-acceptor dyad. The arrows show the occurrence of photoinduced electron transfer.

Jeswin Joseph Chankaramangalam*, John Harrison, MohamdAli Ishaque Kazi*,
Christian Kindel*, Ivy Lanning*, Alan Whitaker*
Mechanical Engineering

Engineers at Play: Interdisciplinary Engineering Through Application-Based Design and Construction of a Miniature Golf Hole

Seven students and faculty from the Wichita State University Kinetic Art Group (WUKAG), responded to a call for proposals from a New York art collective looking for nine groups to each design and build one hole of a miniature golf course to be installed for four months in New York City. The theme provided for the 2010 courses was the "World's Fair" and the course submitted by WSU focused on alternative energy and sustainable development (the topic of the 2008 World's Fair). The proposal submitted by WUKAG was accepted, and the students began design of the miniature golf hole. Among the constraints were: adherence to theme, playability and ruggedness of the course, course aesthetic, and lack of access to electricity. An iterative theory-building process was the primary method used to address these research questions. WUKAG found that the course could be reliably powered via a marine battery recharged by solar and wind power, and developed a building plan to ensure the course could withstand four months of coastal weather. Interactive elements incorporating microcontrollers, amplifier circuits, electromagnets, and mechanical elements were designed and powered completely with alternative energy sources. Through hands-on application of theoretical material, these students were able to successfully create an experience which reminds the player of our responsibility toward worldwide development of a carbon-neutral footprint, but in the context of fun, interactivity, and a wholly unique playful experience. The students working on this project also gained a unique perspective on project-based learning, creative design, and interdisciplinary exploration of problems.

Andrew Niles*, Don Malzahn
Industrial Engineering

Development & Application of Time Standards: One-Off Aircraft

Boeing Wichita's military modification and support program wanted new methods to evaluate the amount of work needed to modify an aircraft. Their modification program focuses on one-off aircraft or nonproduction operation. We documented the current process through interviews and analysis helped the team identify opportunities for improvement. Through research, we generated several alternatives. The first alternative used traditional time standard methods to set standards. The second and third alternatives used two different project management techniques to apply and manage standards: program evaluation and review technique (PERT) and critical chain project management (CCPM). The final alternative combined a synthetic time standard, maxi MOST, and CCPM. Based on a five-year analysis, we determined that the fourth alternative was best, offering an annual savings of roughly \$1.8 million. CCPM had an estimated annual savings of \$330,000, followed by PERT with \$150,000, and lastly, traditional methods, with an annual loss of \$915,000.

Shannon Ray*, Abel Winn
Physics

Measurements with the MIPP Experiment at Fermilab

The purpose of this experiment is to determine cross sections and charged kaon and pion production ratios of various targets. Thin targets include liquid hydrogen, beryllium, carbon, aluminum, copper, silver, bismuth, and uranium. A thick target, NuMI (carbon), was also used. These production ratios are determined by cross section between the presented targets and incident kaon $^{+/-}$, pion $^{+/-}$, and proton $^{+/-}$ beams at momenta ranging from 5 to 120GeV/c. Incident beams are produced by a primary proton beam of 120GeV/c from the Main Injector at Fermilab. Produced particles are tracked and identified in the MIPP detector using a TPC and wire chambers, time of flight, Cherenkov and RICH detectors, and calorimeters. The current cross section results are on the same magnitude as expected from comparison to previous experiments.

Joe Mikelait*, Gerald Scholl
Percussion Studio

Velocities

Velocities is a solo marimba piece written by Joseph Schwantner. It will be me playing a four mallet solo for marimba, expressing the thoughts and emotions Schwantner wrote. It has a variety of different musical themes that are repeated several times a half step higher or lower, giving a sense of tense resolution. In the beginning the surprising loud seventh chords build tension. The following quieter, more melodic segments try and resolve the sevenths, which come back again shortly after these melodies. The piece goes through several transition sections, in which a new theme is introduced and toyed around with. They go through three transitions, and then resolve to the main melody once again but in a minor, more dramatic emotional tone. This wears away into a calming pianissimo which is instantly contrasted with a fast fortissimo section full of sevenths and tension, all of which resolves in the last set of chords. To prepare this piece I have spent at least an hour a day practicing and working on it for the last few months. I have delicately examined every section and the ideas portrayed in all of them.

A. J. Pflumm*, Nick Johnson
Dance Department

Our Infinite Capabilities

This abstract is a solo dance. We struggle constantly with no gain and with no end in sight. The reason for this is that all we see of ourselves is our body. We ignore that which gives us substance, life, vitality, and truth. Without these qualities and aspects, we are merely carbon. We must give more of ourselves in order to learn our true and infinite capabilities. We can mold our reality with a single heartbeat. If only we would throw away our perceived limitations. This dance is characterized by struggling movements, outward reaches, and an inner desire to become more than just a body. The concept and dance came to me after hours of meditation. I wanted to create something that I could learn from and would help me grow. When I discovered the basis upon which I wanted to create my solo, I went from there, using movement to describe the feelings and the artwork I saw in my head. It was a long process, taking the better part of a month, but I ended up learning about my capabilities through this dance and continue to do so every time I polish a movement.

Megan St. Clair*, Monica Meler
School of Art and Design

Cathartic Effusions: An Exploration of Prints

My works are hand pulled prints of which I have created from plates. Thematically my work embraces the unknown. By letting go of preconceived notions of how something should look, I cathartically purge energy into my prints expressing feelings, emotions, to which I do not know how to articulate. Emotional, rhythmical, and spiritual elements are transfused into my prints; imbuing meaning into this visual language that I am creating. Whether I am building up layers in monotypes, collographs, etchings, or lithographs my focus is more on the process rather than the content. My prints deal with experimentation of colors and obscure formations. The physical outpouring of intangible concepts takes shape within my prints. As I mentioned above, all of my prints are hand pulled. I start with a empty plate, whether it is Plexiglas, zinc, or an aluminum litho plate, I then etch my work into the plates through various processes and finally running them through a press.

Krystal Nelson*, Deborah Baxter
Music Education

Macabre Reflections

This would be a performance of four pieces in a six-piece song cycle entitled Macabre Reflections by Louis Calabro. These pieces feature post-modern musical elements, including, but not limited to: serialism; cyclicism with multiple musical themes; development of ideas through cyclicism. The performance is between eight and ten minutes in length, featuring a vocalist and piano.

Landon Taylor*, Linda Robinson
Studio Art

Graphotism

A solo exhibition will be held at the local art gallery, Tangent Lab, on May 28th 2010 as part of the Final Friday art crawl. My work utilizes photography and digital manipulation, the majority of which consists of prints mounted on aluminum to display in the gallery, along with an interactive video display to engage the audience creating a discourse based on my work.

My work investigates the identity of urban landscapes and its personification of culture and community. De-familiarizing architectural structures through the layering of imagery, I create alternate perceptions of place(lessness) and question how identity is formed and assimilated. One's tag or signature is the most personal possession and manifestation of identity. Utilizing graffiti tags to reconstruct the notions of the inherent characteristics urban landscapes possess creates anonymity from identity. The re-appropriation of space and structure through digital manipulation parallels my focus on graffiti's role signifying cultural intersections and identity.

The process of creating prints for the exhibition includes shooting multiple photographs of landscapes and digitally stitching them together, vector tracing of planar objects and architecture from the landscape, and then layering photographs of graffiti to overlay the existing objects.

Andrew Blakemore*, Ron Matson
Sociology

Homogenous Group Formation in Student Organizations

The presentation will discuss a paper which examines the causes and effects of homogeneous group formation. In the research, quantitative methods are used to discern and understand patterns of homogeneous behavioral association among members of a student organization. Drawing from prior research, a novel "dual analysis" is implemented to better grasp both social-structural and individual factors and outcomes surrounding group homogeneity. The two analytical measures, salience and homophily, are applied to six sets of relevant social categories (gender, ethnicity, academic class, Greek affiliation, major, and place of residence) and are interpreted to address 1) the degree of observed homogenous group formation, 2) the causes of this interaction patterning, and 3) effects for both the group and its members. Major findings include: a predominance of Greek affiliation and position in the academic class cycle in shaping the network structure; high levels of homophilic interaction among certain social categories; and a correlation between the level of homophily in a student's associations and their egocentric density in the organization network.

Sheila Cabbage*, Abel Winn
Economics

Cumulative Binary Social Choice

The United States government effectively halted research on voting methods approximately 40 years ago. With the issues of voting irregularities seen in recent elections using the current voting method known as majority rule, study should begin again. A different voting method used on a local or state level could help smaller constituent groups achieve fair representation. Cumulative voting has the potential to yield more effective results than the voting method that United States has now. This deserves further study as do possible other voting methods.

Jillian Jacobelli*, Robert Zettle
Psychology

The Relationship Between Breast Cancer Treatment Choice & Decisional Difficulty

A study of 200 Wichita women was conducted to see if the addition of testimonials to a video decision aid would affect their treatment choice for breast cancer. Participants were asked to imagine that they had just been diagnosed with breast cancer. They then viewed a video decision aid explaining their treatment options and potential outcomes. After the video, participants indicated their treatment preference on a six-point Likert scale ranging from “extremely likely to choose lumpectomy with radiation” to “extremely likely to choose mastectomy”. Additionally, participants rated four measures of decisional difficulty: confidence in decision, difficulty of decision, how overwhelmed participants felt, and their likelihood of changing their mind. Despite the fact that survival rates are the same for both mastectomy and lumpectomy, women who chose mastectomy were more confident in their decision and less likely to change their mind. Women who preferred mastectomy over lumpectomy reported less difficulty in making their decision and also found the overall process less overwhelming. A potential explanation for this is that mastectomy may be psychologically more reassuring than lumpectomy. This interpretation is consistent with previous research showing that patients sometimes prefer more extreme treatments for cancer to the detriment of their health (Fagerlin, Zikmund-Fisher & Ubel, 2005).

Ted Otieno*
Philosophy

Calculus of Normality

Calculus is a study of the rate of change. Change is a term that has become very familiar in the modern world. In most cases, it is that which is moving away from normality. One such example is the change in global climate. This has been an issue that has not been taken seriously despite the open evidence to suggest its dangers. This philosophy seeks to explain the root reason why people are resistant to change, not only with regards to the environment but also any other issues brought before them. It will use the author’s formulas and evidence to support the fact that ,use of the word change to imply what is happening to global climate is wrong .It will also show that for a long time, change has been made the point of focus yet it should be knowledge that is the point of focus. In summary, it will cite the author’s analogies alongside real life examples to counter the misconception; that resistance to change happens only when the outcome is bad. One such study that will be done ;is a study to find out how many people know smoking is harmful to their health yet still smoke.

Larry Prothro*, Kyoung Lee
Social Work

Bereavement, Social Support, and Depression of Assisted Living Seniors

Purpose: Elderly population tend to experience higher levels of depression than the general population, however more research on the extent bereavement and social support has on a person's chances of becoming depressed is still needed. This study exams 100 older adult participants who are 65 years old or over in assisted living facilities in Kansas. The objective of this study is to explore the relationships between bereavement, social support, and depression among the elderly who reside in assisted living facilities. Methods: All participants from six assisted living facilities are selected by using the purposive sampling method. By conducting face-to-face interviews with the participants, researchers obtained complete surveys. This study utilizes a cross-sectional design method and quantitative approach. A structured survey questionnaire includes standardized instruments to measure levels of bereavement, social support, and depression. The interviews are conducted between March 1st and March 30th of 2010. One interview is conducted with each participant and lasts about one hour. Results: Descriptive statistics and regression analysis are used to measure our results. This study expects to discover that high levels of bereavement are associated with high levels of depression, while high levels of social support are associated with low levels of depression. Implications: The overall goal of this study is to understand how bereavement and social support affect levels of depression in order to begin the process of improving mental health services for the elderly in assisted living facilities.

Tatiana Sabbai*, Carolyn Shaw
Political Science

The Democratic Peace Theory: A Case Study of the Lebanon-Israeli Wars of 1982

The Democratic Peace Theory states that no two democratic nation states will go to war with one another. I use the two wars between perceived democratic states, Lebanon and Israel, as a case study to determine whether these instances provide a limit to the theory's applicability. I use quantitative and qualitative data, including the annual Freedom House rankings, to determine if the definitions of the theory apply to both cases; regime type, democratic government, and level of violence. I also analyze external factors that illustrate the theory's weaknesses. What is concluded from the data and research is that the cases being studied consist of two democracies that engaged in war with each other on two separate occasions, with several acts of aggression intermittent between the two wars. The limitations of the democratic peace theory presented by these case studies include; a democracy that is not mature cannot be covered under the scope of the theory; conflicts between a democracy and a non-state sanctioned militia within a democracy cannot be covered under the scope of theory; the relations of democratic states that are free but occupy territories that are not free cannot be predicted by the theory; the relations of democratic states that have foreign troops or guerilla militias within their borders cannot always be predicted by the theory. The 1982 and 2006 wars between Lebanon and Israel are marginal cases that highlight the democratic peace theory's weakness at the margins, despite its general strength.

Chai Fang Tan*, Edgar Merkle
Psychology

Multilevel Growth Models for Decision Confidence

This presentation compares the abilities of two growth curve models to account for judges' confidence in imaginary medical diagnoses. Judges were exposed to 300 cases of medical diagnoses. They learned to make diagnoses using symptoms as criteria to diagnose the disease possessed by the patient in each case. There were 5 conditions that gave judges different instructions for assessing their confidence. Then, the effectiveness of both traditional regression and multilevel models were compared when summarizing and analyzing the data. Results showed that the multilevel models are more accountable for individual differences compared to the regression models. Using the traditional regression model, we found that confidence of judges are similar across all conditions regardless the types of instructions received by judges. The multilevel models, on the other hand, turn out to be useful in eliminating judges who did not learning anything (whose accuracy decreases over time), along with subjects whose confidence went down over time. Compared to Multilevel Models growth curves to traditional regression growth curves, the multilevel models gave us a more realistic account for the causal inferences made on the learning data.

Jamie Hertel*, Justine Rausch*, Andrea Romero*, Becca Tenbrook*, Stacie Welch*, Kyoung
Lee
Social Work

How Bereavement and Social Support Affect the Physical Functioning of Assisted Living Elderly Residents

Purpose: The elderly population encounters many different problems including lack of money, loss of a loved one, lack of independence and so on. These issues can conflict with their overall health and physical functioning in general. This research is intended to prove how the lack of social support and bereavement negatively affects the physical functioning of assisted living residents. The uniqueness of this study was that it intended to explore a topic where not much research has been conducted. However, the results did not live up to the expectations of the hypothesis. The older adults interviewed appeared to be much happier with their life, and didn't let the lack of social support or bereavement affect their physical functioning. **Methods:** This study was conducted by interviewing assisted living facility residents face-to-face using a survey questionnaire composed of questions regarding bereavement, depression, social support, and physical functioning. For this study, the quantitative method was used, and for the design the cross-sectional method is being used. The instruments used were the Texas Revised Inventory of Grief (TRIG), The Multidimensional Scale of Perceived Social Support (Zimet, Dahlem, Zimet & Farley 1988), and The Short Form 36 Health Survey questions. **Results:** This study found that assisted living residents experienced decreased physical functioning with increased bereavement as well as increased physical functioning with increased social support. **Implications:** This demonstrated the need for programs that emphasize social support and bereavement counseling. This study implied that some of the issues and difficulties the elderly population faces is not always negatively affected due to lack of social support or bereavement, but can sometimes just be part of the natural aging process.

Brandy Wallace*, Kyoung Lee
Social Work

Racial Differences of Social Support , Depression, and Physical Functioning of Elderly

Purpose: While Assisted Living Facilities grow at an annual rate of 15-20% and 600,000 people now reside in ALFs, little research has been conducted concerning the residents. Even less research has been conducted comparing the racial differences of the elders concerning their social support and physical functioning and how they influence depression. The objective of this study is to explore what racial differences exist in terms of social support and physical functioning and the affect on depression of elders who reside in ALFs. **Methods:** This cross-sectional, quantitative study was conducted by using the face to face interview format. A purposive sampling method was used to select the participants. A closed-ended questionnaire was given to each resident to measure levels of depression, social support, and physical functioning. The questionnaire included the Geriatric Depression Scale to measure depression. Other scales were used to determine levels of social support and physical functioning. **Results:** The results revealed that African American elders have the same levels of depression as white residents of assisted living facilities. The results revealed that African American residents have a higher level of social support and a higher level of physical functioning, but factors such as income level and access to resources have created more life disadvantages which have caused depression. **Implications:** The significance of this study is to provide information to assisted living facility professionals so they may implement programs and policy to service elders who may be experiencing depression caused by lack of social support or low physical functioning.

Talia Ivalu*
Social Work

Bereavement, Spirituality, and Depression of African American Assisted Living Elders

Purpose: Elderly African American residents in assisted living facilities generally have an increase of depression because of transitional difficulties from their original home to their new one. Also, a plethora of stressful factors, such as bereavement, contribute to their depression, and through them dealing with it, many find an outlet through their spirituality. Throughout this research, two important questions are addressed: Does bereavement cause mental health amongst the African Americans in assisted living facilities? Can spirituality improve their mental health problems?

Methods: The method that is used in this study is quantitative, and a closed-ended questionnaire survey was used, which will take about 50 to 60 minutes for each participant to complete. The 100 subjects in this study are elderly persons age 65 years old or over in six assisted living facilities. An interviewer reads each survey query for the participant to answer each of them thoroughly in a private location to maintain confidentiality.

Results: This study demonstrates that bereavement strongly influences high depressive symptoms of African American residents in an assisted living facility. For example, everyone copes with grief in variety of ways, but it is more difficult if they are away from their family and living with strangers. On the other hand, spirituality of African American older adult residents is strongly related to low depressive symptoms. For those who are actively involved in their religious, they are less likely to become depressed and live longer than those who are not involved.

Implications: This study has many advantages and disadvantages that are accurate as possible; however, this gives an indication as to how African American elderly handle life changing situations through their spiritual beliefs. Furthermore, this study shows importance of spiritual assessment and intervention of service providers to African American residents. By prevailing now, individual that live with depressive symptoms will reduce, and can live their life to the fullest.

James D. Crisler*[†], Brian R. Kilmer[†], Kyle Rowe[†], Brent Cunderla[°], Bruce E. Madu[‡], and Mark A. Schneegurt[†] [†]Department of Biological Sciences, Wichita State University, Wichita, KS; [°]USDI-Bureau of Land Management, Wenatchee, WA; [‡]Mining and Minerals Division, Ministry of Energy and Mines, Kamloops, BC
Biological Sciences

Microbial Life at High Concentrations of Magnesium Sulfate

Epsomite lakes of the northwestern plains of North America are athalassohaline lakes that contain high concentrations of magnesium sulfate (MgSO₄) and represent a distinctive environment that may include unique microbial communities. Few studies have been conducted on the microbial communities that live at high magnesium sulfate concentrations; therefore, preliminary testing was performed on previously obtained bacterial isolates from the Great Salt Plains of Oklahoma. Many of these isolates (24%) grew at 2M MgSO₄ with 1% NaCl at 25C, with fewer (6%) growing with 10% NaCl. At 7C, 15% of the isolates that grew at 25C showed some growth at high MgSO₄ concentrations. Initial testing was also conducted to look at MgSO₄ chaotropicity and other salts through their modification of gel-point temperature of agar solutions over a range of concentrations. We have mounted an extensive study to (1) isolate and characterize both archaea and bacteria via selective cultivation and (2) analyze microbial diversity through culture-independent molecular techniques. Both field-frozen and live-water and sediment samples have been obtained from two epsomite lakes, Basque Lake in BC and Hot Lake in WA. Live samples were plated or used to inoculate different high-salt media (10% NaCl and 2M MgSO₄), while the field-frozen samples were stored at -80C for molecular analyses. A large culture collection has been obtained and characterization of these isolates is underway. DNA has been successfully extracted and bacterial 16S rRNA gene sequences amplified from all Basque Lake samples. As this study progresses the microbial isolates will be characterized both phenetically and phylogenetically, while bacterial 16S rRNA gene sequences are obtained from subsequent analyses of clone libraries. Study of the microbial ecology of these distinct environments may lead to the discovery of unique organisms which possess novel capabilities including the production of new biochemicals that may have therapeutic properties.

A. K Mahoney*, G. R. Houseman
Biological Sciences

Effects of Seed Leachate from an Invasive Plant on Germination of Native Forb Species

One explanation for the spread of invasive species is that these plants release allelopathic compounds that have a direct or indirect negative effects on native plant species. In a recent field experiment, we found that *Lespedeza cuneata* (sericea lespedeza), which is invading grassland in the Great Plains, exhibited a negative density-dependent germination that can be linked to leachate derived from the seed. We hypothesized that the chemical compound in the seed coat might suppress germination of conspecifics. To test this idea, we added either water (control) or the leachate from *L. cuneata* seeds to fifteen native prairie forbs that were grown under artificial lighting for twenty one days. Each treatment was replicated eight times. We found no effects of seed leachate on germination of the fifteen forbs despite large differences in seed mass and germination rates among species. These results suggest that seed leachate does not suppress germination of native species. However, native species may be suppressed by leachate derived from leaf and stem tissue, a hypothesis that we are currently testing. Although it appears that *L. cuneata* seed leachate does not affect the seeds of other species, the chemically dependent, negative density-dependence detected in the field and in the lab may be a mechanism to reduce sibling competition.

Monica O'Hanlon*, William Hendry
Biological Sciences

Histological Analysis of Disrupted Proteomics During Initiation and Promotion Stages of Estrogen Dependent Uterine Cancer

Treatment of hamsters on the day of birth with the synthetic estrogen and prototypical endocrine disruptor, diethylstilbestrol (DES), results in a 100% incidence of uterine hyperplasia / dysplasia in adulthood and a large proportion of the disrupted organs progress to cancer (endometrial adenocarcinoma). Extensive histomorphological investigation of this pathological phenomenon established that, in accordance with the classic two-stage model of carcinogenesis, the neonatal DES exposure event directly and permanently disrupts the developing hamster uterus (initiation stage, IS) so that it responds abnormally when it is stimulated with the natural ovarian estrogen, estradiol (E_2), in adulthood (promotion stage, PS). Molecular elements involved in both stages of this phenomenon were first profiled by microarray and immunoblot analyses of total RNAs and proteins extracted from whole uteri. Our immunohistochemical analyses based on that profiling data generated the following findings:

- Progesterone Receptor: Nuclear staining in both epithelial and stromal cells up-regulated in IS but down-regulated in PS.
- E-Cadherin: Epithelial cell membrane staining up-regulated in both IS and PS.
- Insulin Receptor Substrate-1 (IRS-1): Nuclear staining in stromal cells up-regulated in IS.

- Specificity Protein 1 (Sp1): Epithelial and stromal cell nuclear staining down-regulated in PS.
- Signal Transducer and Activator of Transcription 5A (Stat5A): Cytoplasmic staining in epithelial cells up-regulated in IS.
- Tenascin: Stromal extracellular matrix staining up-regulated in IS (altered distribution in PS).

These results provide important new tissue/cell-specific clues about altered proteomics that selectively accompany the initiation vs. promotion stage of the neonatal DES-induced disruption/neoplasia process in the hamster uterus.

Jonathan Obrist*, Wan Yang
Geology

Petrographic Comparison and Contrast of 290–Million-Year-Old Fluvial and Deltaic

Microscopic petrography of fluvial and deltaic sandstones in the Oread Cyclothem, NE Oklahoma, links their characteristics to depositional environments. Texture and composition of 50 framework grains in each sandstone thin-section were used to calculate the mean, standard deviation, and skewness of grain size. Two fluvial sandstones are quartz arenites and contain minor rock fragments and no matrix, indicating super compositional maturity. The grains are fine, well sorted, rounded, and fine skewed (i.e. with excess finer grains), indicating super textural maturity. The supermaturities indicate that both arenites are recycled. The lower arenite in the basal channel fill is coarser, better sorted, less skewed, but less rounded than the upper arenite in the overlying point-bar deposit. The former was deposited near channel thalweg with higher energy; and its poor roundedness is caused by abundance of rock fragments. Four deltaic arenites in the Heebner and Elgin deltas are similar to the fluvial arenites in composition and texture, indicating the same source area. The medium-grained arenite in the upper Heebner is coarser than the fine-grained arenite in the lower Heebner, probably caused by deltaic progradation. The lower Elgin arenite contains slightly coarser grains than the upper arenite, probably caused by stronger wave reworking, as indicated by field evidence. Overall, both deltas are petrographically similar, although the Heebner was influenced by upwelling currents during sea-level high whereas the Elgin was wave-dominated during sea-level fall. This suggests that sedimentary processes controlling delta formation overwhelmed other processes. Last, the differences between the supermature deltaic and fluvial arenites are that the former contain less rock fragments and are more rounded, as a result of wave reworking and longer transport.

Nathan Ofsthun*, Gregory Houseman
Biological Sciences

The influence of seed-seed interactions on plant emergence

Plant colonization of new sites is often strongly dependent upon the seedling establishment stage. Recent field and laboratory studies have revealed that some species may release chemicals that influence seed germination. Consequently, the presence of seed from other species may alter the germination of a focal species depending on the density and composition of the seed pool. We tested this hypothesis in a field experiment in which we added either monospecific or heterospecific seed mixtures at three densities. Seeds of fifteen native prairie species were sown into a low diversity restored prairie in south-central Kansas. Emergence was quantified during three sample periods in late spring. We found that patterns of emergence varied among species with evidence of positive, negative or no relationship between seed density and emergence. Likewise emergence for some species varied between monospecific and heterospecific seed pools. Our results support the view that the identity and abundance of neighboring seeds influence patterns of emergence suggesting that species interactions may occur at the seed stage before resource competition occurs. Although our experiment cannot distinguish between direct interactions between seeds or indirect effects mediated by pathogens or seed predators, the results suggest interesting interactions occur at this key life stage.

Daniel Pankratz*, Doug English
Chemistry

Development of Biocompatible and PH Responsive Catatonic Vesicles for Drug Delivery

Our current research investigates a class of vesicles known in the literature as “catanionic” vesicles. Catanionic vesicles form from mixtures of cations and anions. They are distinctly different from phospholipid vesicles in that they form spontaneously from inexpensive single tailed surfactant molecules and are indefinitely stable over a range of pH and ionic strengths. The vesicle bilayers have a net charge that allows an electrostatic attraction between the vesicle and organic ions in solution, making our vesicles useful for applications such as molecular electrostatic sequestration. These vesicles can be functionalized with carbohydrates. The ability to sequester and carry drugs and the functionalization with biomolecules makes these materials interesting candidates as chemotherapy drug delivery systems. The current vesicle preparations are formed from mixes of cationic and anionic surfactants. A problem with cationic surfactants is that many of them are toxic. This poster describes development of new vesicle formulations using pyrdinium-based surfactants that are found in many pharmaceutical preparations with the aim of lowering the potential toxicity of catanionic preparations. Combining biocompatible cationic surfactants with titratable anionic surfactants will create less-toxic pH responsive vesicles.

Abigail Pastore*, F. Leland Russell
Biological Sciences

Effect of Above Ground Herbivory Upon Root Systems in *Lespedeza Capitata*

Insect herbivory has been shown to affect many parameters of plant performance above ground. However relatively little is known about how aboveground herbivory might affect the development of root systems due to the challenges associated with studying belowground processes. To examine this topic we grew the native Kansas legume, *Lespedeza capitata*, from seed in containers that were buried in sandy loam prairie at Wichita State University's Ninnescah Reserve. We treated plants either with a non-systemic insecticide, to reduce aboveground herbivory, or with water (ambient insect herbivory control) and carefully excavated the root systems in June, August and October during the 2009 growing season. For each plant we took measurements of aboveground herbivore damage, height, mass, basal diameter, root system length, root system mass, number of nodules and, morphology of the root systems. Analyses indicate that the insecticide treatment reduced leaf damage in June and August. We observed that aboveground insect herbivory had no significant effect on the length or mass of roots or the number of nodules the root system formed. However herbivory did reduce aboveground growth and therefore caused an increase in root/shoot ratio. This study provides a more complete view of how root systems of *L. capitata* develop over a growing season and, therefore, may provide useful information for comparisons with the invasive congener, *Lespedeza cuneata*.

Benjamin A Stukey*, Dr. David M. Eichhorn
Chemistry

Modeling Nickel Active Sites for Super Oxide Dismutase

Superoxide dismutases are a class of enzymes found in nature that assist the conversion of toxic superoxide (O_2^-) to molecular oxygen and hydrogen peroxide. Recently, a new superoxide dismutase, NiSOD, was discovered which has a nickel ion at its active site – the place where the conversion occurs. Our research aims to make a synthetic compound which reproduces the immediate surroundings of the nickel ion in SOD in order to understand how this conversion is facilitated. In NiSOD, the nickel is bound to two nitrogen atoms and two sulfur atoms. Building on previous work in our group, we are synthesizing a nickel complex with two nitrogen atoms, one sulfur atom, and one chlorine atom bound to nickel. Reactions are then carried out to replace the chlorine with a second sulfur to produce a “model” of the NiSOD active site. The resulting models are characterized by various spectroscopic and structural methods to confirm their relevance to the NiSOD active site.

Julianne Burton*, Brigitte Roussel
French

Calligrammes Composed in French After the Nineteenth Century Poet Apoll

After studying Guillaume Apollinaire's amazing Calligrammes, which were short poems in the shape of the ideas they represented, we learned to write our own in the French 223 literature survey course (Fall 2009). We had to come up with a simple theme, object, idea, fantasy that could be summarized in one visual representation. We could write one or several sentences in French, but we could not make them linear. They had to be a figure, or a design. Once we got our idea, we knew what we wanted to do, but the hardest part was to make the French words fit the shape of the design we had come up with. It took several tries to realize the perfect shaped poem and to make it look like what the words were about. It felt like we were really creating a reality that our imagination directed, even though we used our brain power as well to calculate the fitting of the words with the design. When we presented our "Calligrammes", we wrote them on the chalkboards, and it was very pretty to see all those images made of words. There were parts of the image we thought we would never be able to design with words, but in the end, every single part of the image was made with words and looked like a picture. We left the classroom without erasing them.

Jamie Greene*, Victoria Shaffer
Psychology

The Effect of Short-Term Incentives on Investment Behavior

One important goal of a 401(k) plan is to help individuals financially prepare for retirement. Research conducted by Richard H. Thaler and Shlomo Benartzi has shown that it is difficult to compute the savings rate required for the future. Furthermore, even if the proper savings rate is known, households may lack the self-control required to adequately prepare. We are interested in 401(k) retirement plans with short-term incentives that might encourage people to contribute and have begun research in conjunction with the Social Security Administration Office of Retirement Policy. Participants were asked to read an informative section about 401(k) plans and answer questions to ensure that they understood how 401(k) retirement plans work. Next, participants were asked to evaluate separate 401(k) retirement plans that differ in incentive structure. Plan 1 was the matching 401(k) plan, where the employer matches the retirement contributions of the employee up to 5% of the employee's income. Plan 2 was a points 401(k) plan, where the employer awards prize points based on the percent contributed. Lastly, the third plan was a combination of the points and matching plans, which is lowered to 4% income contribution matching along with receiving prize points. After reviewing each retirement plan, participants rated satisfaction with the plan and indicated the percentage of income they would contribute. Data collection is ongoing.

Jillian Jacobelli*, Victoria Shaffer
Psychology

Eating Behaviors and Attitudes

An exploratory study at a Midwestern university examined the relationships between disordered eating behaviors and attitudes and psychological flexibility, experiential avoidance, perceptions of social pressure, and personal control beliefs. 117 female college students were assessed through MRinterview, an online study software, using the Eating Disorder Evaluation Questionnaire (EDE-Q), the Acceptance and Action Questionnaire, Second edition (AAQ-II), the Belief in Personal Control Scale (BPCS), Philadelphia Mindfulness Scale (PHLMS) and the Perceived Sociocultural Pressure Scale. Correlations were found among psychological flexibility, avoidance and control beliefs and disordered eating behaviors and/or attitudes, especially with respect to eating concern. Linear regression analysis found that social pressure accounted for 32% of the variance in eating concern behavior while psychological inflexibility accounted for an additional 4%. Implications of these findings and future research are discussed.

Taylor Martin*, Chris Yates*, Jeff Pulaski
Graphic Design

Contemporary Letterpress Printing

As a group over the last year, we have been working to expand our knowledge of the process called letterpress printing. The process involves the printing of movable type, either carved from wood or cast in metal. We have been working with the medium as a means to strengthen our design skills, and as a creative outlet which allows us to create a wide range of personal work. Last September, with the help of our Faculty mentor Jeff Pulaski, we sent out a call for entries for a contemporary letterpress show. The show was designed to showcase our work, and the work of others who are pushing the limits of traditional printing. We received a strong response from four colleges across the United States, as well as a response from a book-making school in London, England. Each school agreed to supply pieces for the show, and to display the work in their own town. In addition we collected pieces for a traveling exhibition of letterpress work, to be shown at universities in the United States. We held our opening reception at Diver Studio in Wichita on Friday March 26th. We brought a printing press and held demonstrations of the printing process. over 300 Viewers had the opportunity to interact with the press, and examine the type we used to create the work. We have been using the process to educate ourselves and others, and to have a creative outlet.

Devin Naccarato*, Brigitte Roussel
French

Sonnets in the Renaissance Style Written in French

After studying French Renaissance sonnets, we learned to write our own in the French 223 literature survey course (Fall 2009). We had to come up with a theme, some vocabulary to convey the story line, and 4 stanzas in structured form, each having 10 syllables per line : 2 quatrains or 4 line-stanzas, and 2 tercets or three-line stanzas. We first wrote a draft of the storyline in French prose; then we re-wrote the story in verse with as close to ten syllables as possible per line; then we played with the words, changing them without changing the meaning of the overall story, in order to create rhymes in a strict pattern: ABBA ABBA CCD EED. That was the hardest part, especially in French. When it was too hard to have perfect rhymes, we privileged the content of the story and the number of syllables over the rhymes. It was better to have a coherent story and a poetic rhythm than rhymes without the pertinent content. When we were done, we felt we had accomplished something really new and fun that only a small circle of “initiés”(initiated ones) could do. It felt really special because it helped us discover our potential and push back the limits of what we thought we could not do at first.

Kari Nilsen*, Rhonda Lewis-Moss
Psychology

Risk Reduction: Self-Efficacy And Condom Use In African American Adolescents

The purpose of this research is to examine the affect of self efficacy concerning condoms on self-reported condom use of African American adolescents living in the Midwest. A survey was administered to 462 African American youth aged 11- 14. Fifty-six percent of the participants were female (n = 250). Forty-seven percent (n = 217) of the participants were in the ninth grade, 28% (n = 129) were in the tenth grade, and 25% (n = 116) were in the eleventh or twelfth grade. Forty percent (n = 194) of the participants reported attending previous HIV/AIDS prevention classes, and 46% (n = 166) reported that they anticipated having sex in the following year. Due to previous research it is expected that results will indicate that intent to use condoms is directly related to self-efficacy, and that females had higher self-efficacy scores than males. Limitations as well as future research will also be discussed.

Fallon Parks*, Kyoung Lee
Social Work

Gender Differences: Bereavement, Social Support, and Depression of Assisted Living Elders

Purpose: The older generation is often overlooked by society today. It is easy to forget about their quality of life. This study was important to find out how that population can best be served. Also, the “Baby-boomers” are getting to the age where they are to enter assisted living facilities. Because of this, even more of the society is to be affected by this topic. The purpose of the study is to understand the gender differences in regards to bereavement, social support, and depression in older adult assisted living residents. **Methods:** This research is a cross sectional survey study conducted by face-to-face interviews utilizing a quantitative method. Non-probability and purposive sampling methods were used to generate a total of 100 participants aged 65 and over living in assisted living facilities. Those interviewed were interviewed in March at six assisted living facilities in Wichita, Kansas. A structured survey questionnaire was used to measure the dependent variable, which was gender differences. The questionnaire included multiple scales to measure the independent variables, which were bereavement, social support and depression. **Results:** This study showed significant differences between gender for social support, depression, and bereavement of older adult assisted living residents. The study showed that women received more social support than men. Women were more likely to be depressed than men. Loss of a loved one will affect women more adversely than men. Overall the study showed that women were more affected by depression, bereavement and social support than men. **Implications:** The significance of this study is to help contribute to the improvement of the overall health of older adults in assisted living facilities. Assisted living facilities and caseworkers need to offer adequate counseling and therapist for the older adults to help them empower their overall well-being.