VALPARAISO UNIVERSITY
CELEBRATION OF UNDERGRADUATE SCHOLARSHIP
Harre Union, Ballrooms A and B
April 21, 2010

8:30 a.m. –  6:30 p.m.   Posters on Display
8:30 a.m. – 10:30 a.m.   Poster Judging
10:30 a.m. – 6:30 p.m.   Open Viewing for Campus Community
12:00 p.m. – 1:00 p.m.   Lunch for Student Presenters
2:30 p.m. – 3:00 p.m.   Awards Presentation (Brown & Gold Room)

Deans’ Choice Presentations
Harre Union, Brown and Gold Room

| 3:00 p.m. | Mark Schwehn, Provost | Welcome |
| 3:10 p.m. | Cynthia Rutz, Director Celebration of Undergraduate Scholarship | Deans’ Choice Presentations Program |
| 3:15 p.m. | Aaron Harter, Erin Carlson | What Guides Embryonic Cell Migration in the African Clawed Frog? |
| 3:30 p.m. | Evelyn Gomez, Molly Grime, Julie Wingstrom | Relationships among Life-Style, Health Behaviors, and Health Status Outcomes for Underserved Adults |
| 3:45 p.m. | Keith Liput | A Democratic Liberation: Liberation Theology and Rousseau |
| 4:00 p.m. | Chris Hammer, Ian MacDonald, Caitlin Donnelly, Allyson Nieter, Heather Halub, Justin McGiffen, Carly Mohr, Mike Pudlow, Nathan LaGrave, Emily Nelson, Cara French, Victoria Adan | Global Corporate Reporting: The Triple Bottom Line |
| 4:15 p.m. | Kelsey Obenour | Detection and Probability of Ocean Fronts in AMSR-E Satellite Data |
| 4:30 p.m. | Karl Stathakis | Accelerating Simulation of Quantum-Dot Cellular Automata via Graphics Processing Unit |
| 4:45 p.m. | Krystal Warmoth | Love at First Sight |
| 5:00 p.m. | Dr. Martin Buinicki | Undergraduate Scholarship and the 'Snare of Preparation’ |

STEM Faculty Publication Reception
Harre Union, Ballrooms A and B
5:30 – 6:30 p.m.
Overview of the Celebration

The Celebration of Undergraduate Scholarship (CUS) is a conference that allows undergraduate students to showcase their creative and/or scholarly work and research in a professional format. The Celebration began in 1998 as an idea from an interdisciplinary group of faculty who had attended national meetings on the role of undergraduate research in the college experience.

Students who have worked on class projects, senior projects and theses, or independent research projects and scholarship participate in the Celebration. In addition to poster presentations, the Deans of Valparaiso University’s five undergraduate colleges select students to represent their colleges at the Deans’ Choice Presentations, and these students give oral presentations in an afternoon program. As part of this program, a faculty member who has involved students in his or her research program gives a keynote address.

Keynote Presentation

Undergraduate Scholarship and the ‘Snare of Preparation’

Professor Martin Buinicki will discuss the opportunities that undergraduate scholarship provides students to engage the community beyond the classroom, to make a difference in the lives of those around them, and to make professional contributions in their fields – even while pursuing their education. Although such opportunities are exciting and important, they also bring with them significant responsibilities for the University, its faculty, and its students.

Martin T. Buinicki, Ph.D.
Associate Professor of English, Department of English

Martin T. Buinicki is an Associate Professor of English at Valparaiso University and the author of Negotiating Copyright: Authorship and the Discourse of Literary Property Rights in Nineteenth-Century America (Routledge, 2006). He has published essays in a number of books and journals, including Blackwell's Companion to Mark Twain, Scribner's American History through Literature, American Literary History, and American Literary Realism. Most recently, his article “‘Average-Representing Grant’: Whitman’s General” was published in the Walt Whitman Quarterly Review. The article is part of a larger book project entitled Walt Whitman’s Reconstruction: Poetry and Publishing between Memory and History.

In addition to teaching American literature at Valpo, Professor Buinicki regularly teaches Methods of Literary Criticism and Research, a course that introduces students to the techniques of advanced study in literature. He also offers a course entitled Traditions of Giving and Serving in American Life. Students in the class read literary texts that explore questions of philanthropy, but they also learn more about local needs and the non-profit organizations working to meet those needs. This year, in partnership with Doris Buffett’s Sunshine Lady Foundation, the students will award $10,000 to local agencies. In wrestling with the difficult decisions regarding how to give such a substantial gift, students reflect on how the questions raised by a particular literary work – say, Cotton Mather’s “Essays upon the Good” – shed light on their own charitable task. This course exemplifies Professor Buinicki’s commitment to fostering student work that reaches beyond the boundaries of the classroom, as well as his belief that students do not need to wait until they earn a degree to put their education to use in making a difference in the community.
Can You Spot the Fake? The Effects of Mood on Smile Detection

Ryan Abraham, Alyssa Abbate, Paul Allison, Nate Keiser

Departmental Affiliation: Psychology
College of Arts and Sciences

The primary purpose of this study is to determine if training/feedback improve participants’ ability to detect false smiles. Participants in the training group will watch a slideshow that provides information about how to determine if a smile is genuine or false. Participants in the control condition will watch a slideshow about smiles, but the presentation will not provide information about detecting false smiles. Then they will view videos of 10 smiles and determine if the smile is genuine or false. After watching each video, participants in the feedback condition are told whether each smile is genuine or false. Participants in the no feedback condition will not receive this information. Following, participants will watch 10 new videos, determine if the smile is genuine or false, and rate their confidence in that judgment. We expect that participants who receive training/feedback will show more improvement than participants who do not receive training/feedback. A secondary goal of this study is to determine if affect is associated with performance on the smile detection test. To assess affect, the Brief Mood Introspection Scale will be completed prior to training. We expect that people in neutral moods will be able to distinguish between genuine and false smiles.

Information about the Authors:
All authors completed this project as a group assignment for the Advanced Research and Design Analysis Course. They were presented the overview of the assignment and chose the individual variable affect for their project. The effects of mood on smile detection have had little research support in the past, and they hope that their study can contribute significantly to the domain of research.

Faculty Sponsor: Dr. Jennifer Winquist

Student Contact: Ryan.Abraham@valpo.edu

Giving All Their Fair Say – The Power of Research

Kendal Ahlmann, Wayne Douma, Alexandra Faust, Lydia Mertz, Natalie Zibolski

Departmental Affiliation: Communication

Public Relations Campaigns: Assessing the Perception and Reality Gap

Kendal Ahlmann, Nicole Christison, Simone Cooper

Departmental Affiliation: Communication
College of Arts and Sciences

Social responsibility often involves a complex matrix of ideas. The power balance between organizations...
and publics is always a concern. The role of public relations is to balance this power relationship, especially when there are issues of social responsibility or corporate social responsibility. The average person might believe that the worldwide push to “go green” is coming solely from politicians and concerned citizens. In fact, this is not the case. In recent years, many big-name companies have realized their way towards more sustainable and eco-friendly business practices. In an effort to bring the average citizen on board with this worldwide push, public relations practitioners have worked to implement “going green” into many campaigns. This study examines the public’s perception on this all-encompassing idea and whether or not it truly achieves the positive impact desired or just comes off as a “ruse” to gain a better image or reputation.

Public relations agencies such as Edelman Worldwide conduct a yearly “trust” survey to determine the level of trust in certain types of organizations. The data from these studies as well as the data conducted on student groups defining the area of social responsibility establishes the degree of credibility publics perceive companies have when adopting the go-green practice.

Information about the Authors:
Kendal Ahlmann is a senior creative writing and public relations double major with a minor in ethnic studies. Simone Cooper is a senior public relations major and dance minor. Nicole Christison is a senior public relations major.

Faculty Sponsor: Dr. Bonita Neff
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Crossing Borders: Bilingualism and Trilingualism in a School System in Bluefields, Nicaragua

Carly Anderson, Holly Anderson, Jayne Burke, Samantha Frisk, Katie Sheehan, Michael Suhany

Departmental Affiliation: Education
College of Arts and Sciences

Over spring break, six education students traveled to Nicaragua and observed at the Moravian Primary School in Bluefields to investigate bilingualism and trilingualism at the school system. The purpose of the research for this study is to: a) determine the number of students in the school system who are bilingual or trilingual; b) investigate how the school system accommodates non-Spanish speaking learners; c) find out if school texts are in languages other than Spanish; d) seek ways to improve the school system; and e) find out recommendations the Ministry of Education has for the schools on languages. Data was collected through surveys and interviews of the students and teachers in the school system. Mostly qualitative, a few quantitative methods were used while analyzing the data. Results of the research found that many students at the school system are bilingual or trilingual, and that the school highly encourages students to speak multiple languages.

Information about the Authors:
Carly Anderson is a sophomore mathematics and secondary education major. Holly Anderson is a junior elementary education major and special education minor. Jayne Burke is a sophomore mathematics and secondary education major. Samantha Frisk is a sophomore mathematics and secondary education major. Katie Sheehan is a junior elementary education major and Spanish minor. Michael Suhany is a junior history and secondary education major. All six students traveled to Nicaragua over spring break, observing in a school system in Bluefields, Nicaragua.

Faculty Sponsor: Dr. Del Gillispie
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Frenchmen from Foreigners: The Status of Muslim Immigrants in France

Elizabeth Balge

Departmental Affiliation: Foreign Languages & Literatures
College of Arts and Sciences

I have chosen to research the treatment and security of Muslim immigrants in France. France has a tradition of strong national pride, and French people whose families have been in the country for many generations are often threatened by immigrants. The citizens of France are neither a cohesive nor integrated population. Over 6 million people – 10% of the population – is made up of immigrants, many of whom have come from North Africa and the Middle East. The past several years have seen multiple instances of discrimination against this ethnic group, with specific regard to religious attire. My research will focus primarily on the cultural security of immigrants. I will also explore the threat to native French peoples’ economic security which arises when immigrants take jobs. Though there is
evidence of policies enacted by the government toward a better sense of security for Muslim immigrants, I believe it has not been successful. The issue of cultural security, including religious traditions, is relevant and important to study. A country which claims to welcome immigrants should take into account the power family and religious obligations have over the new French citizens. My research project will explore the policies in effect regarding this issue, as well as various points of view. I hope to be able to make conclusions about the current status of immigrants – in the realms of culture, economics, and politics – and make predictions for the future.

Information about the Author:
Elizabeth Balge is a senior international economics and cultural affairs and French major from New Berlin, Wisconsin. She became interested in this topic after living and studying in Cergy, France, a suburb of Paris. After graduation, Elizabeth hopes to return to France to teach English and continue learning about the culture, language, and people.

Faculty Sponsor: Dr. Randa Duvick
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Comparison of CMAQ Model Predictions with Ozonesonde Observations in Houston, Texas, from 2005 to 2009
Ashley Berg

Departmental Affiliation: Physics and Astronomy
College of Arts and Sciences

The Community Multi-Scale Air Quality (CMAQ) modeling system was designed by the EPA for modeling a variety of air quality issues on multiple spatial and temporal scales. A version of the CMAQ model developed by the University of Houston is used to predict ozone levels in Houston, Texas. The model is compared to ozonesonde observations in Houston from 2005 to 2009. This project seeks to explain the differences between the model output and observations. The differences are graphed and analyzed by year and by layer. The effect of meteorological factors on the model is also assessed. A secondary project will assess the impact of assimilated surface monitor and ozonesonde data on the CMAQ model.

Information about the Author:
Ashley Berg is a senior meteorology major. Her research experience includes studying the need for a Houston radiosonde in spring 2009 with Professor Gary Morris and summer 2009 participation in NASA's Undergraduate Student Research Program at the Langley Research Center. NASA is where her interest in atmospheric chemistry developed. She is returning to NASA this summer and will begin her graduate studies in atmospheric chemistry at Colorado State University this fall.

Faculty Sponsor: Dr. Gary Morris
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Community Relations is Challenged by the Growing Diversity of Publics: A Case Study of the Frontier League
Peter Berg, Gabriele Bladdick

Departmental Affiliation: Communication
College of Arts and Sciences

Sports teams are often an integral part of communities in the United States. The success or failure of a team is not only dependent upon the strength of the team but to a large degree the professional approach to community relations. With the growing diversity of communities throughout the country, the degree to which public relations professionals identify their publics and understand the diversity of communities often provides an insight into the relationship. Speech Act Theory, for example, stresses the dialogic and cultural characteristics of communication, both important characteristics when evaluating community relations. This research identified the key public relations tactics (communication pieces) and strategies used by the Frontier League teams’ community relations departments. The analysis of the websites of these teams revealed not only the technical standards met but illustrated how diverse communities are addressed. The results indicate the websites vary in technical standards. The development of relationships with diverse publics is not visible through the websites, suggesting diverse audiences are not addressed. These results also indicate much more is needed to develop a team’s website into a community relations effort. These findings illustrate why such local teams are often struggling for an audience and for a relationship with the publics in the community.

Information about the Authors:
Gabriele Bladdick is a junior majoring in public relations with a minor in business. Currently, she is
serving as the President of VU’s Public Relations Student Society of America. Peter Berg is a senior public relations major with a television radio minor from Chicago. He is the Vice President of Lambda Pi Eta Communications Honor Society and works extensively with WVUR 95.1, the campus radio station.

Faculty Sponsor: Dr. Bonita Neff

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Urbanization and Thermal Change Detection

Tamarind Bobo, Danielle Slotke

Departmental Affiliation: Geography and Meteorology
College of Arts and Sciences

Urbanization is one of the extreme cases of land-use change. As urban areas develop, changes occur in their landscape and the urban heat island. Characteristics observed consist of urban growth and decay and how the thermal band responds respectively. Land use and thermal signature changes have been calculated from satellite-derived data for the Chicago area over the span of 17 years. There is approximately a 3:1 ratio of built up growth compared to vegetation growth in the change detected from multispectral data. Multispectral and thermal land use change values were similar with tendencies for urbanization of 21,747.3 km² and 20,400.09 km² respectively. A strong relationship can be seen with the effect urbanization has on increasing the thermal reflectance which represents growth of the urban heat island effect.

Information about the Authors:
Tamarind Bobo is a senior meteorology major from Aurora, IL. She is graduating in the spring and looks forward to pursuing a career in meteorological instrumentation. Danielle Slotke is a senior meteorology major from Milwaukee, WI. She will be graduating in the spring and then attending graduate school for oceanography in the fall.

Faculty Sponsor: Dr. Bharath Ganesh Babu

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Impacts of the Invasive Species Elaeagnus umbellata on the Pierce Cedar Creek Institute Ecosystem Soil and Water Quality

Kaylene Boroski

Departmental Affiliation: Civil Engineering
College of Engineering

Autumn olive (Elaeagnus umbellata), a woody shrub native to Asia, was planted in the U.S. for its wildlife value and as an erosion control plant. However, as it invades many areas, including Pierce Cedar Creek Institute nature preserve, it crowds out native plants and acts as a nitrogen-fixer, a characteristic that could cause more alterations to the host ecosystem. It was hypothesized that its rapid spread is due to its self-fertilizing ability. This study focused on comparing concentrations of nitrogen species and positive ions in areas affected by versus sans the autumn olive. Soil water samples were tested for concentrations of total nitrogen, nitrate, ammonia, potassium, calcium, and magnesium; the results were statistically analyzed using 2-sample t-tests. Due to this study’s short duration, not enough significant differences in the mean concentrations were found to state that the autumn olive was causing alterations in soil chemistry, excepting the potassium test. The concentration of potassium was significantly lower around locations with the autumn olive than without. This positive result and consideration of the uncertainty of the statistical analyses’ accuracy due to the limited number of samples suggests that significant differences may be seen in the remaining concentrations were the study continued.

Information about the Author:
Kaylene Boroski is a junior civil engineering student, minoring in business administration and math. She became interested in research in general as her interest in graduate school grew; this topic in particular was interesting as she grew up in a home surrounded by a nature preserve which is also affected by similar invasive plant species.

Faculty Sponsor: Dr. Zuhdi Aljobeh

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Forecasting Southern Plains Wind Ramp Events Using the WRF Model at 3-km

Kristen T. Bradford, Dr. Richard L. Carpenter, Brent L. Shaw

Departmental Affiliation: Geography and
Wind ramp events - extreme and rapid changes in wind power output due to abrupt changes in wind speed - are a growing concern for the wind energy industry; therefore, precise forecasting of these phenomena is crucial to the advancement of wind power in the United States. Weather Decision Technologies, Inc., (WDT) is partnering with NanoWeather, Inc., to create a wind forecasting system called WindPredictor™ in order to precisely predict winds (and, in turn, ramps) for the energy industry. WDT’s contribution to WindPredictor will be a customized version of the Weather Research and Forecasting (WRF) model, which is currently being run on a 3-km grid. This presentation assesses the 3-km WRF’s performance regarding ramp event prediction. A comparison between surface wind forecasts and hourly METAR observations was utilized to assess its performance.

Information about the Authors:
Kristen Bradford is a senior meteorology major from Grand Rapids, Michigan. Last summer, she was selected to participate in the National Weather Center Research Experience for Undergraduates (REU) program, during which she conducted this research. Dr. Richard Carpenter and Brent Shaw are employed by Weather Decision Technologies, Inc., a private sector company in Norman, Oklahoma. They were Kristen’s mentors throughout the 10-week program and played a pivotal role in the completion of this project.

Sponsor: National Weather Center REU Program

Student Contact: Kristen.Bradford@valpo.edu

Information about the Authors:
Kevin Brown is a sophomore public relations major and Spanish minor. Lydia Mertz is a sophomore public relations and international service major, Spanish and geography minor. Ali Aljaziri is a junior public relations major. In January 2006, Ali received a scholarship from the Saudi Arabian government to study at Valparaiso University.

Faculty Sponsor: Dr. Bonita Neff

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Modeling the Political Stability of Neighborhoods in the U.S.

Mark Burek, Spencer Roach, Michael Borchert

Departmental Affiliation: Mathematics and Computer Science
College of Arts and Sciences

In a segregation game, the investigator is studying patterns of movement amongst two types of individuals in a community. Individuals are content when they are next to other individuals like themselves. Two types of equilibrium states exist in this game which leave the community either segregated or integrated together. Previous research has demonstrated that segregated equilibrium states are the only stochastically stable states, but has limited its focus to two types of individuals. Our work extends the segregation game to three types of individuals. We show that given random perturbations of groups in a community, the only stochastically stable states are the segregated equilibrium states.
Information about the Authors:
Mark Burek is a math major who has decided to dedicate his life to the pursuit of mathematics. He seeks to obtain a doctorate in mathematics and become a full-time professor and researcher. Spencer Roach is a sophomore math major from Elkhart, Indiana, who became interested in researching mathematical problems upon arriving at VU. He plans on becoming an actuary upon graduation. Michael Borchert is a math and chemistry major who joined the group this year.

Faculty Sponsor: Dr. Rick Gillman
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Gross Domestic Wellness: A Visual Display of the Wellbeing of the States
Matthew Cervarich

Departmental Affiliation: Geography and Meteorology
College of Arts and Sciences

Gross domestic product (GDP) is used as the measure of territorial wellbeing. In this research it is contended that GDP is not an accurate measure of wellbeing, and an alternative “wellness index” has been proposed. Demographic, health, nutrition, and economic datasets are drawn together to derive a wellness index. Geographic Information Systems (GIS) is used to map statewide datasets and the derived wellness index to spatially compare the relationships between the overall wellbeing and individual cultural variables. A series of maps have been produced in this effort.

Information about the Author:
Matthew Cervarich is a senior meteorology major with a strong interest in geography. Researching the wellbeing of states is a new field for him, but one of great interest. He enjoys using Geographic Information Systems to provide spatial analysis and a mode of solving various socio-economic and environmental problems.

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Adam Conner, Wendy Marth

Departmental Affiliation: Chemistry
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The Valparaiso Chain of Lakes watershed consists of 11 lakes, multiple small ponds, and the connecting waterways. Although the lakes share a common topography and are primarily used for recreational and aesthetic purposes, land use in the watershed varies from commercial to natural and there has been substantial construction work completed in the watershed in the past two years. As the Valparaiso community grows and land within the watershed is developed or redeveloped, it is important to track the water quality (WQ) in the watershed. During the summer of 2009, 17 common WQ parameters were monitored at 31 sites to assess the current status of the lakes. Results were compared with data collected annually since 2005. Results were used to assess the effectiveness of recent restoration and preservation efforts intended to maintain and improve the overall WQ. In some cases, there has been modest but progressive improvement in the WQ within the watershed. For example, the nitrogen and phosphorous levels in Mink Lake, bordered by a golf course, have improved since 2005. However, other parameters in some lakes, such as conductivity in Bullseye Lake and Spectacle Lake, have seen negative changes. Additionally, we observed for the first time a dissolved oxygen (DO) level in one of the lakes indicative of a serious algae bloom.

Information about the Authors:
Adam Conner is a senior chemistry major who completed a water quality research project this past summer under the supervision of Dr. Jonathan Schoer. Although Adam had no previous experience in environmental chemistry, he appreciated having the opportunity to learn fundamental research skills that will help him in the future as he enters the job market after college. Wendy Marth is a junior chemistry major who worked under Dr. Jonathan Schoer. Because she has a passion for nature and the outdoors, spending the summer researching water quality was a great fit for her. Wendy plans on attending graduate school to earn her Ph.D. after graduating.

Faculty Sponsor: Dr. Jonathan Schoer
Student Contact: Adam.Conner@valpo.edu

The Effect of Social Media Campaigning on the
Haitian Relief Effort

Wayne Douma, Courtney Gwinn

Departmental Affiliation: Communication
College of Arts and Sciences

Fundraising under normal conditions is the highest paid function in public relations. Generally, a PR professional is working with donor relations, but there are areas where different circumstances yield different results. Fundraising under crisis conditions has brought about an entirely new approach to raising funds. The Haitian catastrophe was the first major disaster to occur when the mobile phone and twitter were in significant force. The instant “response” capability arranged by the telephone company allowed a punch code to place the charge on your phone bill without any additional tax. This immediate possibility yielded a huge number of responses as people globally were emotionally reacting to the dire situation. Twitter was saturated with details on how to contribute to the Haitian cause. This research on social media case studies provided insight into the more recent approaches in fundraising. These efforts brought together a picture of the three primary donor publics – individuals, corporations, and foundations – to raise awareness and funds. Corporations have worked on things like texting in donations and allowing one to contribute straight onto their monthly cellular phone bill. Social media outlets like Twitter and Facebook added a new dimension to fundraising through individuals and nonprofits.

Information about the Authors:
Wayne Douma is a senior public relations and political science double major who is also working on a minor in art history. He is originally from Lansing, Illinois. He spent the spring 2009 semester studying journalism in Washington, D.C. with the American University program where he visited various organizations and interned with the Republican National Committee. Courtney Gwinn is a senior public relations and marketing double major. She is originally from Evansville, Indiana. On campus, Courtney is involved in the Public Relations Student Society of America, and is a SparkPR team leader for the Crusader team.

Faculty Sponsor: Dr. Bonita Neff

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Christianity’s Role in Modern Society as Seen through Contemporary Fiction

Chelsie Droessler

Departmental Affiliation: English
College of Arts and Sciences

In a society which describes itself as secular more often than religious, 78.4% of Americans claim the label Christian. Of this section of the population, however, only 44% go to church. Amid these contradictions, contemporary authors find religious elements a highly debatable inclusion in their works of fiction. Using Alice McDermott's "Charming Billy," Sue Miller's "While I Was Gone," and Ann Patchett's "The Patron Saint of Liars" as examples, this project explores secular authors’ use of religion within their novels and society's reaction to this inclusion. It considers why authors decide to include religion in their novels at all given the controversies that can easily ensue. Gathering information from various secular media as well as texts and interviews, this study has provided an overview of Christianity's role in society as seen through modern writing.

Information about the Author:
As a senior English major, Chelsie Droessler took on this project because she is interested in American society and literature's role in it.

Faculty Sponsor: Dr. Edward Uehling

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Conversations on Love: Nygren, Lewis, and Pieper

Justin Egge

Departmental Affiliation: Theology
College of Arts and Sciences

Although love is one of most unique and important virtues of the Christian life, conversations surrounding the concept reveal the difficulty of a pure understanding of Christian love. We live lives with many discriminate types of love, and thus, the Christian life demands a thoughtful reflection on how to sort these different loves. Anders Nygren, a Swedish Lutheran, significantly influenced the fundamental Christian understanding of love, in his book, Agape and Eros. He argues agape (divine love) and eros (human love) are mutually exclusive. Unlike Nygren, C.S. Lewis and Josef Pieper provide different accounts of love. Lewis argues agape as a love that rescues eros and, similarly, Pieper discusses
the importance of eros and other “loves” for Christians. Nygren’s argument eventually falls apart because he attempts to frame an entire theology around his interest. Man eventually loses his agency, as only divine love can act in the Christian life. On the other hand, Lewis and Pieper provide a more compelling argument by saying man can utilize created loves through the grace of agape.

Information about the Author:
Justin Egge is a senior from Sioux Falls, South Dakota, majoring in biology and theology.

Faculty Sponsor: Dr. Gilbert Meilaender

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Hand Off Communication
Tricia Erdmann, Anne Ferringer, Katie Fodness, Maria Hyrczyk, Caitlin Leahy

Departmental Affiliation: Nursing
College of Nursing

Communication between health care providers is pertinent to patient safety. The purpose of this evidence-based practice project was to determine best practice when conducting hand off communication between emergency department and medical surgical nurses. A review of the literature was conducted using nursing databases such as CINAHL, PubMed, JBI, and AHRQ. Research shows that a hand off tool creates more successful communication between health care providers. Hand off tools were obtained from various medical surgical units to create a baseline understanding of current best practice. Creating a unit-based template using the SBAR (situation, background, assessment, recommendations) model for the hand off procedure aided in improving what information was communicated between nurses. An implementation policy was also utilized in conjunction with the creation of the hand off tool. Given the research, a decision to change practice included the creation of an original hand off communication tool which would be incorporated into the hospital’s practice. Follow up after one month of implementation would include communication satisfaction surveys and observation of nurses using the tool. In conclusion, an increase in patient safety can be achieved through the use of the best communication practice guidelines.

Information about the Authors:
Tricia Erdmann, Anne Ferringer, Katie Fodness, Maria Hyrczyk, and Caitlin Leahy are all senior nursing students. Tricia is hoping to work in a Children’s Hospital after graduation in either an oncology unit or a pediatric intensive care unit. Anne is originally from North Manchester, Indiana, and is looking forward to continuing to explore the many opportunities nursing has to offer. Katie, who has a previous degree in biology, hopes to continue her nursing education, and eventually wants to work in pediatrics or in intensive care. Maria plans to work in Northwest Indiana upon graduation and future plans include working with cardiac or surgical patients. Caitlin is excited about what the future has to offer and is hoping to move to and work in the Chicago area.

Faculty Sponsor: Dr. Nola Schmidt
Land Use Change in the Phoenix Metropolitan Area 1991-2005

Timothy Garibay, Joel Mathwig

Departmental Affiliation: Geography and Meteorology
College of Arts and Sciences

With its relatively young stature as an American city, Phoenix, Arizona, and its neighboring communities have rapidly grown into not only a major Southwest hub but a location of prime importance across the globe. Even within the last half-century, the surrounding desert landscape has been steadily overcome by man-induced sprawl of agricultural and urban uses. The upward population and spatial trends have shown little, if any, signs of diminishing in the near or medium future. By applying remote sensing techniques, and more specifically change detection methods, this study focuses on and analyzes general land usage in the Phoenix Metropolitan Area from the years of 1991 and 2005 and the land use change that has occurred. Using urban, agriculture, barren, and water as classes in our analysis, the resulting data and maps clearly indicate the prevalent land transformation to urban features across the region in this relatively short period of time.

Information about the Authors:
A senior from Griffith, Indiana, Tim Garibay is receiving a Bachelor of Arts in Geography in May 2010. He served as an intern for the Planning Department at City Hall in Valparaiso, as well as a GIS intern with the Active Transportation Alliance and as an Environmental Restoration intern with the National Audubon Society during his Urban Studies semester in Chicago. He will be pursuing a master’s degree in Urban Planning in the fall of 2010. Joel Mathwig, a December 2009 graduate from Fall Creek, WI, currently works for the City of Valparaiso, primarily aiding the engineering, utilities, and planning departments in several Geographic Information Systems and geographical data activities. He plans on pursuing a master’s degree in geography in the fall of 2010.

Faculty Sponsor: Dr. Bharath Ganesh Babu

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Promotions Affected Record Sales of Two Hip-Hop Artists in 2009

Ryon Gilbert, Justin Girouard

Departmental Affiliation: Communication
College of Arts and Sciences

The central idea of our project will be to discuss the publicity and promotional tactics of hip-hop music within the entertainment industry – both product and image. The objective for most specialists is to sell something – CDs, movies, tickets or even an image – and to use the sales promotional techniques targeting audiences to buy the product. (Encyclopedia of Public Relations, 2006). By identifying two artists high on the charts for billboards.com/singles, the data established a key population to be studied. The question remains: Is it the artist’s image or the product per se impacting sales? This research distinguishes the increasing sales revenue established by rating websites to the promotional tactics creating the image of the artists by analyzing visual media and e-articles. This research established the image through visuals and then compared the singles selling more successfully on on-line music downloading websites. There were no best selling singles that did not have a supportive image campaign and respondents were asked to identify these elements to see which aspect dominated; the results were triangulated with musical style, related artifacts such as album covers, music videos, and additional primary sources from print and e-articles for 2009. Other sources of expertise from the music industry, including producers and alumni music enterprise graduates from Valparaiso University, were integrated into the analysis.

Information about the Authors:
Ryon Gilbert is a junior marketing major and public relations and international business and global studies minor. Ryon is the finance chair of the executive board of the Public Relations Student Society of America and a member of the PRSSA SPARK agency team for the Fitness Center at VU. Justin Girouard is a music industry major with a business administration and public relations minor. Justin is a member of the Music Enterprise Student Association and the Sigma Chi fraternity. He has experience working with record companies and aspires to operate a record company of his own.

Faculty Sponsor: Dr. Bonita Neff

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Hawaii Volcanic Detection

Chris Bitcheno, Bryan Gill

Departmental Affiliation: Geography and Meteorology
College of Arts and Sciences

Remote sensing can serve as a powerful tool in the study and prediction of lava flow. By using bands 5-7 of Landsat imagery, temperature can be derived. Through the use of thermal remote sensing, we were able to locate thermal anomalies on Kilauea Volcano in Hawaii. This was done by using band 6 to eliminate cloud interference that is present in the image. Further analysis will be used to quantify the anomalies.

Information about the Authors:
Chris Bitcheno and Bryan Gill were interested in volcanic activity in Hawaii.

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NDVI of Deforested Oil and Petroleum Exploration Area near Swan Hills, Alberta, Canada

Mia Rae Goulding

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Although remote sensing helps to increase accuracy when exploring for fossil fuels in remote areas, the relatively low success rate and clear-cutting methodology is negatively impacting the ecosystem. This can be detected using the NDVI algorithm to yield consistent, conclusive results that can be classified into a thematic map, as well as analyzed to show the proportion of different land uses as well as provide data that could be used to monitor change over time. This study used a subset of a large oil exploration area, near Swan Hills, to show that major deforestation was occurring in this area. In the future, the NDVI that was the result of this study will be used to calculate the extent of deforestation, by comparing pixels classified as barren land to pixels classified as dense vegetation or intermediate vegetation. Hopefully, studies like this can raise awareness about the cost of oil exploration that is not wholly considered by those who scout for new oil fields. It is my hope that this realization of what mankind is doing to these forest reserves will lead to the development of new techniques that are less invasive and more accurate than the current trial and error method.

Information about the Author:
Mia Goulding became interested in this topic through her educational background in Environmental Science and Geography. She hopes to work to restore Native American lands to a healthy state in an attempt to help tribes preserve their traditions. She studied NDVI in her first remote sensing class. She decided to build on that idea to answer a question she had about deforestation and get some practice using an algorithm that she might need to use someday.

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The Corporate Culture of Tobacco Companies vs. Anti-Tobacco Initiatives: An Analysis of Key Public Relations Campaigns

Jennifer Halbert, Sarah Adams

Departmental Affiliation: Communication
College of Arts and Sciences

The role of public relations in health related campaigns is the largest area of study in the discipline. As the growing concern about lifestyle and product consumption affects the very young, the increased effort to reach publics with critical messages remains a central thesis to this area of work. Furthermore, public relations campaigns are well funded by the government in health. For years, tobacco companies have worked hard, instilling values in consumers that tobacco is a way of life. Tobacco companies appeal to various audiences globally by showing how “hip and harmless” tobacco can be. However, not too long ago, tobacco companies were in the hot seat after news that tobacco contains both addictive and harmful ingredients (a fact they already knew) hit the public. Now, many places within the United States have tried to move into an anti-tobacco culture. Smoking bans have been put into place to help promote a healthier environment. For example, Valparaiso University became a tobacco-free environment on July 1, 2008. Members of the University community and campus visitors are asked to abide by the policy to help develop a tobacco-free culture on campus. This study
examines the campaigns of the two groups to assess the effectiveness of their appeals. The corporate social conscious perspective and the ever emerging guidelines and laws were examined to develop a framework for the campaign analyses. The results indicate the importance of developing counter campaigns, especially for the populations most vulnerable.

**Information about the Authors:**
Jennifer Halbert is a public relations and global issues double major from Battle Creek, Michigan. As a senior, Jennifer is open to a career in a variety of fields and is interested in attending graduate school eventually to pursue further education in public relations and advertising. Sarah Adams is senior international economics & cultural affairs and public relations double major from Indianapolis, Indiana. After graduation, she plans to return to Valparaiso University to work on her master’s in international economics and finances. After school, she plans to intern with the FBI and join the Peace Corps.

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**Public Relations Leadership in the Development of Social Networking**

Jennifer Halbert

**Departmental Affiliation:** Communication
College of Arts and Sciences

Communication is the lifeline of the public relations profession. It is hard to think back to the days where public relations professionals used typewriters and solely landline telephones. Since social media is integral to the functions of public relations, a variety of key social media approaches were examined to assess the impact on the public relations profession. A matrix of the social media type was analyzed in terms of use in the public relations profession as a receiver of information, as a sender of communication, and as a means for analyzing the communication process. PR.02 is affecting how one uses cell phones and computers. The professional role of Twitter, FourSquare, RSS, Wikipedia, Facebook and LinkedIn were identified in terms of public relations functions. The most important aspect was to relate how these tools were useful in understanding the relationships between organizations and publics. Ultimately, this research project established public relations as a leader in developing and using social media.

**Information about the Author:**
Jennifer is a senior public relations and global issues double major from Battle Creek, Michigan. She plans to eventually continue her education in PR and advertising but is currently looking for jobs in the public relations field. Inspiration for this research came from Jennifer’s love for social media. As her experience using different means of social media grows, her interest in the future use of new tools is readily anticipated.

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**Engaging Undergraduate Students in “Triple Bottom Line” Reporting: Using Global Reporting Initiative Metrics Inside the Classroom (a case study)**

Caitlin Donnelly, Cara French, Heather Halub, Chris Hammer, Nathan LaGrave, Ian MacDonald, Justin McGiffen, Carly Mohr, Emily Nelson, Allyson Nieter, Michael Pudlow, Victoria Adan

**Department Affiliation:**
College of Business Administration

With increasing stakeholder demand for more corporate accountability, standard concepts of business ethics and environmental stewardship have evolved into more powerful markers of corporate social responsibility and company sustainability reporting. Universal guidelines have been developed to promote increased operational transparency and to level informational reporting asymmetries. The demands and expectations of investors and other entities affected by a business’s operations have served as a catalyst for the development and implementation of universally accepted standards to benchmark an organization’s performance. In this discourse, one such example of a company’s voluntary reporting pursuant to Global Reporting Initiative (GRI) G3 international standards is presented in a unique fashion: university students served as key participants in the reporting process. The pedagogical implications of the activity underscore the need to introduce the formal instruction of other markers of economic success to our next generation of business leaders.

**Information about the Authors:**
Caitlin Donnelly is a finance/mathematics major.
The Effects of Societal Constructs on Perceptions of Masculinity and Femininity

Kathryn Harris, Neal Janssen, Tia Kolasa

Departmental Affiliation: Social Work
College of Arts and Sciences

Society has always been an enforcer of strict gender roles that guide the perception of what is acceptable for each. The purpose of this study is to explore the relationship between personal and social factors and views on one’s own masculinity and femininity. This study will address three research questions: 1. How do societal views compare to personal views in relation to masculinity and femininity? 2. How do social involvements (sports, church, leadership roles, Greek life) affect a person’s perceptions of his or her own masculinity and femininity? 3. How do demographics (sex, race, religion, sexual orientation, age) affect a person’s perception of his or her own masculinity and femininity? To conduct this research, 180 to 200 current Valparaiso University students will participate by completing a survey that consists of two Likert Scales ranking the individual’s masculinity and femininity, a word bank of descriptive terms, and also a section containing demographic information. Each student must be 18 years of age and consent prior to taking the survey. To provide societal perception, each member of this group will, by a set of specific categorical guidelines, rate each participant on the same Likert Scale regarding masculinity and femininity.

Information about the Authors:
Kathryn Harris is a junior social work major from Warren, Michigan. Interested in child development, she feels that this research project will give her insight into the influences of society on gender roles.

Neal Janssen is also a junior social work major. From Long Beach, California, he has always had an interest in the constructs of masculinity and femininity and from this project, hopes to better understand their roles in society. Tia Kolasa, another junior social work major, is from East Lansing, Michigan. With an interest in Gender Studies, she hopes to better understand the relationship between gender roles and sexuality from this research project.

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What Guides Embryonic Cell Migration in the African Clawed Frog (Xenopus laevis)?

Aaron Harter, Erin Carlson

Departmental Affiliation: Biology
College of Arts and Sciences

Vertebrate embryos all undergo gastrulation, a mass migration of cells, to produce normal adult anatomy. Three theories compete to explain gastrulation: Marching Orders: cells follow directions (three steps forward; turn right); Chemotaxis: cells follow a concentration gradient of a diffusible chemical; Differential Adhesion: cells move until they maximize their total adhesive energy. What does each theory predict would happen if the normal starting positions of cells were shifted before gastrulation? Marching orders depend upon the correct starting point to produce a normal result. Chemotaxis demands that the source of the chemical not move. Differential Adhesion allows random movement so long as adhesion remains unchanged. To distinguish between these, living frog embryos were gently flattened for up to 25 minutes, then fixed to reveal their interior cells for the scanning electron microscope. Initially undistorted cells of the blastocoel floor quickly became stretched. However, after ten minutes of continued compression, these cells had returned to their undistorted shapes by cellular rearrangements. Such cellular movements produced embryos that were thinner (fewer cells thick) and broader (more cells long and wide) than normal. Such cellular rearrangements in compressed, unfixed embryos never impeded normal development (n of cases =17). These data support only the differential adhesion hypothesis.

Information about the Authors:
Aaron Harter is a senior biology and chemistry double major with a focus in the pre-medical arts. He
plans to attend Officer Candidate School upon graduation, followed by medical or graduate school. Aaron became engaged in research on amphibian embryology after becoming interested by a project in a course on developmental biology. Erin Carlson is a junior biology major preparing to go to pharmacy school after graduation. She became involved in amphibian embryology research after attending a biology research colloquium.

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The Prevalence of Depression in the Elderly Based on Living Situation

Carlee Nelson, Sarah Johnson, Kelly Henkels

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Depression in the elderly increases as they move from living independently into a facility. Depression in the elderly tends to increase as illnesses develop or worsen and independence becomes more limited. In turn, this increases the risk for suicide. The purpose of this project is to focus on the elderly population (65 and older) in association with their living situation and their level of depression. In order to do so, a survey will be conducted involving individuals living at home, in nursing facilities, assisted living, and retirement homes. The survey will consist of demographics, current place of residency, and questions from standard depression screenings. The hypothesis is that a correlation exists between living conditions and depression levels. There is reason to believe contributing factors to depression levels would be loss of independence, deficit of purpose, lack of communication with loved ones, change in mobility, and depletion of physical health. Faith is a contributing factor. The depression and suicide rates among the elderly are disproportionately high for their population. Depression is going unnoticed in the elderly because many people discredit it as regular life stressors. People need to be more aware of depression among the elderly and aware of symptoms.

Information about the Authors:
Kelly Henkels, Carlee Nelson, and Sarah Johnson are junior social work majors sharing an interest in the mental health field. All three will eventually go to graduate school after Valparaiso University. Carlee hopes to join the Peace Corps, Kelly hopes to work individually in the mental health arena, and Sarah wants to work on suicide prevention and awareness. Kelly, Carlee, and Sarah’s experiences with the elderly and interest in studying a population not frequently studied piqued their interest in this study.

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Social Media and Society: How Social Media has Changed the World of Public Relations

Ricky Hoffman, Luka Dukich

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Social media has modernized the business community. Businesses are now able to reach consumers in a new way - through the internet. Social media has become appealing to big business. Credible brands are utilizing social media to reach old customers, gain new ones, and build or maintain credibility and reputation among consumers. In recent years, social media has drastically grown. This has tremendously increased the number of consumers that producers are able to reach. Social media has not only grown in popularity with the increase in consumer participants, but social media has also expanded globally. Social media “is anything that uses the Internet to facilitate conversations between people.” Social Media refers ‘back to the “two-way” approach of PR.” (PR2.0, 2008). These new methods allow publics and organizations to increasingly use innovative ways to communicate and interact with influencers. Social media allows people to experience more directly without the gatekeeping function operating in the process. This study followed the social media of five public relations agencies as reflected on their web sites or on the personal sites of the top leaders. These sites, for example, analyzed the characteristics important to social media: “the amount of timely information, accurate information, novel information, and information that helps meet deadlines.” Studying different Twitter, Facebook, or blog accounts, it would measure how often social media is used. The criteria developed to evaluate these sites compared and contrasted the information across public relations agencies on key topics in the public relations profession. Most importantly, the degree to which these agencies developed relationships was assessed through the frequency and type of mentions in the exchanges. The results provided insight into the leadership provided by these
organizations.

Information about the Authors:
Ricky Hoffman is majoring in public relations and has a minor in German. He is involved in numerous activities throughout the campus. Luka Dukich is a senior public relations major/business administration minor at VU. He has been heavily involved with VU’s Public Relations Student Society of America (PRSSA), serving as president, vice president, and webmaster over his college career.

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“Cutting to the Chase”: Redesigning Internal and External Communication Tactics

Lauren Hosimer, Scott Quade

Departmental Affiliation: Communication
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Demographics are the characteristics of a population utilized in developing public relations plans primarily though promotions. Using promotions to create interest in an event or organization is a crucial part of establishing a good relationship with the community with particular publics in mind. Community relations helps prepare an organization to meet the diverse needs of the publics. In this case study, the Valparaiso Parks Department desired to revitalize their image by assessing the community relations developed through tactics (brochures, flyers, etc.). The Parks Department is a branch of city government overseeing city parks and offering programs to identified publics in the community. Some strategies included direct mail which simply was a way to get information out to returning or potential participants. Expanding from mailings to more of a community relations approach (public relations) helps create a greater bond with the people of the community. This better demonstrates to the publics that the Parks Department is there for them. To assess the status of the department’s efforts, the promotional tactics were reviewed, changed, and then analyzed for readability, content quality, and comprehensiveness. There were three different promotional items reviewed: a golf outing brochure, a handout for Valparaiso University students, and a brochure for the sale of memorial bricks. The results modified the tactics and reoriented the strategies. The researched promotion pieces now should better connect with the publics and hopefully increase student and community involvement in the

Parks Department’s programs.

Information about the Authors:
Lauren Hosimer is a sports management major with minors in business administration and public relations from Naperville, IL. She is currently a marketing intern for the Valparaiso Parks Department and has been a community relations intern for the Chicago Fire professional soccer team. Scott Quade is also a sports management major with a liberal business and public relations minor from Milwaukee, WI. He has spent one year interning with ESPN radio in Milwaukee and plans on pursuing a job in professional sports marketing.

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Opinions about Smoking Policies, Exposure to Secondhand Smoke, and Smoking Patterns of Undergraduate College Students

Molly Grime, Evelyn Gomez, Julie Wingstrom, Meranda Block, Kara Jachcinski, Lauren Paczkowski, Emily Bernhard

Departmental Affiliation: Nursing
College of Nursing

The purpose of this project was to assess undergraduate college students’ opinions of smoking policies, secondhand smoke exposure, and smoking in public places within a smoke-free campus. Based on a study by Rigotti et al. (2003), smoke-free campuses are favored by the majority of college students across the United States. This research project used an on-line cross-sectional survey. Surveys were emailed via Zoomerang to all undergraduate students at Valparaiso University. Survey questions contained 57 forced-choice or open-ended options. Data were analyzed using descriptive statistics. 1093 students responded: 23% freshmen, 23% sophomores, 24% juniors, 28% seniors, and 2% others. Subjects were female (61%), white (91%), a member of a social fraternity or sorority (30%), an NCAA athlete (7%), and lived in a resident hall (60%). 43% were exposed to secondhand smoke, 55% did not know that VU is a smoke-free environment, 96% have seen smoking on campus, and 71% believed the smoke-free policy is not enforced. 38% admitted to smoking at some point, 28% smoke occasionally, and 15.8% are current smokers. Data from this study will add to the growing body of evidence about college students’ opinions concerning smoking policies and form a foundation
Impact of Nitric Oxide (NO) Treatment on the Spectroscopic Properties and DNA Binding Activity of the Carbon Monoxide-Sensing Heme Transcription Factor, CooA

Edra Jani, Dr. Robert Clark

Departmental Affiliation: Chemistry
College of Arts and Sciences

CooA is a carbon monoxide (CO)-sensing heme transcription factor that regulates CO metabolism in several bacteria including Carboxydothermus hydrogenoformans (Ch). The goal of this research was to investigate the spectroscopic properties and DNA binding activity of Fe(III) Ch CooA that was reacted with NO. Based on electronic absorbance spectra, addition of NO to Fe(III) CooA resulted in the formation of a 6-coordinate (6-C) Fe(III)-NO intermediate species, which slowly converted to a 5-coordinate (5-C) Fe(II)-NO complex. A fluorescence anisotropy assay revealed appreciable DNA binding activity by the 6-C Fe(III)-NO form and lesser activity by the 5-C adduct. DNA binding by 5-C Fe(II)-NO CooA was unexpected because this species has a much different coordination structure than the native 6-C Fe(II)-CO form or the 6-C Fe(III)-NO adduct. Based on these findings, we propose that the most important factor required for activating CooA’s DNA binding function is the presence of a gas molecule (CO or NO) that is bound to the correct (i.e. distal) face of the heme. The authors wish to thank the Valparaiso University College of Arts and Sciences for financial support.

Information about the Authors:
In the words of Edra Jani, “When I look back at my research experience, I realize how valuable this opportunity has been for my professional preparation. Not only have I learned numerous laboratory techniques, but I have also learned patience and to appreciate the pursuit of knowledge. I have become more knowledgeable around the laboratory and I often have designed my own experiments. Also, the camaraderie I have established with my mentor has prepared me for the collaborative work that occurs in medicine. Based in large part on my undergraduate research, I plan to expand my work in basic research while I attend medical school.”

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How Does Theatre Make You Feel? The Study of How Viewing Theatre Affects Emotional State

Jerald Jascoviak, Redrick Taylor

Departmental Affiliation: Social Work
College of Arts and Sciences

Hypothesis: When exposed to dark or gory theatre performances, one’s emotional state is negatively influenced. The purpose of this study is to explore if viewing performing arts affects one’s emotional state. While there are many studies on how the media arts affect someone either in a positive or negative way, studies related to the performing arts are extremely lacking. Since no present studies were found, art therapy was utilized as an alternative way to determine how being exposed to art affects one’s emotional state. Studies have shown that if one is in a positive mood and exposed to or participates in art with a positive stimulus, then this will increase one’s emotional level. It stands to reason that one’s emotional level would be oppositely affected when exposed to or participating in art with a negative stimulus. To test the hypothesis, a survey tool was implemented with a sample of 177 people who viewed the production “The Pillowman” by Martin McDonagh at the Chicago Street Theatre in Valparaiso, Indiana. A Likert scale test was implemented both before and after viewing the play to see how audience members’ emotional state changed as a result of being exposed to its dark, negative themes.

Information about the Authors:
Jerald Jascoviak’s first passion in life has always been the theatre. Based on his own experience of the affect performing arts can have, he sought research support. Finding only studies related to the media arts, he, along with partner Redrick Taylor, decided to pursue this study of how performing arts affect one’s emotional level. With Jerald’s connections to
the theatres in the area and survey development and Redrick's knowledge of social work's policies and procedures, writing, and evaluating, this was an appropriate team research project to explore.

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Alexander the Great: The Panhellenic Agenda

Dan Jason

Departmental Affiliation: Foreign Languages and Literatures
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For thousands of years, the campaign of Alexander the Great has fascinated historians and scholars. A traditional area of inquiry is the Greek desire to avenge the wrongs committed during the 5th century BCE, through the execution of a Panhellenic campaign. Although Alexander displayed some commitment to this agenda, scholars question his true motives for engaging in world conquest. My inquiry will focus upon the relevant secondary sources, including Arrian, Quintus Curtius, and Curtius Rufus. Further analysis will be predicated on information gathered from contemporary authors who have sought to explain the significance of Alexander's conquest, and the imprint he left on history. My primary goal is to assess what aspects of Alexander’s achievement should remain valuable in today’s modern society.

Information about the Author:
Dan Jason is a senior public relations and classics major at VU. He plans to pursue a career in the field of public relations, marketing, or consulting. His interests within the field of classics include the Roman Empire, Athens in the classical age, and the Hellenistic period following the death of Alexander.

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From Chrétien to Gilliam: The Journey of Grail Quest

Kylie Johnson

Departmental Affiliation: Foreign Languages & Literatures
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Perceval, ou le Conte du Graal, a medieval text written by Chrétien de Troyes, is known as the first text to mention the famous yet mysterious Grail. The story follows a young naive man named Perceval in his adventures to become a knight. It is at first in the Fisher King's castle that Perceval sees the Holy Grail and begins his quest. Chrétien describes the Grail as an object that invokes light/wisdom, purity/preciousness, and grace/healing. These qualities and the events following Perceval's sin of not asking about the Grail lead the reader to question the nature of the Grail. Is it just an object or does it represent something more? Terry Gilliam explores this question in his 1990 film, The Fisher King. There are no knights or kings in a modern day New York City setting. Two characters, Perry and Jack, are on a search for the Grail. Although they are searching for a tangible object, they actually find the qualities of the Holy Grail from people, events, and actions around them. For these characters, the power of the Grail is not in the object but in the journey of the quest.

Information about the Author:
Kylie Johnson is currently a junior studying French and international service. She aspires to attend law school after graduation. Between studying French since middle school and visiting France while on a mission trip, French has always been a passion. This topic is of interest because it mixes some of her favorite topics with French – books, film, and medieval lore.

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Using Remote Sensing to Quantify Burn Area from the August 2009 Los Angeles, California, Wildfires

Lucas Kanclerz, Andy Henry

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College of Arts and Sciences

During August, 2009, Los Angeles, California, was subject to multiple wildfires just north of the city in the Angeles National Forest. Estimating quantitatively the amount of area affected and burned through ground measurements would be costly and slow. Remote sensing techniques have been used in the past to estimate burn severity from other wildfires.
around the world. Our research details how multi-spectral imaging can be used to estimate the amount of land burned during the Los Angeles wildfires. ECHO classification and Maximum Likelihood classification of the image shows that training and test fields were very accurate. Thematic classification maps depict the differences between the burn severity and the rest of the image. Kappa statistics for both classifications of 98.8% and 96.0% indicate that classification tests were accurate and overall class performances are precise. Results for ECHO classification estimate burn severity at an area of 534 km and an area 540 km for Maximum Likelihood classification. The results are estimates, but were obtained quickly compared to collecting data on the ground. Future classification could be completed to examine the amount of vegetation rehabilitation during the end of the next summer to look at change detection of the burn area.

Information about the Authors:
Lucas Kanclerz is a senior geography major from Holland Patent, NY. Lucas enjoys using spatial software like ArcMap and Multispec to create thematic maps to look at spatial data. Luke is new to the use of remote sensing application on wildfires and felt this would be a challenging problem to focus his studies on. Luke plans to attend graduate school in the fall for cartographic processes. Andy Henry is a senior geoscience major with a concentration in environmental studies. Andy is from Deputy, Indiana, and wanted to study remote sensing of wildfires since he would like to relocate to Montana or Alaska to pursue his future goals of becoming a conservation officer. Andy feels that using remote sensing will enable him to contribute to research for many environmental studies.

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Predicting Trends in Activation Energy for Oxidative Dehydrogenation of Alkanes by Transition Metal Nanoclusters

Megan Kania

Departmental Affiliation: Physics
College of Arts and Sciences

Quantum chemical calculations were performed to find a mathematical relationship between properties of transition metal clusters and the activation energy required to break the C-H bond of a hydrocarbon molecule. Twelve different four-atom transition metal nanoclusters (M4) were computationally reacted with CH4 to obtain a reactant adsorbed structure and a product structure with the CH3 and H on the same atom. Transition state structures were calculated from the reactant and product structures for each system. Marcus theory was then applied to test the predicted dependence of the activation energy on the reaction energy and C-H bond length difference between the reactant and product structures. Thus far, Marcus theory does not satisfactorily account for the calculated trends in the activation energy.

Information about the Author:
Megan Kania is a junior from Chicago, Illinois. She is currently pursuing degrees in physics and mechanical engineering. She became interested in the dehydrogenation of alkanes when she was informed of the possible application in the production of plastics.

Faculty Sponsor: Dr. Stan Zygmunt
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Fish Habitat in the Little Kankakee River

Chris Bitcheno, McKenzie Kelly

Departmental Affiliation: Biology
College of Arts and Sciences

The Little Kankakee River (LKR) in LaPorte County, Indiana, contains a naturally-decomposing, abandoned beaver dam; the purpose of this study is to monitor its impact upon upstream and downstream silt levels. The LKR is an uncommon example of a good cold-water fishery in Northwest Indiana. However, the river has variable sedimentation levels; deep silt often covers gravel and sand, smothering invertebrates. This research intends to identify/eliminate a possible source of variability in silt levels, benefitting restoration teams in determining affects of dam removals. Furthermore, understanding the impact and pattern of silt levels could guide selection of a single site forecasting system, developed to ease the monitoring of silt levels and general river health. Water depth, silt depth, flow rate, and a description of the river bed are measured and recorded; flow rate fluctuations are to be charted against monthly precipitation, noting changes in flow. We predict that the beaver dam causes fluctuating siltation by collecting silt upstream and then releasing variable amounts during its decomposition. This research could prove valuable for greater understanding of the river system and for
identification of potential forecasting system indicator sites.

Information about the Authors:
Chris Bitcho, a senior geoscience student with an emphasis in geospatial technologies, has worked with Dr. Grayson Davis on diagnosing the variability of silt load in the Little Kankakee River since 2009. Through a field course during summer 2009, he learned various water testing procedures. In mapping silt levels in the LKR, Chris found significantly higher silt levels slightly downstream from the confluence of the mainstream and irrigation canal than the rest of the river. McKenzie Kelly is a junior biology and psychology major. As vice president of the Valparaiso University Biology Club, McKenzie has participated and helped organize stream restoration projects in the area. The “Fish Habitat in the Little Kankakee River” project may benefit restoration groups such as the Valparaiso University Biology Club (VUBC). Through Dr. Grayson Davis, the adviser for both this research project and the VUBC, McKenzie was introduced to the idea of this project.

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The Relationship between Extraversion and the Detection of Genuine and Fake Smiles

Ken Knuppel, Anna Isaacson

Departmental Affiliation: Psychology
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In this study, researchers investigated whether feedback and training positively affects the ability to detect fake smiles. Participants viewed a short series of video clips of smiles and distinguished between each as being either genuine or fake, as well as indicating their confidence in each of these distinctions. Then, they were either trained on how to properly detect fake smiles, or were shown a decoy presentation that included information about smiles, but did not specifically explain how to detect genuine or fake smiles. Participants viewed the same videos again. Half of the participants were given feedback as to whether each smile shown was genuine or fake. Those in the other group did not receive such feedback. All participants then viewed a new series of smile videos and once again indicated whether they thought each smile was genuine or fake. Previous research suggests that people who display higher levels of extraversion are better at detecting nonverbal cues, such as smiles (Akert & Panter, 1988). The relationship between extraversion and the ability to detect genuine or fake smiles was also investigated.

Information about the Authors:
Ken Knuppel is a junior psychology/theology double major. He would like to work on a Ph.D. in clinical or forensic psychology after graduating from Valpo. Anna Isaacson is a junior psychology/sociology double major. She intends to pursue a Ph.D. in educational or developmental psychology. Ken will be working on research in psychology and religion next year as a senior, and Anna has completed research on educational techniques that can be used in psychology courses. They are also both currently researching environmental attitudes and behaviors.

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The Use of Online Days in a High School as a Source of Teacher Preparation

Kellie Koerner

Departmental Affiliation: Education
College of Arts and Sciences

An internet online day consists of teachers uploading assignments to a school-based website where students can access the information and not come to school for a day, completing the assignments from home. A high school located in midwestern Indiana, held their first internet online day on Wednesday, January 27, 2010, and the second internet online day on February 24, 2010. Teachers and students will be surveyed to: a) determine attitudes toward online days; b) explore the benefits and knowledge gained using an alternative method of instruction; c) analyze the benefit and preparation time for teachers. This research project will assist in evaluating the use of internet online days as a productive choice to increase teacher preparation time and/or in-service days.

Information about the Author:
Kellie Koerner is a senior majoring in biology and secondary education with a minor in French. In her secondary science methods course, she became interested in the use of internet online days as an alternative teaching method. Kellie has completed biological research projects with the Biology Department at Valparaiso University and in Paris, France. Kellie plans on continuing her education by
enrolling in a master’s program in conservation biology.

**Faculty Sponsor:** Dr. Del Gillispie

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**Beyond the Volcanoes: Community Education and Action to Improve Health Equity in Rural Nicaragua**

Tricia Erdmann, Kerstin Kost, Brittany Popa, Katherine Thomas, Dr. Amy Cory

**Departmental Affiliation:** Nursing
College of Nursing

Background: Health inequities related to gender, ethnicity, socioeconomic status, and geography exist in rural Nicaragua. The purpose of this ongoing project is to improve health equity in rural Nicaragua through social transformation using community-based participatory action research. Bronfenbrenner’s ecological model provided the framework for this research. Methods: Community-based participatory action research involves six phases: partnership, assessment, planning, implementation, evaluation, and dissemination. In preparation for the implementation phase, community readiness surveys were used to assess community knowledge regarding the relationship between respiratory illness and indoor air pollution. Results: Eight key informants participated in an initial forum and community readiness survey, which was later disseminated in 47 homes throughout the community. The surveys indicated the community members’ readiness to implement a project to improve indoor air quality. Conclusion: Results from the survey indicated a concern in the community about the prevalence and health risks of indoor air pollution, as well as community readiness for a project to address these concerns. Partnership in community assessment, education, and action provides a mechanism to engage community members in social justice through working toward a common goal – health for all.

**Information about the Authors:**
Tricia Erdmann is a senior nursing major with a psychology minor from Racine, WI, interested in pediatrics. Kerstin Kost is a junior nursing major from Avon, IN, interested in becoming a nurse practitioner. Brittany Popa is a sophomore nursing major from Milwaukee, WI. Katherine Thomas is a senior nursing major with a Spanish minor from Evanston, IL, who is interested in obstetrics.

**Faculty Sponsor:** Dr. Amy Cory

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**Yellow-Bellied Sapsuckers and the Effects of Climate Change on Their Migration, Feeding Phenology, and Sap Availability**

Kellie Koerner, Megan Krintz

**Departmental Affiliation:** Biology
College of Arts and Sciences

Sphyrapicus varius, the Yellow-Bellied Sapsucker, breeds in the northeast United States and across Canada and then migrates to southeast parts of the United States and the Caribbean. S. varius arrive in their breeding grounds in late April and start their southern migration in late August. For long-distance migrant bird species, such as the Yellow-Bellied Sapsucker, climate change may advance the phenology in their breeding areas, but they may not detect this while in their wintering grounds. When S. varius passes through this region of Northwest Indiana, they use xylem sap in sugar maples and other trees as source of nutrition; if there is a shift in the timing of sap flow, S. varius could miss the peak of the xylem sap and therefore not have enough nutrition to continue to their migration grounds. There has been documentation that S. varius arrives earlier to their breeding grounds in New York and in Maryland. By tracking the arrival of S. varius as well as the sugar content of sugar maples and tulip trees on Valparaiso University’s campus, we examined the correlation between sap flow rates and the peak of S. varius in Northwest Indiana.

**Information about the Authors:**
Megan Krintz is a senior biology/humanities major with a particular interest in ecology. She has studied the effects of the invasive shrub, Autumn Olive, on bird populations through an internship with Pierce Cedar Creek in Michigan, and has continued to study conservation/management issues as an undergraduate, including this research. In 2008, Megan took a field course in land management and conservation in the American west, and is hoping to return out west in the future. Kellie Koerner is a senior biology and secondary education major with a French minor. She has studied the fish of South America through an internship in Paris, France. At Valparaiso University, Kellie has studied the preference of house sparrows at sunrise and sunset. Kellie hopes to continue her education upon graduating from Valparaiso...
University with a master’s program in conservation biology or ecology.

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**Implementation of Efficient Public Relations Efforts for Small Businesses Operating with Small Budgets**

Abby Lange, Paul Reed

*Departmental Affiliation: Communication College of Arts and Sciences*

In 2008, 29.6 million businesses were in operation in the United States. Of those businesses, approximately 18,000 have more than 500 employees. Remaining organizations fall under the small business category. A majority of small businesses operate with less than 20 employees and small budgets. The Brauer Art Museum fits this criteria operating with three employees and a modest budget. To implement effective public relations campaigns, it is imperative that the public relations budget is being used to its maximum potential. To determine whether the Brauer is utilizing its maximum potential, a communications audit was utilized to examine community relations efforts including social media outlets. Four models of public relations represent organizations including small businesses: one-way symmetrical, two way symmetrical, one-way asymmetrical, and two way asymmetrical. Examining two variables – direction and purpose – it can be determined what model a business is utilizing. Direction describes the party involved in the communication process while purpose describes what organizations do with their communication. Symmetrical models display balanced communication between businesses and publics. Brauer Museum’s communication patterns reflect some symmetrical approaches and some asymmetrical strategies. To achieve needed community support, an organization must implement a mutually beneficial two-way symmetrical model of public relations.

*Information about the Authors:*
Paul Reed is a senior public relations major with a minor in television and radio from Lake Station, Indiana. He spent the fall 2009 semester studying abroad in Cambridge, United Kingdom. Paul interned with Visclosky for Congress. Abby Lange is a senior art history, humanities, and public relations major from Champaign, IL. She is the World Relief Campaign chair for SALT and the VU Chorale manager. In the past, Abby has interned with the St. Louis Art Museum and Krannert Art Museum at the University of Illinois.

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**Putting Wind Power on the Map: Finding Ideal Wind Farm Locations in Illinois**

Chris Larson

*Departmental Affiliation: Geography and Meteorology College of Arts and Sciences*

This project analyzes the most efficient and suitable geographic locations in the state of Illinois for wind farms. Wind farms are an expensive venture, so to ensure that their installation is a cost effective investment, certain site criteria need to be met. Using layered Geographic Information System (GIS) datasets containing wind density, surface slope, and land type, the project determines which parts of Illinois could successfully and efficiently use wind energy.

*Information about the Author:*
Chris Larson is a freshman exploratory major from Woodstock, Illinois. He took GIS with Dr. Bharath Ganesh Babu as an elective last semester and completed this project as part of the class. The idea for his project came after a business in his hometown purchased and installed a large wind turbine to power their company in a place that some neighbors didn't appreciate. This led to an interest in where wind energy can be ideally harnessed.

*Faculty Sponsor: Dr. Bharath Ganesh Babu*

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**The Differences Cuba Caused in the Feminist Art of Ana Mendieta and Elsa Mora**

Tom Lee

*Departmental Affiliation: Foreign Languages & Literatures College of Arts and Sciences*

Ana Mendieta is a Cuban artist born shortly before
Castro's revolution. As a member of an aristocratic family, she fled Cuba at the age of 14 in order to escape persecution. Already rejected by her country, she found more pain in the form of racial discrimination in the United States. In search of a new identity, she joined the feminist movement during her studies at the University of Iowa. In her photographs, she explores her identity as a female and what powers and relationships it has. Many other feminist artists found photography of the female body to be a successful medium for expressing their ideas. Elsa Mora is another Cuban photographer, but she was born after the revolution and was able to remain in Cuba. Both women have similar ideas about feminism but the way in which authority and Cuba affect their work is exceptionally different. Mendieta’s rejection from Cuba led to an influence of Cuba's past. Her art reflects oppression against women as a whole, whereas Mora’s more natural connection with Cuba led to her focusing on women’s rights in relationship to the nation. This project will compare how these two women’s relationship with Cuba affected their art.

Information about the Author:
Tom Lee is a junior statistics and Spanish major. This project is related to work he is doing in the course Latin America through the Arts. He is planning on going to graduate school in statistics but is hoping to continue use of his Spanish major in his future professional goals. He is also interested in photography which is the medium that both Mendieta and Mora use predominantly.

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Time-Tabling Problem of Optimizing Course Scheduling for a University

Tom Lee, Reillie Acks, Matthew Fabrizius

Departmental Affiliation: Mathematics and Computer Science
College of Arts and Sciences

When planning courses, universities must consider many different variables to create the most efficient schedule. This problem is known as the time-tabling problem. Within the time-tabling problem there are many sub problems: which courses should be offered each semester, the time slots of the classes, and the rooms in which each will be placed. The first sub problem can be solved using information about the courses; average enrollment, requirements for majors, and general education requirements help decide how often to offer each class while maintaining balance in the number of courses offered each semester. The focus is the latter sub problem for a single semester assuming the first two sub problems have already been solved. To confront this problem of optimally assigning courses to classrooms, we must prioritize the courses. Courses that need to be in certain buildings or rooms have a higher priority than courses that just need sitting space. Also, certain courses require special classrooms. Our model then assigns courses to classrooms using our calculated prioritization. As we do this, penalties are assigned if a course is not offered ideally. The schedule with the least amount of penalties is the optimal schedule.

Information about the Authors:
Tom Lee is a junior statistics and Spanish major. Reillie Acks is a freshman math, economics and French major. Matthew Fabrizius is a freshman math major. The three of them have been working on this project during the 2009-2010 school year through the department's Research in Mathematics course.

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Modeling of an Oscillating Ozonesonde Balloon

Brian Lehmann, Kelsey Obenour, Dr. Gary Morris

Departmental Affiliation: Physics and Meteorology
College of Arts and Sciences

On 5 August 2007, a balloon released in Las Tablas, Panama, underwent four distinct vertical oscillations from 2 - 5 km over a period of 90 minutes. This behavior may be explained as follows: condensation and freezing of water on the surface of the balloon led to increased mass causing the balloon descent. When the balloon descended far enough, the ice melted, reducing the mass and resulting in balloon ascent again. To test this hypothesis, we created a model of this balloon flight using STELLA software. In this presentation, we describe the model and compare its results to the flight data.

Information about the Authors:
Brian Lehmann is a senior meteorology major at Valparaiso University, minoring in mathematics. Kelsey Obenour is a senior at Valparaiso University with majors in meteorology and geography and minors in mathematics and physics, with goals of
pursuing research in physical oceanography in the future. The development of this model was suggested by Valparaiso Professor Gary Morris after research was done on the oscillation of the ozonesonde launch in Las Tablas, Panama. Launching balloons with instrument payloads is one of the primary data collection methods for meteorologists. Modeling a balloon flight provided an insight into this fundamental aspect of meteorology.

**Faculty Sponsor:** Dr. Gary Morris

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**Social Support, English Proficiency and Interlink Students’ Adaptation to Living in an Unfamiliar Culture**

Emily Dippold, Elizabeth Lewitke, Sarah Volkmann

**Departmental Affiliation:** Social Work

College of Arts and Sciences

Due to the increasing numbers of international students studying in the United States, efforts have been made to track their psychological and social well-being. The knowledge base on international students’ psychological and social well-being and its relationship to their English proficiency is expansive. However, research focusing solely on new international students who have never studied in the United States is limited. This study will attempt to survey newly arrived Interlink students currently enrolled at Valparaiso University. Participants will be asked to complete three questionnaires over the course of one month to track their progress. The questionnaire will serve as a tool to measure the relationship between Interlink students’ perceived social support/English proficiency and their level of adaptation. This questionnaire will include demographic information as well as questions regarding feelings of stress, loneliness, level of comfort when speaking to native and non-native English speakers, confidence in English proficiency, ability to talk about feelings with other Interlink students, and number of on- and off-campus activities attended per week. We hypothesize that students who rate themselves as having a higher amount of social support and a higher level of English proficiency will have a higher level of adaptation to American culture.

**Information about the Authors:**
Emily Dippold, Elizabeth Lewitke, and Sarah Volkmann are all currently junior-level social work majors. Emily is currently interning at Family House in Valparaiso and hopes to pursue a career in a health or a family-based field. Elizabeth is currently interning at Dunebrook in Michigan City. In the future, she hopes to pursue a career with developmentally delayed children or confidence building with abuse victims. Sarah is currently interning at Victim Assistance through the Porter County Prosecutor's Office. She hopes to pursue a career in juvenile justice.

**Faculty Sponsor:** Dr. Matthew Ringenberg

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**Thoreauvian Relinquishment and Whitmanesque Superfluity: An Ecocritical Study and Prescriptive Theory for Writers Today**

John Linstrom

**Departmental Affiliation:** English

College of Arts and Sciences

In an age of unprecedented cultural manipulation of nonhuman nature and facing the increasing endangerment of planetary biodiversity, the study of ecology continues to suggest that the environmentalist tendency to separate human from nature actually distances humans from responsibility for environmental degradation. A new paradigm is needed, or an old one recovered, for understanding the human place in nature, and it must balance nonhuman immediacy and contact with a distinct sense of relinquishment and responsibility. Humans must love the land, and thereby encounter and even do harm to it, but must balance this with a sense of otherness or neighborliness and respect for that other. This study considers the conventionally opposed literary ecocritical values of relinquishment and superfluity attributed respectively to Thoreau and Whitman, and argues that a balance of each is necessary for a responsible, postmodern ecopoetics. Through a study of relevant ecocritical theory, primarily that of William Cronon, Robert Kern, Bonnie Costello, and Lawrence Buell, it fuses the best of literary ecocriticism in an effort to encourage art that does justice to an endangered Earth. The specific studies of Thoreau’s nonfiction and Whitman’s poetry then converge to suggest an ecopoetics for today and for the future.

**Information about the Author:**
John Linstrom is a senior English and humanities major. His interest in ecocritical study began with his Christ College honors thesis on frugality in federal
lands management, which he wrote for a travel seminar to Oregon and which won VU’s 2009 Donnelley Prize. With Donnelley funds, he then pursued an independent study on Thoreau, Emerson, and an “everyday” natural sublimity which won the 2010 Donnelley Prize. This presentation comes from his senior English honors project.

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A Democratic Liberation: Liberation Theology and Rousseau

Keith Liput

Christ College

Latin American liberation theology is often criticized for its Marxist overtones and extremist leanings. A close reading of key figures in the ideology like Gustavo Gutierrez or Leonardo Boff shows that liberation theology has a strong democratic spirit from which it draws its egalitarian critique of contemporary capitalist culture. In essence, the new political system advocated by liberation theology is strongly correlated to Rousseau’s vision of a small, participatory democracy. This paper uses Rousseau’s texts as theoretical guides through the diverse writings of liberation theology and reinterprets liberation theology’s often misconstrued tenets. Liberation theology’s emphasis on equality, base communities, and freedom of religion not only creates a new portrait of Catholicism in Latin America, but also promotes a democratic spirit. By advocating a radically equal and free system, liberation theologians attempt to produce a more personal relationship with God and lay the foundation for His Kingdom, a dream which is best suited to Rousseau’s own work on the nature of a virtuous society.

Information about the Author:
Keith Liput is a senior political science and French double major. This is his second year participating in Valparaiso’s Celebration of Undergraduate Scholarship.

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The Perpetual Quest: Education and the Grail in Chrétien de Troyes’ le Conte du Graal and Terry Gilliam’s The Fisher King

Keith Liput

Departmental Affiliation: Foreign Languages & Literatures
College of Arts and Sciences

Chrétien de Troyes’ epic poem Perceval, ou le Conte du Graal marks the introduction of the grail into medieval literature. The origin and purpose of Chrétien’s grail in the poem remains mysterious. Unlike the modern conception of the grail as an inherently Christian object, Chrétien never directly links it to a particular Christian tradition. Instead, the grail comes to represent the goal of a well-balanced education. Perceval, the story’s protagonist, begins as a naïve Welshman who leaves his home to become a knight. His quest entails combat, hardship, and above all, education. The achievements and disappointments of Perceval together present the image of a noble education. Yet unlike the goal of a typical knight, the grail becomes the apogee of Perceval’s formation; an ideal fusion of chivalry, courtly love, and faith. In a more contemporary context, Terry Gilliam’s film The Fisher King imagines Perceval and his didactic quest in modern day New York City. The adventures of the film’s protagonists, Jack and Parry, suggest that education in modern chivalry, love, and faith still provides fertile ground for obtaining one’s personal “grail.” Thus in spite of their historical distance from one another, the quests of Perceval, Jack, and Parry clearly resonate, illustrating the perpetual pursuit of self-knowledge.

Information about the Author:
Keith Liput is a senior political science and French double major. This is his second year participating in Valparaiso’s Celebration of Undergraduate Scholarship.

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Citizen Views of the Quality of Life in Valparaiso

Chris Jackson, Rob Johnson, Alan Kus, Keith Liput, Christina Lucente

Departmental Affiliation: Political Science
College of Arts and Sciences
The Community Research and Service Center was asked by the City of Valparaiso to survey residents to determine their opinions on a series of issues concerning the quality of life and city services, and their attitudes toward local taxation and city policies. To accomplish this goal, the CRSC and representatives from the City of Valparaiso designed a questionnaire that allowed residents to evaluate and reflect upon these issues. A random sample was drawn and 2,700 questionnaires were distributed to Valparaiso households. Respondents were allowed to return the questionnaire through mail or online. In addition, Valparaiso residents were allowed to answer the survey online even if they were not included in the original sample. Their responses were kept in a separate file. We received a total of 604 responses, a response rate of 23.4%. A majority of respondents, 56.5%, believe the city administration is doing a good job managing the city. Among the report’s findings, the city’s fire protection and public schools received the most positive evaluation with 83.3% and 75.9% of respondents respectively rating these services as “good” or “excellent.” From a similar survey administered in 2004, support for public transportation dropped from 58.9% to 41.9%, a 17% decline.

Information about the Authors:
The CRSC research associates Chris Jackson, Rob Johnson, Alan Kus, Keith Liput, and Christina Lucente are all political science majors. The CRSC’s primary goals are to provide research assistance and other services to government, not-for-profit organizations, and businesses in Northwest Indiana, and to provide undergraduate students with applied research experience. Students, working as Research Associates, become integral parts of the CRSC and not only learn basic research methods, but gain practical experience in working for and dealing with government, business, and other organizations in Northwest Indiana. As a means of achieving these goals, the CRSC forges partnerships with various governmental units and not-for-profit organizations in Northwest Indiana. This report is based upon a continuing partnership with the City of Valparaiso.

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Water Quality in Restored Wetlands: A Study of the Great Marsh Complex in the Indiana Dunes National Lakeshore

Wendy Marth, Adam Conner

Departmental Affiliation: Chemistry
College of Arts and Sciences

The Great Marsh complex in the Indiana Dunes National Lakeshore is an excellent example of landscape modification that affects water quality (WQ). Originally a series of wetlands, the Great Marsh was extensively drained to increase the amount of tillable and residential land in the region. Currently, parts of this complex are being restored. During the summer of 2009, 15 different WQ parameters at 12 sites throughout the Great Marsh were monitored to assess how the restored wetland is functioning. Data collected thus far indicate that the WQ in the restored Great Marsh is typical of that in a wetland in northwest Indiana. For example, the average conductivity in the wetland is 266 μS/cm and E. coli levels decrease as water flows through the Marsh. Total phosphorus levels entering the wetland, at the sites monitored, (0.14 ppm) are lower than those measured near the center of the Marsh (0.80 ppm), suggesting additional unidentified sources of phosphorus. However, the total phosphorus levels exiting the wetland (0.23 ppm) indicate substantial uptake of phosphorus in the wetland. The wetland also experiences seasonal changes typical of a wetland, such as fluctuating water temperatures, water levels, and dissolved oxygen levels.

Information about the Authors:
Wendy Marth is a junior chemistry major who worked under Dr. Jonathan Schoer and with partner Adam Conner. Because she has a passion for nature and the outdoors, spending the summer researching water quality was a great fit for her. Wendy plans on attending graduate school to earn her Ph.D. after graduating, although she is not quite sure what area of chemistry she will study. Adam Conner is a senior chemistry major who completed a water quality research project this past summer under the supervision of Dr. Jonathan Schoer and alongside Wendy Marth. Although Adam had no previous experience in environmental chemistry, he appreciated having the opportunity to learn fundamental research skills that will help him in the future as he enters the job market after college.

Faculty Sponsor: Dr. Jonathan Schoer

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A Study of the Relationships of Individuals between Verbal Discrimination and Positive Association with Vulnerable Populations
The purpose of this study was to explore the relationship between the personal association with vulnerable populations and verbal discrimination within a university setting. The research question was: Is there an inverse relationship between verbal discrimination and positive association with vulnerable populations? This research has implications in discovering a source of verbal discrimination and a possible means of decreasing such acts. Approximately 200 college students were surveyed at Valparaiso University in Valparaiso, Indiana. The survey has inquired about association with listed vulnerable populations and verbal discrimination as well as general demographic features. For the purpose of this survey, verbal discrimination means names that are commonly used to refer to a group of people in a negative way, such as “That’s so gay!” or “You throw like a girl.” Association is defined as any social contact or relationship that has been formed, taking into consideration the duration of time that the relationship has existed. A vulnerable population is defined as those individuals or groups who have a greater probability of being harmed by specific social, environmental, or health problems. For the purpose of this survey, the associations with populations included those that are listed: women, homosexuals, and mentally handicapped.

Information about the Authors:
Jessica McCallum is a junior, majoring in environmental science and theology with a social work minor. Current pursuits include working with outdoor education for children and being a deaconess. Kelsie Tieman is also a junior, majoring in social work with a theology minor. Current pursuits are obtaining a master of social work and being a deaconess. This topic arose from Jessica and Kelsie’s experiences with vulnerable populations and a curiosity if interactions or relationships have an effect on creating a new sense of respect for a vulnerable population. This research will have further implications in both of these women’s career choices and their means of working with all people.

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Psychological research (Rogers, Kuiper, & Kirker, 1977) has shown that encoding information with reference to the self can facilitate recall, but there has been little research on how this can be applied to classroom instruction. One study (Moreno & Mayer, 2000) on the presentation of educational material found that presenting material in the second person with narrative facilitates recall immediately after instruction through the self-reference effect. However, there has been no research to determine whether or not recall can be facilitated by only changing the pronouns to the second person and whether or not this effect can be found a week after learning the material. This study seeks to answer these questions.

Information about the Authors:
Anna Isaacson is a junior psychology major currently wanting to go to graduate school for psychology. Ashley Lawrence is a junior psychology major interested in pursuing graduate school as well. Matt Moffitt is a junior psychology major/pre-medical student pursuing medical school. Angelique Mercier is a biology/psychology double major pursuing a career in genetic counseling. They became interested in this project after talking to Dr. Kieth Carlson and Dr. Jennifer Winquist about their idea and the self-reference effect.

Faculty Sponsors: Dr. Jennifer Winquist and Dr. Kieth Carlson
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Over the course of two years (2008-09), we observed 31 evolved stars in the short-lived proto-planetary nebulae (PPN) phase with Valparaiso University's 0.4 m telescope. The goal of this study is to document the
light changes, and other observable phenomena such as color change, of stars in this PPN phase. A graph of measured brightness versus time was made for each PPN and light variability was found for all. In some cases it was periodic and in others non-periodic. For each of these light curves, a period search program was applied to determine the length of these light variations. The determined periods range from 35 days to as long as 135 days. For some PPN, a change in the amplitude for the period can be seen over the course of the two years. Also, with the use of filters we can see color variations and can compare this to changes in light. In some of the PPN, a correlation can be made between color change and light variation.

Information about the Author:
Zachary Nault’s primary study at Valparaiso University is physics, but he has a hobbyist’s passion for astronomy. These two interests are what drew him into the summer research in proto-planetary nebulae. Zach felt it was truly an enriching experience and a great opportunity to work closely with a leader in the field and get very hands-on with the research. Even though his future goals are pointed towards nuclear physics, he will always appreciate what he has learned.

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Montage of a Dream Deferred: A Dance Translation
Lilia Del Bosque Oakey

Departmental Affiliation: English College of Arts and Sciences

I have always been interested in the limitations of the written word and how the stale contrast of black type on a white page can be overcome. Langston Hughes’ Montage of a Dream Deferred seems limited by the written word in this way. Montage is a series of poems that, even though written in free verse, mimics the sudden changes of rhythm and tone that are prevalent in jazz and be-bop music. The limit of the written word strips the poems of some of the life, vitality, and longing that is packed onto the page. Hughes’ poems also possess a longing of acceptance as well as a socio-economic message that would benefit highly if breath and movement were used to depict them. I have decided to strip Montage of these limitations and transpose the work into a modern ballet. The ballet will explore the relationship between movement and the word, showing the expressive power movement can bring to the word. It will also examine the medium of the ballet as well and how an old form of art, arguably as stale as the written word, can interpret common ideals in a modern setting. The ballet will also explore poetic uses of images, themes, and rhythm and see if these can be better represented in movement. This project ultimately probes the relationship between the two oldest forms of expression - the word and movement - to see if one is able to overcome the limitations of the other.

Information about the Author:
Lilia is a senior creative writing, TV and radio broadcasting, and humanities major. She is involved in WVUR, The Torch, Dance Ensemble, and VU Competitive Ballroom Team. She has recently been exploring different variations of story telling, such as dance and oral story telling, to see why the written word is the most preferred.

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Detection and Probability of Ocean Fronts in AMSR-E Satellite Data
Kelsey Obenour, Peter Cornillion, Christian Buckingham

Departmental Affiliation: Geography and Meteorology
College of Arts and Sciences

Many oceanographic characteristics are affected by the dynamics of ocean fronts - regions of large horizontal gradients in ocean properties. Studies have been conducted on sea surface temperature (SST) fields obtained from satellite-borne infrared instruments, primarily the Advanced Very High Resolution Radiometer. However, a significant problem with SST fields obtained from infrared instruments is their inability to “see” through clouds. By contrast the Advanced Microwave Scanning Radiometer for the Earth Observing System (AMSR-E) aboard the AQUA spacecraft measures SST with a passive microwave instrument, making observations regardless of cloud presence possible. To our knowledge, a systematic study of global ocean fronts has not been conducted on SST fields obtained with AMSR-E data. The University of Rhode Island single image edge detection algorithm has been applied to
seven years of AMSR-E data. The resulting data set consists of two, nearly complete, global maps of the location of SST fronts per day from which we determined frontal probability as a function of space and time on a global scale. A remarkable characteristic of the global monthly fields of frontal probability is the suggestion of zonal bands at mid-latitudes in all major ocean basins separated by a dominant meridional length scale of order 300 to 450 km. The dynamical processes resulting in this banding are unknown at this time.

Information about the Authors:
Research on the Detection and Probability of Ocean Fronts in AMSR-E Satellite Data was conducted at the University of Rhode Island - Graduate School of Oceanography (URI-GSO) during the summer undergraduate research fellowships in oceanography (SURFO) program in 2009. Kelsey Obenour was a participant in the SURFO program and is currently a senior at Valparaiso University with majors in meteorology and geography and minors in mathematics and physics. Christian Buckingham is a graduate student at URI-GSO, and Peter Cornillion is a faculty member at URI-GSO. All authors are looking to continue research in satellite physical oceanography. The research topic was chosen by Peter Cornillion because of the suggested banding structure in a previous study conducted by Ullman et al. with SST fields in Advanced Very High Resolution Radiometer Pathfinder data.

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Timothy Olson

Departmental Affiliation: Physics and Astronomy College of Arts and Sciences

The electrically neutral neutron is known to possess a magnetic dipole moment (nMDM) that is well measured. It is theorized that the neutron also has an electric dipole moment (nEDM), but this property has never been observed, and modern theories do not agree on its predicted strength. A new method to search for the nEDM employs the interaction of the nEDM with the atomic electric fields in a perfect single crystal of silicon. A “proof of principle” experiment using the interaction of the nMDM with the perfect silicon crystal electric fields will be done soon because the nMDM interaction is orders of magnitude larger than the nEDM interaction, which makes it easier to test the method proposed. But the intended effect is still very small, so multiple interactions on each neutron are needed to amplify the effect. These multiple interactions involve the well-known Bragg diffraction of the neutron-wave in the silicon crystal. For this technique to work, the crystal reflectivity must be known to accurately estimate the final neutron count after these reflections. A new procedure was developed to characterize the reflectivity of a crystal quickly and easily, and early measurements of the reflectivity of two crystals indicate that this procedure will be useful as these experiments advance. In addition to knowledge of the reflectivity, a well-defined neutron beam will be essential for this experiment, so Monte Carlo simulations were developed to assist with collimation design and to predict the neutron count rate.

Information about the Author:
Tim Olson is a junior pursuing a physics and mathematics double major with a minor in computer science. He has taken many physics courses including Quantum Mechanics and Nuclear Physics and several computer science courses, all of which contributed to his research. He worked on this experiment at the National Institute of Standards and Technology during summer 2009 and is continuing his work during the 2009-2010 school year. Next summer, Tim will be working in Switzerland at CERN. He will attend graduate school and seek a Ph.D. in physics after receiving his bachelor’s degree from Valpo.

Faculty Sponsor: Dr. Donald Koetke
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Research Based Event Planning: An Organizational-Public Assessment

Katie Pianki

Departmental Affiliation: Communication College of Arts and Sciences

Internal and external communications are critical concepts when an organization is addressing both publics when developing special events. This longitudinal research project, World Banquet, is an annual educational approach to building a sense of world unity at Valparaiso University. Valparaiso’s
International Student Association (VISA), desired to increase American student involvement in the annual World Banquet. The key research focus correcting the concerns of low student attendance (internal) and too high senior citizen community member attendance (external) concentrated on how the internal public, the U.S. students, responded to the concept of an “international” word for an event. Through surveying the U.S. student population, it was discovered that the word “international” translated to mean only non U.S. students. Thus, U.S. students felt they were not included. Hence the “international dinner” was internally referred to as the “World Banquet,” the most neutral words supported by research. The research this year indicated that the students attending were responding to the event very positively. Subsequent evaluation sessions focused on a more ongoing effort in terms of timeline expectations (save the date for CORE classes), an advanced review of tactics prior to the semester of execution, and a theme that more carefully communicated the areas of the world to be featured. Furthermore, the responsibilities of the Public Relations Student Society of America student agency SPARK will be expanded to the fall initial event sponsored by VISA as an opportunity to feature the upcoming “World Banquet.”

Information about the Author:
Katie Pianki is a senior public relations major with a minor in music. Throughout her life, she has been involved in community events and activities that have really sparked her interest for event planning and special events. Her activities include Public Relations Student Society of America (PRSSA) and its Spark Student PR Agency. She also interns at the Wedding Shoppe Directory as an event planning assistant. Her goal in her future career is to be an event planner for either a nonprofit organization or an entertainment company.

Faculty Sponsor: Dr. Bonita Neff
Student Contact: Katie.Pianki@valpo.edu

Visual Poetry: The Birth of Poetic Cinema

Ashley Price

Departmental Affiliation: Foreign Languages and Literatures
College of Arts and Sciences

The art of making films finds its roots in late 19th century France. Over the years, French directors have contributed greatly to the growth of cinema as an art form. One such director is Jean Cocteau (1889-1963). A French polymath in the arts, Cocteau was an artist, playwright, novelist, poet, and filmmaker. As a filmmaker, he brought elements of the other arts into his work as a cinematographer, which is evident in the films Le Sang d’un Poète (The Blood of a Poet), Les Parents Terribles (The Storm Within), and La Belle et la Bête (Beauty and the Beast). In the film Orphée (Orpheus 1950), based on the Greek myth, Cocteau makes particular use of the poetic arts within a visual genre. Cocteau personalizes the film by making the main character a poet and in adding elements of his own struggles as a poet. By analyzing the way Cocteau treats the theme of death and how he makes poetic use of mirror imagery, I intend to demonstrate how he adapts a well-known myth in a modern context and more importantly how this adaptation creates a new genre of poetic cinema.

Information about the Author:
Ashley Price is a senior French major/political science minor, who hopes to receive a Ph.D. in Francophone studies. Through the course of her French education, the study of French films has always been an integral part of many classes. Interest in this subject area peaked as a result of a visit to the Cinémathèque Française (French Film Museum) and from attending a class specifically devoted to the analysis of French films.

Faculty Sponsor: Dr. Timothy Tomasik
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Circle the Cat: A Computational Approach for the Analysis of Quadruphage

Kirk Baly, Tim Olson, Owen Prough, Alex Youngman

Departmental Affiliation: Mathematics and Computer Science
College of Arts and Sciences

Circle the Cat is an adaptation of the classic mathematical puzzle Quadruphage, in which a cat attempts to escape a hexagonal board, but after each turn one square is blocked. We have coded a simulation of this classic puzzle. The result of our development allows for the implementation of varying strategies to computationally examine their effectiveness. The code itself, though extensive, is open for addition/extension. Analysis of the simpler strategies has allowed for improvement of both Cat
and Player artificial intelligence systems.

**Information about the Authors:**
Kirk Baly, Owen Prough, and Alex Youngman are sophomore computer science majors. Tim Olson is a junior physics major. They were interested in conducting research in computer science, and Professor Caristi suggested that they look into developing a computational analysis of Quadraphage. Being interested in artificial intelligence as well as the mathematical analysis of the game, Circle the Cat quickly captured their interest.

**Faculty Sponsor:** Dr. James Caristi

**Student Contact:** Owen.Prough@valpo.edu

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**Exploring Perspectives on Female Ordination**
Stephanie Radke

*Departmental Affiliation:* Psychology
College of Arts and Sciences

Theologians have long debated the appropriate role of the genders within the church concerning who is qualified to serve as priest, pastor, or clergy. Many denominations struggle with how to define gender roles within the church that are in keeping with their interpretation of Scripture. This project seeks to explore how gender orientation (masculine, feminine, androgynous), gendered perception of God (as masculine or feminine), religious commitment, and denominational affiliation relate to perceptions of female ordination. While a denomination may endorse the legitimacy of ordaining women, individual members of the laity may oppose female ordination and thus avoid selecting a female pastor. This project seeks to explore denominational endorsement among the laity by surveying members of two different synods within the Lutheran denomination, the Evangelical Lutheran Church of America (ELCA), which endorses female ordination, and the Lutheran Church Missouri Synod (LCMS), which does not endorse female ordination.

Understanding the various dimensions of perspectives on female ordination among the laity can facilitate improved communication among those invested in the future of clergy training. Gaining a better understanding of perspectives on female ordination also has implications for interdenominational and intradenominational relations such as fostering improved dialogue on the issue of female ordination.

**Information about the Author:** Stephanie Radke is a senior psychology and creative writing major who intends to earn a master’s degree in counseling psychology before continuing on to pursue a Ph.D. in counseling psychology. Stephanie became interested in varying perspectives on female ordination through encounters with people of different denominational backgrounds and through a high school course in church history which touched upon the issue of opposing interpretations of Scripture.

**Faculty Sponsor:** Dr. David Simpson

**Student Contact:** Stephanie.Radke@valpo.edu

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**The Role of Special Events in Fundraising for Nonprofit Organizations**
Kristyn Rein, Katie Pianki

*Departmental Affiliation:* Communication
College of Arts and Sciences

Nonprofit organizations focus on making a portion of society better. In order to achieve their fundraising goals, they need to manage their relationships with key publics on whom the success of the organization depends. In fundraising, there is an interdependent relationship between the donor and the nonprofit organization. The donor provides financial resources and the charitable organization provides the means to carry out the donor's philanthropic wishes. This study takes an in-depth look into what sort of special events the public responds to. It is especially important to consider what sort of special events to sponsor in this economy. Another item to consider is how a nonprofit can distinguish its brand and entice people to attend its event by matching it to a person's values. Nonprofit websites often post their approach and promotions about special events. This study examined these websites to assess the values, the identifications of publics, the communication style (dialogic preferred), and the development of a relationship. The relationship between the organization and its publics should be reflected in the events developed and implemented. The analysis confirmed the assessment with different levels of outcomes: money raised, attendance at events, and the media coverage received.

**Information about the Authors:** Katie Pianki is a senior public relations major with a minor in music. She is involved in Public Relations Student Society of America and PRSSA's Spark
Student Agency. She interns at the Wedding Shoppe
Directory as an event planning assistant. Kristyn Rein
is a junior public relations major with a double minor
in public and corporate communications, and urban
studies. Her involvement with Union Board,
Association for Women in Communication, Public
Relations Student Society of America, and Project
Manager-City of Valparaiso Festivals & Events
contributed to her interest in nonprofits and special
events. Her future career goal is to become a special
event planner in a nonprofit organization.

Faculty Sponsor: Dr. Bonita Neff

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Analysis of Bovine Rhodopsin Cycling in
Drosophila melanogaster

Ciara C. Reyes, Dr. Alex Kiselev, Dr. Joseph
O’Tousa

Departmental Affiliation: Biology
College of Arts and Sciences

Rhodopsins are light sensor proteins integral to
vertebrate and invertebrate vision. A mutation in
nearly any gene that codes for a rhodopsin protein
results in vision impairments such as tunnel vision
(retinitis pigmentosa) or blindness; one such
rhodopsin mutation is rdgC. Previous studies on rdgC
mutants have investigated its action in Drosophila.
The goal of the study reported here was to investigate
the behavior of a vertebrate rhodopsin when
expressed in Drosophila photoreceptors. Two
transgenic strains were used carrying chimeric
rhodopsins consisting of parts of both vertebrate and
Drosophila rhodopsins. Crosses were used to move
the transgene into rdgC+ and rdgC mutant
backgrounds. Western blots were used to test for the
presence of rdgC transgenic protein in these strains.
Pseudopupil analysis was used to examine retinal
degeneration triggered by the presence of the rdgC
mutation. The fly strains generated from this
experiment were exposed to increasing increments of
light. Rhodopsin concentration and retinal
degeneration were monitored to understand the
behavior of the vertebrate rhodopsins in Drosophila
photoreceptors. While this research project is
ongoing, preliminary results indicate that expression
of a chimeric rhodopsin in Drosophila has been
successful. The long-term goal of this project is to
produce an animal model of human retinal diseases in
Drosophila.

Information about the Authors:
Ciara Reyes is currently a junior majoring in biology
and the humanities with a minor in chemistry. During
the summer of 2009, she participated in a biology
REU program (Research Experience for
Undergraduates) at the University of Notre Dame and
researched retinal degeneration in fruit flies
(Drosophila). As an undergraduate, she enjoyed
genetics and conducting research and working with
fruit flies as a TA which influenced her selection of
the REU program. In the future, she plans to pursue a
Ph.D. in genetics. The two co-authors of the
presentation are her faculty mentor Dr. Joseph
O’Tousa and fellow research professor Dr. Alex
Kiselev. Dr. O’Tousa is a professor in the
Department of Biological Sciences at Notre Dame,
and Dr. Kiselev is an assistant research professor in
the O’Tousa lab.

Faculty Sponsor: Dr. Michael Watters

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The Charity Changer

Ben Beres, Daniel Blood, Stephen Dolph, Christian
Rippe, Adam Schuetz, Disa Walden

Departmental Affiliation: Mechanical/Electrical
Engineering
College of Engineering

After purchasing goods and services with cash, one
often receives loose coins as change. This coinage
accumulates and will have to be spent or exchanged.
Because of busy schedules, people may avoid using
coins when purchasing products. While the difference
in time required is only a few seconds, it is enough of
a deterrent for many to not use coins. For those who
feel inconvenienced using loose change, the Charity
Changer alleviates the burden. Rather than counting
out change at a store or exchanging it at the bank,
donate this loose change to one of three charities
using the Charity Changer. The Charity Changer
identifies and stores coins to be donated to charities
while rejecting foreign and unacceptable coinage.
The Charity Changer also allows the user to select
and donate to one of three charities or to make a
donation to all three. Additionally, the Charity
Changer displays the amounts donated to each
charity, the total amount of donations it has collected,
and the amount collected from the last donor.
Because some donations might be large, the Charity
Changer accepts many coins simultaneously. Once
collected, donations are stored inside the Charity
Changer until they are exchanged at a bank.

**Information about the Authors:**
The Charity Changer team is a multidisciplinary engineering team consisting of six senior engineering students. Adam Schuetz is the team's computer engineer focusing on the programming for the project. Ben Beres is the team's electrical engineer focusing on the necessary circuitry. Daniel Blood, Stephen Dolph, Christian Rippe, and Disa Walden are the team's mechanical engineers focusing on the design and fabrication of the mechanical systems. The team also relies on the guidance of faculty advisor Dr. Mark Budnik. All six team members will be graduating in May with their respective degrees. Some team members will be attending graduate schools in the fall while others will be entering the workforce.

**Faculty Sponsor:** Dr. Mark Budnik

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**A Case Study Comparing Student and Community Perceptions of the Gary Railcats’ Web-Based Public Relations**

Josh Robertson, Mackenzie Maddock

*Departmental Affiliation:* Communication  
*College of Arts and Sciences*

"Community relations prepares an organization for meeting the challenges in a diverse often unpredictable climate" (Neff, *Encyclopedia of Public Relations*, 174). Although this applies to all organizations, this statement is relevant in sports, both profit and nonprofit. If a sports organization is unable to convey its messages to key publics, then the organization will cease to exist. As technology progresses, however, the need for successful web-based public relations is also more valuable. This case study explored the effectiveness of the promotional tactics the Gary Railcats use to reach the local community as well as the seasonal student. Research conducted in 2007 indicated a significant lack of knowledge among the students regarding what sport the Gary Railcats represented. Two primary contributing factors to the unawareness included gender representation (women largely unaware) and the students’ concentrated major (nonsports students unaware). Although the 2007 study examined the public relations techniques in regards to Valparaiso University students, both studies revealed that many university students had never heard of the Gary Railcats and did not know what sport the Gary Railcats played. Social media or technology was not considered central to this last study. Now in this replication with extended analysis, web-based public relations was the central focus. This study indicated that the Railcats were not reaching students even though social and electronic media developed rapidly during this time period. Furthermore, the current data also verified the community population was more knowledgeable about the Gary Railcats’ services.

**Information about the Authors:**
Mackenzie Maddock is a senior sports management major with minors in business administration, public relations, and Spanish. She took an interest in researching the Gary Railcats because of her internship last summer with a minor league baseball team in Buffalo, NY. Josh Robertson is a senior sports management major with minors in business administration and public relations. He chose to participate in the Gary Railcats research project because it allows him to gain a better understanding of the challenges that sports organizations face.

**Faculty Sponsor:** Dr. Bonita Neff

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**Implementing a Pediatric Fall Prevention Program**

Mindy Phelps, Christine Redar, Peter Hamang, Valarie Bollenbacher, Samantha Ruffin, Leonard Campbell

*Departmental Affiliation:* Nursing  
*College of Nursing*

Preventing falls is an important safety concern for pediatric nurses. The purpose of this evidence based practice project was to design a tool to identify pediatric patients who are at risk for falling and to implement a pediatric fall prevention program for these at risk children. CINAHL and Joanna Briggs were searched to find evidence of best practice. Analysis of evidence showed that implementing a pediatric patient falls safety protocol reduces the incidence of falls and directly addresses Joint Commission patient safety goals. The first component of the prevention program consists of the Humpty Dumpty Fall Scale (Hill-Rodriquez et al., 2008) to assess the level of fall risk for pediatric patients. The second component involves the implementation of nursing interventions that are appropriate for the assessed risk level. A policy was created and a plan
for implementation was devised. Additionally, an evaluation plan was created to measure whether implementation of the prevention program reduced falls in pediatric patients. A program such as ours has the potential to significantly improve patient outcomes and parent satisfaction with nursing care.

Information about the Authors:
Mindy Phelps, Christine Redar, Peter Hamang, Valarie Bollenbacher, Samantha Ruffin, and Leonard Campbell are a group of senior year nursing students who are working to graduate this May or August and enjoyed working together as a group to compile this research!

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Characterizing the Binary Central Star of Planetary Nebula PN EGB1
Samuel Schaub, Dr. Todd Hillwig

Departmental Affiliation: Physics and Astronomy College of Arts and Sciences

A study of the changing brightness over time of central stars of planetary nebulae is being conducted at Valparaiso University. The study has revealed the central star of the planetary nebula EGB1 to likely be a binary system. By monitoring brightness changes at multiple wavelengths of light and obtaining spectra of the star, we hope to determine physical parameters for the binary system such as stellar radius, temperature, and mass. One star is known to be a white dwarf, a star at the end of its life, from which the planetary nebulae originated, so we know something about its characteristics. From the data we have collected, combined with some previously published measurements of brightness in different wavelengths from other research groups, we hope to learn the nature of the white dwarf’s binary companion star. Preliminary analysis of the data suggests that a relatively cool red dwarf star or brown dwarf could produce the observed variations in brightness and perhaps even well fit the energy distribution versus wavelength of light. The status of this study and some preliminary results are presented along with a discussion of ways in which our analysis is at odds with published results of other research groups.

Information about the Author:
Samuel Schaub is a third year physics and chemistry major at Valpo. He has been performing research under the guidance of Professor Hillwig since the summer of 2008, and he will continue the work at least through this coming summer. After completion of his undergraduate studies, Sam plans to pursue a Ph.D. in physics, specifically either astrophysics or nuclear physics, whichever appears most interesting at the end of next year.

Faculty Sponsor: Dr. Todd Hillwig
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The Study of Variability in Proto-Planetary Nebulae Light Curves
Kristie Shaw

Departmental Affiliation: Physics and Astronomy College of Arts and Sciences

In this project, I was assigned nine proto-planetary nebulae to study and analyze. A proto-planetary nebula is a stage in a star’s life where the star is in the process of losing its outer layers and exposing its core. I observed 23 nights throughout the summer of 2009 at the Valparaiso University Observatory. I took digital images using an electronic camera to collect data on these specific objects. I took the data that was observed, reduced it using an imaging processing program, and collected the results. From the results, I documented light curve variations and looked to find a period in the light curve of the star. The light curve shows brightness versus time of observation, usually showing a cyclical periodic variation and giving evidence of pulsation. I also compared the brightness of the star to the color variation to see if there was a correlation between brightness of the star and its apparent color. This can give us an insight to the star’s surface temperature. Of the nine stars I observed, seven strong periods were determined, ranging from 42 days to 208 days. Through this research, we hope to better understand these stars and their natures.

Information about the Author:
Since Kristie Shaw’s dad first took her out to look at the stars, she has had a passion for astronomy. She never considered making it a career until her first physics class in high school, when her teacher showed her how interesting the world really was. She chose this area of research because she wanted experience working in an astronomy-related position, and this has led her to pursue a dream of working for NASA.
When Does Quarantine Make Things Worse?

Krista Schaefer, Adam Shull

Departmental Affiliation: Mathematics and Computer Science
College of Arts and Sciences

We analyzed an epidemic model that resembles an infection transmitted through both direct contact and an intermediate host. We show that, if the intermediate host cannot be controlled, restricting the infected individuals to quarantine may worsen the spread of the disease or even cause an endemic situation. Specifically, the epidemic reproductive number is computed in the absence and presence of the quarantined population. We show that, if the infection rate among quarantined individuals and susceptible intermediate hosts is high enough, a stable endemic equilibrium will occur while, at the same time, the absence of quarantine measures may still lead to a disease free situation. This theoretical model is inspired by the Bubonic Plague epidemic.

Information about the Authors:
No information was provided.

Sponsor: Dr. Daniel Maxin
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Accelerating Simulation of Quantum-Dot Cellular Automata via Graphics Processing Unit

Karl Stathakis

Departmental Affiliation: Mechanical Engineering
College of Engineering

Moore’s Law states that computers’ calculation speeds will double roughly every 18 months by virtue of increasing transistor counts. But as these chips continue shrinking to accommodate more and more transistors, they will soon (within 10-15 years) reach a limit imposed by the laws of physics. This problem has already slowed Central Processing Unit (CPU) development considerably. However, since many real-world problems demand prodigious computational power, such a barrier is unacceptable. One promising alternative is the Graphics Processing Unit (GPU). CPUs’ main speed limit comes from their serial nature, which means they process instructions one at a time. GPUs sidestep this problem through parallelization, in which multiple processors concurrently execute different portions of the same problem. A mainstream GPU can have up to 480 processors, making it 600% faster than even the fastest CPU, for half the price. An ideal project for such a demonstration is Valparaiso’s Quantum-Dot Cellular Automaton (QCA), which may extend Moore’s Law for decades. Research in this field is currently hindered by the required simulations, which are computationally intensive. But with a GPU, calculations requiring 36 hours may be accelerated by a factor of five or more. Such alacrity would facilitate breakthroughs.

Information about the Author:
Last summer, Karl Stathakis learned graphics-based parallel programming at the University of Michigan. His goal was to accelerate a simulation of Earth’s upper atmosphere using the graphics-processing language CUDA. He has continued learning CUDA at Valparaiso. Should this semester’s testing show promise, he plans to further optimize the simulation by rewriting the code by hand. In the future, he hopes to use graphics processing in a graduate science/engineering program.

Faculty Sponsor: Dr. Jeff Will
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Social Norms in a School Community: Creating a Safe School Environment

Nancy Strezovski

Departmental Affiliation: Education
College of Arts and Sciences

A middle school, located in Northwest Indiana, participates in Creating a Safe School, (CASS). Its mission is to positively impact the social norms in a school community by recognizing the hurtful, covert behaviors of peer aggression and identifying and modeling a more positive set of normative behaviors for educators, parents and students. CASS is a multifaceted change process that brings together a community of administrators, teachers, parents, and students to work collaboratively to change the social culture in a school or school district. In this research project, some of these questions will be addressed: a) Are the CASS activities/events implemented by this middle school effective? b) Do students set personal
goals based on CASS’s mission? c) Do students live by CASS’s mission outside of school? d) In what ways can the CASS program be improved in order to create a better, more positive safe school environment and to instill positive social norms and skills among students within the school community?

Information about the Author:
Nancy is a graduate student at Valparaiso University majoring in the sciences at the middle school level. She currently holds a Bachelor of Arts degree from Purdue University, West Lafayette, Indiana, in consumer family sciences and humanities. Her goal as a teacher is to have a positive impact on students academically and socially. In addition, she believes learning should be “authentic” to students so they can apply what is learned in real life situations. She also speaks the Macedonian language fluently.

Faculty Sponsor: Dr. Del Gillispie

Student Contact: Nancy.Strezovski@valpo.edu

Valparaiso International Engineering for Nicaraguan Turbine Operation (VIENTO)

Rachel Howell, Kirsten Swanson, James Nagel, Kyle Olund, Dan Roggendorf, Mike Lanzerotti, Justin Bui

Departmental Affiliation: Mechanical Engineering College of Engineering

Valparaiso International Engineering for Nicaraguan Turbine Operation (VIENTO) has created a solution for monitoring wind turbine performance data. The system is named the Doria Measurement System (DMS) and will be created in Valparaiso, IN and implemented in El Corozal, Nicaragua. The collected data will allow for better, more efficient wind turbines to be produced and evaluated. The project will allow us to better design wind turbines for applications in developing countries. As the future of alternative energy develops, it is important that sustainable energy sources such as wind power be engineered and re-engineered to promote fiscally feasible solutions. The project also gives the student team an opportunity to successfully implement a technology that will aid in future rural Nicaraguan development.

Information about the Authors:
Rachel Howell is a senior mechanical engineering major with German and humanitarian engineering minors. She has completed humanitarian projects in Kenya, Tanzania, and Haiti. Michael Lanzerotti is a senior mechanical engineering major with a minor in manufacturing management. He participated in a service project in Haiti. Kyle Olund is a senior electrical engineering major with a business administration minor. He has done volunteer work through the philanthropic society, Alpha Phi Omega.

Kirsten Swanson is a senior mechanical engineering major. She is the president of the Society of Women Engineers and is involved in Tau Beta Pi. Justin Bui is a junior computer engineering major and ran track and cross country. Dan Roggendorf is a senior electrical engineering and computer science major who is involved in IEEE. James Nagel is a senior mechanical engineering major with a business administration minor. He has worked on projects in Tanzania, Kenya, and Haiti.

Faculty Sponsor: Dr. Peter Johnson

Student Contact: Kirsten.Swanson@valpo.edu

Player Branding: A Public Relations Approach to Developing Relationships with Team Fans

Mike Targonski, Dan Bartusiewicz

Departmental Affiliation: Communication College of Arts and Sciences

Public relations is focused on developing relationships. Relationships provide the strongest approach to organizational connections with publics. How this relationship is articulated through tactics (brochures, posters, etc.) and the strategy applied often reveals the values held by the publics. In this research, relationships were examined from the “branding” approach directed toward promoting individuals and teams in sports. The branding process should be evident on the team’s websites. To assess the degree to which individuals and a team are branded, the website covering the teams from the basketball Horizon league (men’s and women’s basketball) are analyzed for key elements of branding: clear values identified, the degree of fan orientation in presentation, the clear branding indicators (product is well described, price is thoughtful, place of concepts is easily obtainable, and promotions are central to the website). The ultimate goal is to create a unique identity around value. The ultimate test is to establish a team-fan bond, a fact established by reviewing attendance records. The data from these websites indicated a variance in player/team promotions, particularly the branding. These findings helped to develop a series of standards for website promotions to better brand a team to illustrate the values of such enterprise.
Characteristics of Microbursts in Central Arizona
Elizabeth J. Thompson

Departmental Affiliation: Geography and Meteorology
College of Arts and Sciences

Summertime thunderstorms in central Arizona associated with the North American Monsoon often become severe and are known to frequently produce damaging microbursts. Occurring in a rapidly growing metropolitan region, these costly and hazardous phenomena pose a critical challenge to forecasters and are of extreme concern to local power industries and airport operations. In order to identify the spatial and temporal characteristics, evolution, and intensity of downbursts in central Arizona, data was utilized from a comprehensive Doppler radar network used to observe the 2008 local convective season. Using this new information, microbursts in central Arizona can be compared to previously documented microbursts from other regions, and evaluated in light of the current theoretical understanding of microbursts. Microbursts observed during this study were all classifiable as wet or high-reflectivity microbursts, despite the desert climate. They occurred most frequently between 5 and 9 PM MST (well after the time of maximum solar heating), and were associated with stronger maximum near-surface outflow wind speeds as compared to most other microbursts in the U.S. Further, they were observed to occur over a wide range in diameter and duration. The evolution of downbursts closely matched, and thus supported, the currently accepted conceptual models presented in the literature.

Information about the Author:
Elizabeth Thompson is a senior meteorology major with a minor in geography, headed to Colorado State University in Fall 2010 for graduate school in atmospheric science. She is president of VU’s meteorology honor society, Chi Epsilon Pi, is active in other student and professional meteorology organizations, and in VU’s chapter of Engineers Without Borders

Faculty Sponsor: Dr. Bart Wolf
Student Contact: Elizabeth.Thompson@valpo.edu

Impact of Heme Reconstitution on the Spectroscopic Properties and DNA Binding Activity of the H82A Variant of the Carbon Monoxide-Sensing Heme Transcription Factor, CooA
Rachel Troester, Dr. Robert Clark

Departmental Affiliation: Chemistry
College of Arts and Sciences

CooA is a gas-sensing heme protein that regulates the expression of genes responsible for growth by carbon monoxide (CO) in several bacteria. CO binding to the CooA heme groups results in a protein shape change that initiates CooA’s DNA binding function. All known CooA homologs have a conserved histidine residue that i) acts as the proximal heme ligand and ii) is trans to CO. Together with results from mutagenesis studies, this observation suggests that the presence of a proximal histidine ligand is required for CooA DNA binding. However, since mutants lacking this His were observed to lose heme upon purification, an alternative hypothesis is that the absence of heme, and not the presence of histidine, accounts for this loss of function. To test this hypothesis, we measured the spectroscopic properties and DNA-binding activity of heme-reconstituted H82A. Results obtained using electronic absorbance spectroscopy suggest heme-reconstituted Fe(II)-CO H82A has an iron environment similar to that of wild-type CooA. Preliminary results from a fluorescence anisotropy assay also reveal that reconstituted H82A possesses modest DNA binding activity, suggesting His-82 is not essential for this activity. The authors wish to thank the Valparaiso University College of Arts and Sciences for financial support.

Information about the Authors:
Rachel Troester is a senior chemistry and Spanish double major hoping to pursue a career in medicine. She became interested in Dr. Robert Clark’s research on CooA after taking Biochemistry I taught by Dr. Clark. She researched the spectroscopic properties
and activity of reconstituted H82A during the summer of 2009 and continued that research through 2010. She attended the Indiana Academy of Science 2009 Fall Meeting in which she presented her summer research and will be attending the American Society for Biochemistry and Molecular Biology Annual Meeting in Anaheim, California in April to present her current research.

**Faculty Sponsor:** Dr. Robert Clark

**Student Contact:** Rachel.Troester@valpo.edu

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**The Attitudes and Comfort Levels of Undergraduate Students at Valparaiso University toward Specific Diverse Populations**

Carl Hufford, Sara Tucker, Hailly Wakeland

**Departmental Affiliation:** Social Work
College of Arts and Sciences

The purpose of this study is to measure the attitudes of undergraduate students at Valparaiso University in Valparaiso, Indiana, toward diverse populations that are present on the campus. The study will attempt to include approximately 200 students, of at least eighteen years of age, randomly selected from the master list of classes for Spring 2010 which is representative of the undergraduate community as a whole. The study will be conducted through surveys that are administered during the designated class time. The surveys will have an informed consent section on a separate piece of paper that the participant can keep, a detailed demographics section, as well as a section including a variety of situations in which the participants will measure their degree of comfort based on a Likert-type scale. These surveys will be completed within a one week time span based on the day when the professor of each class is most available. Due to Valparaiso University’s past and present racial makeup, this study is important for assessing the effectiveness of campus organizations that educate and advocate for diversity.

**Information about the Authors:**
Hailly Wakeland is interested in this topic because of the rural setting she grew up in. She did not experience much diversity growing up and wanted to see if that could affect her college experience. Carl Hufford has lived in areas with a fairly low ethnic diversity. He desires to become more culturally competent and aware but wonders if his somewhat ethically limited past makes it harder for him to do so. Sara Tucker grew up in a fairly diverse area. While the majority was white, there were a large variety of other ethnic groups represented. Now that she is at college and observing how areas of different racial makeup have affected the views of college students toward one another, she is interested to find if the region in which one is raised, and whether it is rural, suburban, or urban, has an effect on students’ comfort levels and attitudes toward diverse populations.

**Faculty Sponsor:** Dr. Matthew Ringenberg

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**The St. Louis Cardinals: Creating Communication Relations, Corporate Branding, and Reputation through News Releases**

Matthew Tynski, Jessie Strauch

**Departmental Affiliation:** Communication
College of Arts and Sciences

There are many ways to create community relations, corporate branding, and reputation. Community relations is classified as the overall tone of attitudes within a sphere of influence. Corporate image and branding is the public perception of the organization which is hopefully aligned with its reputation. Publicity is a message issued on behalf of an idea or an institution. These perspectives were examined through the analysis of the news releases posted on the Cardinals’ virtual website. The results established further understanding of how the Cardinals promoted and developed their fan base. The identified strategies and tactics developed from 2002 to the present time focused on selected news releases. Key topics documented included reputations, injuries, fan attendance, community relations efforts, and outcomes, policy issues, change of management, and the winning of the World Series. The results indicate that the posted news releases are a good indicator of the Cardinals’ development of a brand as defined by a community perspective.

**Information about the Authors:**
Jessie Strauch is a public relations major with a business minor. She is an active fan of the Chicago Cubs and St. Louis Cardinals. She has family members that work with the Cardinals as well. Matt Tynski is a sports management and public relations double major. He has been an avid fan of baseball for the better part of his life.
Comparing Promotional Tactics Used by VU Athletics for Men’s and Women’s Basketball

Peter Volmut, Marie Branum

Departmental Affiliation: Communication
College of Arts and Sciences

"Sports promotion is an aspect of the public relations profession that relies heavily on publicity and promotion to foster the brand equity of teams, conferences, types of sports, and specific athletes" (McDonald, 806). Valparaiso University, for example, stimulates interest in its men's and women's basketball programs through a promotional campaign to maintain support for its teams. "As part of the strategic planning process, a program/action plan is a tactical road map that links the goals and objectives developed during the preliminary precampaign planning process with the actual outcomes of the campaign" (Kazoleas, 648). These approaches suggest that the goals and objectives should match the desired outcome. This study thus examined the tactics and processes used by Valparaiso University to promote the basketball program for specific outcomes. Once the goals and objectives were identified, a questionnaire evaluated the effectiveness of the campaign. The questionnaire asked students if they were aware of specific promotional strategies and questioned if these tactics affected their attendance at games. The results of the questionnaire were then compared to the original campaign goals to see if the tactics used were successful or not, what worked, what did not work, and what could be used in the future. The data suggested much more needed to be done to connect the promotions to the students.

Information about the Authors:
Peter Volmut is a sophomore public relations major. He is a member of the Public Relations Student Society of America (PRSSA) and takes part in VU’s PRSSA’s national SPARK program for its client, the mystery writer Kate Collins. Marie Branum is a junior public relations major and Spanish minor. She is also a member of the Public Relations Student Society of America (PRSSA) and is a part of the national VU SPARK Student Agency working with the Crusader mascot issue. She is an intern with the Valparaiso University Athletic Department, recording and editing video footage for the Valpo Athletics website.

Medians of Permutations

Samantha Frisk, Pat Slattery, Brittany Wagoner, Kelsey Watson

Departmental Affiliation: Mathematics and Computer Science
College of Arts and Sciences

The distance between two permutations can provide insight into situations such as voting and comparing strands of DNA. There are many ways to define the distance between a pair of permutations. We have worked with the distance axioms to define new distances. The Median is a permutation which gives the smallest sum of distances between itself and each permutation in the given set. Given a set of permutations and a distance, d, we are interested in computing the Median(s) of that set. For several different distances we are developing theorems to find how many and what medians a set of permutations and a distance, d, may have.

Information about the Authors:
Samantha Frisk is a sophomore mathematics and secondary education major. She is pursuing teaching mathematics at an all girls’ school in Blue Fields, Nicaragua for the summer of 2010. Pat Slattery is a freshman mathematics major with a Chinese minor. Pat intends to be a Christ College Scholar. Brittany Wagoner is a senior mathematics major. In the fall of 2010, Brittany will be teaching secondary mathematics for the Indianapolis Teaching Fellowship in Indianapolis Public Schools. Kelsey Watson is a junior mathematics, biology, German, and humanities major. Kelsey will be working as a research student of geometry and physics in graphs at Canisius College in Buffalo, NY during the summer of 2010.

Mutagenesis Studies to Investigate Ligand Binding to the Carbon Monoxide-Sensing Heme Protein, CooA, from Carboxydothermus

Faculty Sponsor: Dr. Lara Pudwell

Student Contact: Brit.Wagoner@valpo.edu
Hydrogenoformans

Laura Wagoner, Josh Wagoner, Dr. Thomas Goyne, Dr. Robert Clark

Departmental Affiliation: Chemistry
College of Arts and Sciences

The work reported here is part of a larger effort to determine how amino acid residues that compose the heme pockets of gas-sensing heme proteins impact the proteins’ regulation mechanisms and gas specificity. In the present study, we have employed site-directed mutagenesis to prepare protein variants of the carbon monoxide (CO)-sensing heme protein, CooA, from Carboxydothermus hydrogenoformans. These mutants have been designed in an attempt to rationally alter CooA’s effector specificity. We have prepared, isolated, and purified several protein variants to date, including C80T CooA. The C80T substitution is expected to increase the steric bulk on the proximal face of the CooA heme, but eliminates a potential site of S-nitrosylation that may impact protein activation by nitric oxide (NO). Currently, we are investigating both C80T heme structure and this variant’s ability to be activated for DNA-binding by CO and NO. Our next goal will be to prepare mutants that allow us to study proposed cooperative interactions that take place between the monomers of the CooA homodimer.

Information about the Authors:
Laura Wagoner chose to work on this project because it was an interesting opportunity to bring together her knowledge of biology and chemistry to create mutant cell lines whose activity can be studied. She is a double major in chemistry and biology and will graduate this May. Her goals after graduation are to continue work in the field of molecular biology and eventually attend medical school. Josh Wagoner is a sophomore chemistry major and biology minor. He joined this project to gain practical experience in the application of his traditional classroom instruction in these exciting fields and to contribute to the ongoing legacy of scientific research at VU. Having just completed Biochemistry 1 and 2 this year, he is excited to be taking over as a full time researcher on the project this summer when the group will continue investigating cooperativity in the protein CooA by generation of mutant cell lines. He plans to attend pharmacy school after graduation.

Faculty Sponsor: Dr. Robert Clark

Student Contact: Laura.Wagoner@valpo.edu

Love at First Sight: Effects of Attractiveness, Commitment, and Income on Dating and Marriage Choices of Men and Women

Krystal Warmoth

Departmental Affiliation: Psychology
College of Arts and Sciences

Evolutionary perspectives on mate selection suggest men prefer partners who are physically attractive and women prefer partners who have greater resources. However, social construction models suggest that intrinsic factors such as personality and commitment may be more important than extrinsic factors such as attractiveness and resources. The present study investigated the relative effects of potential partners’ attractiveness, income, commitment, masculinity and femininity on dating and marriage choices of male and female participants. Thirty-two profiles of hypothetical partners were created representing a factorial combination of low/high levels of masculinity, femininity, commitment, attractiveness, and income. Male and female participants were asked to assume that each profile described a member of the opposite sex, to form impressions of each TP as a potential partner, and to indicate how likely they would be to date or marry the TP. Results indicated that attractiveness and commitment were more important determinants of dating and marriage choices than was income. Participants chose high-attractive/low-commitment partners over low-attractive/high-commitment partners, and preferred high-commitment/low-income partners over low-commitment/high-income partners. Men were more likely to date high-attractive, low-commitment and low-income partners than were women, and men were less likely to marry a low-attractive partner than were women. These results provide some support for both evolutionary and social construction models of mate selection.

Information about the Author:
Krystal Warmoth is a senior psychology major. She has been a teaching assistant for the General Psychology Lab course for five semesters and is currently the Vice President/Treasurer of Psi Chi, the Psychology Honor Society. After graduating, she plans on attending graduate school in social psychology. Her interest in this topic was sparked by her advisor’s previous research on mate preference and the growing trend of using dating websites to select a partner.

Faculty Sponsor: Dr. Daniel Arkkelin
A Qualitative Comparison of Expired Endonucleases and Taq Polymerase to Their Unexpired Counterparts

Adam Westrick

Departmental Affiliation: Biology
College of Arts and Sciences

The reactivity of expired endonucleases and Taq polymerase was qualitatively explored by means of restriction digestion, polymerase chain reaction (PCR), and agarose gel electrophoresis in parallel with non-expired endonucleases and Taq polymerase. A series of paired reactions were run in which a DNA plasmid was allowed to react with either an unexpired or expired endonuclease. The resulting mixture was then separated by electrophoresis on a 0.8% agarose gel which used a HindIII digest of bacteriophage lambda as a size standard. In addition, expired Taq polymerase was used to amplify a portion of lambda DNA. Similar control reactions were performed using a variety of lambda DNA templates and unexpired Taq polymerases. These reactions were amplified via PCR and also separated by electrophoresis on a 1.2% agarose gel which used a HindIII digest of bacteriophage lambda as a size standard. Images of all gels were captured using a Biorad gel documentation system and analyzed with QuantityOne software. Gels from both experiments consistently showed that the expired reagents performed identically to their unexpired counterparts for reagents that have been properly stored. This information suggests that academic institutions can save money by using expired biological reagents for teaching.

Information about the Author:
Adam Westrick is a junior at Valparaiso University majoring in biology and chemistry and will be applying to medical school.

Faculty Sponsor: Dr. David Scupham

Student Contact: Adam.Westrick@valpo.edu

Relationships among Life-Style, Health Behaviors, and Health Status Outcomes for Underserved Adults

Evelyn Gomez, Molly Grime, Julie Wingstrom

Departmental Affiliation: Nursing
College of Nursing

The purpose was to examine the relationships among life-style, health behaviors, and health status outcomes for underserved adults at a nurse managed center. Guided by Bruhn’s framework, multiple influences impact one’s lifestyle. Health behaviors include actions or inactions that directly or indirectly affect health. A convenience sample of 84 adults was recruited. Data were collected to measure factors influencing life-style and health behaviors. Health status was measured by the SF-12 Health Survey, including general (SF-1), physical (PCS), and mental (MCS) component summary scores. Descriptive statistics and correlations were used to examine the variables. The majority of the sample was white, female, aged 18-64 years, with an annual income < $25,000. Life-style results indicated: subjects slept 7.16 hours, 44% smoked, 59.1% consumed alcohol, 43% used street drugs, and 45% exercised. For health behaviors, 65% engaged in screening and 61% used medications. 89% identified current symptoms; 72% reported medical conditions; and BMI averaged 29.3. The only life-style significantly correlated with health status outcomes was prescription medication usage. Medical conditions were inversely related to all health status outcomes. BMI was negatively correlated with SF-1 and PCS. Findings provided selective support for the study variables. The results can be useful when caring for the underserved.

Information about the Authors:
Evelyn Gomez, Molly Grime, and Julie Wingstrom are all senior nursing students. They presented this research project at the 2009 Sigma Theta Tau International Biennial Convention in Indianapolis, Indiana.

Faculty Sponsor: Dr. Theresa Kessler and Prof. Elise Alverson

Student Contact: Julie.Wingstrom@valpo.edu

Impact of Fitness Programs on the Perception of Self-Esteem and Physical Fitness of Middle-Aged Women

Laura Yohnka

Departmental Affiliation: Physical Education
College of Arts and Sciences

The purpose of this study is to analyze the impact of a fitness program on the self-esteem and physical
fitness of middle-aged women. To do this, baseline readings were taken on thirteen individuals. These readings ranged from predicted volume of oxygen consumed during exercise and flexibility tests to muscular fitness and a self-esteem inventory. Once these tests were complete, the subjects enrolled in a lunch-time or after-work fitness program offered by Valparaiso University's Health and Wellness program. Each individual was to participate in the program for four weeks. Upon completion of the program, each participant was tested again in each of the measures of performance to evaluate improvement. Results are pending and will be completed prior to the Celebration of Undergraduate Scholarship. An updated abstract will follow after the conclusion of post-program testing.

Information about the Author:
Laura Yohnka is a senior exercise science major with minors in human biology and psychology. As an aspiring occupational therapist, it is important for her to know what kind of programs can be therapeutically beneficial for physical fitness and self-esteem. She is also interested in the effectiveness of these programs in producing strength gains, weight loss, flexibility, and increased oxygen consumption.

Faculty Sponsor: Dr. Kelly Helm

Student Contact: Laura.Yohnka@valpo.edu
# Creative Work and Research Student Undergraduate Research Grants

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ADDITIONAL UNDERGRADUATE EXHIBITS AND AWARDS

College of Engineering Design Expo
Saturday, May 1, 2010
10:00 a.m. – 1:00 p.m.
Gellersen Center

Department of Art
Student Art Exhibition
April 21 – May 9, 2010
Brauer Museum of Art
Opening Reception, April 21 – 7:00 p.m., VUCA Lobby
Works selected by VU studio art faculty

Christ College Student Scholarship Symposium

October 1, 2009 winners:
Donor Assisted Fertilization: Consumerism and Parent-Child Relationships
by Molly Reynolds, senior, College of Arts and Sciences

Reawakening to an Everyday Sublime at Walden Pond and Lake Michigan
by John Linstrom, senior, College of Arts and Sciences

February 18, 2010 winners:
by Nick Derda, sophomore, College of Arts and Sciences

The Song of Lincoln: Walt Whitman’s Memory of Abraham Lincoln as Soldier Martyr
by Laura Ehlen, sophomore, College of Arts and Sciences

Supporters of Valparaiso University’s Undergraduate Scholarship

The Valparaiso University Guild

Office of the Provost

Committee for Creative Work and Research

Thanks to all who participated in the planning of this event.
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