

*PROCEEDINGS OF THE ELEVENTH ANNUAL
UNIVERSITY OF WISCONSIN-EAU CLAIRE
STUDENT RESEARCH DAY*



April 28, 2003

**Center of Excellence for Faculty and Undergraduate
Student Research Collaboration**

Office of Research & Sponsored Programs

PROCEEDINGS OF THE ELEVENTH ANNUAL UNIVERSITY OF WISCONSIN-EAU CLAIRE STUDENT RESEARCH DAY

The UW-Eau Claire Student Research Day is supported by funds from the UW-Eau Claire Foundation. Grants supporting Faculty/Student Research Collaborations are made possible through funds provided by the Undergraduate Initiative of the University of Wisconsin System, the UW-Eau Claire Foundation, and the University of Wisconsin-Eau Claire, and undergraduate student differential tuition.

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Schedule of Events

Monday April 28, 2003

<i>Time</i>	<i>Event</i>	<i>Location</i>
7:00 - 9:30 am	Students Set Up Posters	Council Fire Room
9:00 - 9:30 am	Judges Orientation	Alumni Room
9:30 am - 3:00 pm	Judging	Council Fire Room
Noon - 1:00 pm	Judges Luncheon	Alumni Room
Noon - 5:00 pm	Poster Session Open to University Community	Council Fire Room
4:00 - 5:00 pm	Student Research Day Reception	Tamarack Room
4:30 pm	Announcement of UWEC Student Research Day Awards and Kell Container Corporation Collaborative Research Scholarship	Tamarack Room
by 6:00 pm	Students Remove Posters	Council Fire Room

Art

Kristi Barrows (32)

Faculty Advisor/Collaborator: **Stephen Katrosits**

Encaustic: Contemporary Use of an Ancient Medium

In studio painting classes, there has been, on occasion, student interest in the "archaic" technique of encaustic, pigment in wax. This has been problematic for several reasons. Powdered pigments are mixed into melted wax. These pigments are ground extremely fine and some are heavy metals, such as cadmiums and chromiums, an inhalation hazard without suitable filters. Now there are color blocks available with concentrated color in a wax medium eliminating this hazard. Previously, students would have used readily available and inexpensive materials such as tempera paint and paraffin wax. This is extremely fragile and impermanent. There was also very little available for melting wax, so students often used electric fry pans and hotplates - less than ideal. Electric palettes for encaustic are now available and replaces now the "homemade" tools used previously. The equipment, tools, pigment, and mediums now are much improved and safe to use. Also with the greater departmental restrictions on the use of solvents in the studio, the options students have in terms of paints are limited. I would be interested in exploring the feasibility of encaustic for advanced students in the studio. The unique properties of encaustic result from the use of wax as the medium. Encaustics set up quickly and multiple layers may be achieved in a short time. The layers can be very translucent and quite luminous. Other collage materials may be completely embedded in the wax layers. The surface may be scraped, incised, and remelted. The dull sheen of wax is beautiful and the surface may be further buffed and polished. The color of beeswax is suggestive of skin and the tactile quality of wax is sensual. There are a wide range of approaches to be explored and utilized for expressive purposes.

Mary LaVenture, Kristopher Martin and Darrell Walters (167)

Faculty Advisor/Collaborator: **Steve Terwilliger**

Fares (Formerly Movin' on Up-The Making of a Student Movie)

Art students LaVenture, Martin, and Walters are involved in producing a movie from a play written by fellow University of Wisconsin-Eau Claire student, Maurice Urusquieta. Under the direction of faculty mentor Steve Terwilliger, the students have brainstormed, produced, directed, taped, and edited this production. Recent illustration graduate, Michael Jacobsen, produced professional storyboards for the movie while Liam Robinson and Mike Olson wrote and produced original scores for the soundtrack. Other art and theater students with expertise in needed areas have also been involved in the project. All actors are either current students or have recently graduated from this university. The student collaborators have researched information about directors and viewed master cinematography in order to gain more knowledge for this project. They have also documented the entire process through video clips, photographs, notes, and summaries developed along the way. This project will allow other students to become more familiar with the area of fine art film and movie production.

Mary LaVenture (33)

Faculty Advisor/Collaborator: **Deirdre Monk**

Form

Photography has the ability to borrow and transform objects and their meanings. This collaborative project using black and white and color photography examines knowledge and experience focused toward the human form as subject matter. This project involves research of other photographers and traditional artists to gain an understanding of the process in which a sense of intimacy is developed between the viewer and the subject. This body of work observes the dynamic and graphical qualities inherent in the human form. Research of the psychological and physiological processes involved in human interaction and perception were also considered in the production of this work. This photographic project was produced strictly using a large format camera with 4x5 negatives creating the ability to produce striking, large images.

American Indian Studies/History

Aubrey Ashenbrenner, John Barabe, Duane Countryman, Andy Cusack, Nick Dudycha, Beth Erdey, Jon Gaulke, Clint Gunkel, Greta Halverson, Kent Hranicka, Beth Kongsjord, Chris McDonald, Megan McDonough, Dan Powers, Steve Scheurman, Melanie Schroeder, Bill Shatswell, Juli Stone, Trent Thielke, Barbara Blackdeer-McKenzie and Odawa White (10)

Faculty Advisor/Collaborator: **James Oberly**

Studies in the History of the St. Croix Ojibwe, 1854-1936

The St. Croix Band of Lake Superior Chippewa Indians were prominent history-makers in the first half of the nineteenth century. The Band's leaders were represented at the Treaties of 1837 and 1842, and the Band's villages and populations were carefully recorded by the U.S. Indian Agent in 1843. In the terrible winter of 1850-51, the Band's members made the journey to Sandy Lake, Minnesota, at the insistence of the United States, and many perished there in that diseased and starving place. All of this is recorded in documents at UW-Eau Claire. But what happened to the St. Croix Band after 1851? They did not sign the 1854 treaty ceding the North Shore of Lake Superior, and in turn, reserving key lands in Wisconsin for tribal homelands. From 1851 through the 1930s, the St. Croix were known as the "Lost Band" because they did not have a reservation, nor any apparent relations with the United States. This collection of student essays and reproduced historical documents is an attempt to fill in some of the missing past from written sources about the Lost Band between the years 1854-1936. The students worked in consultation with tribal officials of the St. Croix Band and, upon completion, the students presented their research findings to the Band as a gift.

English

Kathleen McCleary (30)

Faculty Advisor/Collaborator: **Dennis Jerz**

Interactive Fiction: A Literature Review and Analysis

Because interactive fiction is a relatively new format and hasn't settled into a narrative genre, I feel it is important to define a category for it, determined by the relationship between the user, author, and the medium in which it is presented. In order to understand how interactive fiction works, I reviewed many others' works and wrote my own interactive fiction game. While researching the limited amount of literature on interactive fiction, I read Lara Whelan's essay "Narrative and Reader Interaction: Revisiting the Question of Genre in Interactive Fiction." Although Whelan made many points, the examples she based them on were unrepresentative of the interactive fiction category. Therefore, many of her conclusions, most importantly the one stating that interactive fiction is a form of traditional fiction, are weak. After choosing more representative works and analyzing how the different aspects of interactive fiction come together, I have found it to be a new genre, different from all of the narrative genres preceding it.

Eliza Mbughuni (170)

Faculty Advisor/Collaborator: **David Jones**

Celebrity, Urban Black Masculinity, and the Life of Sly Stone

This presentation is part of a faculty/student research project on Sly and the Family Stone, an integrated group of popular musicians founded by Sylvester Stewart, reaching their peak of national popularity during the 60s and 70s. The goals of the project have been to compile findings on three related topics: 1) the musical career of Sly and the Family Stone; 2) radical cultural activism and black/white relations during the late 1960s and early 1970s, especially in the San Francisco Bay Area; 3) the ties between the life of Sylvester Stewart and representations of black masculinity, popular music, and celebrity in recent American culture. We will use slides, video and background information to explore these themes. The presentation combines information from literary studies, cultural studies, and music history. The researchers are interested in how urban street life has influenced representations of black masculinity in popular culture. With this focus, we will show how mass mediated texts and images influence collective behavior and action. Studying popular music figures such as Sylvester Stewart is especially useful for showing how imaginary and real dimensions of urban street life enter into the public perceptions of African American males as a larger group.

Foreign Languages

Emily Dieringer (13)

Faculty Advisor/Collaborator: **Johannes Strohschänk**

The Schlegelmilch Family's Impact and Connections to Social, Ethnic, and Community Life in Eau Claire

Eau Claire has been the center of northwest Wisconsin for over 150 years attracting people, commerce, and industry of all kinds. Herman Schlegelmilch and his family arrived to Eau Claire from Germany in 1860. He built the first brick home there in 1871. The Schlegelmilch-McDaniel House remains as a reminder of the historic downtown. Research and documentation about this brick home

holds keys not only to how the city grew over time, but also to the German family that lived there. Information about the Schlegelmilch family and other German immigrants compiled from newspaper articles, local history books, and special collections containing diaries, certificates, and keepsakes details the implementation of their German background into the churches and schools they attended, the public offices they held, and societies they were involved in. This information is presented in a research paper and will be used by the Chippewa Valley Museum to educate visitors on the importance and significance of the German influence in Wisconsin.

Kara Ziehl (14)

Faculty Advisor/Collaborator: **Johannes Strohschänk**
Mapping German Settlement in Wisconsin 1850-1860

The topic of this presentation will be "Mapping German Settlement in Wisconsin 1850-1860." Kara Ziehl, currently a senior German major at UWEC, took part in this research project under Dr. Johannes Strohschänk as a Summer Research Experience for Undergraduates. This project deals with emigration from Germany to Wisconsin from 1850-1860. It focuses on identifying the regions of origin of the German settlers, i.e., if they came from Prussia, Bavaria, Hessen, or another region. This project has great relevancy in light of the fact that many Wisconsinites claim German heritage.

Geography and Anthropology

Jonathan Kramer (31)

Faculty Advisor/Collaborator: **Timothy Bawden**
A Historical Spatial Analysis of the Brewing Industry in the Midwest

The U.S. brewing industry has been historically concentrated in the Midwest. In the decades following the Civil War the number of breweries in this region totaled over one thousand, accounting for half of the country's total. The pattern at that time was largely related to cultural patterns, particularly German settlement, and most of the breweries were small and had just a local market. As the industry evolved and technology changed, large brewers emerged, operating on a national scale, and small scale brewing declined. The rise of micro-breweries and brewpubs throughout the country during the past two decades, however, demonstrates another chapter in the industry's changing geography. This poster will examine the changing spatial pattern of the brewing industry in the Midwest over the period 1890 to the present. It will identify factors associated with these spatial changes at a local, region, and national scale. The data come from a variety of secondary and primary sources including histories, trade publications, and online listings.

Geography and Anthropology/American Indian Studies

Barbara Featherly, Jedediah Durni and Robert Passow (9)

Faculty Advisor/Collaborator: **James Oberly**
Historical Movement of the Mohican Nation

Dr. James Oberly has a manuscript under consideration at the University of Nebraska Press titled "Many Trails of the Mohican Nation: History and Culture." The book is a collection of essays of scholars and Stockbridge-Munsee (Mohican) Indian tribal members on the 400 years of recorded history and culture of the tribe. This history is well described in the text of the book, but when talking about physical locations, maps are needed to have a complete manuscript to show the "Many Trails" of the Mohicans. Through a faculty-student research collaboration grant involving a history professor, a geography professor, and three undergraduate geography students, maps were created for the text. The maps created were of current locations and past locations, along with the tribal movements around the eastern United States and Canada. The professors provided the necessary data and the students applied their cartographic skills along with the Mohican Nation data to create complete maps of the Mohican movement along with the text from the book containing the history and culture that will end in a final published manuscript.

History

Josh Bourget (15)

Faculty Advisor/Collaborator: **Matthew Waters**
The Impact of Greek Colonization and Carthaginian Rivalry on the Evolution of the Roman Navy

From 750-500 B.C.E. the Greek city-states embarked on an aggressive colonization effort as means of relieving increasing population pressures as well as securing new resources. The colonization movement brought Greece into contact with the early Romans in Italy. These encounters are seen as the catalyst for the development and evolution of the Roman navy, along with the First (264-241 B.C.E.) and Second (219-201 B.C.E.) Punic Wars against the Carthaginians from North Africa. This research focuses on the interaction between the Greek colonies in the Western Mediterranean, Rome, and Carthage, and how these interactions with the Roman people

influenced Roman naval technology. This contact led to a change in ship construction and design, as well as naval tactics. This research is based on primary source materials such as Polybius, Thucydides, and Herodotus and augmented with secondary sources which trace cultural transmission and naval developments into Rome.

Jeremy Byers (173)

Faculty Advisor/Collaborator: **Selika Ducksworth-Lawton** and **Patricia Quinn**

Bosnia - Peacekeeping and the American Soldier

Increasingly taxing for the United States' military, peacekeeping operations require sustained troop efforts, unit costs, and ever evolving technological equipment. This project examines the detrimental effects of peacekeeping operations on the United States Army, utilizing the experiences of the 2nd Armored Cavalry Regiment's deployment in Bosnia (1997-1998). The study also illustrates the difficulties presented by operations under the UN, NATO, and American foreign policy. In addition, the study highlights some of the problems (such as retention, degraded ability, declining morale, and force protection) the American Army faces as it struggles to maintain a balance between war fighting tasks and the increasing demands of peacekeeping.

Jeremy Byers (172)

Faculty Advisor/Collaborator: **Patricia Quinn**

Legions of Steel: Small Unit, Combined Arms Tactics on the Eastern Front During World War Two

The Eastern Front played the crucial role in the Allies' defeat of Germany in World War Two. Combined arms units played the key role in both the offensive and defensive actions of the Russian and the German armies. Combined arms units evolved from small, loosely organized groups of men and equipment into strong, well-trained units that were the most capable units either belligerent fielded. This study examines the tactics employed by the combined arms units of the primary combatants in their offensive and defensive roles as they both struggled to overcome their adversary and win the war. The tactics used on the Eastern Front continue to influence United States Army doctrine (via the German experience) sixty years after the conclusion of the war. For their part, the Russians still maintain tactics and doctrine gleaned from their experiences in World War Two and these tactics have found their way (via Soviet equipment and advisers) to countries such as Iraq, China, and North Korea. Thus understanding the evolution of the combined arms strategies and tactics holds contemporary as well as historical significance.

History/American Indian Studies

Loyola Jack (8)

Faculty Advisor/Collaborator: **James Oberly** and **Larry Martin**

The Legal Career of Attorney Larry Leventhal

Over the past three decades, Attorney Leventhal built a specialized practice in federal Indian law. For that entire period, he has served as the outside counsel to the Lac Courte Oreilles Band of Lake Superior Chippewas. In that capacity, he worked on some important, indeed landmark, legal cases including the following: Lac Courte Oreilles Band vs. Federal Power Commission (1971); State of Wisconsin vs. Baker (1976); Lac Courte Oreilles Band vs. Voight (1974); and Four Feathers Partners vs. Babbitt (1998). In addition to working as outside counsel to the Lac Courte Oreilles Band, Attorney Leventhal worked as one of the members of the Wounded Knee Legal Defense Committee (WKLDC) after the 1973 siege by federal authorities of the American Indian Movement (AIM) occupation of the church-site at Wounded Knee, South Dakota. He has also represented individual members of AIM over the past three decades. Finally, Attorney Leventhal has worked with Minneapolis-area Native groups on such projects as the Heart of the Earth Indian School. Senior AIS Major Loyola Jack has identified some of the key legal documents that the Law Office generated, or received, in working on these matters. Further, Ms. Jack has arranged for the reproduction and transfer of the Leventhal Archive to UWEC so that students and faculty can have access to these important historical documents.

History/Foreign Languages

Carli Sanders (171)

Faculty Advisor/Collaborator: **Teresa Sanislo** and **Jefford Vahlbusch**

German National Identity and Cultural Aesthetic Through Third Reich

This project was designed so that as a student I could learn about the research process and the faculty mentors I collaborated with encouraged me to use primary and secondary sources while investigating the subjects involved in the research process. The research I did was on the German national identity and culture, and the various components that were important factors in the development of a national identity. I examined the historical background of the literary and artistic values that were revered by the Germans, and applied

that to the use of culturally accepted images and literature by the Nazi regime. Key concepts I will be presenting for the poster day are the connection with nature the Germans had until industrialization took place, the preexisting attitudes toward other ethnicities and religions, socioeconomic factors that designated the social hierarchy in Germany society, and the consequences of the Nazi regime's use of "Germanic" cultural images and literature.

Music and Theater Arts

Nichole Ray and Rolaine Bearhart (11)

Faculty Advisor/Collaborator: **Gretchen Peters**

Native American Musical Culture in the College Curriculum: Bridging Two Worlds

The goal of this project was to work toward developing a curriculum that is accurate, culturally appropriate, and meaningful to Native and non-Native Students. While a large body of scholarly literature concerning Native American musical culture exists, much of it is from a non-Native and academic perspective. The project's goal was to create a curriculum based primarily on personal accounts and Native perspectives. The research was done during the 2002 powwow season. To respect the longstanding oral tradition of native people, the data was collected via interviews with drums (a group of singers/drummers who play together on one drum) dancers, vendors, and spectators. My involvement in the project focused on the inter-dependence of the drums, dancers, their regalia, vendors, and spectators and how each contributes to the powwow circle. In my presentation I will address from an urban Indian perspective how powwows and dancers have evolved while powwow music has for the most part, remained steadfastly unchanged.

Mauricio Urusquieta (168)

Faculty Advisor/Collaborator: **Terry Allen**

Those That Remain/Los Que Quedan: A Study In Bi-Lingual Playwriting

The project's focus is on bi-lingual playwriting. The plan was to be able to adapt an English script to Spanish and not lose the theme of the play. That is to say that it was not a literal translation, but an adaptation from one culture to another.

Hannah Zimmer (169)

Faculty Advisor/Collaborator: **Gretchen Peters**

Teaching Native American Culture from a non-Native Perspective: An Exercise in Humility

This research project began out of the recognition of the difficulties of teaching Native American musical culture as an outsider. The goal of this project was to work toward developing a curriculum that is both accurate and meaningful to Native and non-Native students, with consideration given to curricula in both the public school and college settings. While a large body of scholarly literature concerning Native American musical culture exists, much of it from a non-Native perspective, the goal was to create a curriculum based primarily on personal accounts and perspectives. We chose to attend Ho-Chunk, Ojibwa, Menominee, and Lakota powwows in the western Wisconsin region where we observed powwow culture, conducted personal interviews, and held informal conversations. Some of the questions included the reasons Native Americans attend powwows, etiquette and procedures surrounding powwows, values instilled at powwows, issues of change in powwow culture, education and transmission of powwow music and dance, and gender roles at the powwow. After acquiring accounts and ideas, the challenge of our study shifted to how educators can effectively and practically bring these ideas into the classroom.

Nursing Systems

Alice Knutson, Karolyn Tamke, Jennifer Platt and Tara Bowlds (12)

Faculty Advisor/Collaborator: **Lois Taft** and **Mary Ellen Stolder**

Nursing History: Memories of World War II and Nursing in the 1940s

OBJECTIVE: The objective of this qualitative research project was to examine oral histories of nurses in World War II and nursing in the 1940s based on personal experiences of retired nurses. **DESIGN:** Naturalistic inquiry guided data collection and analysis. Qualitative interview data and evaluative data were collected from older adult informants. **METHODS:** Research team members interviewed sixteen retired nurses. An open-ended interview guide was used to collect data about experiences from both the military and the home front. Evaluation data from research participants was collected after each interview was completed. All interviews were tape recorded and transcribed. The research team is currently developing case reports from each transcript summarizing the informant's oral history. Case reports will be shared with the informants to verify the accuracy of the data. Inductive analysis will be used to identify themes and report data from multiple informants under thematic categories. Themes suggested by a previous oral history project include education in the Cadet Nurse Corps, coping with the nursing shortage, confronting the polio epidemic in the U.S., and caring for soldiers with traumatic injuries, infectious disease, and combat fatigue.

Adult Health Nursing

Melyssa Heintz (103)

Faculty Advisor/Collaborator: **Rosemary Jadack**

Social Networks: A Comparison of Risk Behaviors in Women and Their Best Friends

Data shows increasing levels of risk behaviors in women, including smoking, alcohol/drug use, and unprotected sexual activity, putting them at risk for negative health outcomes. Researchers have described the importance of peer influence in the decision to engage in risk behaviors, especially those peers belonging to core social groups. Social network analysis focuses on patterns of risk behaviors among close friends, relatives, and acquaintances, and examines how group membership and social norms interrelate to foster or prevent risk behavior. The purpose of this study is to describe the social network characteristics of women and to explore the relationship between risk-taking of respondents and their best friends. A convenience sample of 100 women is being recruited from a rural health department in Western Wisconsin. To date, 40 persons have been interviewed; their mean age is 22 years (SD=.4). Respondents were surveyed about social network characteristics, types of support provided by members of the network, and risk behaviors (drug/alcohol use, sexual risk behaviors, tobacco use, helmet/seat belt non-use, inactivity). Results showed that persons had an average of 7 persons in their social network. The networks had a mean density of .78 (a measure of connectedness between network members), and a mean multiplexity of 2.9 (a measure of the number of social support types provided by network members). Of the sample to date, 87% of the respondents were able to identify a best friend. Paired t-tests showed that best friends provide more types of support activities and were more connected to the overall networks. These results provide nurses with important data that can be used to develop interventions that prevent risk behaviors in individuals and those in their social networks.

Communication and Journalism

Wendy Krautkramer (164)

Faculty Advisor/Collaborator: **Edward Frederick**

Survey Research of Eau Claire County Voters

We administered a telephone survey to 475 Eau Claire County voters about their voting intentions and their attitudes toward the possibility of the U.S. invading Iraq on its own. Several decades of voting research indicates that women are less likely to support the invasion than men. Likewise, the literature indicates women are less likely to vote, but more likely to vote Democratic than men. This study tests whether these gender differences hold for Eau Claire County voters. The study found that the largest number of voters opposed the U.S. invading Iraq on its own and that women were more likely to oppose the invasion than men. Consistent with the literature, more women respondents than men said they did not intend to vote and that they intended to vote Democratic.

Lara Luepke and Jill Steinke (121)

Faculty Advisor/Collaborator: **Terrence Chmielewski and Mike Dorsher**

A Systematic Readership Survey of The Spectator

We conducted the first campuswide, systematic readership study of The Spectator student newspaper, using a random sample survey and a parallel self-selection sample on the Web. A total of 215 people completed the survey from the sample of 1,000 people randomly selected out of UW-Eau Claire's 12,000 e-mail account holders. Another 979 people accepted an open invitation to take the survey online. Both surveys were conducted at zero cost, other than the researchers' and participants' time. The results from both surveys are parallel on all 32 of the close-ended questions. The major findings include: 65.3% rate the overall quality of The Spectator as "good" or "very good," including 75.9% of those who read it at least once a week; 77.3% say its ethics are "good" or "very good"; 18.9% say The Spectator is better now than when they came to UW-Eau Claire, compared to 7.3% who say it's worse now; while 33.5% have bought something based on a Spectator display ad and 27.6% have followed up on something they saw in a Spectator classified ad.

Counseling Services/Psychology

Leigh Durbahn, Kristen Channing and Megan E. Green (102)

Faculty Advisor/Collaborator: **P. J. Kennedy and Allen Keniston**

Analysis of College Drinking Patterns and Their Consequences on Students at the University of Wisconsin-Eau Claire

This study will distribute an online survey to a random sample of 2000 full-time undergraduate students at the University of Wisconsin-Eau Claire. Online information will consist of the following instruments: a cover letter, an online version of the College Alcohol

Inventory (CAI), and an online version of the revised Alcohol and Consequences survey. Analyzed results will provide descriptive statistics highlighting alcohol use patterns on campus and inferential analysis will allow us to identify whether or not alcohol consequences increase as drinking severity increases.

Kim Masters, Melissa Marsh and Sarah Lonsdale (100)

Faculty Advisor/Collaborator: **P. J. Kennedy and Allen Keniston**

Eating Disorders on Campus: Incidence Rates and Correlates

The incidence rate and correlates of eating disorders on a university campus were investigated. A random sample of 2,000 female undergraduate students ("32%") were asked to complete a web survey containing the Eating Attitudes Test (EAT-26) and a brief demographic questionnaire. Data was automatically and anonymously coded in a database. The results of this study were used to assess the prevalence of abnormal eating behaviors and attitudes, provide a baseline to evaluate future prevention programs, and assess the reliability of the EAT-26 for the student population. In addition, correlation between EAT-26 score, body mass index, and demographic variables allowed researchers to identify high-risk populations in order to develop secondary, rather than primary, prevention programs which have proved more effective. Our findings will be used to inform students and their families, faculty, staff, and the surrounding community to the problem of eating disorders. Findings will supplement the few previous studies done with female college students and precede similar studies on other campuses.

Economics

David Fuller (118)

Faculty Advisor/Collaborator: **David Schaffer**

Women in the U.S. Labor Market: Discrimination, Wages and Employment

The status of women in the U.S. labor market changed significantly between 1971 and 2001. By 2002, a much larger fraction of women chose to find paid work outside of their home. Even married women with young children (ages 0-12) - the women that most often choose full-time unpaid household production - were more likely than not in 2002 to have at least some paid work outside of their home. As more women have entered the labor force, many employers have had to adjust their hiring and pay practices. It is clear in the U.S. data from 1971, that labor market discrimination against women was fairly widespread at that time. This discrimination took several different forms including paying lower wages for a woman than for a man in the same position, limiting the advancement opportunities for women, and segregating women into specific jobs which were usually filled by women and which paid lower wages than other "comparable" jobs filled by men. Using Current Population Survey data collected by the Census Bureau over the last 30 years along with a variety of graphical and statistical techniques, we analyze the relative importance of these different discriminatory processes for both 1971 and for 2001.

Juna Miluka (117)

Faculty Advisor/Collaborator: **Thomas Kemp**

Technology, Learning, Strategic Transactions, and Institutional Change

The object of this study is to study recent literature on learning and human cognition in order to better determine how and why people make economic decisions. Within the economics literature there has been significant concern over the lack of realism applied to the economic agent. This work seeks to provide the groundwork for future work on economic agency by summarizing work from several other academic disciplines. Toward this end use is made of existing theories of cognition in economics, ethics, philosophy, and psychology as well as the faculty member's previous research on the economist John Commons, a pioneer in this field

Geography and Anthropology

Emily Alford and Nicole Degner (137)

Faculty Advisor/Collaborator: **J. Brady Foust**

The Religious Landscape of French Louisiana

The purpose of this research project is to consider a primary defining element of the ethnic cultural region commonly known as "French Louisiana" or Acadiana. All regions are a composite of numerous variables that, when taken together, make up a coherent and unique whole. The essential idea of a formal or "uniform" region is an area within which variable X is found within the boundaries, but not outside them. The regional boundary, therefore, is drawn where the occurrence(s) of X drops below some particular level. A region can only be defined by contrasting it with the surrounding area. This study will contrast the differences in religion between Acadiana and the surrounding area to determine whether an acceptably precise boundary can be seen using this variable set. Data from both Religious

Congregations and Membership in the United States by Dale E. Jones and direct field observation will be used to consider the underlying hypothesis that Catholicism is an acceptable variable for defining a regional boundary. We will examine the growth of religion in French Louisiana from the 1970's to the present. Also, we plan to examine the effects of Catholicism on the local culture and landscape.

Beverly Caldwell and Carrie Morrell (151)

Faculty Advisor/Collaborator: **Timothy Bawden**

The Companion Guide to the Cultural Map of Wisconsin: A Prototype

This poster displays a prototype of entries that will be included in an ongoing research effort to produce the Companion Guide to the Cultural Map of Wisconsin. The Cultural Map of Wisconsin was published in 1996 by the University of Wisconsin Press and drew national attention and acclaim. In general, the map cartographically displays 1200 important cultural places in the state with 400 text blocks and 800 icons. The icons are identified in an accompanying booklet, however, the description of the sites are vague. The companion guide will include greater coverage of these places along with graphics, such as maps, tables, and historic photographs. It will compliment the Cultural Map and serve as a cultural atlas on its own.

Lori Hafeman (149)

Faculty Advisor/Collaborator: **Lisa Theo**

Economic Disparity in Wisconsin's Northwoods

Economic dependence on tourism and recreation has created a dual economy in Wisconsin Northwoods. On one side are the long-term residents who have 1) lost higher paying jobs in the forest industry due to increased technological advances, 2) been forced to accept low paying jobs in the service-based tourism industry, and/or 3) been forced off of their land due to rising property values. On the other side are the retirees and vacationers who are buying permanent housing in the region. More often than not, their permanent residence is elsewhere. These differences may lead to significant class conflicts in the coming years. This project investigates socio-economic change in Wisconsin's Northwoods region. Regional patterns of education, employment, age structure, family structure, length of residence, and seasonal housing are compared against patterns found for the entire state of Wisconsin. Changes over time are analyzed as well. Using statistical analysis and GIS, this study hypothesizes that distinct patterns will become apparent for the Northwoods proving it to be a separate vernacular region.

Eric Halvorson and Kyle Oberg (138)

Faculty Advisor/Collaborator: **J. Brady Foust**

Defining Ethnic Cultural Regions: French Louisiana as Delimited by Patterns of Vernacular Architecture

The purpose of this research project is to consider a primary defining element of the ethnic cultural region commonly know as "French Louisiana" or Acadiana. All regions are a compage of numerous variables that, when taken together, make up a coherent and unique whole. The Capstone Seminar in the Department of Geography (GEOG401) is considering a number of primary elements, but this project will be focused on vernacular architecture. The essential idea of a formal or "uniform" region is an area within which Variable X is found within the boundaries, but not outside them. The regional boundary, therefore, is drawn where the occurrence(s) of X drops below some particular level. A region can only be defined by contrasting it with the surrounding area. This study will contrast the differences in vernacular architecture between Acadiana and the surrounding area to determine whether an acceptably precise boundary can be seen using this variable set. Data from secondary (for example, Census or other databases) sources will be combined with direct field observation. We will drive a series of planned transects across Acadiana as defined by other regional geographers. We will map the location of every residence along rural roads using Global Positioning System (GPS) technology. Each record will be scored yes/no for "Cajun elements" and the specific type of folk architecture noted where possible. Within urban areas, we map a set of sample areas to determine the number of Cajun folk elements as a percentage of total housing units. These counts will be used to test the underlying hypothesis that vernacular architecture is indeed an acceptable variable for defining a regional boundary. Secondary data sources past scholarly studies, as well as census housing data (value, date of construction). The final outcome of this project will be a poster presentation during the annual Student Research Day at UWEC.

William Hamilton Jr. and Peter Hitt (139)

Faculty Advisor/Collaborator: **J. Brady Foust**

Defining Ethnic Cultural Regions: French Louisiana as Delimited by Patterns of Toponyms and Surnames

The purpose of this research project is to consider a primary defining element of the ethnic cultural region commonly know as "French Louisiana" or Acadiana. All regions are a compage of numerous variables that, when taken together, make up a coherent and unique whole. The Capstone Seminar in the Department of Geography (GEOG401) is considering a number of primary elements, but this project will be focused on surnames and toponyms. The essential idea of a formal or "uniform" region is an area within which variable X (such as a given percentage of place names and/or surnames) is found within the boundaries, but not outside them. The regional

boundary, therefore, is drawn where the occurrence(s) of X drops below some particular level. A region can only be defined by contrasting it with the surrounding area. This study will contrast the differences in surnames and place names (toponyms) between Acadiana and the surrounding area to determine whether an acceptably precise boundary can be seen using these variables. Data from the USGS GNIS (toponyms) and electronic phone books along with direct field observation will be used to consider the underlying hypothesis that French surnames and regional toponyms are acceptable variables for defining a regional boundary. The final outcome of this project will be a poster presentation during the annual Student Research Day at UWEC.

Erin Heidtke (150)

Faculty Advisor/Collaborator: **Lisa Theo**

Migration Streams To and From Wisconsin's Northwoods

Wisconsin's Northwoods recreational area is experiencing rapid socio-economic changes. For long-term residents, low-paying seasonal employment is the norm, and property values are rising due to high demand for waterfront properties. For newer residents, the desire for expensive waterfront property and urban amenities increases the demand on both natural resources and government services. Community structure could be threatened and tremendous class conflicts could result as the disparity between the wealthy and the poor increases. Our research attempts to determine if the "new" residents to the Northwoods really are new or just returning migrants. This project uses newspaper obituary data in an effort to determine where out-migrants move to, where in-migrants come from, where the next generation migrates to, and what proportion of former residents end up returning in later years. Focusing on the Wisconsin Northwoods community of Tomahawk, (selected from previous research in the region) obituaries were retrieved from the Tomahawk Leader Newspaper for each year between 1940 and 2000 for the months of January and July. Data was compiled in a spreadsheet for statistical analysis and transferred to a GIS in order to determine the spatial patterns of migration streams to and from Wisconsin's Northwoods.

Jonathan Kramer (153)

Faculty Advisor/Collaborator: **Timothy Bawden**

ESPN's 2002 SportsNation Survey: Selected Maps and Analysis

In summer of 2002, ESPN conducted an online survey of more than 40,000 sports fans nationwide. They called this ESPN's SportsNation and published some of the survey results in their magazine in their August 5th 2002 issue. My thesis is comprised of using ESPN's data from the survey to create maps showing geographical patterns in the voting results. In a survey of almost thirty questions, the mapping possibilities are seemingly endless, leading to in-depth mapping analysis for specific sports related topics. This poster presentation will show a sample of sports maps derived from this data.

Jamey McIntosh (165)

Faculty Advisor/Collaborator: **Paul Kaldjian**

The Middle East and North Africa: Real or Reel Geography

This research project is designed to address popular understanding of the Middle East, its people and places. Our goal is to create a comprehensive, accurate and user friendly package of materials, ready for teachers with various degrees of knowledge of the Middle East, to insight the geographical imagination and be used in teaching high school and post-secondary students. This will come through the investigative research on the materials that are available for students to gain understanding of this region, through the surveying of students and teachers and their familiarity of the Middle Eastern culture. From the resources that are already available, the student will look for (misre)presentations of this culture and use these resources to bring a clearer picture of this unknown and unrecognized area of the world. The outcome to this research will be presented in a five step lesson plan manual for teachers and professors, as well as a compact disc depicting the arab world more clearly through images, interviews, and music. The lesson plans and compact disc will follow the fundamental questions of Animals and Environment, Resources and Revenues, Dress and Diet, Ethnicity and History, as well as Religion and its Practices.

Jennifer Peters (152)

Faculty Advisor/Collaborator: **Timothy Bawden**

A Spatial Analysis of Single Family Housing Costs and Values in Eau Claire, Wisconsin, 1980-2000

Changes in housing costs and values can tell a great deal about a geographic region. This poster focuses on the changes in new housing costs and reported values from the U.S. Census Bureau in the city of Eau Claire from 1980 to 2000. It shows the changing geographic patterns during this period and identifies factors associated with them. These factors include the age of housing, age structure of the population, proximity to schools and/or parks, access to major highways, distance from new commercial development, distance from the central business district (CBD), and proximity to land zoned for industry. The analysis was conducted at the block group level, which presented advantages over other units of analysis because the boundaries have changed very little from the 1980 Census to the 2000 Census.

Liz Meils and Jennifer Peters (128)

Faculty Advisor/Collaborator: **J. Brady Foust**

Defining Ethnic Cultural Regions: French Louisiana as Delimited by Patterns of Socio-economic and Demographic Elements

This research project considered primary defining elements of the ethnic cultural region commonly known as "French Louisiana" or Acadiana. This specific project is focused on socio-economic and demographic elements. The essential idea of a formal or "uniform" region is an area within which variable X is found within the boundaries, but not outside them. The regional boundary, therefore, is drawn where the occurrence(s) of X drops below some particular level. A region can only be defined by contrasting it with the surrounding area. This study contrasts differences in age, sex distribution, marital status, income, employment, ethnicity, education, religion and health between Acadiana and the surrounding area to determine whether an acceptably precise boundary can be drawn using these variables. Data from both secondary sources and direct field observation are used to consider the underlying hypothesis that socio-economic and demographic elements are acceptable variables for defining a regional boundary.

Elisabeth Schober (154)

Faculty Advisor/Collaborator: **Helaine Minkus**

The Social Networks of International Students at UWEC and UW-Stout

The research employed questionnaires, interviews and participant observation to study the social networks constructed by international students at UWEC. Although international students were found not to be as isolated from American students as previous research had suggested, international students are considerably more satisfied with their relations with other international students than with their relations with American students. Students spending one academic year at UWEC claimed a higher level of adjustment and more enjoyment of their educational and social experiences than students spending one semester or degree students.

Julie Sowka and Reid Wilson (127)

Faculty Advisor/Collaborator: **J. Brady Foust**

Defining Ethnic Cultural Regions: French Louisiana as Delimited by Patterns of Ethnic Identification

The purpose of this research project is to consider a primary defining element of the ethnic cultural region commonly known as "French Louisiana" or Acadiana. All regions are a compage of numerous variables that, when taken together, make up a coherent and unique whole. The definition of a formal or "uniform" region is an area in which variable X (such as ethnic identification above a given level) is found within the boundaries, but not outside them. The regional boundary, therefore, is drawn where the occurrence(s) of X drops below some particular level. A region can only be defined by contrasting it with the surrounding area. This study will contrast the differences between the self reported ethnicity of the population of Acadiana and those of the surrounding area to determine whether an acceptably precise boundary can be seen using this variable set. Self reported ethnicity data from the 1990 and 2000 Censuses along with direct field observation will be used to consider the underlying hypothesis that ethnic identification is an acceptable variable for defining a regional boundary. The conclusions of the research project will be aided by field work "French Louisiana" during the Spring Semester.

Human Development Center

Kristina Hall, Melissa Irwin and Krista Bowman (58)

Faculty Advisor/Collaborator: **William Frankenberger**

Abuse of Prescribed Stimulant Medication Among College Students

The increase in stimulant use is evinced by data from the United States Drug Enforcement Administration (DEA). According to DEA data, there was nearly a 900% increase in methylphenidate (Ritalin) production from 1990 to 2001. Further, from 1993 to 2001 the production of amphetamines (Dexedrine and later Adderall) increased by 5767%. In the face of these prodigious increases, there has been a dearth of research related to abuse of stimulant medications in general and on college campuses in particular. The purpose of this project was to investigate abuse of these medications at a Midwestern university. The project employed a questionnaire to (a) examine the extent to which prescribed stimulant medications for attention deficit/hyperactivity-disorder was abused by university students (b) gather information on the target effects associated with the use of stimulant medication (c) gather information on side effects associated with use of stimulant medication, and (d) assess the participants knowledge of issues associated with ADHD. Results of this study revealed that 16.8% of 179 surveyed males and 10.9% of 202 females reported using prescribed stimulant medication for non-medical purposes. Forty-four percent of surveyed students stated that they knew students who took stimulants for non-medical purposes. Results show that students at the university had knowledge about stimulant abuse and were aware of some side effects associated with the use of stimulant medication.

Political Science

Glory Koloen (116)

Faculty Advisor/Collaborator: **Geoffrey Peterson**

The Nature of the American Identity

The nature of the American national identity is a question that has received considerable attention since the founding of our country. What is American, and what differentiates America and Americans from all other nations and peoples of the world? National identity is usually based solely upon nationality, meaning Brits are British, French are from France, Scots are Scottish, and so on. This overly simplistic model of national identity fails miserably to allow for the characterization of Americans--who are by nature diverse. In an effort to tackle this conundrum, we have begun a process of comparison using the World Values Survey, which contains over 200 variables concerning values and beliefs from over 70 countries. The Survey, along with demographic data allows us to create a quantitative index of cohesiveness. This index, in effect, will assign a numerical value to each country that will represent that country's level of cohesiveness on a scale. Cohesiveness being similar values and beliefs, when crossed with demographic data. For instance, a country that is virtually all one ethnicity that subscribes to a similarly singular value system will be very cohesive, and will have a very identifiable identity--not only due to ethnicity, but to values. However, it is statistically plausible that a diverse state, such as the U.S. will abide by a fairly congruent system of values--this would demonstrate a diverse, yet cohesive state: a state with a definite identity, however shared by a diverse group. Using this scale of quantitative values, we will then be able to see where America fits in comparison to other countries. Thus, identifying the cohesiveness of the U.S. in comparison to other states, we are able to identify quantitatively whether a consistent American national identity exists.

Caitlin Mai Lee (148)

Faculty Advisor/Collaborator: **Steven Majstorovic**

Among the Hmong in America: Age Cohorts and Postmaterial/Postmodern Value Shifts

Using the World Values Survey structure, this research effort is to survey 100-150 older Hmongs who came to the U.S. after the Vietnam War, and 100-150 Hmongs who were either born in the U.S. or immigrated as young children. The study examines political and social value differences between older and younger Hmong cohorts in four American communities: Eau Claire, La Crosse, and Oshkosh in Wisconsin, and Minneapolis-St. Paul in Minnesota. Utilizing Inglehart's work as a point of departure (*Modernization and Postmodernization: Cultural, Economic, and Political Change in 43 Societies: 1997*), this survey will be a tool used to determine degrees of intergenerational value changes. Inglehart contends the process of modernization in advanced industrial societies created economic and physical security. Gradually shifting from a concern with material/modern values to postmaterial/postmodern values such as prioritizing of leisure time, environmental issues, women's rights, and more tolerant attitudes toward ethnic and sexual minorities. This paper suggests pre-existing postmaterial/postmodern value priorities, especially the environment, that are attributed to younger cohorts in postindustrial societies can also be observed in premodern/preindustrial traditional societies in which older Hmong cohorts spent their formative years, but the degree is less marked than the value shift observed in industrialized societies.

Craig Smith (126)

Faculty Advisor/Collaborator: **Rodd Freitag**

Money Rules: The 2002 Election for the Wisconsin Legislature

Wisconsin has long been known for its squeaky clean political tradition. Yet, some observers have questioned whether Wisconsin has strayed from its tradition and turned instead to a more partisan, money-driven style of politics. This research project addressed that broad question by examining specifically the role that money plays in Wisconsin elections for the legislature. Research on previous state elections in general and Wisconsin in particular points to increased costs for state campaigns, but less so for most races in Wisconsin, with the exception of some obviously expensive races that pull the mean increase significantly higher. In addition, while incumbents enjoy a great advantage in raising and spending campaign money across the states, that advantage is less striking in Wisconsin, giving challengers a better chance of winning at the polls. But the ability of challengers to raise funds that approach incumbent spending is declining as the number of candidates participating in the system of public funding drops. Analysis of the campaign finance reports from the 2002 legislative elections reveals that Wisconsin continues moving in the direction of less competitive elections, privately financed, and overwhelmingly dominated by incumbents.

Susan Zukowski (115)

Faculty Advisor/Collaborator: **Geoffrey Peterson**

Sentencing Disparity in the Midwest

An in-depth statistical analysis of the 1997 Survey of Inmates in State and Federal Correctional Facilities obtained through the Inter-University Consortium for Political and Social Research (ICPSR). The data will be utilized to ascertain whether or not demographics

such as income, education and race affect the sentence an individual convicted of a drug crime in the Midwest receives. In an attempt to exclude factors that could potentially lead to skewed results variables such as whether or not the individual plead guilty, had a judge or jury trial, the classification of drug crime, the type of drugs and the quantity of drugs will be reviewed to equalize the data at various levels. The variables will then be reviewed individually and in multiple combinations to better determine if any relationship exists.

Psychology

Elizabeth Alden-Anderson, Mikhail Koffarnus, Sarah Law, Ashton Robinson and Katherine Solberg (52)

Faculty Advisor/Collaborator: **Kevin Klatt**

Using Preference Assessments to Predict Engagement with Toys in Natural Settings for Typical Children

Various methods have been employed to determine individual preferences, including assessments where stimuli are presented alone (single-stimulus), with another stimulus (paired-stimulus), or with several other stimuli (multiple-stimulus with or without replacement). The purpose of this study is to determine whether preference assessments of toys are predictive of engagement with those toys in natural settings. The first part of the study will include conducting a preference assessment to determine individual preferences. The second part of the study will include direct observation and measurement of engagement with toys during free play times in natural settings.

Jennifer Bresser (56)

Faculty Advisor/Collaborator: **Marie (Mickey) Crothers**

Perceived Social Support and State/Trait Anxiety

A correlational study examines the relationship between social support and anxiety. Previous research has implied a connection between these two variables but there are issues concerning accurate measures. Particularly, perceived rather than received social support needs to be measured, and anxiety measures need to assess state as well as trait anxiety. Social support measures operate on assumptions; if the number of supportive individuals is measured, it is assumed that quality of adjustment correlates with the quantity of supportive individuals. A more precise measure of social support would examine the component functions of social support rather than its effects based on assumptions. One hundred seventy-six university students completed the Social Provisions Scale (Cutrona & Russell, 1987) which evaluates perceived social support using six provisions of social relationships. Concerning the variable of anxiety, the state-trait distinction is important because while states are changeable, traits are stable. Therefore, participants completed the Beck Anxiety Inventory (BAI) (Beck, 1990), which measures this distinction. Expected results are that higher scores on the Social Provisions Scale will be associated with lower scores on the BAI. In other words, it is predicted that individuals who perceive higher provisions of social support will experience lower levels of anxiety.

Stephanie Buchholtz (74)

Faculty Advisor/Collaborator: **Lori Bica**

Motivation and Retention of Information: The Use of PowerPoint Versus Stationary Transparencies

This study investigated the level of motivation and retention of information associated with using different teaching techniques. It was hypothesized that PowerPoint will create higher motivation for learning and greater retention of information. Participants included 200 students of various ages, class standings, and majors from UWEC. Participants were involved in a presentation on neural communication. An audiotape was used to deliver the content of the presentation to ensure that all participants received the same information. The researcher used PowerPoint to accompany the audiotape for 100 participants and stationary transparencies projected on an overhead for 100 participants. All participants were offered the opportunity to take notes on the presentation. Following the presentation, participants completed a motivation measure and a test on the presentation content. Participants were asked to provide their email address if they wanted their test results. It was hypothesized that PowerPoint will create higher motivation for learning as evidenced by length and accuracy of note taking, higher scores on the motivation measure, and choosing to provide an email address. Greater retention of information will be measured by participants' scores on the content test. Analysis of variance will be used to investigate group differences.

Laura Carter and Cassie Lubich (75)

Faculty Advisor/Collaborator: **Lori Bica and Blaine Peden**

The Influence of Movie and College Major on Perceptions of Tourette's Syndrome

The differences in views of Tourette's Syndrome in college students who had watched either a comedic movie featuring Tourette's Syndrome or an unrelated movie were investigated. The effects of college major were also examined. The dependent variables were the perceived seriousness of the disorder and perceived frequency of motor tics. The independent variables were college major and type of movie shown. It was hypothesized that because the comedic movie presented an inaccurate depiction of Tourette's, participants would

judge seriousness incorrectly. It was also hypothesized that participants whose major may include coursework in mental disorders (psychology/ pre-medicine/nursing) would judge Tourette's more accurately than all other majors. A 2 x 2 between-subjects ANOVA examined group differences. No significant interaction was found. There was one significant main effect: college major on perceived frequency of symptoms ($F=9.64, p<.05$). Participants in psychology/ pre-medicine/nursing ($M=3.80$) were significantly more likely than those in the other/undeclared major ($M=2.68$) to accurately estimate that motor tics are necessary to be diagnosed with Tourette's Syndrome. Findings suggest that short exposure to the media does not significantly alter perceptions of a mental disorder. In addition, college major can have an important effect on views of mental disorders.

Kelly Clark (76)

Faculty Advisor/Collaborator: **Lori Bica**

Gender Comparisons in Athlete Portrayal During the Olympics

Women's sport participation, media coverage, and viewing have increased over the past 30 years. The increased attention that is being paid to women's sports does not necessarily mean that women are portrayed the same way that men are in the media. As coverage may be related to motivation for sport involvement, it is important to investigate any potential biases or inequities that may exist. The first page of a Midwestern newspaper's Olympic Games section was analyzed for gender bias in number and prominence of articles, and number and portrayal of photographs. Specifically, it was hypothesized that during the Winter Olympics the newspaper would print more articles about male athletes than female athletes, the articles would be more prominently placed on the page, there would be more photographs of male athletes, and the photographs would portray active participation in the sport. Although means were in the expected direction, no significant differences were found between female and male athletes/teams in terms of the number or prominence of articles, or the number or portrayal of photographs. Findings suggest that gender bias in newspapers during the Olympics may not be common and that progress toward comparable coverage of Olympic athletes has been made.

Alexis Dorsey, Tamara Plath, Sena LaPean, Mark Bune, Krista Steinmetz, Zachary Wedge and Tony Schaffer (81)

Faculty Advisor/Collaborator: **Lori Bica** and **Marie (Mickey) Crothers**

Assessment of a Sexual Assault Prevention Pilot Program

A pilot program was designed to incorporate effective elements/recommendations from existing literature. Six residence hall wings (three female/three male) were selected for the program group ($N=63$). Six similar wings comprised the comparison group ($N=79$). Participants were given a pre-test to determine previous sexual experiences and behaviors that might be linked to sexual assault. The program group then participated in three prevention sessions, each lasting two hours. Some portions of the program were delivered to women and men together, and other portions were presented separately. Participants will be tested twice a year for a period of four years. The focus of this presentation will be a comparison (ANOVA) of the two groups at the first fall post-test. The researchers hypothesize that rates of victimization/perpetration since the pre-test (Koss and Oros's Sexual Experiences Scale) will be significantly lower for program participants. Also, the use of risk reduction behaviors is hypothesized to be significantly higher for program participants. An outcome measure was developed specifically for use in this study to investigate the extent to which participants used the risk reduction behaviors learned in the program. The design of this measure will be discussed. Participants' evaluative comments about program design will also be summarized.

Douglas Flashinski, Charles Burns, Jennifer Zahratka, Katie Umberger, Nicole Guite and Kristina Hall (37)

Faculty Advisor/Collaborator: **David Jewett**

Discrimination Between Levels of Acute Food Restriction: An Animal Model of "Hunger"?

Rats ($n=8$) were trained to discriminate between 2 hr and 22 hr food restriction. On average, rats learned the discrimination in 79.5 sessions (range 34 - 139 daily sessions). Following acquisition, intermediate levels of food deprivation were tested. Six and 12 hr food restriction produced effects similar to 2 hr food restriction. Fifteen and 18 hr food restriction produced intermediate effects. Later, time course tests were initiated. During these tests, the discriminative stimulus effects of 2 and 22 hr food deprivation were assessed every 30 minutes for 2 additional hours. Two hr restriction consistently produced 2 hr-appropriate responding under these conditions. When food was not available, 22 hr restriction resulted in 22-hr appropriate responding throughout the time course test. During other sessions involving 22 hr restriction rats were given access to food during part of the time course test. During the first trial 22 hr restriction produced 22-hr appropriate responding, as expected. Following the first trial, rats were given 25 min access to food, and the discriminative stimulus effects were reassessed. Under these conditions, rats responded exclusively toward the lever associated with 2 hr food restriction. The preliminary findings indicate the discrimination is sensitive to food consumption and food availability.

Douglas Flashinski (57)Faculty Advisor/Collaborator: **Marie (Mickey) Crothers***Mock Jurors' Perceptions of Schizophrenia, Depression, and the Insanity Plea as Mitigating Factors for Capital Murder Trials*

With growing awareness and prevalence of depression, a question arises about how Major Depressive Disorder (M.D.D.) is viewed and dealt with by jurors, considering insanity pleas. Jurors are instructed to treat mental illness and insanity pleas as mitigating factors in murder trials. Little research has investigated mental illness as a mitigating factor and most findings have actually suggested mental illness may be an aggravating factor (Slobogin, 2000). Further, most research has revealed that entering a plea of not guilty by reason of insanity (NGRI) is an aggravating factor (Finkel, Burke, & Chavez, 2000). While Schizophrenia has been researched as a mitigating factor in murder trials, no parallel studies have been conducted regarding M.D.D. The present study explored verdict selections and attitudes toward Paranoid Schizophrenia and M.D.D., each with or without an insanity plea. The results of this research describe mock jurors' perceptions of defendants with mental disorders and is the first analysis of M.D.D as a variable in this paradigm. With ongoing concern about the usefulness of the insanity defense and the NGRI verdict, these findings help clarify how mental illnesses and insanity pleas are examined and interpreted by mock jurors.

Becky Gardner (96)Faculty Advisor/Collaborator: **Steve Baumgardner and Lori Bica***Relationship Expectations in the Utilization of Pornographic Material*

Men and women have held different views about many things, including relationship roles and expectations. Is it realistic to expect one's significant other to never be associated with any pornographic material? What can affect these expectations? The researcher will administer a survey that asks participants what they expect from their significant other, or potential significant other, when dealing with the utilization of pornographic material. It will be assumed that most people find violent and child pornography inappropriate, so questions will not address either of these types of pornography. Also, gender and length of longest relationship will be requested. It is expected that males will have a high percentage of pornographic exposure, while females will report a suspected low percentage of pornographic exposure for males. Females will have a lower percentage of pornographic exposure, but males will report a lower yet suspected percentage of pornographic exposure for females. Males will find their utilization of pornographic material appropriate, but will not want their significant other to be associated with any material. Females will expect their partners not to be associated with pornographic material appropriate, but the high percentage of male association will show that the expectation is not realistic.

Dan Hehli, Mikhail Koffarnus, Thor Flosason, Mike Paul and Ryan Rowe (55)Faculty Advisor/Collaborator: **Greg Madden***Observing in Pigeons Under Concurrent Schedules of Reinforcement*

Twelve pigeons responded under concurrent VI VI schedules. In one condition, distinct schedule-correlated stimuli (colors) were presented to the response keys as is typical in the operant literature. In the other condition, the birds were required to make an observing response to obtain brief access to these stimuli. In the first condition, subjects generally conformed to Herrnstein's matching law. In the second condition, sensitivity to the schedule contingencies was systematically related to the frequency of observing behavior. Observing behavior, when optional, occurred at very low rates in most sessions.

Karin Koenig, Jared Choate and Adria Bye (54)Faculty Advisor/Collaborator: **Greg Madden***The Behavioral Economics of Relative Reinforcer Efficacy*

Traditional measures of relative reinforcer efficacy (i.e., progressive-ratio breakpoint, peak response rate, and preference) do not always demonstrate that one reinforcer type is consistently more effective than another. Bickel and Madden (1999) provided such data in human cigarette smokers and argued that behavioral economic measures (e.g., intensity and elasticity of demand) may provide a more complete picture. The present experiment further tests this hypothesis by examining pigeon's food consumption under single FR and RR schedules. Intensity and elasticity of demand measures derived from these data were then employed to determine which reinforcer would be more effective at a range of unit prices. These predictions were then tested under concurrent FR RR schedules. Data collected thus far, support the behavioral economic predictions. Time permitting, we will examine our ability to use behavioral economic measures to determine which reinforcer will have a higher progressive-ratio breakpoint.

Mikhail Koffarnus, Ilsa Hillert and Connie Cameron (35)

Faculty Advisor/Collaborator: **David Jewett**

Effects of Neuropeptide Y and Agouti-related Peptide on Behavior Maintained Under a FR40 Reinforcement Schedule

Many neurochemicals have been shown to increase eating in rats, however, few agents are effective in increasing both food intake and food motivation (as measured by an increase in food-reinforced lever pressing). The effects of acute food deprivation, neuropeptide Y (NPY), and Agouti-related peptide (AgRP) on operant behavior in food-satiated rats were tested. Six male Sprague-Dawley rats were trained to lever press under a Fixed Ratio 40 reinforcement schedule where 40 lever presses were required for each 45-mg food pellet delivery. Two-hour training sessions were conducted daily. When performances stabilized, rats were implanted with a cannula in the right lateral ventricle. Following recovery, rats were intracerebroventricularly injected with AgRP, NPY, and saline. The time course of these drugs was also evaluated by measuring responses in one-minute bins.

Carla Lagorio and Julie Slowiak (34)

Faculty Advisor/Collaborator: **Greg Madden**

Effects of Handling Costs on Pigeons' Preferences Between Equivalent Unit Prices

This is a systematic replication of the study conducted with human cigarette smokers by Madden, Bickel, & Jacobs (2000). Pigeons were given choices between two reinforcers available at the same unit price (response requirement/reinforcer magnitude) but with different reinforcer amounts (and corresponding response requirements). Like humans, pigeons tended to prefer the relatively smaller reinforcer (with its corresponding smaller response requirement) as the unit price of both alternatives increased. At low unit prices, pigeons were indifferent (as predicted by behavioral economics), while humans preferred the larger reinforcer at comparable prices. When a handling cost inherent in the human procedures was added to the pigeon study, the birds preferences mirrored those of humans.

Sarah Lonsdale, Kim Masters, Tim Lefever, Amy Beaudry, Heather Petersen, Douglas Flashinski and Charles Burns (36)

Faculty Advisor/Collaborator: **David Jewett**

Effects of NPY and Ghrelin on Behavior Maintained Under PR Reinforcement Schedules

Many neurochemicals have been shown to increase eating in rats, however, few agents are effective in increasing both food intake and food motivation (as measured by an increase in lever pressing to obtain food). Our laboratory began examining behavioral and pharmacological mechanisms related to food motivation. Rats were trained to lever press under progressive ratio (PR) reinforcement schedules where the response requirement increases following each food reinforcer delivered. Rats (n=7) responded under a PR 3 (three additional responses were required for each food reinforcer). Other rats (n=6) responded under PR 1 (one additional response was required for each food reinforcer) conditions. These experimental paradigms provide quantitative measures of food motivation. Food motivation-inducing effects and the orexigenic (feeding-inducing) effects of neuropeptide Y and ghrelin were assessed. This research may allow the identification of pharmacological and/or behavioral treatments that reduce not only eating behavior, but also food motivation and a desire to eat.

Ellie Mauel (59)

Faculty Advisor/Collaborator: **Kevin Klatt**

The Effects that Deprivation/Satiation and Preferences have on Teaching Children with Autism to Mand

One of the core deficits of autistic disorder is a pronounced delay in communication skills. Approximately half of children diagnosed with autism do not acquire verbal skills. Perhaps, then, the most important skill to teach children with autism is functional language. One type of functional language is manding, using language to obtain what one wants. Different environmental events may effect how quickly the child learns how to mand. Whether a child is deprived (has little access to an item) or satiated (has a lot of access to an item) may affect learning to mand. Furthermore, whether an item is high preferred or low preferred may also affect learning to mand. This study assesses how both deprivation/satiation and preferences affect learning to mand for a child with autism.

Ellie Mauel (53)

Faculty Advisor/Collaborator: **Greg Madden and Kevin Klatt**

Using Percentile Schedules to Teach Self-Control to Children with Attention Deficit Hyperactivity Disorder

Many children are currently diagnosed with attention deficit hyperactivity disorder (ADHD). One important component of ADHD is impulsivity, which has been defined as choosing the smaller immediate reinforcer over the larger delayed reinforcer (self-control). One way of teaching people, who are impulsive, self-control is to provide both the small reinforcer and large reinforcer immediately and then slowly increase the delay between the choice and the larger reinforcer (Mazur & Logue, 1978). There are no guidelines about how fast and at what increments the delay should increase in order to get the most effective results. Applying percentile schedules (Galbicka, 1994) to teaching self-control, may provide a systematic way to increase the delay. Percentile schedules are based on the

person's history of waiting for the larger reinforcer and would inform researcher when to and how much to increase the delay. Furthermore, percentile schedules would inform researchers what amount of time the delay should be decreased when the delay has been increased too fast. In this our first attempt with percentile schedules we are teaching children diagnosed with ADHD to wait longer periods to receive larger tangible rewards. Data were recorded by a computer so reliability is assured.

Catherine Micale (80)

Faculty Advisor/Collaborator: **Lori Bica**

Challenging Rape Myths Through the Use of Augmented Activation

The study investigated whether augmented activation (AA) is an effective technique for changing a rape myth (N=86 students). AA involves activating naïve conceptions, then directing people to attend to ideas that contradict their own. Participants responded to the Rape Myth Acceptance Scale; specifically, women falsely reporting rape for attention was the focus. Participants included: 1) control group - neutral reading, 2) rape facts only group - reading contained facts about victims' unwillingness to report, 3) activation group - reading challenged participants' false claims and included facts about victims' unwillingness to report. HYPOTHESES: (I) females will endorse the myth significantly less than males, (II) the activation group will endorse the myth significantly less than other groups. A t-test investigated gender differences in myth endorsement. A 2(gender) x 3(group) x 2(time) repeated measures ANOVA was conducted, with repeated measures on the time variable. No significant differences in female/male myth endorsement were found. Significant differences emerged between the activation group (M=2.81) and both the control (M=3.58) and rape facts only (M=3.44) groups in terms of myth endorsement. Findings have implications for sexual assault prevention programs. Presenting general information about rape myths is insufficient in changing beliefs. Myths must be activated and challenged.

Alyssa Moore and Karin Koenig (99)

Faculty Advisor/Collaborator: **Blaine Peden**

How College Students View Cheating Whether it is On-line or Off

PROBLEM/MAJOR PURPOSE: This study examines how college students view cheating or infidelity in real-life and in cyberspace. Although there is minimal research about cybersex or on perceptions of infidelity online, numerous studies of being unfaithful to your partner have shown that many people feel differently about cheating that entails an emotional attachment versus meaningless sex. This topic has practical significance because 23 percent of the U. S. husbands and 12 percent of U. S. wives have reported having had sex with someone else other than their spouse (Knox, Zusman, Kaluzny & Sturdivant, 2000). Our experiment employed a 2 (Real-life Scenario vs. Internet Scenario) x 2 (male participant vs. female participant) between subjects design and ratings of emotional attachment cheating and sexual intercourse cheating. PROCEDURE: We block randomized on the basis of the sex of the participants to make two different study groups. Subsequently, one group was given a real-life scenario and the other group was given an Internet scenario in two different rooms. After the researchers read the study instructions verbatim and collected the consent forms, the participants then completed a demographic survey, read the scenario and made their ratings. The researcher then collected the surveys and debriefed the participants in order to ensure that ethical standards were being met according to the APA standards reported by Shaughnessy, Zechmeister, and Zechmeister (2000). RESULTS: The results revealed a statistically significant main effect, such that participants taking the Internet Survey were not as likely to rate the sexual intercourse question as cheating as much as the participants taking the real-life Survey.

Lisa Nackers (166)

Faculty Advisor/Collaborator: **Catya von Karolyi**

Susceptibility to Visual Illusions: Are There Gender Differences?

A vast body of research presents contradictory findings of whether there are gender differences in visual spatial abilities. Whereas some studies report no gender differences in performance, others report either that males outperform females or that females outperform males depending on the type of visual spatial task. Although research on gender differences in susceptibility to visual illusions is limited, here too, contradictory results emerge. Numerous studies find females more susceptible to illusions, but others find no such gender differences. In order to clarify the relationship between gender and susceptibility to visual illusions, and to test the hypothesis that females are more susceptible to them, a systematic investigation was undertaken. As part of a larger study of visual spatial abilities, male and female undergraduate college students were given a computer-based task that included two forms of visual illusion: apparent size (Muller-Lyer, Vertical-horizontal, and Ponzo illusions) and apparent bend (Orbison, and two variants of the Hering illusion). For each illusion, participants were presented a series of figures progressing from an image in which the illusion was strong to one in which there was no illusion. Participants indicated by a key press when the illusion seemed to recede or emerge. Results are discussed.

Jessica Pinch and Tesa Zimmerman (98)

Faculty Advisor/Collaborator: **Blaine Peden**

Perceptions of Marital Name Choices: Sex Differences or Similarities?

This study replicated others in that it tested existing attitudes regarding traditional and non-traditional name changes upon marriage. Marriage traditionally results in a name change for the female partner (e.g., woman replaces surname with man's); even though other name change options (e.g., woman retains surname or man alters surname) are available to both partners. Our study examines how female and male college students perceive female and male marriage partners who make various non-traditional name choices. There are practical reasons for further research regarding name choice options at the time of marriage. One practical reason is a growing awareness among young adults about the issues of marital name choices. Discussions about these issues have gained prominence in the popular press (e.g., Goodman, 2001) and on numerous web sites. A second practical reason is that professionals will increasingly confront these issues in interactions with clients. Thus, the practical objective of the proposed research is to sensitize both participants and future professionals to issues pertinent to matrimonial commitment and stability.

Julie Slowiak (77)

Faculty Advisor/Collaborator: **Marie (Mickey) Crothers**

Extraversion, Perceived Stress, Coping, and Social Support Networks in College Students

This project will extend the work of Brisette, Carver, and Scheier (2002) that examined the role of optimism in the development of social support networks, coping, and psychological adjustment of college students. This study will examine extraversion rather than optimism. Research by Amirkhan, Risinger and Swickert (1995) showed support for the relationship between extraversion and optimism, suggesting extraversion may be related to coping and social support in a similar way as optimism. This project seeks to answer three questions. One is whether a relationship exists between extraversion as the central variable and coping, social support, and perceived stress, respectively. Another is whether extraversion versus other personality characteristics associates with different coping resources for stress. A final question is whether there is a relationship between coping resources and social support networks. One hundred twenty first-year undergraduate students at UW-Eau Claire will be recruited to participate. Each will be given a questionnaire packet containing a demographic survey, the Myers-Briggs Type Indicator Form M, Perceived Stress Scale, Coping Resources Inventory, and Social Support Questionnaire. Data analyses will be computed using SPSS. Descriptive statistics on all scales will be calculated, along with Pearson's r correlations to assess significance of personality differences among dependent variables.

Tesa Zimmerman and Jessica Pinch (97)

Faculty Advisor/Collaborator: **Blaine Peden**

Marital Name Choice: Perceived Legality versus Desirability

This study looks to provide an explanation for the negative views towards non-traditional name changes existing in American Society. Approximately 125 female and male participants provided semantic differential ratings for perceived legality, desirability, and traditionalism of ten different name options for both female and male marriage partners. Results showed a bias towards non-traditional name options as being less desirable, and supported the cultural expectations toward a man's marital name choice.

Social Work/Psychology/Counseling/Nursing

Julia Bobbe, Andrea Boh and Rebecca Oppenheim (101)

Faculty Advisor/Collaborator: **Gloria Fennell, Marie (Mickey) Crothers, Katherine Schneider and Winifred Morse**

University Students' Responses to September 11th Terrorist Attacks and Campus Deaths

Researchers investigated UWEC students' responses, both immediate and current, to September 11th, student deaths, and personal losses, along with coping strategies used, and perceptions of the university services offered. Two thousand randomly selected students received an e-mail survey. 413 usable e-mail surveys were completed and 19 in-person interviews were conducted. Participants were over 70% female upperclassmen. Losses having the greatest impact were 9/11 (55%), unspecified personal loss (15%), and loss of a family member (11%). Immediately after the event, students experienced feelings that the event was not real. While females felt more horror and helplessness, males experienced poor concentration and detachment. Students reported a decrease in intensity of their reactions over time, but concluded that some feelings would continue through life. According to qualitative and quantitative data, the most common coping strategies used immediately after the event were watching the news and talking with others. Often students found university services to be available and helpful, especially news releases, religious services, and class discussion. Students generally thought the university dealt with events properly, but desired more discussions with faculty and friends. Overall, many students felt the event had changed them in both positive and negative ways.

Sociology

Jenee Jerome (120)

Faculty Advisor/Collaborator: **Melissa Bonstead-Bruns**

An Examination of Bias in College Recruitment Patterns at Public High Schools

Studies indicate that students from low socio-economic backgrounds are less likely to go to college than their wealthier counterparts. One possible explanation for this educational discrepancy may involve the recruitment practices of college admissions offices. This project is an examination of the relationship between college recruitment and the predominant socio-economic class of students attending public high schools. We will be distributing an original survey to both public high school guidance counselors and college admissions counselors. The surveys will provide data on the amount and kind of recruitment practices employed at low-income (Title I) high schools as compared with high schools serving a more economically stable student body.

William Mac Millan (119)

Faculty Advisor/Collaborator: **Jeff Erger**

They Suck! The Social Construction and Maintenance of Reputation in a Heavy Metal Subculture

This research tests a sociological theory of reputation by applying it to the generation and maintenance of reputation in a local heavy metal subculture. Gary Allen Fine's theory draws on elements of social exchange theory, symbolic interactionist theory, and theories of economics to develop a wide ranging theory of reputation where interpersonal communication (aka gossip) is the primary mechanism (Fine, 1996, 1977; Rosenow and Fine 1976). By investigating how personal and professional reputations are formed, changed and maintained, the central claims of Fine's theory are tested. Additionally, through qualitative research employing participant observation methods, the structure of the local "scene" is described. Given that heavy metal music is currently marginalized, investigation reveals how participants maintain positive individual identities as members of the stigmatized group, and how the group continues to function in light of external disinterest and ridicule (Hayden 1996).

Women's Studies/Psychology

Heather Rouillard (79)

Faculty Advisor/Collaborator: **Susan Turell**

Successful Women Today: A Retrospective Look at Mentoring During High School

This survey was conducted to better understand to whom successful women of today pay tribute during their High School years. The survey was mailed to 456 women in the Houston Area, whose names were provided by the Greater Houston Women's Foundation. Eighty-one women across several different career areas responded to the survey. The main area of interest of this study was the support and guidance they received from adults in their families, community, and high schools. The most influential people from High School were teachers (59%) followed by club advisors (21%). The main supporters from their family were their mother (63%) and father (69%). The most influential people in the community were Clergy or religious staff (46%). This study provides information on mentoring influences that these successful women had while they were in High School. These results can be used to encourage mentoring relationships for today's young women, and help in their leadership development.

Katie Rustleund (78)

Faculty Advisor/Collaborator: **Susan Turell**

An Examination of Services Provided for Same-Sex Relationship Abuses

Susan Turell (1999, 2000) conducted an ethnically diverse research study called "Power and Control Dynamics in Same-sex Relationships in Texas." Additional data gathered (N=760) provided an accurate depiction of the types and quality of domestic violence services available to gay men, lesbian, bisexual and transgendered people (LGBT). The current study furthers her research by analyzing legal, medical, shelter and psychological services sought and desired by this population. In addition, this research compared the helpfulness of services based on gender, sexual orientation, income, age and ethnicity. Differences were found for each subgroup for certain services. The implications of this research reveal the need to tailor medical, legal, shelter and psychological services for domestic violence to specific groups within the LGBT population.

Accounting and Finance

Erin Hyduke (163)

Faculty Advisor/Collaborator: **Mehdi Sheikholeslami**

The Impact of Intangible Assets on the Accuracy of Analysts' Earnings Forecasts

This study examines the relation between analysts' earnings forecasts and firms' intangible assets. It is assumed that firms with substantial intangible assets, most of which are not recognized in firms' financial statements, have more information asymmetry between managers and analysts and thus exhibit more inherent uncertainty about future earnings than do other firms. Accordingly, we hypothesize that analysts' earnings forecasts of internet firms tend to be less accurate than earnings forecasts of food processing firms. Test results support the hypothesis.

Adult Health Nursing

Jill Behnke, Bobbi Jo Thompson, Megan Wald, Stacy Miron and Kirsten Simonson (180)

Faculty Advisor/Collaborator: **Rita Sperstad**

Stories of Birth: Meaning Through Nursing Educational Reflective Practice

Lumby (1998) explains that stories are powerful, particularly to nurses, because "stories are a part of their practice... and they use such stories to inform the way in which they craft their practice" (p. 98). Diekelmann (1993) has suggested that as nursing education is transformed, storytelling has become recognized as narrative knowing. This student/faculty poster will summarize an interpretive reflective educational research project. The methods of storytelling and guided group reflection were used toward the goal of transforming nursing through reflective education. Students and faculty agreed to meet and share a story of nursing care during labor and birth from two different care settings. One birth story was from the hospital setting, while the second birth story was from an experience at a birthcenter in a cultural diverse setting. Names and identifying information of clients were not used. After the sharing of stories, the faculty member facilitated a process of critical reflection through the following levels: searching for meaning, making meaning, transforming meaning and sharing meaning (Lumby). Storytelling and reflection seminars were tape recorded and transcribed for analysis. Results of the reflective educational process and suggestions for transforming nursing will be summarized.

Jill Behnke, Bobbi Jo Thompson and Megan Wald (107)

Faculty Advisor/Collaborator: **Rita Sperstad**

Labor Support: An Evidenced-Based Nursing Project

This poster presentation summarizes a project of evidence-based practice in nursing by three senior nursing honors students. Labor support was identified as the overall clinical practice issue to be investigated, with specific application to each student's area of study in their honors academic work. Findings from a review of current literature on labor support suggest that benefits are evident to the mother and infant during labor, birth, and after birth; however factors, such as the increased use of technology, affect the behavior of labor support provided. Effects and benefits of labor support will be discussed in application to high-risk labor, postpartum depression, and cultural implications. A plan for utilization of the findings for change in nursing practice will be proposed. Evaluation of the change in nursing practice will also be discussed.

Lisa Hildebrand and Alana Sutter (132)

Faculty Advisor/Collaborator: **Cheryl Brandt**

Transcription and Analysis of Qualitative Data from a Study of Chronic Lung Disease Management

This project represents one aspect of the faculty mentor's larger research study titled "Description of the Self-Regulation Process Used by Persons with Chronic Lung Disease and Its Relationship to Health-Related Outcomes." Undergraduate research assistants Lisa Hildebrand and Alana Sutter transcribed the audio tapes of interviews with subjects with chronic lung disease. The interviews elicited information from the subjects as to how they use the process of self-regulation (defined as self-observation, self-judgment, and self-reaction) in the course of self-management of their lung disease. The research assistants also worked with the faculty mentor to begin the process of qualitative data analysis of the data transcripts using the Interpretive Description method of analysis as described by Thorne, Kirkham, and MacDonald-Emes (1997). Preliminary findings are described in this poster.

Erin Shane, Mary Hinz, Penny Every and DuWayne Shelley (131)

Faculty Advisor/Collaborator: **Joan Stehle Werner, Robin Beeman, Ruth Tanyi and Mary Richbourg**

Spiritual Well-Being, Psychosocial Adjustment to Illness, and Self-perceived Health Status in Community-dwelling Women with End-stage Renal Disease Receiving Hemodialysis Treatment: Phase II

End stage renal disease (ESRD) is a debilitating and progressive disease that affects thousands of women in America. The surviving women must adjust to many major physiological, psychosocial, and relational problems. In May 2002, Ruth Tanyi, graduate student (for her thesis) and Joan Werner (thesis advisor) conducted a study to investigate the role of spirituality as a resource for adjustment to illness in women with end stage renal disease. The purpose of the descriptive-correlational study was to examine the levels of and relationships among spiritual well-being, adjustment to illness, and self-perceived health status in community-dwelling women with end-stage renal disease receiving hemodialysis treatment using survey methodology. The sample was comprised of 65 community-dwelling women age 24 to 82 on hemodialysis. There were some very interesting and curious findings in this study. The purpose of the current project is to continue the study with Joan Werner, Robin Beeman, Ruth Tanyi, and Mary Richbourg as research mentors, with new student research collaborators, adding at least 40 more women to the sample size to help further clarify findings. Methodology for the continuing study will be the same as in phase one of the study, adding two new research sites, and one new tool, the Daily Spiritual Experiences Scale. The Psychosocial Adjustment to Illness Scale and the Spiritual Well-being Scale will continue to be used. Participants will complete instruments during dialysis.

Art/Communication Disorders

Mark Bune (113)

Faculty Advisor/Collaborator: **Sangram Majumdar and Lisa LaSalle**

Children's Illustrations for a Story Retelling Experiment

This project represents interdisciplinary effort (i.e. illustrators and a speech-language pathologist/psycholinguist team). The illustration student will create 35 color images to work alongside the text in the project. There will be five simple, seven-line stories. Faculty members will meet with the student throughout the semester to check progress and provide suggestions. The illustration student will experience a situation similar to what a professional illustrator might experience in working with an art director, working within a set of specific image and audience guidelines. Three to five year olds are the audience, and they will be asked to retell each of five simple, seven-line stories. Once the story retelling paradigm is ready for use with children, both those who stutter and those who are normally fluent, analysis of child narrative samples could be ready as early as April 2003.

Communication Disorders

Kelly Christenson, Krisha Hamblin, Jessica Lahti, Rebecca Nelson and Amanda Stanek (112)

Faculty Advisor/Collaborator: **Linda Carpenter**

Clinical Practice with Developmental Apraxia of Speech

The project examined the knowledge and current practice of speech-language pathologists with children who demonstrate developmental apraxia of speech (DAS). Survey questionnaires were sent to 500 randomly selected speech-language pathologists who work in the school and medical settings in Wisconsin. These participants were selected from the membership of the Wisconsin Speech-Language Pathology and Audiology Association. The results of this study will serve to increase awareness of current practices regarding DAS.

Communication and Journalism

Patricia Hamilton and Rachel Spande (158)

Faculty Advisor/Collaborator: **Terrence Chmielewski**

Monitoring Sacred Heart Hospital's "Healthcare 2004" Campaign

Sacred Heart Hospital initiated a television campaign in December 2000 to improve health care in the Chippewa Valley. That campaign, "Healthcare 2004," is a four-year program to enhance the image of Sacred Heart through publicizing its positive qualities and facilities. Students in two research classes at UW-Eau Claire conducted an image survey of Sacred Heart's primary and secondary service areas in March 2001 (Time 1). Results of that survey aided in modifying the campaign to reflect Sacred Heart's perceived strengths and desired image. Another survey was conducted in a third research class at the mid-point of the campaign, in March 2002 (Time 2). This research examines Time 1-Time 2 comparisons in Sacred Heart's image as a way of assessing the effectiveness of the campaign, and to provide information for further adaptation of the campaign. Results show that the campaign has been successful in modifying residents' impressions of Sacred Heart. Recommendations are made for modifying the campaign to ensure campaign success over the next two years.

English

Aaron Broege (92)

Faculty Advisor/Collaborator: **Ruth Cronje**

Evidence-Based Medicine in an Intercultural Context

In recent years there has been a paradigmatic shift in the way many Western health care professionals diagnose and treat patients. Computer technology has largely increased doctors', nurses', and even patients' access to the most current medical literature; however, with this increased access to information one confronts greater difficulties in knowing what studies to trust. David Sackett and others proffer Evidence-based medicine (EBM) as the most reliable system for making medical decisions. By systematically reviewing the most current research articles - paying close attention to study design and statistical validity of the study - doctors will, in theory, be able to improve patient outcomes. While this method of practicing medicine has been integrated to varying extents into Western medicine, adoption of this ideological system has been slow to filter through non-Western countries. Our study examines the efficacy of transcultural implementation of this novel approach to practicing medicine and many of the epistemological barriers to this process. With the assistance of the American International Health Alliance, we were able to explore the extent to which non-Western health care systems, specifically those of former Soviet Bloc countries, are understanding, accepting, and implementing evidence-based practice.

Leon Buck and Danielle Aanenson (91)

Faculty Advisor/Collaborator: **Ruth Cronje** and **August Rubrecht**

Popularizing Science: An Analysis of Stephen Jay Gould's Stylistic Techniques

Stephen Jay Gould, renowned paleontologist and science writer, claimed in an interview that "anything, even the most complex material, can be written for general audiences without any dumbing down." If Gould is right, his techniques can help teachers and students of scientific and technical communication make texts more readable and may help other scientists communicate important findings to ordinary citizens. By utilizing an analytical scheme (devised by Allen Gross et. al.), we aim to determine whether/how Gould modifies his writing for general audiences. Also, we adopt the cloze procedure as our guide to determining whether students find his general audience material significantly easier to read. All of this is overlaid with statistics in order to find significant differences and make conclusions.

Marnie Gamble Henderson (90)

Faculty Advisor/Collaborator: **Gloria Hochstein**

Analysis of Writing Assignments, Student Writing, and Instructor Responses in the Disciplines

Project WIND-EAU is a systematic effort to learn how faculty in all disciplines at the University of Wisconsin-Eau Claire (UWEC) assign, use, and evaluate writing in their courses. As part of a faculty/student undergraduate collaborative research grant, we analyzed 216 examples of graded student work from 17 faculty in 23 disciplines noting the types of writing responses elicited by various assignments as well as patterns in evaluation and marginal comments made by faculty. Textual analysis of graded student work included investigation of student writing literacies in logic and/or critical thought, mechanics and grammar, organization and structure, and research skills and proper documentation skills. Conclusions from the textual analysis and observation of graded student work indicate that faculty are putting great amounts of time and effort into evaluating and commenting on student writing. Faculty comments that have the greatest impact explain the strengths and weaknesses of the writing and suggest specifically how students could improve. Faculty want students to become good critical thinkers, to engage in thorough and meaningful research, to learn how to organize and develop their ideas effectively, and to apply the conventions of English grammar and usage accurately and creatively.

Family Health Nursing

Samantha Gueldenzopf and Kimberly Davids (130)

Faculty Advisor/Collaborator: **Susan Moch**

Hmong Youth and Parents Together

This is an action research project which was done in collaboration with youth and parents at the Hmong Mutual Assistance Association, undergraduate research assistants, two graduate nursing students, and one clinical course in the nursing program. The objectives for this project were: to identify the health needs of Hmong youth and parents, to identify whether women and girls and men and boys in the Hmong community want to relate in a more organized fashion, and to determine whether the Hmong Women's Circle model used by Kashia Moua in St. Paul, Minnesota would fit in this Eau Claire community. The significance of this project was to understand more about the health needs of youth and parents of the Hmong community. Research has shown that people of different cultures/races receive less quality health care in the United States. Through this action research project, we identified health needs and gained feedback about possible health interventions for youth and parents within the Eau Claire Hmong community. Hmong parents and youth participated in focus groups to discuss these topics. Interviews were also done to receive information about youth and parent needs. The process and results of this project are shared on this poster.

Leah Herstad, Alison Knudsvig and Angela Kolnik (160)

Faculty Advisor/Collaborator: **Karen Solheim**

Promoting Death with Dignity: AIDS in Rural Cambodia

This project, Death with Dignity in AIDS Patients in Cambodia, stemmed from the desire of the Dhammayietra Peacemakers Program to implement death with dignity into their care for individuals, families and communities affected by AIDS in rural Cambodia. As many as five hundred thousand Cambodians will be infected with AIDS by 2006. The Mongkol Borei district of Banteay Meanchey Province, identified as a high risk area of HIV/AIDS in Cambodia is where at least one hundred and twenty six deaths occurred at home during the year 2000 due to AIDS. The purpose of our project is to explore what it means to experience death with dignity through the review of literature as well as consultation with the Cambodian non-governmental organization to confirm our information, we hope to accumulate relevant information for them to utilize in their practice and care for patients. It is important to encourage death with dignity because it will help patients live as actively and satisfied as possible until death. While prevention programs are increasing, education for health care providers needs to expand as well, providing the country with dignified palliative care. This requested review of literature will guide the future experiences of not only those infected with HIV but also their families, care providers and communities.

Dianna Moll, Jennifer Greiber and Kathryn Forkrud (129)

Faculty Advisor/Collaborator: **Kathryn Hoehn Anderson**

Couple Interaction in Breast Cancer: Issues and Dynamics

Breast cancer is one of the most common malignancies among women in the United States. In the USA in 2002, 205,000 new BrCA cases were expected to be diagnosed (American Cancer Society, 2002) with approximately 40,000 women expected to die from BrCA. Couple relationship tension and the ongoing psychosocial morbidity of the spouse/partner during BrCA are found in both cross sectional and longitudinal studies (Lewis & Deal, 1995; Hilton, Crawford & Tarko, 2000; Weihs, Enright, Howe & Simmens, 1999). Northouse (2001) calls for further research to explore the reasons for couple responses to breast cancer. Twenty couples experiencing breast cancer were interviewed after diagnosis and 10 months later about their experience with breast cancer. A secondary analysis of the first interview couple data examined couple interaction on average five months after BrCA diagnosis to determine couple interaction characteristics that might have an influence on marital distress and marital satisfaction. This poster reports the issues of concern to the couples and also describes couple interaction dynamics during the breast cancer experience. Couple breast cancer issues included diagnosis, treatment, treatment effects, fear of recurrence, fear of death, support, coping, the health system, and financial concerns. Couple interaction issues included spouse support, understanding the spouse's view, communication, intimacy, couple coping, changing life, thinking of the future, and growing as a couple. Implications for research and practice based on the findings are presented.

Foreign Languages

Elizabeth Peters (114)

Faculty Advisor/Collaborator: **Kate Reynolds**

Development of Preposition Accuracy Through the Writing Process

This research study brings interlanguage theory (Selinker, 1972) to bear on the writing process, and investigated written assignments collected from the writing portfolio of an advanced ESL (English as a Second Language) student from Spain in a university-level academic writing course at a small liberal arts university. Written assignments were analyzed for preposition use via qualitative research methods, which revealed that student progress in preposition accuracy while writing was influenced by formal instruction of the writing process. Patterns emerged that were significant to current best practice in second language teaching, especially in regards to the procedures involved in implementing the writing process. This presentation will discuss interlanguage theory, research methodology, findings relevant to international students' preposition use in the writing process, connections to interlanguage theory, and pedagogical ramifications.

Geography and Anthropology

Sarah Buss and Adam Lange (162)

Faculty Advisor/Collaborator: **Paul Kaldjian**

Mapping Fast Food

Fast food restaurants have become increasingly popular across the United States (and the world) since their birth in the early 1940s. Fast food chains are implicated in globalization and economic development - their impacts on space, culture and the landscape are not uncontested. We examine the changes in the spatial distribution of fast food restaurant businesses across the United States in the context of changing national demographics in order to identify causes and consequences of change, human geographic trends, and regional variations.

Jonathan Kramer (161)Faculty Advisor/Collaborator: **Sean Hartnett***University of Wisconsin-Eau Claire Campus Safety*

This GPS project was designed to determine the level of security at the University of Wisconsin-Eau Claire. For this analysis, we chose to focus on two distinct variables: The lightpoles and the emergency phones on campus. Other factors can influence security measures, but lighting and availability of these specialized phones were excellent factors for our analysis. All data for this project was retrieved by the use of a Trimble Pro Differential GPS unit. We gathered data for the more than 300 lightpoles on campus, and the 20 emergency phones. We then proceeded to map the data over an aerial photograph of the area for better analysis. Maps of illumination coverage on campus were created, in addition to buffers of emergency phone distances. The results of these maps were then used to determine if more lighting is necessary on campus, and whether or not additional emergency phones are needed.

Health Care Administration**Wally Apland III (134)**Faculty Advisor/Collaborator: **Jennifer Johs-Artisensi***Effects of Resident Relocation*

This study has been initiated in order to identify an optimal method that will lead to the smooth transition of nursing home residents to different facilities and community placements across the state of Wisconsin. More specifically the long term goal of this project is to identify the most current practices for resident relocation in the state of Wisconsin and how those practices have impacted outcomes. We are currently searching and reviewing potential resources for the purpose of deciding which parameters are most relevant to survey and include in the study. This is currently and continuously being aided by collected literature which has initiated the initial framework for the investigation. Our next angle of attack is meeting with state officials to gain an official perspective, the interviewing of residents before, during and after the transition and the visiting of facility closings. Such outcomes we are searching for are smooth transitions for residents and family, indicators that tell of quality of life and quality of care/service, and information that would contribute towards changing legislation and policy. Thus this research would support how to avoid negative outcomes for residents such as harm, death, injury, depression, and regression.

Health Care Administration/Nursing Systems**Laura Weiss and Greg Meyer (133)**Faculty Advisor/Collaborator: **Doug Olson** and **Mary Zwygart-Stauffacher***A Survey of Directors of Nursing in Long-Term Care*

The goal of our research project, "A Survey of Directors of Nursing in Long-Term Care", is to gather information about the role of the Director of Nursing (DON) in long-term care. An instrument was created to measure or assess the present roles and responsibilities of this position. Long-term care facilities are extremely challenged with a seemingly endless list of pressures: changing consumer preferences, staffing shortages and financial constraints. With difficulties such as these, an excellent leadership team is needed for the nursing home. One of the key ingredients for this team is the DON. This role is in charge of the nursing department, responsible for delivering high quality care to residents. Over the years, the definition and role functions of the DON has become broader to include greater authority, responsibility and range of control. The survey developed for this study has been distributed to DON's in Wisconsin and Minnesota. The purpose of this presentation is to describe the development of this survey instrument. Rather than implying the new definition and roles of this position, our survey goes in-depth to describe what is going on inside the walls of a long-term care facility regarding the pivotal role of a Director of Nursing.

Management and Marketing**Martina Jorve and Jennifer Larson (108)**Faculty Advisor/Collaborator: **Robert Erffmeyer***An Investigation Into Improving Student Evaluation Response Rates Of Online Business Courses*

Anecdotal responses and standardized end-of-course evaluations from students completing on-line MBA coursework have indicated a generally favorable evaluation of course offerings. Whereas on-campus course evaluations typically involve faculty distribution and immediate collection, their online counterparts have a somewhat different twist. On-campus courses invoke a certain level of demand characteristics by the presence of faculty member not only giving class time but then waiting outside the classroom for completion of the instrument. These are not present in on-line courses. On-line students complete anonymous evaluations if and when (within limits) they want to. On-line course evaluation return rates for MBA online courses in 2002 were significantly less than their on-campus

counterparts. A total of 182 students, from 21 different on-line courses in the summer and fall 2002 terms were interviewed on the telephone by the researchers. Respondents insights on course evaluation response rates and several measures of course quality were collected. Suggestions for improving on-line course evaluation practices are offered.

Music and Theatre Arts

Alyson Hudock (109)

Faculty Advisor/Collaborator: **Toni Poll-Sorensen**

The Alexander Technique: Improving Children's Vocal Quality, Rhythmic Awareness, and General State of Attention

Current research on the Alexander Technique emphasizes how correct body alignment can improve a person's vocal quality, rhythmic awareness, and general state of attention. The Alexander Technique is a form of movement reeducation that emphasizes recognizing habitual holding patterns, reevaluating the idea of uprightness, and attending to personal perceptions of tension or stress. The Alexander Technique suggests alternative ways of using one's body to maximize efficiency through any number of activities. The activities that we chose for this study included elements of a third grade music curricula and explorations around the Alexander Technique. As teacher/researchers, we implemented Action Research through alternating periods of action and critical reflection to design, evaluate, and recreate experiences in the Alexander Technique. It was our objective, that through this intervention, the students would 1) improve the children's "use" 2) improve their vocal quality and rhythmic awareness and 3) develop calm and centered behavior. Analyses of the qualitative data lead us to numerous questions and conclusions regarding the outcomes of using the Alexander Technique in the music curricula. Quantitative data regarding this intervention was also collected from this study. Overall, the students saw the Alexander Technique as a positive experience.

Music and Theatre Arts/Biology

Alyson Hudock (110)

Faculty Advisor/Collaborator: **Toni Poll-Sorensen** and **Christy Carello**

The Alexander Technique: Efficiency in Human Movement

Current research on the Alexander Technique emphasizes how correct body alignment can improve a person's movement efficiency. The Alexander Technique is a form of movement reeducation that emphasizes recognizing habitual holding patterns, reevaluating the idea of uprightness, and attending to personal perceptions of tension or stress. The Alexander Technique suggests alternative ways of using one's body to maximize efficiency through any number of activities. This research project examined the effect of the Alexander Technique on walking efficiency. Four specific parameters of efficiency were measured. We investigated whether lessons in the Alexander Technique would 1) improve blood pressure 2) decrease metabolic cost 3) increase oxygen consumption and 4) decrease heart rate. Our results are leading us to believe that the use of the Alexander Technique can significantly decrease systolic blood pressure ($P < 0.5$) along with decreasing metabolic cost (approximately by 5%).

Music Therapy

Jacquelyn Petroni (111)

Faculty Advisor/Collaborator: **Lee Anna Rasar**

Assessment of Therapeutic Effects of Harp for Patients on Ventilator Support

Patients on the Ventilator Unit at Lakeside Nursing and Rehabilitation Center will engage in passive and active harp engagement. A baseline of each patient's blood pressure, pulse oximetry, and respiratory rate will be obtained and compared with measures of blood pressure, pulse oximetry, and respiratory rate before, during, and after passive and active harp engagement. Patients and staff at Lakeside will assess patients' emotional state, presenting mood, and mental outlook before and after each session of harp engagement. Individualized programs of harp engagement will be developed for each patient based on responses to the harp engagement. Comparisons between passive and active harp engagement responses as well as comparisons of measures prior to, during, and after each harp engagement session will be made by Music Therapy student Jacque Petroni in conjunction with two other students. Dr. Mark Lindsay, Lakeside staff, and university professor Lee Anna Rasar will assist in developing the research plan, completing IRB requirements, collating, analyzing, and presenting the data. Results from the study will present information about the results of passive and active harp playing on medical measures recorded for patients who are on ventilators, as well as implications for future research.

Nursing Systems

Leslie Bruss (136)

Faculty Advisor/Collaborator: **Cecilia Wendler**

Data Management: Maintaining Rigor for Qualitative Research in Progress

Recent history has shown the evolution of qualitative research, ultimately resulting in increased interest of these studies by many health care professionals. Over the years qualitative researchers have provided professionals with rich studies adhering to strict rigor and critical analysis techniques. However, skeptics of qualitative rigor still remain. The techniques used to achieve results in qualitative research deserve to be credited as universally as their quantitative counterparts. There are highly structured variables associated with maintaining rigor in qualitative research such as credibility, transferability, dependability, and confirmability (Lincoln & Gubba, 1985). The purpose of this presentation is to describe a standard approach to qualitative data analysis, attending to the standards of rigor (Lincoln & Gubba, 1985). An ongoing study, "Exemplars of Novice Tellington TTouch Practitioners: A Qualitative, Descriptive Study," provides examples to illuminate these processes. Implications for research are offered.

Mary Thelen, Ann Kabat and Elizabeth Remmers (135)

Faculty Advisor/Collaborator: **Cathy Cooper and Lois Taft**

Examining the Role of Technology in Learning: An Evaluation of On-line Clinical Conferencing

The use of instructional technology in academia continues to expand rapidly, requiring that faculty be open to new types of teaching and learning situations. Traditionally in nursing education, clinical conferences are conducted after students complete the clinical experience. Time, fatigue, as well as needing to debrief following the clinical experience, may contribute to students being less participative in clinical conferences. The purpose of this study was to examine the role of technology in learning. Specifically, two instructional methods of conducting clinical conferences for senior nursing students were compared: online versus face-to-face. Quantitative and qualitative data were collected from students and faculty in four clinical sections of a senior capstone nursing course. Mean scores for all 11 items on a Clinical Evaluation Tool were higher for students who conferenced online than for those participating in face-to-face conferences. Advantages identified included the opportunity for equal participation and flexibility. Barriers were also described. Findings suggest that students are able to successfully achieve the intended purpose of clinical conferences through the use of an online instructional technique. Ongoing research in the use of technology to enhance student learning is needed to support adopting new models that facilitate meeting student needs.

Social Work

Michelle Washebek, Yeng Yee Lor and Amy Welbourn (159)

Faculty Advisor/Collaborator: **Donald Mowry and Richard Ryberg**

Addressing the Digital Divide: Information Technology Integration and Nonprofit Agencies in the Information Age

The influx of information technology has created change in all aspects of society. For the nonprofit agency sector, the growing convergence of information delivery systems (e.g., broadcasting, computers, telephones, video) is making one of the primary roles of nonprofits, the role of information provider, a critical role that could lead to general improvements in the quality of life. However, nonprofit organizations, foundations, and local community groups have not kept pace with other sectors of society and face the growing danger of being on the wrong side of the digital divide. This research project was designed to determine the nature and extent of a digital divide among the nonprofit agencies in Wisconsin's Chippewa Valley. A comprehensive information technology survey to assess information technology utilization and integration was sent to 35 nonprofit social service agencies. This comprehensive assessment went beyond a simple count and assessment of hardware and software to include other critical components such as readiness of nonprofit staff to integrate technology, presence of initial and ongoing staff training and development, and the presence and adequacy of long-range plans for information technology use. The results may be used to maintain or enhance adequate information technology systems in nonprofit agencies.

Biology

Josh Bonis and Laura Radtke (179)

Faculty Advisor/Collaborator: **Jon Scales**

Interaction of EphA4 with Cadherin Adhesion Complexes Via a Carboxy-terminal PDZ Binding Motif

We propose to definitively identify the juxtamembrane region of cadherin as the region sufficient and necessary for recruitment of EphA4 to adherens junctions. Furthermore, we will further investigate the potential interaction of this cadherin domain with PDZ domain proteins which could serve to physically connect EphA4 and cadherin. We have recently shown the dependence of EphA4 function on its carboxy-terminal sequence which appears to serve as a binding motif for a PDZ domain protein. We hypothesize that a PDZ domain protein binds to both the C-terminus of EphA4 and the juxtamembrane domain of cadherin and links these two proteins into a functional complex at points of cell adhesion, i.e., adherens junctions. The arrangement of EphA4 together with cadherin at adherens junctions would permit localized stimulation of EphA4 catalytic activity to down-regulate the adhesive function of the adherens junction in a very localized manner resulting in subcellular responses to eph signaling. Such a mechanism could be used to permit compartmentalization, a developmental process in which eph RTKs, their ligands, ephrins and cadherin are known to be required.

Lindsay Bremer and David Prall (3)

Faculty Advisor/Collaborator: **Lloyd Turtinen**

Development of Quantitative ELISAs to Measure Cytokine Release from Monocytic Cells Exposed to Different Amphotericin B Formulations

Cost effective in-house enzyme linked immunosorbent assays (ELISA) were developed to quantify cytokines released from the monocytic cell line (THP-1) exposed to different amphotericin B formulations. The design included coating 96 well plates with streptavidin followed by binding with an optimal concentration of commercially available biotinylated anti-IL-6, anti-IL-8 or anti-TNF- α antibodies. Known amounts of purified IL-6, IL-8, TNF- α or samples containing unknown amounts of these cytokines were captured by the immobilized antibodies followed by detection with a peroxidase labelled antibody and the enzyme substrate tetramethylbenzidine. An Excel macro was designed to create a standard curve and convert the absorbance data obtained from an automated plate reader into picograms per ml. THP-1 cells were exposed for varying lengths of time and to various concentrations of each of four commercially available amphotericin B formulations (Fungizone, Amphotec, Abelcet and Ambisome), or lipopolysaccharide (LPS). Of the four drug formulations Fungizone and Amphotec induced the greatest release of cytokines but not as high as LPS induced cells. The levels of each cytokine are discussed with reference to known side effects of each drug.

Brian Brezinski and Kristin DeGroot (45)

Faculty Advisor/Collaborator: **Evan Weiher**

Patch- and Landscape-Level Effects on Bird Diversity in an Oak Savanna - Bottomland Hardwood Forest Mosaic

Local vegetation structure, habitat geometry, and the quality of the surrounding landscape can affect bird diversity, but rarely have all of these factors been simultaneously addressed. Furthermore, we know of no cases where structural equation modeling has been used to assess the independent effects of these factors. We mapped the main vegetation units in a 1200 ha mosaic of bottomland hardwood forest, oak forest, oak savanna, prairie, and shrub thicket and conducted four replicate breeding bird counts at 90 sampling points. Vegetation data included measurements of cover, structural complexity, composition, and diversity. We used GIS to determine patch geometry (area, area-perimeter ratio, distance to edge), and surrounding landscape context (surrounding habitat diversity at five scales). In general, standardized richness (species richness divided by the log of the number of detections) increased with vegetation cover and evenness, with bird abundance, and with landscape diversity. We used structural equation modeling to determine the independent effects of four latent variables on standardized richness: landscape diversity, patch geometry, local vegetation, and bird abundance. The final structural equation model explained 33% of the variation in standardized richness. Vegetation and bird abundance independently had twice the effect of landscape factors, while habitat geometry was not significant.

Michelle Clark (21)

Faculty Advisor/Collaborator: **Julie Anderson**

Isolation of Regulators of Oxidative Stress Induced Apoptosis in Yeast

Apoptosis or programmed cell death has been linked to the pathogenesis of many human diseases characterized by uncontrolled cell accumulations or loss including cancer, autoimmune diseases, neurodegenerative diseases, and AIDS. In addition, apoptosis may

contribute to the general decline of physiological function associated with aging. Some elements of the apoptotic pathway are conserved in yeast and animals and are therefore, part of a basic, evolutionarily old mechanism. Study of these mechanisms in yeast may be useful to trace the roots of apoptosis and solve some of the problems and apparent disagreements inherent in the current models of apoptosis. Research from a number of groups suggests that oxidative stress plays a major role in yeast apoptosis. The long-term goal of this project is to identify the genetic mechanism that connects the reactive oxidative stress signaling pathway to the apoptosis regulatory machinery in yeast. A genetic screen was designed to isolate yeast mutants dependent on an apoptosis inhibitor for survival under oxidative stress. The results of initial pilot experiments to test conditions for this genetic screen will be described.

Jimmy Gosse (19)

Faculty Advisor/Collaborator: **Sasha Showsh**

Gene Transfer in Bacillus subtilis via Tn916 Ori-T Recognition

Tn916 is able to disseminate resistance determinants by transfer of the element itself as well as by mobilizing other replicons found on plasmids. It has also been implicated in the transfer of chromosomal genes. The mobilization mechanism is still not completely understood and is the subject of intensive research. We are working to identify DNA segments on various plasmids including pUB110, pC194, and pE194 that are required for mobilization by Tn916. Fragments of the plasmids will be cloned into a vector and then introduced into *Bacillus subtilis*. Recombinant plasmids that transfer will be isolated for sequencing and identification of the inserts. The results gained from these experiments will guide the development of an experimental approach for finding similar Tn916 OriT-like sites in the chromosome of *B. subtilis*.

Laura Isaacson (4)

Faculty Advisor/Collaborator: **Rudy Buiser**

Use of a Synthetic Mutant Integrase Gene to Study the Potential of Inhibiting Nuclear Localization of the Protein

The viral genome can be integrated into a host chromosome through the activity of the enzyme HIV-1 integrase. This activity is essential if successful viral infection is to occur. We have identified a putative bipartite nuclear localization signal (NLS) in the HIV-1 integrase gene. We have mutated the suspected NLS in a synthetic integrase gene via oligonucleotide cassette mutagenesis. By fusing wild type and mutant integrase genes with green fluorescent protein, we will be able to follow the cellular localization of the wild type and mutant integrase. If the suspected bipartite sequence is a true NLS, the mutant integrase should remain in the cytoplasm. If nuclear localization of integrase can be blocked, then successful viral infection can be prevented by inhibiting the viral genome from integrating into the host chromosomes.

Tim Johnson (178)

Faculty Advisor/Collaborator: **Wilson Taylor**

Single Grain Analysis of the Lower Devonian Spore Cymbosporites echinatus Using Light and Electron Microscopy

A thorough modern analysis of plant spore wall ultrastructure involves light microscopy (LM) as well as both scanning electron microscopy (SEM) and transmission electron microscopy (TEM). The specimens of interest range in size from 25-75 μ m (1000 μ m per mm) and are removed from rock samples in mixed assemblages (many types of spores together). Traditional processing of these assemblages for TEM involves bulk embedment (bypassing LM and SEM) in epoxy and sectioning - a destructive process - that renders LM and SEM analysis impossible. This limits the certainty of observations made on a single species of spore since different individuals of a given species must necessarily be studied with different processes (LM/SEM vs. TEM). The only alternative is to choose and manipulate single grains using LM, examination using SEM and then embedment of the same spore for subsequent preparation for TEM. Spores identified as *Cymbosporites echinatus* were extracted from Lower Devonian (400,000,000 years old) rocks, but their plant affinities are not known. Application of the aforementioned techniques has allowed an unusually complete structural understanding of the walls of these spores. Further analysis will provide a robust data set bearing upon what might have produced these resistant walled bodies.

Kelly Leinberger (24)

Faculty Advisor/Collaborator: **Joseph Rohrer**

Relationships Among Species of North American Plums Inferred from DNA Sequences

Fourteen species of wild plums (*Prunus* sect. *Prunocerasus*, Rosaceae) are native to North America, north of Mexico. Many of them are very similar in appearance, and the relationships among the species are unclear. To elucidate these relationships we have used nucleotide sequence fragments from two genes: *s6pdh*, a gene that codes for the enzyme sorbitol-6-phosphate dehydrogenase, and *LFY*, a gene that codes for a transcription factor which regulates conversion of a leafy shoot into a flowering shoot. Using liquid nitrogen we ground leaves of 12 North American species, plus two related species for comparison, with a mortar and pestle and then extracted genomic DNA from the cells with a Qiagen DNeasy plant mini kit. Polymerase chain reaction was used to make multiple copies of the gene fragment of interest to us. Fragments were then purified and sent off-campus for automated sequencing. Sequences for *s6pdh* and

LFY are very similar among the native American plums, much more so than among other species of the same genus, suggesting a very close relationship. Most distinct is *Prunus subcordata*, the only species growing west of the Rocky Mountains. The eastern species appear to form a couple of groups.

Elisabeth Major (44)

Faculty Advisor/Collaborator: **Paula Kleintjes**

Vegetative Response to Ungulate Browsing in the Jemez Mountains

In the Jemez Mountains of New Mexico, preliminary observations indicate that exponentially growing populations of elk (*Cervus elaphus*) are negatively impacting native vegetation. To quantify such impacts, we measured vegetative response to ungulate browsing in Bandelier National Monument in New Mexico during the summers of 2001 and 2002. We used seven replicated ungulate exclosures (60m x 60m) and reference areas in aspen - mixed conifer forests. Within each of these sites we measured species richness, plant abundance, height, biomass and presence of blooming flowers. Our research indicated that browsing is having an effect on certain plant communities by altering their structure and abundance. We found significant differences in aspen (*Populus tremuloides*), shrubby cinquefoil (*Potentilla fruticosa*) and chokecherry (*Prunus virginiana*) populations between the exclosure and the reference sites. There was no significant difference in aspen abundance, but there was for aspen height ($\text{Chi}^2=56.6$, d.f.=1, $p<0.001$). Shrubby cinquefoil showed significant difference in height ($\text{Chi}^2=30.57$, d.f.=4, $p<0.001$) and number of flowers ($\text{Chi}^2=727.5$, d.f.=1, $p<0.001$) between exclosed and reference sites. Fruit abundance on chokecherry plants also differed significantly between the exclosed and reference sites ($\text{Chi}^2=9.2$, d.f.=1, $p<0.01$). To protect biological diversity within aspen - mixed conifer forests, it may be necessary to implement elk management in the Jemez Mountains.

Sara Mickelson (20)

Faculty Advisor/Collaborator: **Julie Anderson**

DNA Transfer Between Bacteria and Yeast Via the Conjugative Transposon, Tn916

The transfer of DNA between distantly related species could be a significant factor in evolution and may help to explain discrepancies in phylogenetic trees. In addition, successful transfer raises the possibility of productive interactions between bacteria and mammalian cells including the transfer of DNA-protein complexes, naked DNA or even DNA-free proteins. One example of gene transmission occurs between bacteria and certain plant species. This DNA transfer is mechanistically similar to the process of bacterial conjugation. Bacterial conjugation (genetic transfer requiring cell to cell contact) has been known to exist among gram-negative or gram-positive bacteria since the 1950s. Tn916 is a conjugative transposon originally identified in a gram-positive bacterium (*Enterococcus faecalis*) and is capable of transfer between gram-positive and gram-negative bacteria. Recently transkingdom gene transfer between a gram-negative bacterium (*E. coli*) and a eukaryote, yeast (*S. cerevisiae*), has been demonstrated, indicating that the elements necessary for transfer are compatible between the two systems. To date, the transfer of Tn916 between more primitive gram-positive bacteria and microbial eukaryotes has not been demonstrated. The proposed project is designed to demonstrate the transmission of genetic material between prokaryotes and eukaryotes and to investigate the underlying mechanisms of this transfer.

Erin Moritz, Jodi Swanson and Jamia Hill (23)

Faculty Advisor/Collaborator: **Wilson Taylor**

Electron Microscopic Evaluation of Fossilized Algal Samples from East African Lakes

Pediastrum, a genus of fresh water green algae, is abundant in lake bed samples obtained during an ongoing study of climate reconstruction in East African lakes. The fossilized alga is being evaluated as a possible cause of anomalous ^{14}C dates of core samples. Photosynthetic organisms assimilate carbon from the immediate surroundings, and local volcanic activity can introduce "fossil" carbon into that environment. Uptake of fossil carbon may then contribute to anomalously old dates. This proposed mechanism of anomalous dating is dependent upon sufficient numbers of photosynthetic organisms (e.g. green algae) in the test sample. Examination of sediment cores with light microscopy reveals the presence of mature colonies of *Pediastrum*, but in insufficient quantities to account for the dating anomaly. However, the sample also contains large numbers of ambiguous unicellular bodies that vastly outnumber the mature colonies. If the unicells are photosynthetic organisms, this could help explain the dating anomaly. The photosynthetic nature of these unicells could be established by positively identifying them as part of the *Pediastrum* reproductive cycle. Our goal is to analyze and compare the surface sculpture and fine structure of the unicells and *Pediastrum* colonies, using a combination of scanning and transmission electron microscopy.

Zachary Najacht and Steven Chevalier (42)

Faculty Advisor/Collaborator: **Amy Krist**

*Life-History Traits Due to Variation of Parasite Prevalence Among Populations of the Freshwater Snail, *Helisoma anceps**

This study investigates whether the incidence of parasitism causes selection on life-history traits and if trade-offs exist between these life-history traits. Life-history traits include traits that are closely tied to an organisms survival and reproduction. Life-history theory

examines how an organisms life history evolves under differing ecological conditions. Based on life-history theory, our predictions were that an increased level of parasite prevalence within natural populations will result in increased reproductive effort as well as decreased age and size at maturity. We also predicted that trade-offs should occur between size and age at first reproduction, growth and reproduction, as well as between reproduction and survival. To examine these predictions, we collected freshwater snails from 14 lakes which varied in prevalence of castrating trematodes. To examine the first prediction, we measured reproductive output in these snails over a two week period. We found that no correlation existed between parasite prevalence and reproductive effort in the field caught snails. This result may be due to environmental effects such as availability of food or predation. Currently, we are raising juveniles in the laboratory in order to control environmental effects and reveal underlying genetic differences among populations, and examine trade-offs between life-history traits.

Carrie Norquist, Joe Eaton and Heather Stroik (22)

Faculty Advisor/Collaborator: **Jon Scales**

Genomic Structure of EphB3

We propose to isolate additional genomic DNA clones corresponding to EphB3. Our 18Kbp of initially isolated sequences have proven not to contain as significant a proportion of potential transcriptional regulatory sequences as we had hoped necessitating further isolation of DNA sequences. We are continuing to characterize all of the sequences we have cloned in order to fully map the genomic structure of *Xenopus EphB3* and contribute to a better understanding of the genomic structure so eph RTKs in a variety of animal species. Upon identification of additional, upstream DNA sequences, we will immediately begin to test these sequences for their ability to correctly drive transcription of reporter genes in vivo.

David Prall and Lindsay Bremer (2)

Faculty Advisor/Collaborator: **Lloyd Turtinen**

Cytokine Release Profiles of Amphotericin B Treated Monocytic Cells Using Chemiluminescent Antibody Arrays

Amphotericin B (AmB) is an anti-fungal antibiotic with activity against systemic fungal pathogens. However, its side-effects in patients have prompted the search for formulations that are effective yet less toxic. Four different commercial AmB formulations: Fungizone (FZ), Ambisome (SOM), Amphotec (TEC), and Abelcet (CET) were tested for their ability to induce pro-inflammatory cytokines from human monocytic cells. These cytokines are a major cause of the undesirable side-effects which include fever and chills and sometimes renal complications. Using high throughput macro-array chemiluminescent analysis of 23 different cytokines simultaneously, we have begun to establish cytokine profiles for each drug formulation. In terms of the number of cytokines released and the amount of each cytokine present, we found FZ > TEC > CET > SOM. Cytokines detected and semi-quantified included Gro, Gro- α , IL-6, IL-8, IL-10, MCP-1, RANTES, and TNF- α . Continued cytokine profile analysis and development of new formulations should improve the therapeutic index of this anti-fungal antibiotic and perhaps remove the reputation of 'amphoterrible' from its name.

Jamie Roper (25)

Faculty Advisor/Collaborator: **Kristina Beuning**

Paleograssland Community Composition Near Lake Malawi, East Africa Over the Last 25,000 Years

The carbon isotopic values of charred fossil grass epidermal fragments from Lake Malawi, East Africa demonstrate shifts in the relative abundance of C3 and C4 grasses indicative of changes in moisture balance in this region during the last 25,000 years. The modern grass flora around Lake Malawi includes approximately 90% C4 grasses and 10% C3 grasses. This distribution is reflected in a bulk grass community carbon isotopic value of ~ 14 per mil. With the exception of two temporal intervals, over the last 25,000 years charred grass epidermal fragments preserve bulk grass community values between -11.8 and -15.2 ± 0.4 suggesting the continued predominance of C4 grasses in the region throughout this time. Between 10,500 and 10,000 and from 6,000 to 4,500 calendar years BP, charred epidermal carbon isotopic values shift to more depleted values of -19.3 ± 0.4 and -25.6 ± 0.4 respectively, suggesting increased abundance of C3 grasses at these times. Independent limnological and palynological data indicate increased precipitation: evaporation values allowing expansion of montane taxa during these intervals. Such increased moisture should also allow increased C3 grass abundance as is suggested by the carbon isotopic data in this study.

Chris Wallace (41)

Faculty Advisor/Collaborator: **David Lonzarich**

Microhabitat Use of Juvenile Coho Salmon and Rainbow Trout in a Lake Superior Tributary

Introduced from western North America, coho salmon and rainbow trout have become the most common fish species in many tributary streams of Lake Superior. The successful establishment of these species to this region has come despite the fact that flow conditions, thermal environments, and prey and predator densities are very different from conditions commonly found in western streams. Because the environmental setting of a stream can determine the behavior and habitat use of salmonid fishes, and because so little is known

about these aspects of salmonid ecology in this region, we set out to document the micro-distribution and behavior of coho salmon and trout during their first summer in a stream. For reasons associated with survival and growth, this period is very important in the life history of anadromous salmonids. Consequently, efforts to manage stream environments often focus on the habitat requirements of juveniles. Our main goal was to learn whether the summer behaviors of juvenile salmon and trout in a Lake Superior stream differ from those typically reported from western streams. The results add to our growing knowledge of how these two species thrive in the Lake Superior ecosystem.

Nalee Xiong, Mark Phillips and Dana Schilling (1)

Faculty Advisor/Collaborator: **Dan Conklin**

Development of a Vasospasm Model: V. Hydrogen Peroxide Effects in Isolated Human Blood Vessels

Cardiovascular diseases, including coronary artery vasospasm, are directly responsible for the leading cause of mortality in the U.S. Vasospasm is a spontaneous, prolonged hypercontracture of a blood vessel which reduces blood flow. Vasospasm occurs in coronary artery bypass graft (CABG) blood vessels causing significant patient morbidity and mortality. The causes of vasospasm are unknown and are largely understudied phenomena. To better understand CABG vasospasm, and vasospasm in general, we developed an in vitro vasospasm model using CABG blood vessels and the cardiovascular toxicant, allylamine (AA), to induce CABG vasospasm. Allylamine-induced vasospasm is a semicarbazide-sensitive amine oxidase (SSAO) activity dependent event, and AA breakdown by SSAO forms acrolein, hydrogen peroxide (H₂O₂), and ammonia. Thus, AA's effects are dependent on one or more of these metabolites. H₂O₂ is a highly reactive compound and it stimulates blood vessel contraction and relaxation. We tested whether H₂O₂ was important in AA-induced vasospasm in human CABG blood vessels. H₂O₂ induced vessel-specific biphasic effects that were similar to AA's at 1-100 mM but H₂O₂ did not produce CABG vasospasm as did AA (1 mM). We conclude H₂O₂ is not, by itself, responsible for AA-induced CABG vasospasm.

Biology/Art

Mark Soderling, Sara Betterly and Erin Kalla (177)

Faculty Advisor/Collaborator: **Dan Conklin** and **Bobby Pitts**

Diagramming Surgical Techniques: An Illustrated Guide to Rat Coronary Artery Dissection

The dissection of the rat coronary artery for physiologic experimentation is a tedious, labor-intensive procedure. It is currently performed in very few laboratories for a variety of reasons. One reason for this under-use may be that there is no available illustrative documentation of this intensive procedure. There are several manuals on rat surgery but none of these address the rat coronary artery procedure studied herein. Thus, it is difficult to train research students in this technique because of the lack of an illustrative guide. Therefore, we documented the dissection of the rat left coronary artery to encourage more widespread use of said technique and improve training of research students. This was accomplished by combining several forms of illustrative media with technical documentation of the protocol into an easy to follow guide. The illustrative forms include black and white sketches and line drawings of anatomy and equipment, computer renderings using a variety of illustration software, video and digital camera images, and detailed high ratio/resolution color illustrations. The final product is of significance to the cardiovascular research community at large and to those training research students.

Biology/Geography and Anthropology

Tiffany Gorges, Erin Hammel, David Joosten, Elisabeth Major, Melissa Peterson, Rachel Schoen, Kristi Stubbe and Laurel Weinkauff (66)

Faculty Advisor/Collaborator: **Evan Weiher** and **Garry Running**

Vegetation - Environment Relationships in De Soto National Forest, Southern Mississippi

The purpose of this investigation is to better understand the relationship between geomorphology (drainage conditions, topographic position, local-scale hydrology, and soils) and the vegetation in remnant pine savannas and southern hardwood forests. The study area, about 10 miles east of Wiggins, Mississippi is located on deeply incised, relict Tertiary near-shore coastal deposits. A xeric Longleaf Pine Savanna community was associated with higher ground, likely formed of stabilized coastal sand dunes. Intermediate landscape positions were associated with a wet-mesic Slash Pine Savanna community adapted to seasonally wet conditions. There was an apparent sharp ecotone between these communities, and the nature of this ecotone will be discussed. A mesic, closed-canopy hardwood forest community (baygall) is associated with the lowest, yet well drained landscape positions. These communities are associated with the heads of intermittent low-order stream channels. Geography students will map these landforms using dGPS and GIS technology, and sample and describe the soils and sediments in them (the subject of another poster). Biology students will describe the vegetation communities associated with each landform.

David Joosten, Rachel Schoen, Tiffany Gorges, Erin Hammel, Elisabeth Major, Melissa Peterson, Kristi Stubbe and Laurel Weinkauff (65)

Faculty Advisor/Collaborator: **Evan Weiher** and **Garry Running**

Multiple Controls on Plant Diversity in Bon Secour National Wildlife Refuge, Alabama

The purpose of this investigation is to better understand the relationship between species diversity and other characteristics of vegetation communities across a transect of coastal landforms. The study area, near Gulf Shores Alabama is located on a spit near the mouth of Mobile Bay. The landform assemblage in the study area is a topographic and chronological transect that includes swash zone (most recent deposits), deflation zone, younger coastal dunes, older coastal dunes ridges, lagoon margin, and lagoon deposits (oldest deposits). This transect provides an excellent opportunity to test hypothesis regarding the impact of time (length of landscape stability) and geomorphology on characteristics of plant communities. In addition, this research will provide a better understanding of the landscape-vegetation dynamics upon which the Alabama Beach Mouse is dependent. The Alabama Beach Mouse is an endangered species endemic to the study area but characteristics of its habitat, important to its continued survival are not well understood. Geography students will map these landforms along the transect using dGPS and GIS technology, and sample and describe the soils and sediments in them (the subject of another poster). Biology students will investigate the factors affecting plant diversity along the same transect.

Biology/Mathematics

Matthew Oglesby (26)

Faculty Advisor/Collaborator: **David Lonzarich** and **Vicki Whitledge**

Modeling the Effects of Fish Movement on the Spatial Organization of Fish Assemblages in Stream Pools

Existing as physically distinct habitats, stream pools provide a natural focus for research on fish and have shaped how ecologists perceive stream diversity patterns. By viewing the fish fauna of individual pools as discrete assemblages, stream ecologists have long thought that (e.g., habitat complexity, food abundance, predators) are the main determinants of spatial variability in stream fish diversity. Under this local-control model, pool assemblages are stable and diversity is predictable depending on pool quality. Although useful, this perspective is being challenged by research showing that fish readily move across pool boundaries, and that pool assemblages are very dynamic. These findings have suggested to us the possibility that spatial differences in diversity might arise from pool-specific differences in extinction and colonization (controlled by pool isolation and size), and species-specific differences in movement. To explore this possibility, we developed an empirically based computer model (using field data from Arkansas streams) to simulate the effects of isolation and movement on the spatial organization of pool assemblages. This is the first generation of a larger model that eventually will incorporate other variables (e.g., pool complexity, predators), and be used to explore the relative importance of different mechanisms in shaping fish diversity patterns in streams.

Chemistry

Elizabeth Anne Brown (62)

Faculty Advisor/Collaborator: **Elisabetta Fasella**

Synthesis of Dehydroalanine Derivatives and of Substituted Imidazolones as Precursors to Mimics of Phenylalanine Ammonia Lyase

The synthesis of imidazolones from reaction of oxazolones with glycine is being investigated. The introduction of an exo-methylidene group on the imidazolone ring would provide us with a small molecule which has the potential to act as a catalyst in the deamination of aromatic amino acids. The synthesis of a phenylselenocysteine derivative has also been initiated. We intend to incorporate this amino acid into a peptide as a precursor to a dehydroalanine residue. The methylidene functionality has been proposed to be crucial for the activity of phenylalanine ammonia lyase in deamination reactions and we intend to study whether this transformation can be mimicked in a synthetic, non-enzymatic system.

Brian Buss (29)

Faculty Advisor/Collaborator: **Michael Carney**

Synthesis, Structure and Reactivity of Iron(II) Complexes Incorporating Bis(2-pyridylmethyl)amine and Tris(2-pyridylmethyl)amine Ligands

Ethylene polymerization catalysts containing iron burst upon the scene in the mid 1990s. The catalysts, comprised of iron(II) bis(imino)pyridine complexes activated by methylalumoxane (MAO), are extremely productive, forming up to 107 grams of polymer per gram of iron. Recent work suggests that the bis(imino)pyridine ligand is intimately involved in the catalysis reaction and performs more than just a supporting (ancillary) role. We sought to further explore the impact of ligand structure and electronic properties on the polymerization activity of iron(II) complexes. Specifically, we have synthesized and structurally characterized iron(II) complexes coordinated by tridentate bis(2-pyridylmethyl)amine and tetradentate tris(2-pyridylmethyl)amine ligands. Tridentate bis(2-

pyridylmethyl)amine and bis(imino)pyridine ligands are structurally similar, however, the former lacks the latter's electronic delocalization and ease of reduction, allowing us to examine the impact of these differences on polymerization activity. Compounds in the present work have been characterized by a combination of x-ray crystallography, elemental analysis and various magnetic and spectroscopic techniques. These results will be presented along with a comparison of polymerization activity and polymer property data with that reported for iron(II) bis(imino)pyridine complexes.

Paul Erdman (51)

Faculty Advisor/Collaborator: **David Lewis**

Reactions of Hydrazine with alpha-Cyanocinnamate Esters: An Unexpected Fragmentation

The reaction between hydrazine and acrylate esters to give pyrazolinones is a well-established reaction. In the course of our attempts to prepare beta-aryl-alpha-cyanopyrazolinones, we treated the alpha-cyanocinnamate ester with hydrazine in ethanol. Whether under reflux or at room temperature, these reactions all gave the same product, which we have identified as the azine of the aromatic aldehyde from which the alpha-cyanocinnamate ester is prepared by a Knoevenagel condensation. The course of this reaction will be discussed, a putative mechanism will be proposed, and the limitations which this imposes on the synthesis of pyrazolinones by this method will be addressed

Derek Fox and Michael Mitchell (72)

Faculty Advisor/Collaborator: **Jason Halfen**

Electronic Structure Control of Nucleophilic Reactivity in Metal(II)-thiolate Complexes

In order to further delineate the fundamental properties of cysteine-ligated metalloenzyme active sites in biology, we have prepared and fully characterized a family of square-pyramidal metal(II)-thiolate complexes that model the active site topology of the non-heme iron enzyme superoxide reductase. As is observed for other metal-thiolate complexes, these compounds are readily alkylated by electrophiles such as benzyl bromide, generating metal(II)-bromide complexes and thioethers as products. Of particular interest is our observation that the alkylation rates are entirely dependent on the metal ion: the nickel(II)-thiolate complex is alkylated ten times more rapidly than either the iron(II)- or cobalt(II)-thiolate complexes. Detailed structural, spectroscopic, and theoretical studies suggest that these divergent alkylation rates result from a "filled-filled" orbital interaction that activates the nickel(II)-thiolate unit towards alkylation; this interaction is absent in both the iron(II) and cobalt(II) analogs. The results of these reactivity studies and the corresponding spectroscopic and theoretical investigations will be presented.

Glen Gullickson (50)

Faculty Advisor/Collaborator: **David Lewis**

Aldol Addition Reactions of Propionanilide Dianions

The reaction of N-phenylpropanamide with two equivalents of butyllithium at 0°C gives the dilithio derivative as a 92:8 mixture of stereoisomers which reacts rapidly with aldehydes at 0°C to give a mixture of the syn and anti aldols in a ratio of approximately 2:3. The anti aldol adduct crystallizes from the crude reaction mixture. In the case of aromatic aldehydes, the reaction is accompanied by competing Cannizzarro-type reduction. The reaction path is interpreted in terms of competing Zimmerman-Traxler transition states for the irreversible addition.

Christopher Knutson and John Wrass (84)

Faculty Advisor/Collaborator: **James Phillips**

Structure and Bonding in the Nitrile Complexes of Borontrifluoride

The structural chemistry of acetonitrile - borontrifluoride (CH₃CN-BF₃) and its analogs has attracted much attention over the past 10 years. The two primary reasons for this are that B-N bond distances measured for these species indicate an interaction that defies classification as a purely bonding or non-bonding interaction. Moreover, the structures display a marked sensitivity to chemical medium, which is best demonstrated by dramatic differences in B-N bond lengths between the gas phase and solid state; nearly 0.4 Å for CH₃CN-BF₃. We employ a combination of IR spectroscopy, x-ray crystallography, and computational chemistry to probe the structural changes resulting from both intramolecular effects (i.e. changes in the nitrile substituent) and intermolecular effects (changes in the surrounding chemical medium). Solid-state structures have been obtained for C₆H₅CN-BF₃, FCH₂CN-BF₃, ClCH₂CN-BF₃, and ICH₂CN-BF₃, and they are all quite similar to CH₃CN-BF₃, though the halogenated complexes are slightly bent about the C-N-B linkage. Gas phase structures computed via B3LYP calculations reveal marked gas-solid structure differences, and in the case of FCH₂CN-BF₃, the difference in B-N distance is nearly 0.9 Å! Solid-state IR spectra all show nearly identical frequencies for the BF stretching and bending modes. The effect of an argon matrix on the structures of these species will be demonstrated through a comparison of frequencies from the argon matrix, the solid state, and the gas phase (from B3LYP calculations).

Chong Hoong Leong (83)Faculty Advisor/Collaborator: **Fred King***Resolution of Some Mathematical Issues for the Atomic Four-Electron Problem*

Major mathematical problems connected with the theoretical calculation of certain atomic properties of beryllium will be resolved. The mathematical approach to calculating the properties of an atomic or a molecular system is to determine a quantity called the wave function. In order to determine this wave function, some integrals need to be evaluated. Much work has been done in evaluating these integrals. But for certain properties of the beryllium atom, the integrals become extremely difficult to evaluate and high precision cannot be obtained. In spite of this, it is important to continue with this study because beryllium is the first atomic system with four electrons to be attacked by the Hylleraas expansion approach. The latter technique is known to yield the most accurate results of any computational technique. A careful and detailed study of this atomic species will ultimately lead to a better understanding of the metallic properties of beryllium. The purpose of this project is to perform high precision calculations for a number of key properties of the beryllium atom, which include the energies of the ground and lowest excited states. It is extremely important that the theoretical and recent experimental results are in agreement.

Joel Lischefski (49)Faculty Advisor/Collaborator: **David Lewis***A "Green" Synthesis Sequence Experiment for the Organic Laboratory*

The use of "green" chemistry - chemistry that reduces or eliminates the need for toxic reagents or solvents - has become a priority as concerns about toxic chemicals in the environment increase. To this end, we have designed a synthesis sequence experiment for the organic chemistry laboratory in which all reactions are carried out using water as the solvent. In addition to being "green" based on solvent choice, this sequence also exhibits remarkable atom economy, a second principle of "green" chemistry - the elimination of wasteful reagents by reagents which are used in their entirety.

Westley Manske and Mike Mbughuni (82)Faculty Advisor/Collaborator: **Marcia Miller-Rodeberg***The Catalase/Peroxidase Enzymes from the Gram(+) Bacteria, Brevibacterium fuscum*

Catalase/peroxidase enzymes have two primary functions in organisms. In all obligate aerobes, catalase enzymes remove toxic hydrogen peroxide produced as a by-product of aerobic metabolism. Peroxidase enzymes oxidize organic and metal substrates with concomitant reduction of H₂O₂ to water. A principle role of plant and fungal peroxidases is the oxidation of aromatic compound side chains for lignin synthesis and/or degradation. Because some bacteria, such as *Brevibacterium fuscum*, utilize aromatic hydrocarbons as a carbon and energy source, a role of bacterial peroxidases may be to remove extraneous side chains from aromatic compounds, which are subsequently further degraded. In our effort to understand the chemistry of the degradation of aromatic hydrocarbons by Gram (+) bacteria, we have identified and characterized two different catalase/peroxidase enzymes from *B. fuscum*. The enzymes have been separated using standard purification techniques of ammonium sulfate fractionation and ion exchange and hydrophobic column chromatography. Both enzymes have optical spectra consistent with a heme active site. These two enzymes are readily differentiated by their catalytic properties and apparent subunit size, as determined by SDS-PAGE. The physical and catalytic properties of the two enzymes, from *B. fuscum* will be presented.

Erin Moritz (38)Faculty Advisor/Collaborator: **Melville Sahyun***Spectroscopic Analysis of Cyanine Dye-Cyclodextrin Complexes*

This research is concerned with the spectroscopic properties of complexes formed between cyanine dyes and beta-cyclodextrin hydrate (B-CD). The dyes used were 3,3'-diethylthiacarbocyanine iodide (n=3 or DTCl), 3,3'-diethylthiadithiacarbocyanine iodide (n=2 or DTDCI), and 3,3'-diethylthiatricarbocyanine iodide (n=3 or DTTCl). We expected these dyes might display increased hyperpolarizability on complex formation, increasing their capabilities as frequency doublers. Such properties are of interest in fields of image capture, optical communications, fluorescence microscopy, and photodynamic therapy. Analytical methods used were absorption spectroscopy, fluorescence spectroscopy, and Hyper-Rayleigh Scattering (HRS), also known as second harmonic light scattering, which allows estimation of hyperpolarizability by comparison to a reference compound. We found that all three dyes form B-CD inclusion complexes, which may be 1:1 or 2:1, dye to cyclodextrin. Of these complexes, only the complex with n=1 showed enhanced hyperpolarizability compared to the dye in solution. Under conditions where complexes form, dye tends to form aggregates in absence of B-CD. Dyes and complexes are fluorescent. On the other hand, we found that aggregates in solution may dissipate photoexcitation energy by dissociation, a heretofore unreported reaction of dye aggregates. Also we found that the dyes form adsorption complexes with silver nanoparticles; these complexes are highly hyperpolarizable.

Nathan Pillsbury, Emily Gilles and Katie Bushnell (73)Faculty Advisor/Collaborator: **Stephen Drucker***Electronic Spectroscopy of Transient Molecules*

We have recorded the ultraviolet spectrum resulting from the pyrolysis of ethylenediamine at 1000 degrees C. The spectrum shows vibronic features in the 260-nm region that have not previously been reported. The infrared spectrum of the pyrolysis product mixture shows the presence of some transient imines and amines, including the tautomers ethanimine and vinylamine. The resolved vibronic features in the ultraviolet spectrum are most likely due to one or both of these molecules. The resolved ultraviolet features are superimposed on a broad background absorption that could be due to methanimine (which was also identified in the infrared spectrum). When isopropylamine is used as a starting material, the broad background is absent, and no methanimine appears in the infrared spectrum.

Nicholas Robertson (28)Faculty Advisor/Collaborator: **Michael Carney***Synthesis and Reactivity of Chromium(II) and Chromium(III) Complexes Incorporating Bis(2-pyridylmethyl)amine and Tris(2-pyridylmethyl)amine Ligands*

Polyethylene is used in a wide variety of plastics applications including the fabrication of trash bags, milk bottles, fuel tanks, and medical supplies. Chromium ethylene polymerization catalysts produce nearly 14 billion pounds of polyethylene per year in the United States alone. The molecular structure and mechanisms of these catalysts are still poorly understood, which has driven the development of discrete organometallic chromium complexes in attempts to model commercial catalysts. Most of these complexes have employed mono-cyclopentadienyl as well as other anionic ligands; some of which are effective polymerization catalysts. We have prepared a series of chromium(II) and chromium(III) complexes supported by neutral tridentate bis(2-pyridylmethyl)amine and tetradentate tris(2-pyridylmethyl)amine ligands, which have proven to be moderately active polymerization catalysts. These complexes have been characterized using x-ray crystallography, elemental analysis, magnetic susceptibility, and various spectroscopic methods. These results will be presented with synthetic schemes and polymerization data showing how ligand structure, counterion, and metal oxidation state affect catalyst activity and polymer properties.

Don Rogness (61)Faculty Advisor/Collaborator: **Cheryl Muller***Sulfoxides in Selective Alcohol Oxidations*

The Swern reaction of alcohols can be carried out using many substituted sulfoxides, in addition to the traditional reagent based on DMSO. Our attempts to use sterically hindered sulfoxides led to some enhancement of the oxidation of primary alcohols over secondary alcohols, leading to modest selectivity for production of aldehydes over ketones in competition experiments. Various diols containing both primary and secondary hydroxyl groups were synthesized as potential substrates for the Swern oxidation. Currently we are looking at the oxidation of these diols and investigating the effect of intramolecular hydrogen bonds on the oxidation of the diol.

Joseph Schaefer (40)Faculty Advisor/Collaborator: **David Lewis***A Fluorescent Sensor not Subject to Quenching by Paramagnetic Metal Ions*

6-(2-Aminoethyl)amino-2-butylbenzo[de]isoquinoline-1,3-dione was prepared, and its fluorescence emission spectrum in isopropyl alcohol was measured in the presence of four rare earths from the lanthanide series: dysprosium, holmium, terbium, and lanthanum. It was found that the fluorescence emission intensity increased, rather than decreased, on complexation of the metal ions. No evidence for paramagnetic quenching of fluorescence was observed on complexation of the paramagnetic metal cations, and the number of unpaired electrons on the metal did not affect the intensity of the emission spectra. This compound was able to detect the metal in concentrations as low as 4mM (0.6 ppm).

Tim Schleusner and Matt Goertz (27)Faculty Advisor/Collaborator: **Marc McEllistrem***Cluster Formation on GaN Surfaces*

Light-emitting diodes (LEDs) that emit green light are becoming increasingly common. For example, "high brightness" versions of these devices are now used for green lights and arrows in traffic lights. Other colors are possible, such as "white" LEDs that are now used in long-life flashlights. The hope is to develop the white LEDs to replace fluorescent bulbs in household and commercial lighting (which constitutes 20% of the US's electricity consumption). For white LEDs to be a feasible lighting alternative, they must convert electricity to light more efficiently than is currently possible, which in turn requires better quality material. Gallium nitride (GaN) is the

semiconductor material of choice from which to make these LEDs. Our research has focused on the surface composition and structure of GaN, since surface properties directly influence the quality of the material. Our studies have shown that, in contrast to most models for GaN, the surface is covered with small clusters that are not readily removed. These clusters have a direct impact on the quality of GaN that can be currently grown.

Benjamin Schmiede (71)

Faculty Advisor/Collaborator: **Elisabetta Fasella**

Synthesis of Substituted Methylidene Imidazolones as Simple Analogues of the Cofactor of Phenyl Ammonia Lyase

The enzyme phenylalanine ammonia lyase incorporates an unusual structural modification: a 4-methylideneimidazol-5-one ring derived from cyclization and dehydration of three amino acids in the protein backbone. The methylidene imidazolone is believed to act as an electrophilic catalyst for the deamination of phenylalanine in a transformation unprecedented with synthetic reagents. The alternative degradation pathway of phenylalanine mediated by a mimic of phenyl ammonia lyase could potentially be useful for the treatment of patients who suffer from the genetic disease, phenylketonuria. A synthetic route to a small organic molecule incorporating the methylidene imidazolone functionality has been designed with the goal of testing the intrinsic reactivity of the methylidene imidazolone as a deaminating agent for aromatic amino acids. Initial efforts to obtain the target compound were hampered by difficulty in removing one of the protecting groups. Alternative protecting strategies are currently being tested.

A synthetic route to a hexadepsipeptide designed to undergo intramolecular cyclization leading to formation of the methylidene imidazolone functionality is also pursued. This work should lead to a better understanding of the relationship between amino acid sequence and peptide structure. The enantiomeric resolution of tropic acid, which is to be used as one of the building blocks of the hexadepsipeptide, has been accomplished.

Corey Schuster and Kristy McNitt (39)

Faculty Advisor/Collaborator: **David Lewis**

Water-soluble Fluorescent Dyes from Amadori Reactions of Carbohydrates

The Amadori rearrangement of aminoglycosides is a potentially useful method for incorporating a fluorescent label into biologically active amines without affecting their biological activity (specifically, the charge on nitrogen). In order to make use of this reaction for the fluorescent labeling of biologically active amines (e.g. amphotericin-B), we are preparing aldohexose derivatives labeled with a 4-alkylamino-1,8-naphthalimide fluorophore. Progress towards these fluorescent carbohydrate derivatives will be discussed.

Grant Tharaldson (60)

Faculty Advisor/Collaborator: **Alan Gengenbach**

Synthesis of Amide-Linked Porphyrin Dimers

Photosynthesis converts solar energy into chemical energy. In photosynthesis, carbon dioxide and water are used to form sugars and starch and the energy required for this process is obtained from sunlight. Photosynthesis is a multiple step process involving numerous enzymes and proteins. In green plants, the sunlight is absorbed by chlorophyll molecules and the energy is transferred through a series of chlorophyll molecules until it reaches the reaction center and the chemical energy is produced. The chlorophyll molecules that are integral to this process contain molecules called porphyrins that bind metal ions. In chlorophyll, the bound metal ion is magnesium. The goal of this project is to make new molecules that mimic the energy transfer properties of the series of chlorophyll molecules found in plants. To accomplish this objective, porphyrins containing amine groups and porphyrins with carboxylic acid substituents were synthesized. Zinc derivatives of these porphyrins were prepared for use in energy transfer studies. Finally, the individual porphyrins were coupled together to form dimers. In future work, the energy transfer properties of these dimers will be studied.

Computer Science

Nick Karpenske (106)

Faculty Advisor/Collaborator: **Paul Wagner** and **Michael Wick**

A Java Run-Time Simulator (JaRTS) to Assist Understanding of the Java Execution Environment

One of the most significant concepts in an introductory object-oriented programming course using the Java programming language is how the objects in a Java program are created, referenced, and destroyed in computer memory during the execution of that program. This is a difficult concept for beginning computer science students to understand. Historically instructors have attempted to explain this through a combination of providing oral and written description of the various events that happen, and drawing simplified examples of how memory would look at any given point in program execution on the board. Such attempted communication is difficult, time-consuming, and partial in its explanations at best. The major objectives of this research are two. First, we are designing and building a

Java run-time memory simulator system, to be used in demonstrating to students the management of program objects in computer memory during the execution of a Java program. Second, we want to develop an experiment, tentatively to be administered in the semester following this project, to determine if the use of a Java run-time simulator system in the classroom assists students in learning this important concept.

Michael LeMay (175)

Faculty Advisor/Collaborator: **Jack S. E. Tan**

On Complete Privacy and Security with the Secure Email Transport Protocol

The widely deployed Simple Mail Transfer Protocol, (SMTP) as it is typically used, reveals important private information that renders it an impractical medium for secure communication. By examining archives on mail servers or capturing SMTP packets in transit, network intruders (unauthorized recipients) can exploit compromised information that includes the identity of the sender and recipient, the date the message was sent, the length of the message and perhaps even the actual contents of the message. Thoughtfully designed software will obscure all of this information except the identities of recipients, and with a slight modification of the way mail is addressed to recipients even this may be obscured. A variation on SMTP has been proposed which will encourage software designers to adopt the recommended practices put forth above and will allow the new form of addressing that has been mentioned. A companion key distribution protocol has also been proposed to work in concert with the message transmission protocol that will provide senders with effective message controls that are active even when a message is in transit or in storage on a machine other than the sender's. This comprehensive solution will enable private messages to be transmitted in confidence across public networks.

Zack Pederson and Ben Covi (174)

Faculty Advisor/Collaborator: **Daniel Stevenson**

Programming for the Emotion Engine

Recently, a major hardware and software development firm (SONY) released a Linux development kit for one of their current pieces of cutting-edge proprietary hardware, the PS2. To make such a kit available to the public is highly uncommon outside the open source community, and we felt this was an opportunity which bore investigation. The primary objective of this project was to examine and catalog the system's capabilities while researching how best to create pieces of software optimized for use within the PS2 environment. The students involved have a high level of interest in this facet of the computer programming industry, and would gain invaluable experience in topics ranging from hardware organization to real-time rendering engines, physics models, and artificial intelligence. The hands-on approach this project offered educated the students and their mentor alike, and placed them in the unique position of having first hand knowledge normally only available to licensed developers.

Justin Sabelko (104)

Faculty Advisor/Collaborator: **Paul Wagner**

Developing an Open Source Database Benchmark System

Benchmarking the performance of a database management system (DBMS) is a difficult task to undertake. There aren't many tools available for this process, and those that are generally available have significant cost (e.g. \$800 for a tool from one corporation). This option often isn't practical, especially if the database that is going to be developed isn't extensive. However, another option is developing from the open source community. The Open Source Database Benchmark project has started to develop open source benchmarks for several DBMSs, but hasn't developed anything as of yet for the Oracle DBMS, one of the most commonly used DBMS products in both industry and academia. The major objectives of this research are twofold. First, we are researching what structure is needed and what issues arise in developing an open source database system benchmark for a commercial DBMS. Second, we are developing a prototype benchmarking tool for the Oracle DBMS that conforms to the specifications of the Open Source Database Benchmark project.

Marcia Vaughn (105)

Faculty Advisor/Collaborator: **Michael Wick and Paul Wagner**

A Research Proposal to Develop an Intelligent Data Analysis Web Service (DAWS)

Recent advances in enterprise data systems present considerable opportunity for cross-fertilization among several topical areas in computer science that previously were difficult and impractical to combine. In particular, the onset of the .NET enterprise model (developed by Microsoft), the ubiquitous presence of the World Wide Web (Web) in commercial applications, and the emergence of new Web Services technology all combine to provide realizable support for the application of artificial intelligence and machine learning techniques to the analysis of customer data records. Further, these new supporting technologies appear to provide significant promise for developing an intelligent data analysis engine that is sufficiently general as to allow integration into virtually any comput-

ing environment (including varied application domains, programming languages, and enterprise data models). In this proposal, we seek funding to design, implement, and deploy a generic artificial intelligence data analysis framework for the Internet. A successful investigation will be of significant interest to several applied areas in computer science, including machine learning, database system, and enterprise data systems. Further, a successful project would also be of considerable interest to the computer science education community as it would represent a plausible capstone experience that integrates several previously disjoint courses in the typical undergraduate computer science curriculum.

Geography and Anthropology

Ryan DeChaine (155)

Faculty Advisor/Collaborator: **Harry Jol**

Archaeological GPR Investigation at Rennes-Le-Chateau (France) Utilizing 3-D Animation

Ground penetrating radar (GPR) surveys were conducted at several sites within the hillside town of Rennes-le-Château, France. The town is linked with many traditions and mysteries associated with the Templar movement and its treasure including, according to some documents, the possible location of the Holy Grail. Key areas of GPR investigation were: the Tour Magdala, the Church of St. Mary Magdalen, and the surrounding gardens. The GPR survey at the Tour Magdala was carried out to image any cultural features (i.e. burial crypts, documents, currency, etc) located beneath the tower floor or around its outer base. 2-D results indicate the tower is built on the local bedrock with possible surface and subsurface disruptions in the local GPR stratigraphy, while 3D cubes show a hyperbolic reflection pattern, which may indicate the presence of a buried object. The GPR survey at the Church was carried out to image any cultural features that may be located beneath the church floor. 2-D and 3-D images show a subsurface anomaly (hyperbolic feature) that extends along several parallel lines that may indicate a burial crypt. Utilizing industry standard software (pulse EKKO 3D, RockWare), 3-D visual modeling of data collated from the 2001 and 2002 research expeditions allowed for the creation of accurate 3-D animations of subsurface anomalies. Detailed animations from this investigation will be used to advise the Government of France's Archaeological Branch where to excavate at Rennes-Le-Chateau.

Jedediah Durni and Robert Passow (47)

Faculty Advisor/Collaborator: **Sean Hartnett**

Global Positioning Systems Mapping and Micro Geographic Information Systems in the Village of Alma Center, Wisconsin

This poster presents a cost-effective modernized mapping and data storage system for Alma Center, a small village in Wisconsin. This project provided the village with up to date maps and a modernized Geographic Information System for data storage that can function within existing budgetary constraints. Previous information for infrastructure location the village maintained is more than fifty years old and consists of maps and notebooks filled with location data. A global positioning system (GPS) was used to gather the spatial data. The GPS system (Trimble ProXR) is a very accurate system, acquiring data with sub-meter accuracy. These data were then organized into a geographic information system (GIS) for data storage and presentation. The GPS data was imported, analyzed and drafted in Pathfinder, ArcView 3.2, and Adobe Illustrator, to create a user friendly, interactive web-based data storage and retrieval system and maps. The project resulted in an inexpensive and modernized mapping system that solved the original problem. Moreover, the village can update and expand the GIS easily with available expertise and within existing budgetary constraints.

Carrie Morrell (64)

Faculty Advisor/Collaborator: **Garry Running**

Geologic and Geographic Investigation of Holocene Terraces Along the Lower South Saskatchewan River, Central Saskatchewan, Canada

The purpose of this project is to provide archaeologists with a better understanding of the areal extent, stratigraphy, and geoarchaeological significance of fluvial landforms within the South Saskatchewan River valley, from St. Louis, Saskatchewan downstream to the confluence with the North Saskatchewan River. The study reach is located within the Forks Locality, central Saskatchewan, one of four archaeologically-rich, ecologically complex localities across the Canadian Prairies under investigation by SCAPE (Study of Cultural Adaptations within the Prairie Ecozone). For this study component, aerial photographic interpretation and dGPS data were combined using ARCGIS software to map Holocene fluvial terraces identified in the study reach. There are 3 terraces identified with an active floodplain. Moving downstream, the terraces decrease in size, while scarps become more prominent. Of the 3, the upper terrace (T3) is the most extensive. The middle terrace (T2) shows prominent swell and swale topography, and the lower terrace (T1) is difficult to identify, as it's covered with thick forest vegetation. Radiocarbon dating of bison bone indicates that terraces T1 and T2 are of Holocene age, and therefore have the best potential for archaeological finds.

Robert Passow (156)Faculty Advisor/Collaborator: **Harry Jol***Ground Penetrating Radar and Global Positioning System: Archaeological Aids at Qumran, Israel*

Ground penetrating radar (GPR) and global positioning system (GPS) surveys were conducted as part of the 2002 archaeological research expedition to Qumran, Israel. Qumran is located on the northwest shore of the Dead Sea, and is noted as the site closest to the caves where the Dead Sea Scrolls were found, one of the most important manuscript discoveries ever made. Earlier studies at Qumran have shown that GPR can provide images of the subsurface that indicate potential caves and gravesites. The objective of this paper is to present research results from two sites associated with Qumran. In 2001, while excavating the first site (a mourning enclosure -Tomb 1000), two sets of 2000-year-old re-buried female bones were discovered. In 2002, a detailed GPR grid was laid-out at Tomb 1000 and data was collected using both 225 and 450 MHz frequency antennae. Based on GPR and GPS data, 3-D imagery indicated anomalous reflections, which provided evidence for further excavation. The re-excavation of Tomb 1000 yielded a significant discovery of a subsurface tomb containing a skeleton with associated grave goods. Investigating the second site utilized the combination of GPR and GPS in an attempt to locate the latrine individuals at Qumran would have used. Religious regulations recorded in the Dead Sea Scrolls indicate that the latrines should be located 1000 cubits away from habitation. Two grids using 225 MHz antennae revealed two possible sites for future excavation. GPR and GPS both proved to be valuable tools during the 2002 research expedition at Qumran.

Rubin Seifert and Daniel Thom (46)Faculty Advisor/Collaborator: **Doug Faulkner***Assessing the Hydrologic Impacts of Urbanization in the Otter Creek Watershed, Eau Claire County, Wisconsin*

Floods are costly natural disasters that are made worse by the hydrologic effects of urbanization. In the Otter Creek watershed in southern Eau Claire County, land use is predominantly rural at the present time, though residential development is slowly converting portions of it to urban land use. In this study, we assessed the effects that future urbanization in the watershed could have impact on flooding along Otter Creek and identified those areas of the watershed where urbanization would have the greatest impact on the creek's flood hydrology. We did this by developing a rainfall-runoff computer model for the watershed using the hydrologic software application HEC-HMS. With this model we characterized the flood hydrology of Otter Creek for current land-use conditions and for the hypothetical future conditions of a more urbanized watershed. In particular, we investigated the spatially distributed effects that urbanization could have on flooding along Otter Creek and identified those areas that would be the most hydrologically sensitive to development. In addition to shedding the light on the hydrology of urbanization, this project has practical significance in that it provides useful information to planners concerned with minimizing the environmental impact of urban development in southern Eau Claire County.

Joel Stevens and Ryan Zahler (48)Faculty Advisor/Collaborator: **Sean Hartnett***GIS Site Mapping Using dGPS Survey*

This project involved the creation of a detailed, multi-layered GIS site map of the Lower Chippewa River Confluence Field Station. This 138-acre property, located 30 miles southwest of Eau Claire on the banks of the Chippewa River, was recently leased from the State of Wisconsin to support the research activities of UW-Eau Claire faculty and students. The core of this site map is a differential Global Positioning System (dGPS) survey of the property and surrounding environs. Using Trimble ProXR dGPS with sub-meter positional accuracy, the infrastructure of roads, buildings, trails, rock outcroppings and vegetation were mapped. A Digital Elevation Model (DEM) of the 3D dGPSdata (lat-long-elevation) was created to capture the fluvial topography present at this site that includes river bluffs, terraces, and the river channel and flood plane. A detailed bathymetric map of river depths was constructed for a mile long stretch of the Chippewa River bordering the study site. Significant changes in the channel's location are gauged by draping this map of the current river channel over the 1992 high-resolution Digital Ortho Quadrangle (DOQ) images. All of this survey data will be integrated into a comprehensive GIS of geo-referenced dGPS, DEM and DOQ data.

Geography and Anthropology/Biology

Dana Bickelhaupt and Elisabeth Major (43)Faculty Advisor/Collaborator: **J. Brady Foust and Paula Kleintjes***Butterflies of the Valles Caldera National Preserve, New Mexico*

The Valles Caldera National Preserve (VCNP) that covers 89,000 acres in the Jemez Mountains of New Mexico was established in July, 2000. The VCNP was a privately owned ranch >200 years so little is known about its biological diversity. Baseline information on the flora and fauna of the preserve is paramount for resource management of the reserve, especially since the reserve is grazed by high numbers of cattle and elk and will be opened for human recreation in the near future. In 2001, we began to document the butterfly

species occupying the VCNP. We used general survey, transect, and point count methods to document species richness and abundance in a variety of habitats, June-August of each year. UTM's of each survey site were also recorded and entered into an ArcView GIS. So far we have documented over 2000 individual butterflies belonging to 56 species and we have discovered a new colony of the regionally rare, silver-bordered fritillary *Boloria selene*. This is the southernmost known population of the species. We have also mapped the distribution and abundance of five habitat-sensitive species to assist us in documenting potential changes in their numbers and localities over time. Butterflies are often used as indicators of habitat quality thus our current efforts to identify species and butterfly habitats of special concern will assist resource managers in protecting the biodiversity of the VCNP.

Sarah Buss, Robert Debbout, Jedediah Durni, Travis Franz, Tracey Gilbert, Beth Guse, Steven Kruger, Adam Lange, Richard Larson and Jamie Roper (68)

Faculty Advisor/Collaborator: **Garry Running and Evan Weiher**

Coastal Geomorphology, Bon Secour National Wildlife Refuge, Alabama

The purpose of this investigation is to better understand the relationship between species diversity and other characteristics of beach vegetation communities across a transect of coastal landforms. The study area, near Gulf Shores Alabama is located on a spit near the mouth of Mobile Bay. The landform assemblage in the study area is a topographic and chronological transect that includes swash zone (most recent deposits), deflation zone, younger coastal dunes, older coastal dune ridges, lagoon margin, and lagoon deposits (oldest deposits). This transect provides an excellent opportunity to test hypotheses regarding the impact of time (length of landscape stability) and geomorphology on characteristics of plant communities. In addition, this research will provide a better understanding of the landscape-vegetation dynamics upon which the Alabama Beach Mouse is dependent. The Alabama Beach Mouse is an endangered species endemic to the study area but characteristics of its habitat important to its continued survival are not well understood. Geography students will map these landforms along the transect using dGPS and GIS technology, and sample and describe the soils and sediments in them. Biology students will describe diversity patterns (the subject of another poster) along the same transect.

Sarah Buss, Robert Debbout, Jedediah Durni, Travis Franz, Tracey Gilbert, Beth Guse, Steven Kruger, Adam Lange, Richard Larson and Jamie Roper (67)

Faculty Advisor/Collaborator: **Garry Running and Evan Weiher**

Soil Geomorphology, De Soto National Forest, Southern Mississippi

The purpose of this investigation is to better understand the relationship between geomorphology (drainage conditions, topographic position, local-scale hydrology, and soils) and the vegetation in remnant pine savannas and southern hardwood forests. The study area, about 10 miles east of Wiggins, Mississippi is located on deeply incised, relict Tertiary near-shore coastal deposits. A xeric Longleaf Pine Savanna community was associated with higher ground, likely formed of stabilized coastal sand dunes. Intermediate landscape positions were associated with a wet-mesic Slash Pine Savanna community adapted to seasonally wet conditions. There was an apparent sharp ecotone between these communities, and the nature of this ecotone will be discussed. A mesic, closed-canopy hardwood forest community (baygall) is associated with the lowest, yet well drained landscape positions. These communities are associated with the heads of intermittent low-order stream channels. Geography students will map these landforms using dGPS and GIS technology, and sample and describe the soils and sediments in them. Biology students will describe the vegetation communities (the subject of another poster) associated with each landform.

Geology

Nikki Athnos (63)

Faculty Advisor/Collaborator: **Karen Havholm**

Geologic and Geographic Investigation of Holocene Terraces Along the Lower South Saskatchewan River, Central Saskatchewan, Canada

The purpose of this project is to provide archaeologists with a better understanding of the areal extent, stratigraphy, and geoarchaeological significance of fluvial landforms within the South Saskatchewan River valley, from St. Louis, Saskatchewan downstream to the confluence with the North Saskatchewan River. A collaborator from geography determined the extent of the terraces. Stratigraphy and sedimentology of terrace deposits were investigated by describing, photographing, and sampling (for detailed laboratory analyses) Geoprobe cores and cutbank exposures. Three terraces (T1-T3) and an active floodplain (T0) are observed in the study reach. T1 and T2 are Holocene in age (1000-2000 BP and 5000-9000 BP, respectively) and are composed of a silty vertical accretion (floodplain) facies with numerous thin, weakly expressed buried soil profiles over sand and gravel lateral accretion (channel) facies. Abandonment of these terraces and subsequent incision resulted from adjustments to local base level changes controlled by glacial Lake Agassiz. T3 is cut into till or glaciolacustrine deposits and is graded to levels of glacial lakes Saskatchewan and Agassiz during terminal late-Pleistocene deglaciation. T1 and T2 floodplain sediments have the best potential for preservation of Holocene cultural materials.

Luke Beranek (86)Faculty Advisor/Collaborator: **Phillip Ihinger***Field Geology and Geochemistry of a Layered Intermediate Intrusion (LII), North Doherty Mountain, Southwestern Montana*

The North Doherty Mountain Intrusive Complex (NDMIC) is one of several satellite plutons related to the areally extensive Boulder batholith of southwestern Montana. The Boulder batholith comprises multiple plutons and intrusive phases, and the magmatism has long been thought to be subduction-related due to its calc-alkaline granodioritic composition. The NDMIC represents an ideal microcosm of the batholith for petrogenetic and structural studies because it exposes both mafic and felsic units and was emplaced in the limb of a major thrust related fold. We present new geologic mapping and detailed whole-rock major and trace element geochemical analyses to show that the entire mafic-to-felsic suite of rocks in the NDMIC represent a single pulse of dioritic magma that preferentially fractionated generating a layered intermediate intrusion (LII). Three distinct lithologies portray a stratigraphic relationship consistent with progressive crystal fractionation in the form of 1) basal, olivine and pyroxene cumulate; 2) intermediate horizon of diorite to monzodiorite; 3) ceiling capped by thin veneer of felsic granodiorite. The continuous stratigraphy of the LII provides important clues into the evolution of dioritic magmas above subduction zones and lends insight into the origin of continental crust.

Jacob Chmielowiec and Ryan Prechel (157)Faculty Advisor/Collaborator: **Phillip Ihinger***Growth of Hydrothermal Quartz Crystals: Insights from Computer Modeling*

We present computer simulations of crystal growth from hydrothermal solution. Our computer models are coded in the object-oriented language, C++, in order that we may better display our results visually using OpenGL. Our new code uses data gathered from measurements of impurity concentrations within natural quartz crystals. These measurements show that different crystal faces grow at different rates in the natural environment (and hence incorporate different concentrations of impurities). Our code is unique in that we control the growth rate of each individual face during crystal growth. Our results are used to constrain the actual timing involved in the healing of fractures in the geologic environment.

Sarah Gordee and Emily Hauser (88)Faculty Advisor/Collaborator: **J. Brian Mahoney***Magmatic Evolution of the Eastern Coast Plutonic Complex, Bella Coola, British Columbia (93D)*

The eastern Bella Coola region straddles the boundary between the Coast Plutonic Complex in the west from Early Jurassic to Early Cretaceous island arc assemblages of the Stikine Terrane in the east. Numerous, compositionally diverse plutons, which become progressively younger and more voluminous from east to west, intrude the layered volcano-sedimentary successions. The plutonic rocks are distinguished and delimited into intrusive suites on the basis of field relationships, lithology, mineralogy, alteration assemblages, geochemical attributes and age. Intrusive suites in the Bella Coola region, include, from oldest to youngest: 1) Firvale suite (ca. 132-149 Ma), characterized by pervasively chloritized mafics, saussuritized plagioclase, and interstitial, dark-pink alkali feldspar which gives a characteristic pink and green mottled appearance. Preliminary geochemical analysis of the Firvale suite suggests an uncontaminated volcanic arc origin. Rapid exhumation of this suite is indicated by an erosional unconformity below the overlying Early Cretaceous volcanic assemblage; 2) Desire suite (ca. 120 Ma), a texturally and compositionally diverse assemblage of hornblende gabbro/diorite to granodiorite which is commonly foliated and contains abundant metavolcanic xenoliths; 3) Fougner suite, a distinct salt and pepper, sphene-bearing tonalite to granodiorite that is syn- to post-kinematic with respect to the Paleocene Coast Shear zone; and 4) Four Mile suite, a homogenous coarse-grained garnet-bearing muscovite-biotite granite that post-dates deformation associated with the Coast Shear zone, and includes a preliminary U-Pb date of 72.9 ± 0.5 Ma. Trace element patterns from the Four Mile suite display a LILE pattern characteristic of continental volcanic arcs. Ongoing petrographic, geochemical, isotopic and geochronological analyses will further refine suite designations and permit a detailed assessment of the magmatic evolution of the Bella Coola region.

Geology

Rachel Greve (69-70)Faculty Advisor/Collaborator: **Kent Syverson***Effect of High-Relief Topography on Deglaciation Ice-Flow Patterns, Phillips 7.5' Quadrangle, West-Central Maine*

The Phillips 7.5' Quadrangle, west-central Maine, is located in the foothills of the Appalachians. The Sandy River flows approximately east-west through the Quad. Striae on the area's highest points indicate that Late Wisconsinan ice covered the entire landscape. We measured flow indicators in the Phillips Quad to study topographic effects on ice-flow directions during deglaciation. Striae data were sorted into size categories, ranging from large grooves to small, inconspicuous striae, and also separated into two geographical categories (north and south of the Sandy River). In the northern area, rose diagrams show an ESE trend (116° mean) for grooves/striae

formed during ice-flow maximum. Younger, smaller striae show a more easterly flow direction (102° mean). In the south, the largest flow indicators have a 133° mean orientation, typical of the west-central Maine's regional ice-flow direction. Smaller striae indicate more easterly flow (108° mean). From this data we infer that during the Late Wisconsinan glacial maximum, some ice flowed SE directly over highlands, while some was funneled down the Sandy River valley by topographic highs to the north and south. As ice thinned and wasted back, flow was deflected more toward the east by the emerging high-relief topography.

Ben Paulson (85)

Faculty Advisor/Collaborator: **Phillip Ihinger**

Differentiation in the Mafic Alkaline Magmas: The Role of Volatiles at Sub-Solidus Conditions

The Shonkin Sag laccolith in central Montana is a large differentiated intrusive complex that consists of a continuous series of crystals that were progressively removed from a single vat of mafic alkaline magma. Due to crystal fractionation, the Shonkin Sag laccolith is stratified with distinct horizons that represent varying degrees of differentiation. During the summer of 2002, we collected samples within the Shonkin Sag complex that represent different stages of crystallization of this magma. These samples have been sectioned and analyzed petrographically for mineral content and mineral texture. Whole-rock geochemistry of the major and trace elements has been obtained. In addition, detailed mineral chemistry of the principle phases was collected in order to document the crystallization sequence. Our initial results indicate that there has been major remobilization of elements at sub-solidus conditions. These dueteric reactions need to be understood in order to get a sense of the original differentiation trends of this unique rock type. Furthermore, because all magmatic systems experience varying degrees of dueteric alteration, an understanding of the reactions at this locality can be applied in any magmatic system.

Laura Strumness and Taryn Lopez (89)

Faculty Advisor/Collaborator: **Robert Hooper** and **J. Brian Mahoney**

Lateral Variability in Heavy Metal Speciation within Lacustrine Environments, Lower Coeur d' Alene River Valley, Idaho

The lower Coeur d' Alene (CDA) river valley of northern Idaho has been heavily impacted by lead and zinc contaminants from the CDA mining district upstream. Variation in hydrologic regime, redox conditions, porosity/permeability, organic content and microbial activity results in complicated metal transport pathways. Documentation of these pathways is a prerequisite to effective remediation. A combination of sequential extraction and scanning electron microscopy provides a comprehensive assessment of particulate speciation of heavy metals within the lacustrine environments. This investigation examines the lateral and vertical variability in heavy metal speciation in four lacustrine environments within the CDA River Valley. Lead and zinc are sequestered as authigenic, biogenic and detrital phases; the mechanism of metal sequestration varies with distance from source. Near the source, lead occurs as coarse authigenic or fine grained detrital material, and downstream as non-stoichiometric, biogenic material. In contrast, in the lower reaches of the valley, Zn occurs as fine grained detrital and coarse grained authigenic material. Curiously, upstream, Zn is apparently sequestered in biogenic phases. The contrasting contaminant behavior may be the result of hydrodynamic sorting, varying residence times, variations in sediment supply, or biotic differences within the lake systems. Ongoing analysis is designed to test these hypotheses.

James Watkins and Jesse Bernhardt (87)

Faculty Advisor/Collaborator: **Phillip Ihinger**

Alkaline Magmatism from Calc-Alkaline Source Regions: Insights from Square Butte and Sweetgrass Hills, MT

Geochemical analyses of the Square Butte (SQB) and Sweetgrass Hills intrusive suites (SGH) of central and northern MT show strong arc-like affinities similar to the high-potassic magmas that make up the Cretaceous Boulder and Idaho batholiths. This is striking, given the extreme eastern location of these magmas relative to the active arc at the time of their intrusion. We present whole-rock major and trace element analyses, mineral chemistry, and petrographic analyses of a variety of stocks and dikes from SQB and SGH. The intrusive rocks sample low-silica, high-alkalic magmas that were derived from a similar source to that of the older batholiths. Other Eocene alkalic magmas, such as the volatile-rich, ultramafic intrusion at Haystack Butte in central MT, have markedly different trace element signatures and reflect derivation from a separate source. Clearly, at least two distinct sources are involved in the generation of the Eocene magmas. The ultimate cause of the widespread Eocene Cordilleran magmatism is vigorously debated today. Models of shallow slab subduction suggest devolatilization as the mechanism for generating these magmas. However, these models cannot account for the concurrent production of two distinct alkalic magma types. We present a new model for formation of alkaline magmas in the western US.

Mathematics

Rachael Caldie (95)

Faculty Advisor/Collaborator: **Shyam Chadha**

A Study of Linear Inequalities-Applications and Algorithms

In this research work we propose to study and develop an algorithm for solving a system of linear inequalities (SLI). Many problems in business and science are better described by inequalities than by equalities. For example, a manufacturing problem may be solved by using certain linear inequalities that represent production constraints such as the availability of materials and/or labor. Our intention here will be to come up with a method for solving a system of linear inequalities.

Amanda Potts (94)

Faculty Advisor/Collaborator: **James Walker**

Investigation of Frequency Patterns in Music

This project will feature an investigation of Brillinger's and Iritarry's hypothesis of $1/f$ frequency spectra for music. Both western and non-western musical samples, along with random noise, will be analyzed to see if they conform to their predicted $1/f$ pattern. In addition, new fractal musical synthesis will be analyzed. Initial experiments indicate that the $1/f$ pattern is not exhibited for some non-western, or regional folk music, and does not yield music for random noise without frequency banding.

Jamie Thoma (93)

Faculty Advisor/Collaborator: **Vicki Whitledge**

Heat Transfer in the Casque of Macrocephalon maleo

A south pacific bird, Macrocephalon maleo, has an extremely unusual skull configuration. The skull cap is very thickened and has the appearance of a helmet. The purpose of the unusually shaped skull is an open question. One hypothesis postulates that the thickened skull protects the bird's brain from extreme temperatures while it burrows in volcanically heated soils. In this research, we will be using the heat equation to mathematically model the transfer of heat in the skull. The model will be used to support or discredit the hypothesis.

Physics and Astronomy

Thomas Awe (5)

Faculty Advisor/Collaborator: **Jin Huang**

Verification of Poynting Vector Theory Through the Study of Double-Slit Interference

When coherent light is incident upon two parallel, thin slits, the two emerging wavefronts will interfere with one another, creating an ordered pattern of high and low intensity regions. Initial curiosity over this phenomenon led to the solidification of the wave theory of light. The double slit experiment has many other implications in many fields of physics. One optical property that can be studied with the double slit experiment is the relationship between the amplitude of the electromagnetic wave and the detectable intensity of the light. Theory states that the intensity of light is proportional to the amplitude of the Electric Field squared. This can be proven by examining the relationship between the intensity of the interference pattern with the light intensity from the constituent parts. In order to accomplish this, one must block one slit at a time, but due to the close proximity of the slits, the blocking device causes diffractive edge effects, thus compromising the data. It is our effort to limit these edge effects, thus creating experimental data to fully support electromagnetic theory. Also, by utilizing, LabView, in conjunction with appropriate data acquisition devices, we will automate the experiment, thus reducing several forms of error.

Sara Chamberlin and Sandra Mehlberg (18)

Faculty Advisor/Collaborator: **Doug Dunham**

High Resolution X-Ray Photoelectron Spectroscopy Study of Si-rich β -SiC(100) and Si-terminated $c(4 \times 2)$ Oxidation: Importance of Surface Reconstruction

Silicon carbide is a promising semi-conductor for use in high temperature, high power, high frequency, and high voltage electronic devices. If used in such environments, the oxidation of the silicon carbide surface will be important - insulating oxide layers are a requirement for metal-oxide-semiconductor (MOS) devices. Silicon carbide has many different surface reconstructions, but our research has focused on the (3×2) and $c(4 \times 2)$ surface reconstructions of β SiC(100). These two constructions differ in that the (3×2) construction has an extra layer of silicon on top compared to the $c(4 \times 2)$ construction. In the Si-rich (3×2) surface construction then, the top most layer of silicon is further away from the carbon atoms than it is in the Si-terminated $c(4 \times 2)$ surface construction. We believe this is what causes significant differences in surface oxidation between these constructions. Our high resolution photoemission results

show an increase in surface oxidation as both temperature and oxygen exposure are increased for the (3x2) surface construction, and that carbon may be participating in the oxidation. But the c(4x2) construction shows much less oxidation under the same conditions - the closer carbon possibly acting as a strong resisting layer to the oxidation.

Seth King (16)

Faculty Advisor/Collaborator: **Matt Evans**

in situ Studies of Annealed Co on GaAs(001)

Cobalt can be epitaxially grown on gallium arsenide with little strain due to a 0.2% lattice mismatch between the two crystalline structures. In its elemental form, cobalt is a ferromagnetic material with a high spin polarization at the Fermi level. This property allows cobalt to be very useful in the area of spintronic devices. When annealed, however, the magnetic properties of the sample degrade and scanning tunneling microscopy shows a smoother surface morphology. As the annealing temperatures are increased, the hysteresis loops, showing magnetic properties, degrade further and the surface continues to flatten. X-ray Photoelectron Spectroscopy was used to determine what chemical changes occur from this annealing process and give insight as to whether the sample surface is still pure cobalt or if CoAs or CoGa type compounds have been formed.

Seth King (7)

Faculty Advisor/Collaborator: **Paul Thomas**

Melting of an Ice Block: Experimental Comparison to a Numerical Model

Numerical models of phase transitions have been widely used in the study of geophysical processes (e.g. solidification of lava flows and dikes). We use a two-dimensional finite element code designed to model the freezing process on Europa, a satellite of Jupiter believed to maintain a thin, icy crust over a tidally heated ocean. To apply the numerical model to experimental data, a 10 cm radius cylinder of clear ice, 6 cm thick, initially at -10°C is submerged in warm circulating water at 26°C. As the ice melts, digital images are taken and profiles extracted from these images. The resulting data is compared with the numerical model.

Jack Kollwitz (17)

Faculty Advisor/Collaborator: **Kim Pierson**

Low Temperature Epitaxial Growth of Thin Silicon Films for Semiconductor Devices: Ion Source Miniaturization

This project is part of a long-term program to develop a technique to deposit thin epitaxial silicon films at low substrate temperatures. This has been a goal of the semiconductor for many years. It would allow advanced designs of integrated circuit to be realized. The system that we have constructed provides advantages over other techniques currently employed in this field. Our system is a miniaturized ion source that can be used to clean the surface of substrates upon which the thin films are deposited, deposit the silicon atoms that will make up the film and provide localized energy input to crystallize the atoms into an epitaxial film. This ion source has the capability to scaled up to commercial production. Results will be presented on recent experiments designed to find the process parameters that produce the best films.

Mike Tarras (6)

Faculty Advisor/Collaborator: **Nathan Miller**

Observational Astrophysics

We will be using UWEC observatory facilities and CCD cameras to collect brightness data for selected cataclysmic variable stars which fit the specifications of our equipment and which have appropriate periods of variation. After calibrating the images, we will create light curves for each object. We will combine our time-series analysis with research on the relevant literature of cataclysmic variables to better understand the physical processes which create the periodic magnitude fluctuations we have observed and plotted.

Jeff Wilson (176)

Faculty Advisor/Collaborator: **Andrew Swanson**

Molecular Dynamics Simulation

The many-body problem is one of the classical problems in physics. It involves determining what will happen to a large number of atoms when they interact with each other. To do the necessary calculations by hand would be unfeasible, but computers are well suited to the task. I have solved the many-body problem using the powerful techniques offered by Molecular Dynamics Simulation. I used the Lennard Jones Potential and the Weber 3 Body Potential to model the interactions that occur between atoms. It is then possible to obtain many useful measurements that can either further our understanding of atomic theories or can advance current technology.

Graduate Entries

Adult Health Nursing

Sharon Hydo and E. Marie Allison (144)

Faculty Advisor/Collaborator: **Joan Stehle Werner**

Continuation of Development of Research: Spirituality, Quality of Life and Health in People with Chronic Mental Illness

Despite a historical commitment to nursing the spirit as well as the body and mind, it is only in contemporary times that nursing has begun to re-emphasize the place of spirituality in health, wellness, disease, and illness. Much of the current nursing research in these areas, however, is with people who are healthy or who have a chronic physical illness. The aim of the present study, therefore, is to explore spirituality, health, and quality of life from the perspective of people with chronic mental illnesses. During this continuation project, the proposal is being finalized, IRB forms are being submitted, and data collection will begin. This study employs a descriptive/exploratory design with triangulation of methods and investigators. The sample will include at least 30 people with a verifiable chronic mental illness, residing in the community for the quantitative portion of the study, with from 15 to 20 of these persons continuing on to complete an interview. Settings will include community gathering places/agencies for people with chronic mental illnesses. The concepts that will be measured quantitatively using well-accepted instruments, are every day spirituality, self-perceived health motivation, and subjectively perceived quality of life. Participants who agree to a follow-up interview, will be interviewed using a schedule containing open-ended questions focusing on meaning in life, health and life satisfaction. A working model by Underwood is being used as a framework for conception of study phenomena.

Communication Disorders

Jennifer Carlson (147)

Faculty Advisor/Collaborator: **Lisa LaSalle**

Slow Rate Effect on the Fluency of Preschoolers Who Stutter: Clinician-Child Adjacent Utterances

The purpose of this study was to apply adjacent utterance pair analysis (Brown, 2002; Yaruss & Conture, 1995) to determine if clinicians' slow speech rates facilitate the spontaneous fluency of preschoolers who stutter. Seven preschoolers who stutter and their clinicians were audiotape recorded during speech fluency therapy sessions. Per clinician-child dyad, two sessions were randomly selected, and spontaneous adjacent utterance pairs identified. Clinician's speech rates were measured and categorized into "slow" (≤180 syllables per minute), or "quick" (200+ syllables per minute), and the children's resulting fluency as "stuttered" or "normally disfluent/fluent." As a group, observed probabilities did not differ from expected where the child either stutters or speaks with normal fluency, given the clinician speaks either quickly or slowly ($\chi^2 [1, N = 373] = .301, p > 0.01$). However, a boy whose clinician achieved an ideally slow speech rate average showed significantly ($p=0.000$) more stuttered utterances contingent on her occasional quick utterances. In contrast, a boy who both stuttered and presented with a severe phonological disorder showed the opposite significant ($p=0.02$) effect: Subsequent to slow speech, he stuttered and subsequent to quick speech, he spoke fluently or with normal hesitations. Findings support the need for considering individual differences in this area of research.

Tina Pirkle (146)

Faculty Advisor/Collaborator: **Linda Carpenter**

Treatment of the Concomitant Disorders of Stuttering and Phonology: Preliminary Findings

Approximately 40 percent of children who stutter also demonstrate disordered phonology. This study explored effectiveness of treating the concomitant disorders of stuttering and phonology under three treatment conditions. Subjects were two 3- to 4- year old children who stuttered and had disordered phonology. Each child produced three or more within word disfluencies in a 100 word sample and demonstrated at least a moderate phonological disorder as determined from the Assessment of Phonological Processes-Revised (APP-R). A modified multiple baseline design was implemented with each child for the length of three cycles, with each cycle representing one treatment condition. Cycle length was determined using results from the APP-R. Treatment conditions included treating fluency using an indirect approach, treating phonology using a cycles approach, and integrating fluency and phonology treatment goals together in the same treatment session. Each child was assigned to the treatment that corresponded with his parents' greatest concern. Phonological errors decreased for both subjects regardless of the treatment condition. Fluency was more subject to variability based on the treatment condition, but each child's within word disfluencies also decreased across conditions from the beginning to the end of treatment.

Foundations of Education

Stephanie Larson (122)

Faculty Advisor/Collaborator: **Katherine Rhoades**

Exploring Power, Privilege, and Inequality Through Reader's Theater

In this qualitative research study, we seek to understand, in specific terms, why and how Readers Theater is (a) efficacious in furthering undergraduate students' understanding of differences such as race, class, gender, ethnicity, and ableness among a diverse group of people; and (b) efficacious in helping students construct knowledge of how power, privilege, and inequality operate in connection with concepts of difference among people. Our findings will illuminate a path toward interrogating and hopefully improving teaching/learning practices and activities in classrooms that seek to connect students with deeper understandings of how the self both shapes and is shaped by society.

Human Development Center

Trisha Groeschl (125)

Faculty Advisor/Collaborator: **William Frankenberger**

The Effects of the Lac du Flambeau Service Learning Project on Student Development

The Lac du Flambeau service learning project provides undergraduate students at the UW-EC with the opportunity to share in a cultural and learning experience with the Lac du Flambeau Reservation. During this project students participate in an orientation seminar to acquaint them with the reservation and culture. On a two day return trip to Lac du Flambeau, students work in the Headstart classrooms, elementary school classrooms, and tutoring students after school. Pre and post tests are administered to evaluate changes in attitudes and experiences.

Nursing Systems

Robyn Smith, Michelle Bailey, Sharon Hydo, Sylvia Mews and Susan Timm (145)

Faculty Advisor/Collaborator: **CeCelia Zorn**

All the Voices in the Room: A Triangulation of Action Research and Phenomenography

Teaching modalities that integrate the humanities expand our appreciation of the human experience and are necessary for nurse educators to develop in themselves and in the students they teach. There is little integration of the humanities in the traditional teaching methods used by nurse educators. As a result, the voices of nursing students and educators may be silenced. Only by incorporating the full range of human experiences into nursing can the nursing profession maintain its meaning in a diverse and changing society. Since "nursing is the prevention of illness, the alleviation of suffering, and the protection, promotion, and restoration of health in the care of individuals, families, groups, communities, and populations" (American Nurses Association, 2003, p. 5), which requires "attention to the full range of human experiences and responses" (American Nurses Association (ANA), 1995, p.6); using the humanities to integrate and expand our appreciation of the human experience is a necessity. Although recent advancements in technology have strengthened the science of health care, there is an underutilization of the art of health care (AACN, 2002). Furthermore, consumers are demanding that health care be humanized and that they be treated as the special human beings they are. In the current study a triangulation of research methods utilizing action research and phenomenography was used to explore what happens when art is linked with the teaching of student nurses. Five graduate nursing students, a faculty member from University of WI, Eau Claire and a visiting faculty member from Boras Sweden participated in action research in an attempt to link education of nurses to a deeper level of teaching and learning. Several implications emerged as practical knowledge from this research.

Psychology

Trisha Groeschl (124)

Faculty Advisor/Collaborator: **Barbara Lozar**

The Inclusion of Children with Autism vs. Cognitive Disabilities: Teacher Knowledge, Preparedness and Beliefs About the Benefits of Inclusion

288 first grade general education teachers from the state of Wisconsin were sent questionnaires regarding the inclusion of students with autism and cognitive disabilities in their general education classroom. 144 teachers received questionnaires regarding autism and 144 received questionnaires regarding cognitive disabilities. Each questionnaire contained questions regarding knowledge about the disability, beliefs about the benefits of inclusion to the children with a disability and to the others in the classroom, and the teachers' preparedness to include such children in their classroom. Scenarios of students were also included in which teachers were to rate how

willing they were to include these students in their classroom and with what amount of support. The data was then analyzed to determine if there was a difference between these factors depending on disability.

Marisa Miller (123)

Faculty Advisor/Collaborator: **Marie (Mickey) Crothers**

Middle School Students' Perceptions of School Safety: A Comparison of Students Who Receive Special Education Services in a Resource Room Setting and Students in General Education Classes

The prevalence of bullying and violent behaviors in schools has increased over the years, causing some children to perceive their schools as unsafe. The purpose of this study is to examine how safe middle school students in a city in the upper Midwest feel at their school. This study will focus on determining whether students who receive special education services within a resource room setting, differ in their perceptions of school safety as compared to students who are in general education classes only. Upon reviewing the literature it was discovered that students with learning disabilities, ADHD, and/or students that receive instruction within resource room settings have some deficits in social skills and less positive peer interactions than students without disabilities (Frederick, & Olmi, 1994; Guevremont, & Dumas, 1994; Hall, & Richmond, 1985). Previous studies have assessed the effects of variables such as gender, ethnicity, and grade level on students' perceptions of school safety, but no studies were found that assessed the perceptions of students with disabilities. This study's focus is to understand whether students who receive special education services differ in their perceptions of schools safety from their peers in general education classes.

Terri Olsen (140)

Faculty Advisor/Collaborator: **Kimberly Knesting**

Teacher Perceptions of Student-to-Student Sexual Harassment Among Middle School Students

In 1993 an American Association of University Women (AAUW) study that reported that 79% of high school students were experiencing sexual harassment from another student and results from a follow-up study done by the AAUW in 2001 found almost identical experiences. One of the important findings in this research was that despite almost 60 % of harassment occurring in the hallways and classrooms, only 11% of students went to teachers to report the incident (AAUW, 2001). This finding raises the question if teachers are labeling and seeing these same behaviors between students that the students themselves are reporting, as well as what their typical response to these situations is. The current study is an examination of student to student sexual behaviors in middle school from the point of view of the teachers. A survey will be sent out to 500 middle school teachers in Wisconsin to identify if they would rate behaviors, defined as sexual harassment in the 1993 and 2001 AAUW studies, in a similar way as students. The survey also will be asking the teachers to estimate how often they witness these behaviors among students in their school. The current study is also examining what teachers would do in response to vignettes that demonstrate these behaviors between students.

Kristie Redmann (141)

Faculty Advisor/Collaborator: **Barbara Lozar**

Older and Younger Siblings: Perceived Pressure to Participate and Excel in High School Athletics

The purpose of this study was to examine younger siblings' perceived pressure to participate and excel in high school athletics. This study examined how younger siblings feel about participating and excelling in high school athletics when they have an older sibling who participates and/or excels in high school athletics. Varsity athletes in grades nine through twelve and their younger siblings in grades six through eight were given different questionnaires. The older sibling (varsity athlete) questionnaire looked at the older sibling's perceived pressure to participate and/or excel in high school athletics. It also looked at their perception of their younger sibling's future participation in high school athletics. The younger sibling questionnaire looked at the younger sibling's perceived pressure to participate and excel in high school athletics.

Sheila Schmitz (142)

Faculty Advisor/Collaborator: **Marie (Mickey) Crothers**

Cross-Age Peer Tutoring Versus No Tutoring for At Risk Students: A Comparison of Self-Concept and Grade-Point Average

The study will examine differences in self-concept in Middle School students who have been identified as being at risk in academic areas, according to their school criteria. Academic self-concepts have been identified as playing a role in children's ability to attain academic and social achievements in the general classroom. The purpose of this study is to examine whether academic self-concept and academic achievement differ before and after students receive peer tutoring services. Self-concept scores and grade point averages will be compared across two groups: The members of the intervention group will be at-risk students who received tutoring; the members of the control group will be at-risk students who did not receive tutoring. The comparisons will be made initially in January, then again at the end of the second semester (June).

Melissa Williams (143)

Faculty Advisor/Collaborator: **Beverly Dretzke**

Ethnic Identity Attitudes of Hmong Students and Their Perceptions of Issues Relating to School Attendance, Academic Success, and Extracurricular Activities: Comparisons Across Gender, Year in High School, and English Language Competence

The purpose of this project is to examine attitudes of Hmong high school students regarding ethnic identity, school attendance, academics, and extra-curricular activities. Ninth through twelfth grade students at North High School (NHS) in Eau Claire, Wisconsin were surveyed. Responses will be compared across gender, year in high school and English language competence (whether or not students receive ESL programming). Ethnic identity attitudes were assessed through the use of a survey developed by Dr. Jean Phinney. Attitudes regarding the other issues were assessed through the use of a supplemental survey created by the researcher with the help of NHS staff. This study was designed around issues of concern to North High School. The school has a desire to better understand the attitudes of Hmong students so programming can be developed to better meet the needs of these students who are typically less successful than the other students. It is also hoped that the results of this study will assist the school in developing a plan to increase the attendance and involvement of Hmong students as well as help them become more successful academically.

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