Symposium on Undergraduate Research & Creative Expression
and Graduate Academic Symposium

Thursday, May 4, 2017  Harre Union Ballrooms

Program Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00 a.m. – 4:00 p.m.</td>
<td>Posters on Display</td>
</tr>
<tr>
<td>10:00 a.m. – 12:00 p.m.</td>
<td>Undergraduate Oral Presentations</td>
</tr>
<tr>
<td>12:00 p.m. – 1:30 p.m.</td>
<td>Lunch for All Participants</td>
</tr>
<tr>
<td>1:30 p.m. – 3:30 p.m.</td>
<td>Poster Presentation Evaluations</td>
</tr>
<tr>
<td>2:30 p.m. – 4:00 p.m.</td>
<td>Open Reception</td>
</tr>
<tr>
<td>3:30 p.m. – 5:00 p.m.</td>
<td>Graduate School Oral Presentations</td>
</tr>
<tr>
<td>4:00 p.m. – 5:00 p.m.</td>
<td>Students Remove Posters</td>
</tr>
</tbody>
</table>

Deans’ Choice Awardees

<table>
<thead>
<tr>
<th>Name</th>
<th>College</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria Bruick</td>
<td>Christ College</td>
<td>When Fools Push Back: Identifying Subversion in <em>King Lear</em> and <em>Twelfth Night</em></td>
</tr>
<tr>
<td>Jonathan Cisneros</td>
<td>Political Science, College of Arts &amp; Sciences</td>
<td>Censorship on College Campuses and the Forces Behind Campus Speak Disinvitations</td>
</tr>
<tr>
<td>Emily Owens</td>
<td>Global Service College of Arts &amp; Sciences</td>
<td>Desmond Tutu’s Influence in Apartheid South Africa: The Reconciliation of a Broken Gospel in the Restoration of a Divided Nation</td>
</tr>
<tr>
<td>Hannah Koby</td>
<td>Music, College of Arts &amp; Sciences</td>
<td>Christ lag in Todesbanden: Tracing Early Lutheran Congregational Song</td>
</tr>
<tr>
<td>Matthew Klapman</td>
<td>Mathematics &amp; Statistics, College of Arts &amp; Sciences</td>
<td>A Simulation of Anthropogenic Columbian Mammoth Extinction</td>
</tr>
<tr>
<td>Moriah Carmel, Kelly Braun, Janelle Bouman, Raenah Bailey</td>
<td>Biology, College of Arts &amp; Sciences</td>
<td>Diurnal Oviposition of Blow Flies</td>
</tr>
<tr>
<td>Nathan Mahan, Randall Swanson</td>
<td>Information &amp; Decision Sciences, College of Business</td>
<td>Employing Visual Analytics to Understand Worldwide Prevalence and Impact of Diabetes Epidemic</td>
</tr>
<tr>
<td>Samantha Kopping, Jack Hoeniges, Jesse Greenhagen</td>
<td>Mechanical Engineering, College of Engineering</td>
<td>Model of a Rotary Kiln Solar Reactor for the Reduction of Cobalt Oxide Particles in a Two-Step, Hybrid Thermochemical Water Splitting Cycle</td>
</tr>
<tr>
<td>Ellie Ashbrook, Bradley Adkins, Andrea Pertl, Jennifer Mitchell, Samantha Salvador, Kelly Wilkins, Madissen Brookshire-Green</td>
<td>Nursing, College of Nursing &amp; Health Professions</td>
<td>College Students’ Perceptions and Use of Marijuana</td>
</tr>
<tr>
<td>Time</td>
<td>Alumni Room</td>
<td>Heritage Room</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>Victoria Bruick</td>
<td>Nathan Mahan &amp; Randall Swanson</td>
</tr>
<tr>
<td>10:20 a.m.</td>
<td>Kayla Houp</td>
<td>Jonathan Cisneros</td>
</tr>
<tr>
<td>10:40 a.m.</td>
<td>Jessica Lewis</td>
<td>Leena Aljobeh</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>---</td>
<td>Abigail Fate</td>
</tr>
<tr>
<td>11:20 – 11:25 a.m.</td>
<td>5 MINUTE BREAK</td>
<td>5 MINUTE BREAK</td>
</tr>
<tr>
<td>11:25 a.m.</td>
<td>Adam Bruno</td>
<td>Andrea Sanchez &amp; Jennifer LeCaptain</td>
</tr>
<tr>
<td>11:45 a.m.</td>
<td>---</td>
<td>Sarah Chamness</td>
</tr>
<tr>
<td>12:05 p.m.</td>
<td>Emily Owens</td>
<td>Natalie Bittles</td>
</tr>
<tr>
<td>12:25 p.m.</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>
Overview of the Symposium on Undergraduate Research and Creative Expression

The Symposium on Undergraduate Research and Creative Expression (SOURCE) is a conference that allows undergraduate students to showcase their creative and/or scholarly work and research in a professional format. This annual event 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. Formerly known as the Celebration of Undergraduate Scholarship, the event was renamed the Symposium on Undergraduate Research and Creative Expression in 2017.

One of the many joys of completing a research project or creative endeavor is to share the results with others. In a typical year, the Valpo Symposium brings together more than 150 students and 45 faculty sponsors to share their research experiences with the campus and local community. Students who have worked on class projects, senior projects and theses, or independent scholarship are encouraged to participate. All students present their work in either a poster or oral presentation format.

Students and faculty are encouraged to read the poster and oral presentation guidelines on the Undergraduate Research website (http://www.valpo.edu/undergraduate-research/) for guidance on the development of their presentations. Faculty sponsors also provide guidance and support for their students, both in developing the original research and in transmitting that research to a poster or oral format.

Each year, the deans of Valparaiso University’s five undergraduate colleges select individual students or student groups to represent their colleges as Deans’ Choice Awardees. The Deans’ Choice Awardees receive a special certificate in recognition of their achievements. This year’s award winners can be found on page 1.

Please join me in congratulating all of our participants on their excellent work!

Cynthia Rutz, Ph.D.
Director, SOURCE
Assistant Director of Undergraduate Research

Supporters of Valparaiso University’s Undergraduate Research
The Valparaiso University Guild
Office of the Provost
Committee for Creative Work and Research
Valparaiso Institute for Teaching and Learning (VITAL)

Thanks to all who participated in the planning of this event.
When Fools Push Back: Identifying Subversion in King Lear and Twelfth Night

Victoria Bruick

The court fool of Shakespearean drama made snarky comments, sang nonsense verses, played tricks, and revealed weaknesses all at the expense and amusement of his superiors. Had any other character attempted such subversive acts, they would likely face punishment. However, because rulers sanctioned the fool’s positions in the court, his foolery was not seen as subversive. By employing Jonathan Dollimore’s three part model of social power (consolidation, subversion, and containment), and Bakhtin’s theory of the carnivalesque, I argue that the stock fool character falls in the category of consolidated power not subversion since he is licensed in his foolery. The fool can only be labeled subversive if he breaks beyond his job description. In King Lear and Twelfth Night the viewer meets two fools who actually prove to be subversive. They go outside of the bounds of their role as fool and push back against the authority over them. Through close analysis of what they say and do not say, do and do not do, I examine how Lear’s Fool and Feste break beyond the power exerted over them.

Information about the Author:
Victoria Bruick is a senior English and music double major from Bakersfield, CA. As a junior, she studied abroad at Anglish Ruskin University and was excited to study Shakespeare in the context of the playwright's homeland. With a particular interest in Bakhtin's theory of the carnivalesque, she explored subversion and foolery in her research. In April, she presented this research in Memphis at the National Conference on Undergraduate Research through the support of Christ College.

Faculty Sponsor: David Western

Student Contact: victoria.bruick@valpo.edu

Ebola the Enemy: How the U.S. Media Militarized the 2014 Ebola Epidemic

Sarah Chamness

The 2014 Ebola outbreak shocked the world. In western Africa, the scale of the tragedy was surprising. But equally surprising was the excessively fearful response of the international public to a disease that most public health experts agreed was unlikely to significantly impact countries with strong healthcare infrastructures. This included the United States, where the intensity of fear with which the American public responded was disproportionate to the actual threat. Because the outbreak is still recent, most research into America’s response to Ebola has focused on trying to characterize or quantify the extreme reaction that the epidemic produced, with only speculation as to what caused the fear. This paper will demonstrate that the public’s fear of Ebola had at least one specific cause: the distinctly militarized language that the media used to describe the disease. Because of the media’s use of military terms, the American people were inclined to view Ebola more as a military enemy than a medical one, and they largely reacted with three responses associated with the threat of war: fear, isolationism, and aggression. The public became reluctant to send the aid to Africa that many public health officials agreed was necessary to stop the epidemic. This paper argues that the media’s irresponsible use of military language when discussing the epidemic helped cause the unhelpful mass panic among American citizens, when a humanitarian response characterized by increased aid to the affected countries would have been more effective in controlling the Ebola outbreak and keeping America safe.

Information about the Author:
Following a life-long interest in disease that led her to pursue nursing, Sarah Chamness chose to research the Ebola epidemic for her Christ College seminar Sinful Words. After skimming a few news clips, the military metaphor for Ebola became obvious, and she chose to continue her research and try to determine what effects the language of the epidemic had on America's responses. After college, Sarah hopes to use her research to be an advocate for the responsible use of language in a medical setting.

Faculty Sponsor: David Western

Student Contact: sarah.chamness@valpo.edu
Frenemies: Disunity of Women in Margaret Atwood's The Handmaid's Tale

Abigail Fate

As a fictional novel about a post-apocalyptic theocracy, we might think Margaret Atwood’s The Handmaid’s Tale is too imaginary and extreme to be relevant as a warning to contemporary America. Yet as fantastic as Atwood makes her dystopian world, the novel remains influential and widely studied thirty years after it was written, with significant literary research continuing to address the adversarial relationships between the female narrator and the other female characters. In this paper I combine a literary analysis of The Handmaid’s Tale with a study of contemporary society to argue that the kinds of relationships that Atwood explores and interrogates in her novel continue to flourish in modern America. I investigate the structure of this imagined futuristic society and evaluate the effect that the strict patriarchal system has on interactions between women. These relationships, and the kind of socio-political manipulation of women that Atwood details, remain remarkably applicable in modern times. After dissecting Atwood’s imagined society, I examine current research that shows America’s patriarchal culture makes women likely to create divisions between themselves when they feel threatened. This contributes to the collective oppression of women, as they are competing against one another, rather than the system that oppresses them, much like in the theocratic and patriarchal society of The Handmaid’s Tale. Thus, Atwood’s novel serves not only as a warning to women, but as a call to action if they wish to avoid moving closer towards the extreme society that she portrays.

Information about the Author:
Abigail Fate is a sophomore psychology major from Glen Ellyn, IL. She is minoring in Spanish and human biology, and is a student in Christ College. She plans on pursuing her Ph.D. in health psychology after graduation.

Faculty Sponsor: Megan Telligman

Student Contact: abigail.fate@valpo.edu

Attitudes of Neighborliness at Valparaiso University

Eric Smith

Who is your neighbor? What is your responsibility to your neighbor? What attitudes inhibit neighborliness? In our deeply divided times, these questions have never been more relevant. Authors have come at these questions from a religious, political, and spatial perspective. One survey that has attempted to understand attitudes of neighborliness is the World Values Survey. The survey has been run in hundreds of countries around the world to measure attitudes on a variety of topics. To better understand the attitudes among undergraduates at Valparaiso University, I will be using the questions on neighborliness from the survey. The information will be collected from a campus-wide survey with the assistance of Greg Stinson. The information collected will be analyzed to see what factors, such as religion, race, and regional hometown location, affect attitudes of neighborliness among undergraduate students. This information will be helpful in better understanding how students at Valparaiso view their neighbors and responsibility towards them.

Information about the Author:
Eric Smith is a senior at Valparaiso studying political science and economics. He has worked on the President’s diversity and inclusion committee, which made him interested in how people from different backgrounds view each other. This interest led him to design his senior thesis around questions of neighborliness.

Faculty Sponsor: Allison Schuette

Student Contact: eric.smith3@valpo.edu
Human Nature

Blake Larson

Departmental Affiliation: Art

"Human Nature" focuses on the relationship between the natural and the human realms through the processes of creation and destruction, tension and tranquility, yin and yang. Jenga, a game of stacking blocks, is the main visual element in this video piece. Imagine playing Jenga for a moment. Take out one piece at a time, placing it on top. The tower becomes unsteady. Now imagine the tower is nature. My mind ponders this question of preserving nature throughout this piece.

A course in rural geography offered two views on nature: 1) nature is fragile and needs preserving and 2) nature is resilient and bounces back. Minor White, one of my influences, was himself influenced by Eastern philosophies. He created images around the concept of “equivalency,” referring to the spiritual energy in an image. I looked to Maya Deren’s film “At Land,” because of her unique way of puzzling clips together seamlessly. Lastly, I looked to Meredith Monk’s audio piece titled “On Behalf of Nature,” because she approaches ecological awareness with empathy instead of lecturing. All of these artists, myself included, are fascinated with nature and its process. As humans, we do not always treat nature with the respect it deserves. As represented in Jenga: each block we take is then returned continuing the cycle of creation and destruction.

Information about the Author:
Blake Larson is a senior at Valparaiso University majoring in digital media art. Asian cultures and philosophies have always interested her. She views each class as an opportunity to learn something new. The concept of balance is her life philosophy and a recurring theme in her work. Future goals include working in the graphic design or photography industries.

Faculty Sponsor: Liz Wuerffel
Student Contact: blake.larson@valpo.edu

Process & Creative Practice: Painting, Printmaking, Collage

Regan Weber, Candace Watters, Ashley Montelongo

Departmental Affiliation: Art

As the capstones to our undergraduate education, the three of us senior studio art majors researched and developed our distinct art installations. Together, we received a CWR grant in order to develop and push these projects further. Each of our projects are based on ideas that we had throughout our career at Valparaiso University and utilize different methods that showcase the variety of techniques we have learned. The projects include: a study of cloud formations using watercolor and pointillism; a depiction of the effects of body dysmorphic disorder using collage; and finally an installation that contemplates how we leave our mark in the places we experience and how those places leave a mark in our memory using printmaking and viewer participation. Each project has its own identity; however, together they represent the creative and intellectual endeavors of an art major. They are currently on display at the Brauer Art Museum.

Information about the Authors:
As the three seniors on the studio arts track, Regan Weber, Candace Watters, and Ashley Montelongo have worked alongside each other as they have developed their own artistic voices. The three grew up in Valparaiso, Indiana and attended high school together as well, but it was not until they had classes together that they understood their common passion. Since then, they have continuously helped each other work through ideas in order to create thoughtful art.

Faculty Sponsor: Liz Wuerffel
Student Contact: regan.weber@valpo.edu
**Diurnal Oviposition of Blow Flies**

Moriah Carmel, Kelly Braun, Janelle Bouman, Raenah Bailey, Kristi Bugajski

*Departmental Affiliation: Biology*

Blow flies (Diptera: Calliphoridae) are usually the first insects to oviposit (lay eggs) on carrion. The timing of blow fly oviposition is critical for determining a postmortem interval (PMI) estimation, which is the time that has passed between death and corpse discovery. The objective of this investigation was to gain more information about the timing of blow fly oviposition so that a more accurate PMI could be calculated. Past research in our lab has shown that blow fly oviposition occurs an average of 4.75 hours after sunrise. This year’s research expanded on previous studies by placing three piglets in a remote, wooded area one hour after sunrise. The piglets were checked once an hour until oviposition occurred, and it was recorded whether flies and eggs were present each hour. Egg masses were collected. DNA analysis and BLAST were used to identify the individual blow fly species. The timing of oviposition, in hours after sunrise, was analyzed with respect to temperature, humidity, and light intensity. The research was repeated six times in the fall of 2016. Flies were first seen an average of 2.3 hours after sunrise, and oviposition was observed an average of 4.16 hours after sunrise. The average lux reading at the time of oviposition was 26,755 lux, but ranged between 5,790-52,300 lux. This research has importance in both the scientific and forensic communities, as a more accurate PMI can assist with the validity of a forensic investigation.

*Information about the Authors:*

Raenah Bailey is a senior biology major from Chesterton, IN. Moriah Carmel is a sophomore biology major from Laporte, IN. Kristi Bugajski, Ph.D., is an assistant professor of biology at Valparaiso University. Kristi (Zurawski) Bugajski specializes in the area of forensic entomology, focusing on oviposition timing and factors that influence oviposition.

*Faculty Sponsor: Kristi Bugajski*

*Student Contact: moriah.carmel@valpo.edu*

---

**Effect of Inflammatory Cytokines and High Fat Diet on Inositol-1,4,5-Trisphosphate (IP3) Receptors Binding Protein Released with IP3 (IRBIT) Expression in Intestinal Cells**

Kelli Cook, Natasa Petreska, Jesse Smallwood, Kenneth Bridgmon, Chase Jones

*Departmental Affiliation: Biology*

IP3 upon binding to the IP3 receptor (IP$_3$R) causes the release of intracellular calcium from the endoplasmic reticulum, which drives many cellular responses (*e.g.*, cell spreading, exocytosis). In addition to releasing calcium, IP3 also causes the release of IRBIT from the IP$_3$R. Over the past decade IRBIT has been described as a protein that regulates calcium release due to interaction with the IP$_3$R, the activity of the Na-HCO$_3$ cotransporter, the cystic fibrosis transmembrane regulator and the Na/H exchanger (NHE3). Lack of reabsorption of Na$^+$ by NHE3 in the intestine is responsible for diarrhea. Recently it was shown that IRBIT and NHE3 expression was decreased in a mouse model of diabetes and the loss of NHE3 expression induced diarrhea in this model. Insulin treatment restored IRBIT and NHE3 expression, resulting in a decrease of diarrhea. Besides insulin, very little is known about factors regulating IRBIT expression in intestinal epithelial cells. In this work, we set to study the effect of inflammatory cytokines and high calorie diet on IRBIT expression due to the fact that diabetes is associated with chronic inflammation and high caloric intake. To test the effect of inflammatory cytokines we used the human colonic crypt cells T84. Exposing T84 cells to interleukin 13 or tumor necrosis factor alpha for 72 hours decreased IRBIT expression by 36% (*P* < 0.001, *n* = 5), 44% (*P* < 0.001, *n* = 3) respectively. Finally, we compared the expression of IRBIT in mice fed with low fat milk (control) versus high milk fat (37%). We found that in the duodenum of 3 mice with a high fat diet a substantial increase of IRBIT expression compared to the control. Our work is the first to demonstrate that inflammatory cytokines and dietary fat can alter IRBIT expression.

*Information about the Authors:*

No information provided.

*Faculty Sponsor: Patrice Bouyer*

*Student Contact: kelli.cook@valpo.edu*
Elucidating Internalization Mechanism of the Na-K-2Cl Cotransporter 1 and Its Fate in the Endocytotic Pathway During Protein Kinase C Activation in Epithelial Cells

Jesse Smallwood, Kenneth Bridgmon, Kelli Cook, Natasa Petreska

*Departmental Affiliation: Biology*

Gut clearance (*i.e.*, fluid secretion) is an important mechanism for host defense. Fluid secretion flushes luminal toxins and prevents bacterial attachment to intestinal epithelial cells, which otherwise would harm the host. In the colon, transepithelial chloride fluid secretion drives fluid secretion. The basolateral Na-K-2Cl cotransporter 1 (NKCC1) is the main protein pumping chloride inside the cell for its secretion by apical chloride channels. Previous studies have demonstrated that activation of the protein kinase C (PKC) causes a rapid internalization of NKCC1, thus decreasing chloride secretion. To date, the protein kinase C downstream targets involved in NKCC1 internalization and the fate of NKCC1 in the endocytic pathway is unknown. Using the human colonic crypt cells T84, we demonstrate that T84 cells express α-adducin and Myristoylated, Alanine-Rich C Kinase Substrate, two substrates of the PKC involved in protein internalization in other cells. In presence of phorbol 12-myristate 13-acetate (PMA), an activator of the conventional and novel PKC, we demonstrate that T84 cells express α-adducin and Myristoylated, Alanine-Rich C Kinase Substrate, two substrates of the PKC involved in protein internalization in other cells. In presence of phorbol 12-myristate 13-acetate (PMA), an activator of the conventional and novel PKC, we demonstrate that α-adducin is strongly phosphorylated in T84 cells. Next, we hypothesized that upon activation by PKC, α-adducin binds to NKCC1. In T84 cells subjected to PMA, we show that phospho α-adducin co-immunoprecipitates with NKCC1. Next, we used Mardin Darby Canine Kidney (MDCK) cells stably expressing eGFP-NKCC1. In this model, using immunocytochemistry we show that NKCC1 colocalizes with α-adducin at the plasma membrane during PKC activation. Finally, we tested the fate of NKCC1 in the endocytic pathway. In MDCK cells exposed to PMA, we found that NKCC1 colocalizes with LAMP1, a marker of the lysosome. In conclusion, our data suggest that α-adducin participates to NKCC1 internalization during PKC activation and NKCC1 is targeted for degradation.

*Information about the Authors:*
No information provided.

*Faculty Sponsor: Patrice Bouyer*

*Student Contact:* kelli.cook@valpo.edu

Analyzing Water Quality and Identifying Microfibers in the Lake Michigan Watershed

Jessica Hanson, Troy Janesheski

*Departmental Affiliation: Chemistry*

Public awareness of the issue concerning microplastics and microfibers in our water systems has slowly increased over the last few years. Since research is still in its preliminary stages, the degree that these artificial residues have on the health of the ecosystem or the health of aquatic species is unknown. In attempts to gather some information about the issue in the local Lake Michigan Watershed, a team of Valparaiso University students began research in the summer of 2015. Macroinvertebrates from various locations in the watershed were collected and analyzed to locate microplastics. Although microplastics were not found, a surprising abundance of microfibers from the digested macroinvertebrates were identified. Even more surprisingly, these microfibers were able to be isolated from only 500 mL of water samples in all tested locations of the watershed. These findings are currently in the process of being quantified to obtain sufficient data describing the extent of the microfiber pollution present in the Lake Michigan Watershed.

*Information about the Authors:*
Troy Janesheski started this project as summer research during the summer of 2015, and Jessica Hanson picked up the project in the fall of 2016. The project began as a collaboration with local middle school students about water quality and expanded into more intensive research. Troy is a biology and chemistry double major, and Jessica is a chemistry and environmental science double major, which led both to an interest in lab work and environmental testing. Troy will be graduating in May 2018 and Jessica in December 2018.

*Faculty Sponsor: Julie Peller*

*Student Contact:* jessica.hanson1@valpo.edu
Spectroscopic Studies of Brooker’s Merocyanine in Zeolite L

Benjamin Henning, Kelsey Weber, Thomas Dabertin

Departmental Affiliation: Chemistry

Zeolites are porous, crystalline substances that have very unique atomic organizations which allow for the formation of complex channels within the crystals. Each type of zeolite has a distinct shape and structure. To better understand the properties of zeolite channels, a dye molecule known as Brooker’s merocyanine was inserted into Zeolite L. Maximum dye loading into the zeolite channels was achieved by altering different experimental variables, such as heat, solution concentration, stirring, cation exchange, and light exposure. X-ray diffraction was used to verify the synthesis of zeolites, the cation exchange process, and dye loading. UV-Vis spectroscopy was used to measure the amount of dye adsorbed by the zeolite. By using the UV-Vis absorbance values and Beer’s Law, the concentration of dye in the zeolites was determined. The results showed that an increase of heat and stirring correlated to an increase of adsorption of dye by the zeolite. Due to the light sensitivity of Brooker’s merocyanine, it was found that limiting the amount of light exposure of the dye solutions also resulted in higher dye adsorption by the zeolites. An increase of the concentration of the dye solution increased the rate of adsorption in the channels. However, exchanging the potassium ions found within the synthesized Zeolite L channels with smaller hydrogen ions did not have an effect on the adsorption of dye in the channels. Characterizing how to achieve a maximum of dye adsorption in the zeolites allows for a better understanding of how dye molecules interact within the zeolite channels.

Information about the Authors:
Kelsey Weber is a junior chemistry major with a Spanish and biology minor who hopes to pursue medicine and/or pharmacy after graduation. Thomas Dabertin is a junior chemistry major with a business minor and hopes to pursue an MBA after graduation. Benjamin Henning is a junior biochemistry major who hopes to attend graduate school after graduation.

Faculty Sponsor: Jennifer Holt

Student Contact: benjamin.henning@valpo.edu

Research in Forensic Chemistry

Paige Pressler, Samantha Prentice

Departmental Affiliation: Chemistry

Valparaiso University recently added a forensic science minor. As part of the minor, a course in forensic chemistry is being developed. Experiments for the course were designed, developed, and/or adapted from established methods used in forensic chemistry laboratory or other resources. Some of the developed experiments are described here. Experiments were conducted and experimental procedures were written and subsequently followed by other scientists (students) to determine if the expected results were obtained. Experimental procedures contained background information, a description of applications to crime scenes, the procedure, and a lab report sheet. Several lab experiments were designed, including: determination of metal residues on hands from metal weapon; separation of ink dyes; analysis of suspected drug mixtures by IR, GCMS, and LCMS; analysis of potential gunshot residue; determination of the refractive index of glass fragments. Some of the different techniques used include: colorimetric analysis with 8-hydroxyquinoline, thin layer chromatography, infrared spectroscopy, gas chromatography-mass spectrometry, and refractometry.

Keywords: chemistry, forensic chemistry, gas chromatography, colorimetric analysis, bullet hole analysis, thin layer chromatography, spectroscopy

Information about the Authors:
Samantha Prentice is a senior chemistry major at Valparaiso University. Paige Pressler is a senior chemistry and global service double major, with a Spanish and biology minor at Valparaiso University. She plans to attend medical school after graduating.

Faculty Sponsor: Jon Schoer

Student Contact: paige.pressler@valpo.edu
Synthesis of an Unnatural Fluorescent Amino Acid

Cody Steel, Thomas Goyne, Leena Aljobeh, Yeongseo An, Bill Trimoski

Departmental Affiliation: Chemistry

“The goal of this project is to chemically synthesize a fluorescent amino acid that will later be used as a glow-in-the-dark building block for proteins. The resulting glow-in-the-dark proteins are of great value to biologists because fluorescent microscopy can then be used to observe the protein’s spatial and temporal location within a living cell. The specific objective of this project is to synthesize the phthalimide environment-sensitive fluorescent amino acid shown in the equation below. We have synthesized and coupled the two building blocks and have characterized the coupled product by liquid chromatography mass spectroscopy (LC-MS), 1H and 13C nuclear magnetic resonance (NMR) spectroscopy.”

Recent work has focused on: 1) using anhydrous reaction conditions to attach the allyl protecting group, 2) development of an assay to quantitate formaldehyde, and 3) exploring better methods to remove excess formaldehyde following the methylation reaction. The remaining tasks are to: 1) scale up the synthesis and 2) remove the two protecting groups.

1Stephen Sekoulopoulos, Thomas Goyne, “Phthalimide-Substituted Amino Acid, a Polarity-Sensitive Fluorophore.” poster presented in several venues fall 2016.

Information about the Authors:
Cody Steel is a biology/chemistry double major at Valparaiso University. Thomas Goyne is a faculty member in the Chemistry Department at Valparaiso University. Yeongseo An is a senior biochemistry major at Valparaiso University. Leena Aljobeh and Bill Trimoski are also students at Valparaiso University.

Faculty Sponsor: Thomas Goyne

Student Contact: cody.steel@valpo.edu

COMPS Collaborative Chat

Chinedu Emeka, YesuKheJagvaral, Brian Sukowicz

Departmental Affiliation: Computing and Information Sciences

The COMPS Computer-Mediated Problem Solving project supports student typed-chat collaborative exercises. Students work on structured problems in small groups. Unlike spoken conversations, they can all type-chat at the same time and see each others’ typing as they do so. In this work, we show examples of how students use this ability to interact with each other. Usually when typing simultaneously each is reacting to utterances that occurred earlier.

“Simultaneous response” occurs when two persons A and B respond to an earlier dialogue turn, often by a third person C. “Interruption response” occurs when person B responds to person A without waiting for A to finish. “Simultaneous utterance” occurs when A and B are separately contributing to the discussion without responding to each other. In all three varieties, A and B can type without reading each others’ current words. In addition to cataloging examples of these behaviors, we show how typing patterns differ in the solo-typing and simultaneous-typing regimes. Behaviors that change when the other person starts typing include frequency and length of pausing and frequency of backspace-deletions. We also observe conversational turn-taking, and measure how participants know when somebody is done typing and relinquishing a turn. Finally, we look at data from pre- and post-tests to get a peek inside the student experience: can we determine whether students are learning anything from the conversations? What they learn, and how they experience the exercise, seems to depend on how well prepared they were relative to their fellow group-members.

Information about the Authors:
Brian Sukowicz is a sophomore majoring in computer science. Chinedu Emeka is graduating this spring with a bachelor's degree in computer science and minors in math and statistics. YesuKheJagvaral is an undergraduate comptuer science and physics student, currently a junior.

Faculty Sponsor: Michael Glass

Student Contact: chinedu.emeka1@valpo.edu
Virtual Laboratory for Flexural Beam Testing

Chase Greenhagen, Benjamin Dillon, Leighton Fritze, Clarence Wallace, Henry Uchekwe

Departmental Affiliation: Computing and Information Systems

As part of an ongoing project to build out a suite of enhanced curricular tools for the Valparaiso University Civil Engineering Department, a group from Computing and Information Systems (CIS) has been tasked with creating a curricular support product that presents data from flexural concrete beam testing. The project follows earlier prototyping conducted in previous semesters and builds on the designs and requirements captured through the earlier efforts; this provides an experience of building on prior software engineering products for the CIS team. Additionally, the latest iteration adds a MATLAB-based image processing tool that adapts the photos for proper display. The system also incorporates a back-end website for tool administrators that is constructed with PHP that allows faculty to manage uploaded data sets. The user-facing site then displays photos from the concrete flexural beam test concurrently with the numeric data from the tests in an interactive manner for the students. This reusable educational asset will allow students to experience a flexural concrete beam test and retrieve its data without wasting additional time and monetary resources. The long-term goal is for the project to become a starting point for a multi-institutional education asset, creating greater curricular flexibility and increasing cost savings.

Information about the Authors:
Ben Dillon, Chase Greenhagen, Leighton Fritze, Clarence Wallace, and Henry Uchekwe are pursuing computer science or computer engineering degrees at Valparaiso University. They view this virtual laboratory software as a unique and effective curricular support system that can be transferable to other academic programs. All team members believe their programming backgrounds can contribute to the project requirements. They are all interested in pursuing careers in software development. The team is hopeful it will benefit the university and be a lasting contribution.

Faculty Sponsor: Nicholas Rosasco

Student Contact: chase.greenhagen@valpo.edu

Choices! App Development

Charles Morris, Nicholas Kwiecinski, Nathaniel Bouman, Andrew Mueller, Savannah Smith

Departmental Affiliation: Computing and Information Sciences

Today, technology is playing an increasingly significant role in remote healthcare by delivering treatments and assisting patients to manage their conditions. This is particularly true for patients fighting addictions. Choices! Counseling Services has commissioned an app to help patients recovering from addictions to handle appointments, control symptoms, and find support when needed. Our team, through the Computing and Information Sciences Department of Valparaiso University, and in collaboration with Paula Dranger, assistant director of the Valparaiso University SAAFE Office, has created a proof of concept and initial implementation for a support tool for those dealing with chemical dependency issues. The software was created using the Ionic 2 Framework and the Firebase real-time database to simplify multi-platform and multi-device support. The suite includes two separate applications: an app for patients receiving treatment, and a backend interface for caregiver staff. Features for patients include viewing a calendar with meetings and important dates, logging when they feel triggered by their addictions, viewing a list of contacts to receive help, and tracking short and long term goals. Caregivers using the accompanying administrative app can configure the patients’ apps, set up appointments, and track patients’ progress. Caregivers will be notified if a patient feels triggered and needs help. This is made possible by the shared database between the apps. These tools will assist patients managing their addiction and help them recover. Using this prototype as a model, Choices! Counseling Services hopes to commission a full-scale application for use with their clients, as well as for other practices.

Information about the Authors:
As students in a software design class, Charles Morris, Nicholas Kwiecinski, Nathaniel Bouman, Andrew Mueller, and Savannah Smith were interested in this project for both its challenge and its potential to help people. Charles Morris is a senior computer science major hoping to attend graduate school for cyber security. Savannah Smith is a senior computer engineering major hoping to work in the software development industry. Nicholas Kwiecinski is a sophomore computer engineering major hoping to work in the computer programs and systems field.
Nathaniel Bouman is a junior computer science and physics double major hoping to work in the software development field.

Faculty Sponsor: Nicholas Rosasco

Student Contact: charles.morris2@valpo.edu

Improve Scholarly Efforts in Understanding Ancient Texts Using a Web Interface

Shea Ridgeway, Isaiah Sorvaag, Christopher Evans

Departmental Affiliation: Computing and Information Sciences

This project is intended to extend and refine the initial system created to interact with the TEI XML markup scholarly edition of the *Le livre de cuysine*. This will allow this cultural artifact to be more accessible and have higher utility than the standard web-based platform initially deployed using the TEI Boilerplate system created by John Walsh, Grant Simpson, and Saeed Moadeli from Indiana University. This second generation of the project will provide the necessary features needed to provide a visually appealing presentation and better preserve the formatting and metadata found in the original volume of *Le livre de cuysine*. This implementation allows a toolbar to switch between the original, corrected, and eventually English versions of the text that retain proper formatting. Each of these enhancements provides the ability to view two versions in a parallel fashion within one browser. This project will provide the framework for international scholarly efforts to create similar advanced systems that will compare translations and increase the understanding of ancient texts. This cross-disciplinary work is being done in collaboration with and to support the scholarly efforts of Professor Timothy Tomasik of the Foreign Languages and Literatures Department at Valparaiso University.

Information about the Author:
No information provided.

Faculty Sponsor: Nicholas Rosasco

Student Contact: shea.ridgeway@valpo.edu

Implementing Machine Learning Techniques in Financial Modeling

William Arloff

Departmental Affiliation: Data Science

The data science competition forum Kaggle, in conjunction with Two Sigma, proposed a financial modeling competition open to the public. The challenge is to predict an anonymous time-varying financial instrument based on anonymous features given in the dataset. To accomplish this task, we will demonstrate several machine learning techniques and show how well they perform in the prediction of the class variable. These techniques include Ridge Regression, Extreme Gradient Boosting, and Extremely Randomized Trees. We will review each of the techniques, and then show the results of how they worked independently and together.

Information about the Author:
William Arloff is a senior data science major at Valparaiso University. He plans on obtaining a job back in his home state of New York in the field of data science after graduation.

Faculty Sponsor: Tiffany Kolba

Student Contact: william.arloff@valpo.edu
USGS Indiana Dunes Microclimate Existence Exploration

Maxwell Grover, Cullan Jewell, Benjamin Levandowski

Departmental Affiliation: Data Science

Some years ago, the USGS at Indiana Dunes National Lakeshore started to collect data to study the climate of the park and search for the existence of microclimates. A microclimate is defined as the climate of a very small or restricted area, or when that differs significantly from the area around it. A benefit of finding whether or not a microclimate exists is the ability to identify which areas of the park are better suited to particular animals. At the Dunes, the Karner blue butterfly is only able to withstand certain conditions in nature in a particular microclimate. At the Dunes National Lakeshore, there is a unique geographical area created by the sand dunes. Certain sides of the dunes receive more sunlight or more wind than other areas. Also, some areas are grassy whereas others are more sandy. The difference in soil aids in creating different microclimates within the park. In order to verify the existence of microclimates and which specific microclimates exist within the park, we must have data. Over these years, the staff of the USGS has placed sensor stations to collect light and temperature data. Each station has four sensors, and each collected data readings every thirty minutes. The sensor data is then retrieved and manually checked for errors and cleaned. For this project, we will be doing many analyses with this same data that they have collected, which they have provided to us. Some of our responsibilities include bringing the data together into one uniform dataset, analyzing this data to provide environmental information around the park, and providing graphs and data counts to test the quality of the data.

Information about the Authors:
Max Grover is a sophomore meteorology major. Cullan Jewell is a senior, majoring in actuarial science with a minor in mathematics. Benjamin Levandowski is a sophomore, majoring in mathematics and computer science.

Faculty Sponsor: Karl Schmitt

Student Contact: maxwell.grover@valpo.edu

Using Predictive Analysis for Meals on Wheels

Dylan Snyder, Adali Johnson, Omar Wasim, Jason Henry

Departmental Affiliation: Data Science

Meals on Wheels of Northwest Indiana is a local, private nonprofit that provides nutrition services to individuals in their home, day care, or congregate sites. They provide a prepared meal once a day, Monday through Friday, and receive funding through multiple different sources, private and public. In our project, we are sifting through the data to find relationships between certain clients in the program, and how they may affect the future of Meals on Wheels.

Information about the Author: No information provided.

Faculty Sponsor: Karl Schmitt

Student Contact: dylan.snyder@valpo.edu
Sloppy Seconds: A Play and How it Came to Be
Michelé Strachota

Departmental Affiliation: English/Creative Writing

Although many people have attended a play or musical in their life, not many take the time to think about the process behind the works they see on stage. Before a play ever gets to production, it begins on the page, and before that, in an author’s head. My presentation will explain (at least in a subjective perspective) how plays come to be. Specifically, I will explain how my play Sloppy Seconds came to be. Unlike other writing, playwriting requires a community to bring the work to life. As this is precisely what attracts me to playwriting, I wrote Sloppy Seconds in a way I believe allows a lot of flexibility for anyone trying to put on a production. Overall, I want to illustrate that playwriting, and my play in particular, is meant to bring communities together. More than anything, I have learned that playwriting is made to be uncomfortable, to push boundaries, and to experiment. The risks I took in writing Sloppy Seconds brought me the title of regionals winning playwright at the recent American Collegiate Theater Festival (ACTF). A few of the actors who performed at the festival will read a scene from the play during my presentation. Plays are meant to be heard and seen, so as much as I can talk about what I have written, it is best for everyone to experience it first hand.

Information about the Author:
Michele Strachota has wanted to be a writer since she was nine, so it was no surprise that she chose to study creative writing. However, the desire to be a playwright is much newer. She took the playwriting class because she believes in studying across genres; she had no idea it would land her with a regionals award and the desire to continue doing theater. She wants to keep writing plays, growing both as a writer and a person.

Faculty Sponsor: George Potter
Student Contact: michele.strachota@valpo.edu

Interpreting Latin American Literature:
Obsession Until Dissociation
Leena Aljobeh

Departmental Affiliation: Foreign Languages and Literatures

Latin American literature plays a significant role in not only the Hispanic world but also in various cultures today. Notably, Julio Cortázar, Horacio Quiroga, and Gabriel García Márquez are three esteemed Latin American authors whose themes and thematic ideas relate to individuals on both a historical and everyday level. One such thematic idea is the obsession with something "other," which plays an important role in the development of not only the plot but also the interpretation of the literature. Specifically, in the short stories "Axolotl," "Las armas secretas," "Las babas del diablo," and "Cartas de mamá" by Cortázar, "La gallina degollada" by Quiroga, and "Sólo vine a hablar por teléfono" by García Márquez, the obsession with something "other" results in an immersion in this object until the protagonist dissociates from him or herself or reality. These obsessions and immersions occur in relation to three types of objects—an animate object, an inanimate object, and an abstract idea—and each focal point of obsession is due to a distinct interpretation of either history, guilt, or a sense of abandonment, respectively.

Information about the Author:
Leena Aljobeh is a senior Spanish and chemistry double major from Valparaiso, IN. She is interested in Latin American literature and cultures and their societal effects and has published an original poem in the Spanish literary magazine Letras. Leena will be attending medical school in the fall and hopes to continue pursuing her interest in Latin American culture.

Faculty Sponsor: Stacy Hoult-Saros
Student Contact: leena.aljobeh@valpo.edu
Transcribing, Coding and Eating Our Way Through a Renaissance French Cookbook

Andrea Sanchez, Jennifer LeCaptain

Departmental Affiliation: Foreign Languages and Literatures

The process of creating a digital scholarly edition of a Renaissance French cookbook, Le Livre de cuysine [The Book of Cookery], provided a unique opportunity to study the history of 16th century cuisine. This project required learning how to read a Gothic printed text and understanding the recipes contained in a cookbook from this period. The final project involved transcribing and then coding the text in XML using TEI mark-up language. Along the way, we had to make editorial decisions that arose because of the nature of the cookbook text. For example, TEI coding requires that paragraphs be distinguished in the text and coding. This posed a challenge because the cookbook did not have clearly divided paragraphs. The archaic spelling in the original text also raised questions about whether or not to modernize the spelling. Finally, since this cookbook edition was filled with printing mistakes, we occasionally had to insert notes to explain difficult passages. In the end, the completed digitized text now allows new access to scholars to learn more about the text and Renaissance French cuisine.

Instead of participating in a traditional lecture course on French literature, we were able to obtain hands-on experience doing actual scholarly research. The experiential nature of the course then culminated in a Renaissance French banquet complete with dishes made from recipes out of Le Livre de cuysine.

Information about the Authors:
"Transcribing, Coding and Eating Our Way Through a Renaissance French Cookbook" is a project that came about with two seniors and one professor. Jennifer LeCaptain, a music industry and French major, and Andrea Sanchez, political science and French major, decided to embark on one of their most difficult projects thus far. For their senior seminar, Professor Timothy Tomasik gave them a wide range of options when deciding what their senior project should be. They decided to try something new and different. They picked a cookbook from the Renaissance and decided to transcribe it as well as correct some of the French into more modern French. They then learned to code in order to create a digital edition of their version of the Renaissance book. They decided to take this project on because it would really challenge the perception of what can be done with language studies. They gained new skills such as reading Gothic text and a bit of coding. These skills will help achieve their career goals by adding a different dimension of capabilities. After graduation, Jennifer plans to start a career in the music industry that can best utilize her skills and experiences, while Andrea plans on attending law school in the hopes of becoming a lawyer.

Faculty Sponsor: Timothy Tomasik

Student Contact: andrea.sanchez@valpo.edu
Geospatial Inventory of Vegetation in Taltree Arboretum

Donald Long, Hector Reyes Figueroa, Rachel Brandenburg, Sidney Noble

Departmental Affiliation: Geography and Meteorology

Taltree Arboretum contains a collection of 90 Oak species on their "Oak Islands" exhibit. However, the facility does not have a proper location-based inventory of their collection. As a collaborative effort between Valparaiso University and Taltree Arboretum, four students helped collect geospatial inventory of the oak trees and developed a geospatial inventory of the trees for the arboretum to use for long term record keeping and monitoring. This was also a simultaneous hands-on training experience in geographic information systems (GIS) as well as field inventory collection.

Information about the Authors:
Donald Long is a meteorology major with minors in mathematics and geographic information systems. His interests include synoptic-scale meteorology, convective/severe weather, and disaster preparedness/relief. In the future, he plans on pursuing graduate study and earning his Ph.D. Afterwards, he is considering either going into secondary education or operational meteorology. Hector Reyes Figueroa was born and raised in Puerto Rico. Currently, he is part of the track and field team at Valpo and a double major in mathematics and economics. He aspires to earn a Ph.D. in economics after undergraduate school and returning to Puerto Rico to be a professor in economics. Sidney Noble is a physical geography and environmental science major. His interests include trail running, cross country, backpacking, forest ecology, and environmental philosophy. After graduation he plans to attend graduate school for ecosystem/ecological restoration and then work in the public sector. Rachel Brandenburg is a geography major with minors in Spanish and urban studies. She is fascinated by the interactions between people and their environment. She loves making connections with people all around the world in a variety of ways, from casual conversations over coffee, to academic discussions about world issues. Her interests include hiking, biking, attending concerts, and exploring new places.

Faculty Sponsor: Bharath Ganesh Babu

Student Contact: donald.long@valpo.edu

Relationship Between Canopy Gaps and Understory Vegetation in Northwest Indiana

Grace Roman, Beata Ramza

Departmental Affiliation: Geography and Meteorology

Invasive species management is currently an issue in many parts of the country and specifically the Northwest Indiana region. In order to better manage invasive plant species, it is critical to understand what promotes the advance of these species. This study was designed to understand the relationship between the percentage of canopy gap and invasive woody plant growth. It was expected that a higher percentage of canopy gap would correlate to a higher percentage of woody invasive species. The research was conducted at Sunset Hill Farm County Park in Valparaiso, Indiana. Twenty quadrats, 2 meters in diameter, were chosen through transect random sampling. In each quadrat, the number of invasive and non-invasive woody plants was recorded. Photographs were also taken of the canopy from the center of the quadrant using a fisheye lens. These photographs were then analyzed with ENVI isodata unsupervised classification to determine percentage of canopy gap. The result was correlation of .03162 between woody invasive species and canopy gap. In this particular site, a strong correlation between canopy gap and woody invasive understory was not found.

Information about the Authors:
Grace Roman is a senior geography and biology double major at Valparaiso University. Beata Ramza is a 2016 Valparaiso University alumna. In the fall of 2015, Grace and Beata came together to create an ecological and remote sensing based independent research projects based on mutual interests and goals. They have since completed their research and are not only presenting their findings here, but also at the 2017 American Association of Geographers annual meeting in Boston, MA.

Faculty Sponsor: Bharath Ganesh Babu

Student Contact: grace.roman1@valpo.edu
Desmond Tutu’s Influence in Apartheid South Africa: The Reconciliation of a Broken Gospel in the Restoration of a Divided Nation

Emily Owens

Departmental Affiliation: Global Service

The legacy of apartheid in Southern Africa is widely known to have resulted in significant intergenerational trauma and enduring inequity, tragically influencing the nation’s history for centuries to come. Largely left undisussed in the context of global history, however, is the religious aspect of this oppressive regime that propelled it forward. Specifically through influence of the Dutch Reformed Church (DRC), religion and faith acted as not only complicit members, but driving forces behind South African apartheid. As such, apartheid legislature was uniquely initiated, perpetuated, and eradicated by one Christian Gospel understood through two radically different perspectives. This work explores both the harm and healing which can be invoked through the presence of religious influences in matters of public policy, specifically through analyzing doctrine of the DRC alongside that of South African Archbishop Desmond Tutu. Acting as a catalyst for conflict, the message of the DRC relied on concepts of spiritual unity and divinely ordained parallel development to justify apartheid, diverging significantly from the evangelism of Archbishop Desmond Tutu. Tutu alternately advocated vehemently for an anti-apartheid scriptural understanding granted by a God partial to victims of oppression. The teachings of Tutu ultimately expose the DRC’s inherent flaws in both local and international spheres, fundamentally shaping the way in which anti-apartheid social gospel produced anti-apartheid social movement. In examining closely the multifaceted nature of religious perceptions such as those of Tutu and the DRC amidst a context of blatant injustice, we are further enabled to evaluate critically the integral roles that religion’s constructive use and abuse play in the overall existence of legalized inequalities today.

Information about the Author:
No information provided.

Faculty Sponsor: Heath Carter

Student Contact: emily.owens@valpo.edu

Coded Language: The History, the Message, and 2016

Adam Bruno

Departmental Affiliation: History

How do politicians, particularly presidential candidates, talk about race without talking about race? Since the 1960s, race baiting in American politics has gone increasingly underground into the realm of "coded language" and dog-whistle rhetoric; that was until 2016 when the election of Donald Trump brought much of this conversation from the covert and into the over, the old codes were not gone, but they seemingly meant less. Through an examination of campaign ads and convention speeches from the elections of 1968, 1988, and 2008, this paper explores the history of coded language to provide a partial explanation of what made President Trump's rhetoric so powerful. This paper incorporates two intermediate theses to illustrate its ultimate thesis. First, that as times change race baiting language must also change in order to incite the greatest following from backlash voters. Second, that this language must occur alongside social turmoil and anxiety amongst the backlash electorate. These two theses come together to generate an ultimate thesis that Trump took years of coded practices, broke many of them, and played to backlash voters fears of outsiders, particularly Muslims and Latinos.

Information about the Author:
Adam Bruno is a senior history and secondary education double major and political science minor. During the 2016 election, he became increasingly intrigued about the way that race was discussed, particularly by Republican candidate Donald Trump. An independent study senior seminar with Professor Ostoyich allowed him to explore the history and evolution of coded language in American presidential elections.

Faculty Sponsor: Kevin Ostoyich

Student Contact: adam.bruno@valpo.edu
The Effects of Dynamic Warm-up on Functional Movement Screening Scores

Kyle Jones

Departmental Affiliation: Kinesiology

The Functional Movement Screen (FMS) is a tool used to assess movement dysfunction and potential injury risk. The purpose of this study is to determine the effects of a dynamic warm-up on FMS scores. Subjects will include twenty (10 male, 10 female) recreational athletes from various sports. Using a double-blind experimental study design, subjects will complete four of the seven FMS tests (deep squat, hurdle step, in-line lunge, and rotary stability) two times each. In between the two FMS assessment sessions, subjects will complete a randomly assigned intervention (dynamic warm-up, walking, or sitting). FMS tests are scored on a 4 point scale, 0= pain during the movement, 1= unable to complete the movement pattern, 2= complete movement pattern, but must compensate in some way, and 3= performed correctly without any compensation. Scores will be compared between pre- and post-tests and males and females. Analysis of collected data is ongoing.

Information about the Author:
Kyle Jones is an exercise science major from Debary, FL. After graduation, Kyle will be attending Florida State University to earn a master's degree in exercise physiology. After that, he hopes to pursue a career in physical therapy.

Faculty Sponsor: Alfred Simpson

Student Contact: kyle.jones1@valpo.edu

Analysis Between Functional Movement Forward Lunge and Muscle Activation in Division One Swimmers

Annaliese Schalk

Departmental Affiliation: Kinesiology

The purpose of this study was to examine quadriceps muscle activation while performing a lunge in Division I swimmers. The question to be answered was “What impact does the FMS forward lunge have on quadriceps muscle activation of DI swimmers?” Twenty swimmers participated in the study (M=10; F=10). Surface electrodes were attached to the Rectus Femoris, Vastus Lateralis, and Vastus Medialis of each leg. Each participant performed three FMS lunges with each leg. Each lunge performance was assessed by a trained observer and score was recorded. Electromyograms (EMG) of each movement, complete with eccentric and concentric phases of each movement, were recorded and analyzed with the Delsys Trigno™ Wireless EMG System. Root mean square (RMS) of the EMG signal was normalized to the peak RMS value detected across all three trials. Mean percent of maximum value contraction (MVC) values during eccentric and concentric contractions were recorded. Of the 20 participants, 17 scored the maximum score of “3” for the FMS lunge while three scored a “2” as the lunge required compensation. Analysis of mean EMG scores indicates that the concentric phases display greater average muscle activation than the eccentric phase across all subjects.

Information about the Author:
Annaliese Schalk aspires to become a physical therapist.

Faculty Sponsor: Kelly Helm

Student Contact: annaliese.schalk@valpo.edu
The Impact of Energy Drinks on Anaerobic Performance

Ella Soltis

Departmental Affiliation: Kinesiology

Energy drinks sales have been on the rise and claim to peak mental and physical performance. The objective of this study was to determine the impact of an energy drink on anaerobic performance as measured by the Cunningham and Faulkner test. Nine subjects from the University's Kinesiology courses participated in a blind within-subject repeated measures assessment. The experiment had a control group (n=9, M=6, F=3) and an experimental group (n=9, M=6, F=3). All subjects were instructed to consume either a placebo drink or an experimental drink and sit for one hour before performing assessment. Standard deviation, mean, and percent differences will be calculated for anaerobic performance time, blood lactate levels, and heart rate. Analysis is ongoing.

Information about the Author:
Ella Soltis is an exercise science major with human biology and psychology minors. Her future goals include pursuing a career in occupational therapy for special needs individuals.

Faculty Sponsor: Alfred Simpson

Student Contact: ella.soltis@valpo.edu

Analysis of Functional Movement Screen Forward Lunge and Electromyography of Division 1 Tennis Players

Joshua Topp, Kelly Helm

Departmental Affiliation: Kinesiology

The purpose of this study was to examine quadriceps muscle activation while performing a lunge in Division I tennis players. The question to be answered was “What impact does the FMS forward lunge have on quadriceps muscle activation of DI tennis players?” Eleven tennis players participated in the study (M=2; F=9). Surface electrodes were attached to the Rectus Femoris, Vastus Lateralis, and Vastus Medialis of each leg. Each participant performed three FMS lunges with each leg. Each lunge performance was assessed by a trained observer and recorded. Electromyograms (EMG) of each movement complete with eccentric and concentric phases of each movement, were recorded and analyzed with the Delsys Trigno™ Wireless EMG System. Root mean square (RMS) of the EMG signal was normalized to the peak RMS value detected across all three trials. Mean percent of maximum value contraction (MVC) values during eccentric and concentric contractions were recorded. Of the 11 participants, 10 scored the maximum score of “3” for the FMS lunge while one scored a “2” where compensation was evident. Analysis of mean EMG scores indicated that the concentric phases displayed greater average muscle activation than the eccentric phase across all subjects.

Information about the Author:
No information provided.

Faculty Sponsor: Kelly Helm

Student Contact: joshua.topp@valpo.edu
A Comparison of Anterior Cruciate Ligament Reconstruction Procedures: A Survey of Physicians

Alessandro Vasile

Departmental Affiliation: Kinesiology

Anterior cruciate ligament (ACL) reconstruction is a surgical technique used in orthopedics to fixate or repair the major ligament in the knee. The purpose of this study is to investigate which surgical method is most effective for patient recovery. The question to be answered is which ACL surgical procedure is most effective for the patient’s recovery. Seven orthopedic surgeons in the NW Indiana region are being interviewed separately about preferred ACL surgical techniques. This qualitative study includes open ended questions that each surgeon will be asked. Response analysis will include comparison of differences and commonalities within the group of surgeons. Interviews are still in progress.

Information about the Author:
No information provided.

Faculty Sponsor: Kelly Helm

Student Contact: alessandro.vasile@valpo.edu

Mathematical Modeling of Vaccine Noncompliance

Jordan Bauer

Departmental Affiliation: Mathematics and Statistics

Vaccine scares can prevent individuals from complying with a vaccination program. When compliance is high, the critical vaccination proportion is close to being met, and herd immunity occurs, bringing the disease incidence to extremely low levels. Thus, the risk to vaccinate may seem greater than the risk of contracting the disease, inciting vaccine noncompliance. A previous behavior-incidence ordinary differential equation model shows both social learning and feedback contributing to changes in vaccinating behavior, where social learning is the perceived risk of vaccinating and feedback represents new cases of the disease. In our study, we compared several candidate models to more simply illustrate both vaccination coverage and incidence through social learning and feedback. The behavior model uses logistic growth and exponential decay to describe the social learning aspect as well as different functional forms of the disease prevalence to represent feedback. Each candidate model was tested by fitting it to data from the pertussis vaccine scare in England and Wales in the 1970s. Our most parsimonious model shows a superior fit to the vaccine coverage curve during the scare.

Information about the Author:
No information provided.

Faculty Sponsor: Alex Capaldi

Student Contact: jordan.bauer@valpo.edu

Statistical Consulting for Nursing Implementation Projects

Jordan Bauer

Departmental Affiliation: Mathematics and Statistics

This poster will describe my experience with working as a statistical consultant for the Doctor of Nursing Practice students at Valparaiso University. In particular, I will describe a selection of the individual projects focusing on implementations and educational interventions applied to topics such as transition times of patients to their assigned beds in the hospital intensive care unit, hospital hygiene, depression screening, and workplace violence. Many of the projects used a pre-test and post-test design to obtain the results. In addition, I will describe the statistical consulting process, which includes assistance with selecting appropriate statistical tests to use on the data, creating useful graphs for the paper, and using the statistical program SPSS. Statistical consulting involves strong communication, analysis, and flexibility. My project mirrored aspects of statistical consulting in the real world and provided experience and challenges as I used my statistical analysis skills.

Information about the Author:
No information provided.

Faculty Sponsor: Tiffany Kolba

Student Contact: jordan.bauer@valpo.edu
Statistical Consulting for Doctor of Nursing Practice Projects

Matthew Klapman

Departmental Affiliation: Mathematics and Statistics

For my statistics major final project in the Spring 2017 semester, I worked as a consultant for six graduate students in Valpo’s Doctor of Nursing Practice program. Each graduate student had his or her own final project for Nursing 799. They had all collected most of their data prior to the spring semester, and were then in the stage of data analysis. I helped each student determine what kinds of inference tests to run and what statistics to present in their final project papers. There were three specific projects that I helped with the most. One project was researching fall rates among patients in one hospital based on certain medications and safety accommodations. The staff was then educated on the subject and fall rates were measured again. Another project was researching the effect of a flu-shot education on one’s intent to receive a flu shot. Finally, another project that I worked with was researching mistakes in discharge papers. The student reviewed discharge papers for patients who were being sent home, specifically looking for the accuracy of prescription descriptions. The student then provided education to the nurses filing the discharge papers and observed any changes in accuracy afterward. This project allowed me to gain experience consulting on a variety of different projects, using the skills I have learned throughout my statistics major in order to help others with their own research.

Information about the Author:
Matthew Klapman is a senior mathematics and statistics double major at Valparaiso University. Within the field of statistics, he is specifically interested in projects using surveys and plans to attend graduate school for survey methodology. A final project is required for the senior year statistics colloquium, and so he chose to act as a consultant for graduate students in the nursing program.

Faculty Sponsor: Tiffany Kolba

Student Contact: matthew.klapman@valpo.edu

A Simulation of Anthropogenic Columbian Mammoth Extinction

Matthew Klapman

Departmental Affiliation: Mathematics and Statistics

The cause of the extinction of the Columbian mammoth (Mammuthus columbi) and other species of megafauna during the end of the Pleistocene epoch is unknown. The current proposed hypotheses are climate change, disease, a meteor impact, and overkill. In this study, we used mathematical modeling to test the overkill hypothesis first proposed by Paul Martin in 1973. The overkill hypothesis claims that early humans migrating from Asia through Beringia and into North America hunted the majority of the continent’s megafauna to extinction. Previous research has been conducted on the overkill hypothesis for the Columbian mammoth using a continuous differential equations model. We improved on this work by developing a computationally more efficient and more realistic discrete stochastic model. Most model parameters were obtained directly from the literature; migration parameters were calibrated to the model. Our results provide evidence in support of the overkill hypothesis.

Information about the Author:
Matthew Klapman is a senior mathematics and statistics double major at Valparaiso University. Within the field of mathematics, he became interested in biomathematics and modeling when he took the infectious disease modeling class. This inspired his research as he took concepts from this class and applied them to the subject of species extinction.

Faculty Sponsor: Alex Capaldi

Student Contact: matthew.klapman@valpo.edu
Comparing Average Salaries of Teachers in Indiana and Ohio

Nicholas Lewandowski, Ashley Hire, Teresa Wheeland, Vincent Russ

Departmental Affiliation: Mathematics and Statistics

The focus of this project is to compare average salaries of teachers in Indiana and Ohio. Data was obtained from information published in the Lafayette Journal and Courier and the Dayton Business Journal for the 2013-2014 academic year. We computed the mean of the average salary by school district for Indiana and compared this to the corresponding mean for Ohio. We conducted a two-sample t-test to determine if there is a statistically significant difference between the two means. We also discuss limitations of the data and the extent to which the results can be generalized for graduating education majors who are seeking jobs in Indiana or Ohio.

Information about the Authors:
Nicholas Lewandowski, Ashley Hire, Teresa Wheeland, and Vincent Russ are a part of Valparaiso University’s MSEED Program where they are double majoring in mathematics and education. They are all freshman who share a common desire to learn more about how starting salaries of teachers compare between two Midwestern states.

Faculty Sponsor: Tiffany Kolba

Student Contact: nicholas.lewandowski@valpo.edu

L(4,3,2,1) Labeling

Hector Reyes Figueroa, Samuel Iselin

Departmental Affiliation: Mathematics and Statistics

An L(4, 3, 2, 1)-labeling of a vertex-edge graph G is a function f that assigns either 0 or a specific positive integer as a label to each vertex with the following condition: given 2 vertices, the sum of the difference of their labels and their distance in the graph must be at least 5. Symbolically: |f(u) − f(v)| + d(u, v) ≥ 5 if u ≠ v. The L(4, 3, 2, 1)-labeling number of a vertex-edge graph G is the smallest positive integer k, such that the condition previously stated is followed and there is no label greater than k. In this paper, we show the L(4, 3, 2, 1)-labeling number of several types of graphs including cycles, paths, spider graphs, stars, and some caterpillars.

Information about the Authors:
Samuel Iselin is a sophomore mathematics major from Platteville, Wisconsin. He is the vice president of the Valpo Karate Club and a member of Social Action Leadership Team at Valparaiso University. Samuel plans to continue research in mathematics throughout his time at Valparaiso University. Hector Reyes Figueroa was born and raised in Puerto Rico. Currently, he is part of the track and field team at Valparaiso University and a double major in mathematics and economics. He aspires to earn a Ph.D. in economics after undergraduate school and return to Puerto Rico to be a professor in economics.

Faculty Sponsor: Zsuzsanna Szaniszlo

Student Contact: samuel.iselin@valpo.edu
**Dissecting Weber’s Opera to Inform Performance of Concertino for Clarinet**

Victoria Bruick

*Departmental Affiliation: Music*

For most music enthusiasts, the phrase “German Romantic opera” often evokes thoughts of Carl Maria von Weber. In the world of clarinetists, however, Weber is most often associated with his concertos that have become standard clarinet repertoire. A common performance tip clarinetists hear is to make the more lyrical parts of his concertos dramatic and sweeping as one would hear in his operas, but how can this best be applied? In pursuit of *Totaleffekt*, the total conception of the opera as one whole unit: music and drama, Weber orchestrates with an integrated approach. The clarinets do not have particularly flashy or virtuosic parts. Instead, the sound of the clarinet is weaved into the full orchestra to produce the desired effect. To tease out the relationship between his clarinet concertos and his operas, we must turn to the vocal and melodic lines indiscriminate of instrument. In my research I focus particularly on *Concertino* and his operas *Euryanthe* and *Der Freischütz* with analysis of the musical scores and consideration of historical context and what is known of Weber’s life.

*Information about the Author:*
Victoria Bruick is a senior English and music double major from Bakersfield, CA. Her interest in Carl Maria von Weber began in high school when she first heard his "Concertino." Her interest in the concerto went beyond learning and performing the piece, and she chose to dive into the historical context and theory analysis of Weber’s work for her culminating music history research project.

*Faculty Sponsor: Katharina Uhde*

*Student Contact: victoria.bruick@valpo.edu*

---

**Christ lag in Todesbanden: Tracing Early Lutheran Congregational Song**

Hannah Koby

*Departmental Affiliation: Music/Church Music*

While popular perception holds that Martin Luther radically reformed church music, this research shows that Luther was relatively conservative in his reforms. Instead, his impact was to begin a tradition of congregational song and vernacular hymnody, along with a decentralization of worship decisions, which continued to be developed in the following centuries. This paper describes how Martin Luther drew on existing church music resources to create congregational music by focusing on Luther’s hymn ‘Christ lag in Todesbanden’ (Christ Jesus Lay in Death’s Strong Bands) and its use in the 1520s and beyond. The progression of this hymn can be traced during Luther’s lifetime from a chant-like treatment, which Luther inherited, to hismetrical adaptation, which is easier for congregational singing. This new version was first published in Luther and Johann Walther’s 1524 hymnal Geystliche Gesangbuchleyen. Examining a facsimile of the original German part books from 1525 exposes intentional melodic differences in ‘Christ lag in Todesbanden,’ indicating that Luther did not want to decree details of worship, as the image of radical reformer would suggest, instead leaving such decisions to local leaders. The paper concludes with a look at a hymnal from 1586 which was the first to place the melody in the highest voice to make it easier for congregations to sing together with the leadership of a choir singing in parts. This is just one example of how Luther’s principles continued to shape Protestant church music beyond Luther’s lifetime.

*Information about the Author:*
Hannah Koby is a junior church music major and German minor. In 2016, she spent a semester of her sophomore year studying in Germany at the Hochschule für Kirchenmusik (church music conservatory) in Rottenburg am Neckar. Along with a church music and liturgical theology class at Valparaiso, the semester abroad sparked Hannah’s interest in bilingual church music and liturgical theology research. After graduation, she plans to continue studying sacred music at the graduate level.

*Faculty Sponsor: Lorraine Brugh*

*Student Contact: hannah.koby@valpo.edu*
The Opening Night of the *Barber of Seville*

Meghan LaCroix

*Departmental Affiliation:* Music

Gioachino Rossini’s *Barber of Seville* (1813), composed in just three weeks, is one of the most popular operas today. However, its first performance was not so successful. The opera’s premier on 20 February 1816 was a complete and utter disaster. Some of the reasons include underprepared performers, an audience that was favoring the version of Rossini’s contemporary, Giovanni Paisiello, and a mysterious cat that wandered onto the stage. The second night, however, was a triumphant success. In my research paper, I would like to investigate the premiere and early performance reception, throwing light on some of the opera’s novel musical strategies, and provide a brief comparison with the more old-fashioned version composed by Rossini’s rival, Paisiello. I’ll be looking at Rossini’s overture using topic theory and sonata theory. Specifically, Rossini’s use of the “crescendo module” in the closing area of his exposition (the first part of the sonata form) gives some indication for the novelty as well as for the lasting success of the opera.

*Information about the Author:*
No information provided.

*Faculty Sponsor:* Katharina Uhde

*Student Contact:* meghan.lacroix@valpo.edu

---

Stability of the Tower Gains of the STAR Endcap Calorimeter in 2012 Data

Chamindu Amarasinghe

*Departmental Affiliation:* Physics and Astronomy

The Solenoid Tracker at RHIC (STAR) experiment, based at Brookhaven National Laboratory’s Relativistic Heavy Ion Collider (RHIC), uses polarized-proton collisions to investigate sea quark and gluon contributions to the proton spin. The STAR detector’s Endcap Electromagnetic Calorimeter (EEMC) is of particular interest in this experiment because it covers a kinematic region that is sensitive to gluons carrying a low fraction of the proton momentum, where the gluon’s contribution to the spin of the proton is poorly constrained. The EEMC is located in the intermediate pseudorapidity range, 1 < η < 2, and as a lead-scintillator sampling calorimeter, measures the electromagnetic energy of particles produced in the polarized-proton collisions. The calorimeter consists of several layers that include pre-shower, shower maximum, tower, and post-shower detectors. In these detectors, the energy gains, which convert a measured signal into an energy deposition, have been determined using data taken from the year 2012. The sensitivities of the tower energy gains to beam intensity and running time were studied. The results from these sensitivity studies will be reported.

*Information about the Author:*
No information provided.

*Faculty Sponsor:* Shirvel Stanislaus

*Student Contact:* chamindu.amarasinghe@valpo.edu
Investigating Electrical Breakdown in Liquid Helium for the nEDM Experiment at Oak Ridge National Laboratory

Nathaniel Bouman

*Departmental Affiliation: *Physics and Astronomy

The SNS nEDM experiment at Oak Ridge National Laboratory aims to search for the electric dipole moment of the neutron (nEDM) at the $3 \times 10^{-28}$ level. The experiment is currently in the critical component demonstration phase. The design of the experiment calls for an electric field of 75 kV/cm across the experimental cells between electrodes within a bath of liquid helium (LHe). However, the electric breakdown phenomenon in LHe is poorly understood. Experiments investigating the breakdown of LHe were carried out at Los Alamos National Laboratory using a small-scale high voltage (SSHV) test apparatus at temperatures from 1.7K to 4K. Effects of varying temperature, pressure, and electrode surface conditions on LHe breakdown were investigated. Results and their implications to the SNS nEDM experiment will be presented.

*Information about the Author:*
Nathaniel Bouman is a junior computer science and physics double major pursuing a bachelor’s degree at Valparaiso University. After graduation, he hopes to pursue a career in a computer science related field. He became involved with the nEDM experiment via the opportunity to do summer research at Valparaiso University in the summer of 2015 and was able to continue work on the nEDM experiment at Los Alamos National Laboratory in 2016.

*Faculty Sponsor:* Shirvel Stanislaus

*Student Contact:* nathaniel.bouman@valpo.edu

Computational Study of Amino Acid Analogues on Silicene

Yesukhei Jagvaral, Haiying He

*Departmental Affiliation: *Physics and Astronomy

A computational study of solvent phase adsorption of different amino-acid analogues on a silicene sheet has been performed using the Gaussian 09 software. Amino acid analogues are CH$_3$-R molecules, where R is the functional group present in amino acid side chains. We have identified three different groups within the 10 amino-acid analogues. For the first group, adsorption to the silicene sheet is driven by Si-O, Si-OH interaction. For the second group, adsorption to the silicene sheet is driven by phenyl and silicene interaction. For the third group, adsorption to the silicene sheet is driven by N-Si interaction. The third group shows the strongest binding to the silicene (e.g. the binding energy $E_b=1.7$ eV for guanidine). These results shed light on the amino acid lateral chains that are intrinsically more prone to efficiently interact with silicon nanomaterials and those that are responsible for the protein/Si nanomaterial contact.

*Information about the Author:*
Yesukhei Jagvaral is a physics student at Valpo.

*Faculty Sponsor:* Haiying He

*Student Contact:* yesukhei.jagvaral@valpo.edu
Neutral Pion Analysis in Longitudinally Polarized proton+proton Collisions

Taegyun Kim

*Departmental Affiliation:* Physics and Astronomy

Beyond the valence quarks’ spin contribution to the total spin of a proton, gluon and sea quark contributions are becoming clear as well. For proton+proton collisions at a center of mass energy of 510 GeV, neutral pion production is dominated by gluon-gluon and gluon-quark scattering. An avenue to constrain the gluon polarization is the asymmetry, $A_{LL}$, in the production of neutral pions from collisions of longitudinally spin-polarized proton beams. Our experiment was performed with the STAR detector at the Relativistic Heavy Ion Collider (RHIC), unique for its ability to collide spin-polarized proton beams. The Endcap Electromagnetic Calorimeter (EEMC) of the STAR detector with its pseudorapidity ($\eta$) range between 1.09 and 2.00 and full azimuthal coverage measures energies of photons from $\pi^0$ decays. We consider the invariant mass of all photon pairs in the EEMC as we identify $\pi^0$ candidates. We will present the current status of the analysis of the $\pi^0 A_{LL}$ as measured by the EEMC at STAR in 2012 data with center-of-mass energy of 510 GeV.

*Information about the Author:*
No information provided.

*Faculty Sponsor:* Adam Gibson-Even

*Student Contact:* taegyun.kim@valpo.edu

---

Silicene Catalyzed Reduction of Nitrobenzene to Aniline: A Computational Study

Christopher Morrissey

*Departmental Affiliation:* Physics and Astronomy

The reduction of nitrobenzene to aniline has a broad range of applications in the production of rubbers, dyes, agrochemicals, and pharmaceuticals. Currently, use of metal catalysts is the most popular method of performing this reaction on a large scale. These metal catalysts usually require high-temperature and/or high-pressure reaction conditions, and produce hazardous chemicals. This has led to a call for more environmentally friendly nonmetal catalysts. Recent studies suggest that silicene, the recently discovered silicon counterpart of graphene, could potentially work as a nonmetal catalyst due to its unique electronic property and strong interactions with molecules containing nitrogen and oxygen. In this computational study, we have investigated the plausibility of using silicene as a catalyst for the reduction of nitrobenzene. Possible reaction mechanisms will be discussed with a highlight of the difference between silicene and metal catalysts. All calculations were performed in the framework of density functional theory.

*Information about the Author:*
Christopher Morrissey is a senior physics major at Valparaiso University. He is graduating this year and will be taking a gap year in between undergraduate school and graduate school. The research project being presented is his honors project. Over spring break, he presented this research at the American Physical Society March Meeting in New Orleans. The project was inspired by research he did with Professor He last year as well as research he did over the summer at Michigan Tech University.

*Faculty Sponsor:* Haiying He

*Student Contact:* christopher.morrissey@valpo.edu
Measurement of the Temperature Dependence of the Dielectric Constant of PMMA for the nEDM Experiment at Oak Ridge National Laboratory

Marcus Ochsendorf

Departmental Affiliation: Physics and Astronomy

The nEDM experiment at Oak Ridge National Laboratory aims to search for the electric dipole moment of the neutron at the $10^{-28}$ level. The experiment is currently in the research and development phase. In the experiment, ultra-cold neutrons stored inside of a container made from PolyMethylMethAcrylate (PMMA) will be subjected to a strong electric field. In order to calculate the electric field within the box very precisely, the dielectric constant of PMMA must be known very well. The experiment will take place at 0.4K and it is not known if the dielectric constant of PMMA changes as a function of temperature. In order to test this, a simple cryostat was constructed. PMMA was cooled down to 77K, and the dielectric constant of PMMA was measured as a function of temperature. Experimental details and results of the tests will be presented.

Information about the Author:
Marcus Ochsendorf is a sophomore physics and chemistry major.

Faculty Sponsor: Shrivel Stanislaus

Student Contact: marcus.ochsendorf@valpo.edu

Searching for Periodic Light Variability in Proto-Planetary Nebulae Candidates

Kathryn Willenbrink

Departmental Affiliation: Physics and Astronomy

The purpose of this research is to find periodic light variability in proto-planetary nebulae (PPNe) candidates. These are Sun-like stars that have expanded into a red giant and then ejected their outer layers. Pulsations in the star cause the light variability we observe, and the period of these pulsations can give us key information about the star itself. Using measurements of brightness over many years, the light curves can be analyzed to search for periodicity. Six PPNe candidates were studied in the southern-hemisphere for analysis. They were observed remotely with the SARA consortium telescope in Chile over an interval of five to six years and light curves were obtained from the data. These light curves were then analyzed by using a period searching program based on a Fourier analysis of the data. Of the six candidates, five were found to vary and three had periodic light variation. Periods range from 30 to 90 days. This is consistent with the periods of about 20 other previously studied and published PPNe. This research was supported by grants from the National Science Foundation and the Indiana Space Grant Consortium.

Information about the Author:
No information provided.

Faculty Sponsor: Bruce Hrivnak

Student Contact: kathryn.willenbrink@valpo.edu
Censorship on College Campuses and the Forces Behind Campus Speaker Disinvitations

Jonathan Cisneros

*Departmental Affiliation:* Political Science and International Relations

College and university campuses have long been held as bastions of freedom of speech, and expression. However, as time has progressed and ideals and attitudes have changed, the clash between rules and rights concerning freedom of speech and expression has become more evident. Censorship has become a more prevalent aspect of campus life, towards students, faculty, and staff. At the same time, the public and media have become active participants in the discussion of what happens on college campuses in terms of speech, expression, and censorship. Institutions of higher education are often put in positions where they must quickly respond to demands from the public and media or face negative publicity and criticism. As a result of protests in various forms from both internal and external groups, tools such as speech codes and speaker disinvitation have become the norm on college campuses across the United States. This paper focuses primarily on discussing the importance of external versus internal forces that play into campus speaker disinvitation attempts. I draw on data from college and university reactions to student protests as well as external groups such as the public and the media. I use the FIRE Disinvitation Database to test the proposed hypothesis that pressures external to campus, such as public opinion and media, are more likely than internal campus pressures, such as student and faculty protests, to result in campus speaker disinvitation.

*Information about the Author:* Jonathan Cisneros will graduate from Valpo in May 2017 with a Bachelor of Arts in Political Science. His studies also include a double minor in legal studies and German. After graduation, he will be pursuing a Masters in Higher Education Administration. Combined with his interest in politics, his future career aspirations have motivated him to study the affects of politics on the institution of higher education.

*Faculty Sponsor:* Amy Atchison

*Student Contact:* jonathan.cisneros@valpo.edu

The Legitimacy of the Brain Balance Center as Treatment for Developmental Disorders

Jennifer Ahlden

*Departmental Affiliation:* Psychology

Since 2006, Brain Balance Center has been steadily expanding as a franchise, resulting in over 130 centers across America, with the closest one being in Portage, Indiana. These centers claim to significantly lessen, and in some cases even eliminate, symptoms of autism, ADHD, dyslexia, and a multitude of other disorders. Because any insight into the treatment of these disorders is important, I decided to research the methods behind Brain Balance Center’s claims to determine whether or not their claims were supported by evidence. Reviewing their website provided no sound theoretical rationale for or empirical support for their claims (peer-reviewed research, theories backing up their claims, etc.). Furthermore, the information provided by the Brain Balance Center's website closely aligned them with a majority of the characteristics of pseudoscience. Additionally, there are multiple treatment alternatives that are supported by scientific research that parents could choose instead of the Brain Balance Center. This information shows that programs offering this type of help need to be closely scrutinized by parents and scholars.

*Information about the Author:* Jennifer Ahlden is a sophomore psychology and criminology double major who is also a Christ College scholar. She became interested in this project after learning about a nearby Brain Balance Center. She hopes to work later in her life to help prisoners reintegrate into society after sentencing.

*Faculty Sponsor:* Kieth Carlson

*Student Contact:* jennifer.ahlden@valpo.edu
A Relationship Between Mood and Memory

Inga Majewska

Departmental Affiliation: Psychology

There has been research involving episodic and semantic memory that has shown a relationship between negative affect and improved episodic memory (Kensinger E. A. 2005). Additionally, there is a tendency for people to create more generalized episodic memories under positive affect compared to negative affect (Wessel, I., & Wright, D. B. 2004). To further investigate this relationship, we used the PANAS (Watson, D., Clark, L. A., & Tellegen, A. 1988) to measure participants’ current affect and gave them episodic and semantic memory tasks. We predicted that people who report more negative emotion will have better episodic recall than semantic recall, and people who report more positive emotion will show no difference between episodic and semantic memory. A 2 within (semantic vs. episodic memory) by continuous (affect) ANOVA test was run, and it was found that there was a significant main effect of type of memory, there was not a significant main effect of positive vs. negative affect as measured by the PANAS. There was not a significant interaction between memory and affect, however, due to the large effect size and small sample size. This study may show significant results with a larger sample size.

Information about the Author:
Inga Majewska is from Chicago, Illinois. She is majoring in biology and psychology and hopes to pursue a career in the field of neuropsychology. Inga enjoys collaborating with her peers and professors on projects, especially involving research, and she hopes to continue doing so beyond her undergraduate degree.

Faculty Sponsor: Geoff Wetherell
Student Contact: inga.majewska@valpo.edu

Violence Against Women and Its Impacts Across Cultures

Bayan Fares, Dejah Johnson, Alejandra Alejos

Departmental Affiliation: Social Work

Violence against women has existed for decades. Misogyny and patriarchy have been plaguing various societies all over the world and have played significant roles in justifying such violence through culture. Although not every culture or religion has patriarchal teachings or means to be misogynistic at times, there are surely certain disciplines within each culture and society that guide women’s roles in life and can be misused to justify violence. Violent tendencies may be human instinct, but violence perpetuated towards women is taught. The curiosity to examine this concept is what provoked this research. There is no blaming religion or culture for the violent crimes committed all over the world – especially the ones perpetrated against women; in fact, there are profound and beautiful practices within each category of society. However, there is a need to understand violence against women, and how the very factors that construct society – culture and religion – play huge factors in justifying such violence towards women. This project studied how violence was reinforced by specific cultures within the United States and the negative effects it had on the women within them; effects that shaped their mentality and how they connected with the world around them. We have found that when violence, and specifically the violence that is reinforced by cultures and religions, is unconsciously consumed by women (whether they have experienced first hand violence or not), their outlook on life is shaped by that violence.

Information about the Authors:
Bayan Fares is a social work and global services double major. Dejah Johnson and Alejandra Alejos are social work majors. They became interested in this topic specifically when they realized that each of them were from different ethnic backgrounds yet were bonded under one national identity. They used their differences and similarities to their advantage and decided to explore a very potent issue within society: violence against women. They also thought to make it more interesting by exploring how that violence is perceived and reinforced through various cultures.

Faculty Sponsor: Matthew Ringenberg
Student Contact: bayan.fares@valpo.edu
Effects of Social Stigma on Breastfeeding
Felicia Hunter, Alice Baker

Departmental Affiliation: Social Work

This study explored whether there is a relationship between the current negative social stigma around public breastfeeding and the rates of mothers who choose to breastfeed and continue to breastfeed as long as is recommended. To do this, a survey was sent to mothers asking questions about a variety of things such as if they ever breastfed, were they comfortable doing so, would they be comfortable to do so in public, etc. This study examines the relationship between social stigma and mothers choosing whether or not to breastfeed their children. This could help to better understand the obstacles of breastfeeding mothers and also offer another way to better support them.

Information about the Authors:
Both Felicia Hunter and Alice Baker are students at Valparaiso University. Felicia is also a mother of a two-year-old boy who faced her own struggles with breastfeeding. She wanted to study this topic so she could find ways to better support breastfeeding mothers so that more might choose to do so.

Faculty Sponsor: Matthew Ringenberg
Student Contact: felicia.hunter@valpo.edu

Alcohol Consumption - Comparing Dry vs. Wet Campuses
Kaycie Jones, Maria Bahena, Megan Leinard

Departmental Affiliation: Social Work

The purpose of this study is to explore alcohol consumption among students on dry and wet campuses. The prevalence of binge drinking and alcohol consumption in United States colleges has grown greatly in the past few decades. According to a 2002 study, just over 30 percent of university students qualify as alcohol abusers. A study done by the National Institute on Alcohol Abuse and Alcoholism in 2005 reported that close to 2,000 university students attending two or four-year programs (ages 18 to 24) die each year because of alcohol-related injuries (Do College Alcohol Policies Affect Student Drinking?, 2013). This study uses data that has been collected from two private institutions, one in which identifies as a wet and the other as a dry campus. The results of this study will be useful in providing updated information on alcohol consumption among college students and can be used as a tool to encourage conversation pertaining to safe alcohol consumption.

Information about the Authors:
Maria Bahena is a senior social work major at Valparaiso University. She ia currently interning at Thomas Jefferson Elementary, working alongside the school social worker. Eventually, she would like to work as a school social worker. Kaycie Jones is a senior social work major at Valparaiso University. She is currently employed by the Caring Place of NWI where she works as a client assistant to aid clients in their transition from recovery to an independent lifestyle. Following graduation in May 2017, she will be attending Indiana University where she will be earning her Masters of Social Work with a specialization in health. Megan Leinard is a junior social work major at Valparaiso University. She is currently interning at Porter County Substance Abuse Council and volunteers with College Mentors for Kids. Doing research on alcohol consumption on college campuses is something that is particularly intriguing to her, and she would like to expand her skill set and knowledge. She believes that expanding this skill set will help her in the future, including grad school or job placement.

Faculty Sponsor: Matthew Ringenberg
Student Contact: kaycie.jones@valpo.edu
Impact of Distracted Driving PSA on College Students

Isabella Kalwasinski, Kayla Caves, Luke Bandyk

Departmental Affiliation: Social Work

This study revolves around a major threat to public safety in today’s society - distracted driving. The researchers explored whether there is any difference in behavior or opinion on distracted driving after watching a public service announcement on the dangers of distracted driving among college aged individuals. The null hypothesis states that there will be no change in driving behavior or opinions on distracted driving between the control group who did not watch the public service announcement and the control group which views the public service announcement prior to filling out the questionnaire. The research hypothesis states that those who view the public service announcement will say they will be more cautious while driving going forward. This questionnaire was distributed through the Valparaiso University Facebook groups to reach a large number of students as well as conducting in-person questionnaires.

Information about the Authors:
Isabella Kalwasinski, Kayla Caves, and Luke Bandyk are all junior social work majors.

Faculty Sponsor: Matthew Ringenberg

Student Contact: isabella.kalwasinski@valpo.edu

Sororities and Self Image

Emily Kunkle, Kylie Foster, Kelsey Stallter

Departmental Affiliation: Social Work

The American culture places a large emphasis on outward appearances and beauty. Women are specifically prone to place more value on appearance versus any other attribute. Negative self image and body image has been a rising issue among college women. Sororities are popular college organizations that provide college women with career networking opportunities, philanthropic values, a community of friends, a lifelong support system. However, body image disorders have been discovered as a common theme among sorority women who report that they have negative self-image. It has also been reported that being in a sorority causes a woman’s self-image to decrease compared to women who are not in a sorority (Rolnik, 2010). An online survey was used to gauge the quality of self-image of both sorority and non-affiliated women. Based on our findings and other research, we hypothesize that one’s sorority affiliation has an affect on how one views their own self-image. This study explored the effects of sorority affiliation on one’s own self image, hypothesizing that sorority affiliates would be associated with self image.

Information about the Authors:
Through the Valparaiso University Social Work Department, Kylie Foster, Emily Kunkle, and Kelsey Stallter conducted a research project titled Sororities and Self-Image. This study was designed to examine if there is a correlation between sorority affiliation and how women view themselves. Kylie, Emily, and Kelsey are all social work majors. Emily and Kelsey are both members of sororities at Valpo, and their interest in this topic developed from all of their involvement on campus.

Faculty Sponsor: Matthew Ringenberg

Student Contact: emily.kunkle@valpo.edu
Safe Sexual Behavior on Private and Public College Campuses

James Meyer, Autumn McCormick, Marcy Kiger

Departmental Affiliation: Social Work

Aim of study: The purpose of this study is to examine safe sex behaviors on private universities compared to public universities. Hypothesis: Null: Students on private college campuses will use the same degree of safe sexual behaviors as their counterparts on public college campuses. Research: Students on private college campuses will engage in safer sexual behaviors than their counterparts on public college campuses. Background Information: Studies about safe sex have occurred on individual campuses ranging from public institutions, private institutions (Davidson & Moore 2008), and commuter campuses (Prince, & Bernard (1998). While this information can help provide a guideline and understanding on individual cases, it does not provide adequate information on a college comparison. Currently, no direct studies have examined a safe sexual behavior comparison between private and public institutions. What other studies have found: Prince, & Bernard found that unsafe sexual practices occur on non-traditional campuses and traditional campuses just as frequently (1998). Unanswered Questions: It’s possible that a religious affiliation or faith background will have an effect on choices of sexual behavior. As sexual behavior can be tied to religious morals and values, this could create an extraneous variable in our study. Another unanswered question is what constitutes “unsafe sexual behavior?” Textbook definitions of safe sexual behavior includes condom usage with oral sexual activity. While this is considered safe sex, others may think unprotected oral sex is a safe sexual behavior. This study asks subjects’ definitions of “safe sex.” This was included to see if that’s a predictor of preventing unsafe sexual behavior.

Information about the Authors:
James Meyer, Marcy Kiger, and Autumn McCormick have been interested in the well being and health of the students on campus. As social work majors, they have a duty to help all people and this was a topic that interested them. James and Autumn are both transfer students and they have had different experiences with how issues surrounding safe sex are dealt with. James personally has had some experiences with the party culture on campuses both public and private and wanted to see if there was a comparison between them. As a group, they took this project on because it was interesting and could help them adjust the programs at Valparaiso if they are ineffective on unsafe sex related issues.

Faculty Sponsor: Matthew Ringenberg
Student Contact: james.meyer2@valpo.edu

Substance Abuse and Correlating Causes

Ashley Simpson, Jessica Edmonds

Departmental Affiliation: Social Work

The proposed research project will look at substance abuse, as well as the correlation between substance abuse and the causes of substance abuse. What are the main causes that make adolescent turn to substance abuse? What are the main causes that make an adolescent turn to substance abuse? The hypothesis (H1) is that adult children of substance abusers are more likely to develop an addiction than those who have parents that abstain. However, the primary aim of this study is to determine various causes of substance abuse.

To test this hypothesis, two groups of people will be chosen to participate in a survey. The chosen groups will not be at random. Group #1 will include people who have substance abuse problems. Group #2 will consist of individuals who decided to abstain from drugs and alcohol. It is vital to have a sample from both of these populations to allow a better understanding and to look for other causes of substance abuse. During our study, every effort to protect the participant’s identity will be taken. The survey does ask some demographic questions. However, the answers will not be clear identifiers of any individual. At the beginning of the survey there will be a disclosure. This will explain to the participants that if at any time during the survey they become uncomfortable they may stop. The survey is completely voluntary. The survey will be posted to substance abuse support groups Facebook pages. We have reached out to the following pages and are currently awaiting approval to post the link to our survey onto their page: Drug Addiction & Substance Abuse, Substance Abuse USA, Substance Abuse Counseling Forum, and Substance Abuse Awareness. The survey will consist of thorough questions aimed at retrieving the information that we need to accept or reject our hypothesis. The survey will be made and administered by using a database called Qualtrics. The questions will range from topics such as socioeconomic status, parental substance abuse status, the age that the individual started their substance abuse, and how many other substances have they tried/become addicted to since the starting
point. It is important that our survey addresses the appropriate questions for us to receive a significant conclusion. The questions will also be phrased in a manner that will be compassionate to those participating in the survey. The goal is to obtain as much information while having as little effect on the participants as possible. It is understood that this survey may cause some individuals discomfort or cause an individual to want to seek help. This is why, at the end of the survey, there is a table that has a list of resources from half-way houses to family counselors, their phone numbers and addresses. This will allow any participant the ability to seek help if they become affected by answering the survey.

Once the information is received through the survey, the data will be compiled into the database and searched for correlations. The only places that the data collected will be stored is on Qualtrics (password secured), SPSS, and a secured university folder. The ultimate goal is to determine which factors have the greatest effect on adolescents becoming substance abusers. With that information, there can be a better understanding on how to prevent future generations from developing a substance abuse problem.

Information about the Authors:
No information provided.

Faculty Sponsor: Matthew Ringenberg

Student Contact: ashley.simpson@valpo.edu

Orange is the New Black and Its Representation of Women's Prisons

Alexandra Garcia

Departmental Affiliation: Sociology and Criminology

First airing in 2013, Orange is the New Black (OITNB) is a Netflix original series. The series focuses on the life of fictional characters in a women's prison based on Piper Kerman's real life experience behind bars. The purpose of the research is to connect how well OITNB relates to real life women’s prisons. I expand upon prior research according to four reoccurring variables: race, gender, sexuality, and correctional issues. I will explore how these key variables are represented within season one of OINTB. I argue that season one gives visibility to women incarcerated; however, minorities and the LGBTQ community are often negatively portrayed thus perpetuating harmful stereotypes. For those who have no prior knowledge on life behind bars, OITNB provides viewers with a fictionalized insight of a women's correctional facility. While this portrayal is fictional, many scenes mirror real life incidents occurring in America's women prisons.

Information about the Author:
Alexandra Garcia took information from prior research and compared it to the OITNB portrayal of women prisons. She wanted to study if this show could help people understand what life is like behind bars. The media sparked her interest for this project as they often perpetuate stereotypes and ignore real problems in women prisons. Her expectations were to highlight the real issues going on behind these prisons and end negative stereotypes of these women.

Faculty Sponsor: Danielle Lavin-Loucks

Student Contact: alexandra.garcia@valpo.edu
Looking Through the Glass Ceiling: Social and Individual Influences on Women’s Career Decisions

Megan Gilliam, Jessica Luth, Lauren Patzer

*Departmental Affiliation: Sociology and Criminology*

Presently, the research regarding the social and personal motivations behind women’s self-limiting decisions has been minimal. Our work discusses how women are still underrepresented in the upper echelons of organizations, and although inequality does partially explain the gender disparities, this explanation leaves women with little ability to impact the course of future change, and ignores the choices women make to leave, or not advance, in the workforce. Social pressure for women to lead and succeed in so many different roles has created more self-limiting behaviors as women choose to simplify. The question we are attempting to answer is why we still have the glass ceiling; if the explanation is social pressure and unfair gender environments, then it may support large-scale trends. If it is individual choice, then gender inequality may not be the driving factor. It is possible that this research might reveal a decline in social pressure to minimize career advancement. By surveying women to study a relationship between career beliefs and self-efficacy, we will then attempt to show that the statistical disparity between women and men holding high-level career positions may be less about gender inequality than originally hypothesized. Therefore, this research aims at uncovering whether internalized stereotypes and expectations influence women’s self-limiting behaviors more than the lack of opportunities to advance. Keywords: gender, career, women, self-limitation, goals, social influences

*Information about the Authors:*
Megan Gilliam is a junior at Valparaiso University, majoring in English and sociology/criminology with a minor in psychology. She has always been passionate about social justice, and after taking VU’s sociology course “Systems of Social Stratification,” she began to focus primarily on gender studies. Upon graduation, Megan intends to pursue a Ph.D. in sociology with a focus in social stratification. Lauren Patzer is a junior at Valparaiso University majoring in mathematics with a minor in applied statistics. She has always had an interest in numbers and statistical analysis, and hopes to go into data analysis after graduation. Jessica Luth is a junior, non-traditional student at Valparaiso University majoring in sociology/criminology. She has spent years working in social services and is looking forward to working towards her master’s degree in therapeutic counseling and eventually working with at risk teens.

*Faculty Sponsor: Lissa Yogan*

*Student Contact: megan.gilliam@valpo.edu*

Stress Among Valparaiso University Students: "Stressors and Coping Mechanisms"

Cody Labanowitz

*Departmental Affiliation: Sociology and Criminology*

Large amounts of stress can wreak havoc on an individual’s life. Students at Valparaiso University and many other universities around the world are faced with situations that cause stress levels to fluctuate and affect their lives in different ways. As stress is a phenomenon that is not easily defined or measured, it becomes difficult to study and even more difficult to combat. The “Stressors & Coping Mechanisms” survey looks at students attending Valparaiso University and attempts to highlight practices and behaviors that may create stress in specifically Valparaiso student’s lives; it also looks at practices and behaviors students with lower scores on the Perceived Stress Scale may have in common. The three main categories examined are physical activity, technology usage, and social behaviors. Along with these three categories, factors like gender, school year, major, etc. are analyzed to search for patterns in the Valparaiso student community. The end goal of this survey and study are to find out what some of the major causes of stress for students are, and also what behaviors or practices are the best at alleviating or combating stress.

*Information about the Author:*
Cody Labanowitz is a senior sociology major. He was a Valparaiso University student-athlete for three years but has since retired. After graduating in December of 2017, he hopes to continue his education and gather more life experience by joining the United States military.

*Faculty Sponsor: Lissa Yogan*

*Student Contact: cody.labanowitz@valpo.edu*
The Examination of Fitness Patterns in College Students

Anna Rafanelli, Sarah West, Kelly Rayner

Departmental Affiliation: Sociology and Criminology

Fitness is widely acknowledged as an important element in maintaining a person’s health and wellbeing. As a person gets older, however, patterns in exercising and fitness tend to change. This has been shown to be true for college students due to multiple factors that change after high school. They are adapting to a new lifestyle and environment, subject to different pressures and motivations, and have greater opportunities for exercise. This proposed research is aimed at examining common fitness patterns in college students and the factors--such as gender and socioeconomic status--that may affect these patterns. This will be accomplished through a survey designed with items that ask participants to identify specific fitness activities they engage (or do not engage) in and various demographics of the student. The survey will be sent to undergraduate students at Valparaiso University through their university email. We hope to discern through survey results the primary factors impacting how college students engage in fitness activities as well as characteristics of these fitness patterns. We predict that changes in pressures and opportunities cause college students to exercise more. By examining fitness patterns in college students through our research, we hope to offer insights into possible factors affecting health in young adults and guidelines for fitness habits that promote improving health and wellbeing. Our research will also call for more examination in how to improve fitness habits in college students as well as further research exploring how fitness is related to overall health in students.

Information about the Authors:
Anna Rafanelli is a junior pursuing criminology and psychology degrees. She has taken courses that have focused on social institutions such as education and the criminal justice system. Future plans include attending law school and continuing after in a career as an attorney. Kelly Rayner is a sophomore majoring in criminology and psychology. She has attended multiple sociology classes and has been an athlete for the majority of her life. Her interests include a career in federal law enforcement. Sarah West is a junior majoring in sociology and criminology, with a minor in German. She hopes to pursue a position with the Federal Probation and Pretrial Service in Hammond, Indiana.

Faculty Sponsor: Lissa Yogan
Student Contact: anna.rafanelli@valpo.edu

Key Factors in Choosing to Attend Valparaiso University

Bethany Riethmeier, Brian Almanza, Hannah Vandermolen

Departmental Affiliation: Sociology and Criminology

Our research project will be focusing on the factors that are important to students who chose to attend Valparaiso University. We will be stratifying our research sample based on colleges within the university. This means we will be surveying students within each college at VU proportionately, through an online survey. We hypothesize that the reputation of the college will have been the most important factors in applying to those surveyed within the colleges of Nursing, Engineering, and Christ College than to members of the College of Business and the College of Arts and Sciences. We also hypothesize that financial aid will be one of the most important factors in the decision to attend Valparaiso University for students in all five colleges. Factors we ask about in our survey include proximity to home, financial aid, program reputation, family and friends and their connection to Valpo. This is significant in that it will indicate what factors are important particularly in choosing a smaller school such as Valpo out of all other schools that were viable options to students.

Information about the Authors:
Bethany Riethmeier, a criminology major with a minor in political science, became interested in the topic after wondering what factors influenced others to choose Valpo, as she has family history at Valpo which influenced her decision. Bethany plans on going to law school for environmental law. Hannah Vandermolen is a psychology and criminology major, a commuter who stated that proximity to home was an important factor to her. Hannah plans to attend graduate school to pursue her majors further. Brian Almanza is a sociology and coaching education major, and he is also a commuter who came to Valpo for its proximity, among other reasons. He wants to go into coaching.

Faculty Sponsor: Lissa Yogan
Student Contact: bethany.riethmeier@valpo.edu
The Effect of Undergraduate GPA on Future Success

Noah Roderick, Nicholas Isajczuk, Takia Peebles

Departmental Affiliation: Sociology and Criminology

Studies from the past say that GPA plays a role in future success after college. We are going to be conducting a study to see if that remains true today. In order to try to prove our hypothesis, which is that GPA has an effect on your future success, we will be conducting a brief survey to determine whether college GPA affects one’s career, as well as other aspects of their life such as family and happiness. We will be measuring key variables such as occupational success and family life. The measurements will be done through a website called Qualtrics that will help us to determine if there is a correlation between GPA and how successful people view themselves in their own lives. The survey will determine how one views their own personal success. This is important because not all people view success in the same way and just because you do not have a great job that pays a lot does not mean that you are not successful. We hope to use this information to demonstrate just how important GPA is and how it can greatly affect opportunities later in life.

Information about the Authors:
Takia Peebles is a junior from Chicago, IL. She plans to obtain a bachelor's degree in criminology and later pursue a career in law enforcement. Nicholas Isajczuk is a junior from Winamac, IN. He is pursuing his bachelor's in sociology/criminology. He plans to work as a law enforcement officer. Noah Roderick is a sophomore sociology/criminology major from Joliet, IL. He also plans on becoming a law enforcement officer in the future. The authors feel that this research is important because it will help others to understand just how important it is to do your best while in college.

Faculty Sponsor: Lissa Yogan
Student Contact: noah.roderick@valpo.edu

Desistance in College Students

Alonzo Skinner

Departmental Affiliation: Sociology and Criminology

Many forms of minor criminal behavior are known to be more commonly engaged in by young people. As individuals grow older, they become less likely to engage in those minor crimes. To better understand this desistance from crime, it is necessary to understand how major life events which individuals experience as they mature impact their involvement with illegal activity. Attendance at college is a life event which may affect young people’s involvement with crime, and it may be one of great importance in an era when college enrollment is so common. This research, by way of a survey administered to a sample of current undergraduate students at a small, private Midwestern university, aims to determine if attending college delays desistance from minor crime among young people, as is hypothesized in the study. Considerations are made for the effects of peer influences and students’ own perceptions of their level of maturity as potential contributing factors to delayed desistance, while previous experiences with the criminal justice system and religiosity are also considered as factors which might promote desistance.

Information about the Author:
Alonzo Skinner is a junior criminology major from Earl Park, IN. He is interested in ultimately uncovering ways in which desistance from crime might be promoted by institutions such as colleges and universities, and he hopes with this study to generate interest in further research into the specific mechanisms of how and why desistance occurs.

Faculty Sponsor: Lissa Yogan
Student Contact: alonzo.skinner@valpo.edu
The Impact of Surgically Induced Weight Loss on an Individual's Psychological Health

Angelica Torres

Departmental Affiliation: Sociology and Criminology

With obesity becoming an increasingly chronic physical illness prevalent in all ages throughout the United States, bariatric surgery continues to give individuals battling obesity a second chance to better their lives. While many have argued that weight loss surgery is the easy way out and obese persons just need to diet and exercise, further research has shown that surgically induced weight loss plays a critical role in that person's psychological well-being. I will be distributing a survey of questions, pertaining to experiences before and after surgery, across multiple bariatric support groups on social media. This will demonstrate if an individual’s previous and current stress levels, perception of themselves, and psychological well being differs after experiencing a significant amount of weight loss. In all, I hope to see whether women between the age of 25 - 38 will lose a lesser amount of weight due to higher stress levels and greater psychological distress prior to and post bariatric surgery in comparison to men between the age of 25-38.

Information about the Author:
Angelica Marie Torres is a sophomore studying sociology and psychology in hopes of becoming a pediatric occupational therapist. Her interest in bariatric surgery and psychological health began after undergoing bariatric surgery herself in July of 2016 at the age of 19. During her weight loss journey, she experienced many changes in not only her physical image, but in her psychological and behavioral well-being. Before undergoing the sleeve gastrectomy weight loss surgery, she was the girl who never raised her hand in class and walked with her head down; however, now she is the woman who is outspoken and strides the sidewalks looking forward. Her entire view on life has changed and her soul has risen. However, she realizes that weight loss surgery is not the easy way out. Making healthy decisions is still hard and remembering to take her vitamins is even more difficult. Despite the downfalls of bariatric surgery, she only has one regret—that she should have done it sooner.

Faculty Sponsor: Lissa Yogan

Student Contact: angelica.torres1@valpo.edu

Sorority Life and Campus Social Integration

Abigail Wichlinski, Elisha Matthews

Departmental Affiliation: Sociology and Criminology

The purpose of this research project is to understand how sorority life impacts social integration and college campus involvement at Valparaiso University. This study may help to eliminate stereotypes about sororities and display their important contribution to Valparaiso University's campus. It is hypothesized that women on the Valparaiso University campus, had they not joined Greek Life, were at a greater risk of leaving Valparaiso University. This study explores whether students feel disengaged from Valparaiso University's campus and considered dropping out of college or changing schools prior to joining Greek Life (specifically sorority life). Ultimately, we want to know if sorority life made students stay enrolled at Valparaiso University. This study will also address specific reasons as to why women on Valparaiso University's campus go through the sorority recruitment process in order to enhance that process as a whole. Survey research will be conducted because it is considered the most efficient way of reaching sorority members on campus. The key variable is women involved in sorority life and their involvement on campus prior to joining a sorority and after joining a sorority. The survey will be conducted in the spring semester of 2017, and the research will be concluded before the end of April.

Information about the Authors:
Elisha Matthews is a sociology and criminology major with a minor in psychology. She is from Forest Park, Illinois. Abigail Wichlinski is also a sociology and criminology major with a minor in social work. She is from Valparaiso, Indiana. This project was an interest to both students, as one is a Greek affiliate, while the other is not. Both individuals were curious as to whether or not sorority life helped with campus integration and college life as a whole.

Faculty Sponsor: Lissa Yogan

Student Contact: abigail.wichlinski@valpo.edu
I Ain't Afraid of No God: Atheism in Hindu Traditions

Kayla Houp

Departmental Affiliation: Theology

Hinduism separates itself from the standard polytheistic and monotheistic religious traditions of the modern age by establishing itself as a fluid philosophy over a structured religion. Contrary to its popular counterparts—namely the Abrahamic traditions—Hinduism is a henotheistic set of traditions that are rooted in duty and action over faith. Though many Hindu traditions follow and worship a deity, the presence of such deity is not universally fundamental for salvation. Rather, many traditions within Hinduism are atheistic in nature, focusing on the disciplining of the mind to achieve salvation. The research focuses on the representation of modern atheism in society versus its actual definition, and how this atheism plays a key role in aspects of the Hindu traditions that may be overlooked or ignored. This research seeks to cultivate an understanding of salvation separate from faith, and how salvation and the liberation from the cycle of rebirth can be achieved without the presence of a creator deity. Through analyzing the Hindu traditions of Yoga and Sāṁkhya in an philosophical lens, it becomes established that they can achieve salvation, fulfill their duties, and thrive in their culture without the presence or worship of a creator deity. This paper will demonstrate the functions of atheism in the modern time, the atheistic Hindu traditions, and models of salvation in Hinduism, and conclude that the lack of a creator god does not actually impede salvation.

Information about the Author:
Kayla Houp is a junior communication student. Her paper attempts to combine her interests in different religious traditions and atheism, and was written as part of a final research project for a Hinduism course taken in Fall 2016.

Faculty Sponsor: George Pati

Student Contact: kayla.houp@valpo.edu

The White Rose Resistance Movement and the Analysis of Their Leaflets

Jessica Lewis

Departmental Affiliation: Theology

The story of the White Rose resistance movement is not generally known in the narrative of Nazi Germany because it falls among the many other resistance movements that appeared to be more effective than the White Rose. Yet, many scholars overlook that the leaflets the White Rose wrote played a role in the resistance to the Nazi government. My paper addresses the White Rose resistance movement during the Third Reich and how its resistance was exemplified in the leaflets through the discussion about belief in God and hope for a better Germany. In my paper, I will do a literary analysis of the six White Rose leaflets to highlight Christian religious themes. I will examine how the religious language in the leaflets articulates the political goals of the White Rose movement and creates a call to action for Germans. Closely examining the leaflets and understanding the members of the White Rose that wrote them sheds new light on the rarely acknowledged works of the White Rose resistance movement.

Information about the Author:
Jessica Lewis became interested in this topic when she took a class on Christianity in Nazi Germany with Professor Becker. He spoke about a young woman, Sophie Scholl, and a group of college students, The White Rose. The resilience, courage, and faith that Sophie Scholl displayed inspired Jessica to learn more about this group. She plans to pursue a masters and would like to further research the topic of Christian movements in times of political oppression.

Faculty Sponsor: Melanie Trexler

Student Contact: jessica.lewis@valpo.edu
Employing Visual Analytics to Understand Worldwide Prevalence and Impact of Diabetes Epidemic

Nathan Mahan, Sanjeev Jha, Randall Swanson

Departmental Affiliation: Information and Decision Sciences/Business Analytics

The International Diabetes Federation (IDF) has declared diabetes to be one of the largest global health emergencies of the 21st century (International Diabetes Federation). IDF estimates about 415 million adults have diabetes currently and about 318 million adults having impaired glucose tolerance making them highly susceptible to develop diabetes. As per the estimate in the year 2012, 29.1 million Americans or 9.3% of the population had diabetes and diabetes was the 7th leading cause of death in the United States (American Diabetes Association). Also, the United States has the 3rd largest number of confirmed cases of diabetes after China and India (Albert Einstein College of Medicine). Diabetes is dangerous because it engenders gradual long-term complications like cardiovascular disease, nerve and kidney damage, blindness, hearing loss, and Alzheimer’s disease (Mayoclinic). In this study, we employ visual analytics to analyze and understand the prevalence and impact of diabetes worldwide and the United States. Our analysis uncovers countries and the counties in the United States that are at higher risk of diabetes where preventive measures and early detection can help save lives and reduce medical expenses.

Information about the Authors:
Nathan Mahan is a senior majoring in business analytics. He is president of Valpo Club Bowling, president of the Geography Club, and production director for WVUR. He is also a national finalist in the IBS Radio Awards for production. Randall Swanson is a senior majoring in business analytics and finance. He is a member of Phi Beta Lambda and the Financial Management Association. Both students are completing an independent study and participated in the Merck Analytics Challenge where they researched the impact and prevalence of diabetes.

Faculty Sponsor: Sanjeev Jha

Student Contact: nathan.mahan@valpo.edu
A Better-Sounding Classroom

John MacNeil

Departmental Affiliation: Electrical Engineering

This project focuses on how acoustic treatment in a lecture hall or classroom can be utilized to enhance student learning capabilities through the maximization of speech intelligibility. The first stages of the study involve taking acoustic measurements and impulse responses in empty rooms, using measurement microphones and audio signal analysis software, and subsequently taking the same measurements with students, furniture, and objects in the room to determine the ways in which student and object presence affects acoustic properties in the classroom. After this data is collected, wall treatments will be added to the room to enhance acoustic resonance. Students may be brought into the treated classroom in order to observe the effects of the acoustic treatment and enhanced speech intelligibility in the treated classroom. This data will be used to develop the optimal acoustic environment for speech intelligibility, as well as student understanding and learning, in the classroom or lecture hall setting. Efficient acoustic wall treatments can be developed in order to treat the classrooms and lecture halls that are already in use on campus, in order to enhance student learning on the VU campus.

Information about the Author:
No information provided.

Faculty Sponsor: Dan White

Student Contact: john.macneil@valpo.edu

Model of a Rotary Kiln Solar Reactor for the Reduction of Cobalt Oxide Particles in a Two-Step, Hybrid Thermochemical Water Splitting Cycle

Samantha Kopping, Jack Hoeniges, Jesse Greenhagen, Robert Palumbo, Luke Venstrom

Departmental Affiliation: Mechanical Engineering

Thermochemical water splitting cycles remain a promising approach to produce hydrogen from water using concentrated sunlight due to their high theoretical solar-to-hydrogen conversion efficiency. One promising cycle is a hybrid cycle based on cobalt oxide. Hydrogen is produced in two chemical steps. In one step, concentrated sunlight is used to reduce cobalt oxide from Co3O4 to CoO near 1000°C. In the second step, the CoO is integrated into the anode of an electrolysis cell and oxidized back to Co3O4 during the electrolysis of water near room temperature to produce hydrogen. The Co3O4 is recycled and a fraction of the hydrogen produced is fed to a fuel cell in order to provide the small electrical input for electrolysis such that the net effect of the cycle is the splitting of water using concentrated sunlight. The ideal solar-to-hydrogen conversion efficiency is 38%. One advantage of this approach is that the fuel production step is decoupled from the solar step and proceeds at room temperature; it can be carried out where water is readily available. The cycle brings the sun to the water rather than the water to the sun.

At Valparaiso University, we have been developing a rotary kiln solar reactor for the reduction of Co3O4 particles to CoO. The defining feature of this reactor is its ability to disperse the Co3O4 particles into a “cloud” spread over the volume of the reactor. The hypothesis is that this cloud enhances the direct absorption and distribution of the concentrated solar input to reaction sites and thereby increases the thermal efficiency of the reactor. To determine the impact of the cloud of Co3O4 particles on reactor performance, we developed a numerical model that couples the radiative and non-radiative heat transfer within the cloud to the cobalt oxide reduction kinetics in order to calculate the reactor temperature and the rate of reduction of Co3O4. Radiation is simulated using Monte Carlo Ray Tracing, and the reduction kinetics follow the shrinking core model. Several cases of particle motion were investigated, including plug flow and mixed flow. In this presentation, we show the results of the modeling effort. Reactor
thermal efficiency, which is defined as the fraction of solar energy used to drive the reduction reaction, is discussed as a function of the feed rate of Co3O4, the solar power, and the volume fraction of Co3O4 in the cloud.

Information about the Authors:
No information provided.

Faculty Sponsor: Luke Venstrom
Student Contact: samantha.kopping@valpo.edu

Establishing the Kinetics for the Electrolytic Oxidation of Cobalt Hydroxide

Daniel Kotfer, Robert Palumbo, Jonathan Schoer, Carol Larson, Shahin Nudehi

Departmental Affiliation: Mechanical Engineering

We are developing a finite-difference model to describe the kinetics for the electrochemical oxidation of cobalt hydroxide in a water splitting process. Evidence from exploratory studies suggests a reaction pathway involving diffusion and adsorption to form the desired products, cobalt oxyhydroxide and cobalt (II, III) oxide. Coupling diffusion and surface processes at the anode allows the model to determine the parameters that define the kinetics of the electrochemical system. The model is consistent with experimental evidence: a fit is possible only when the model includes electron transfer with the dissolved and adsorbed electroactive species. Due to the highly non-linear equations defining the mechanism, the parameters of the fit are highly dependent on the initial input for related values. To ensure a high level of confidence in the kinetic parameters, model outputs will be compared between concomitant experimental techniques and with values reported in literature.

Information about the Authors:
No information provided.

Faculty Sponsor: Robert Palumbo
Student Contact: daniel.kotfer@valpo.edu
Correlation Between Health Care Organization Career Ladders and Employee Satisfaction

Natalie Bittles

Departmental Affiliation: Health Care Administration

Aim: The aim of this study was to examine the influence of empowering work conditions and workplace performance on healthcare workers’ experience of burnout and health care workers retention identified in the literature. Background: A major cause of turnover among healthcare workers is related to unsatisfying professional conditions in the workplace that are associated with burnout, lack of on the job training, and stagnant future career options. The use of career ladders in the workplace is an example of a program that may help with the decrease in turnover among healthcare workers. Method: The review of literature examined the impact of workplace empowerment, employee career ladders and burnout on three employee retention outcomes: job satisfaction, organizational commitment, and turnover intentions. Results: A study between 136 nurses with BSN degrees or higher and on a career ladder track recorded an average of 3.6 on a 5 point likert scale, suggesting that the career ladder was an effective way for nursing expertise to be recognized and to enhance and further their career (Korman & Eliades, 2010). Conclusion: The review of literature suggests that healthcare workers' perceptions of empowerment and future career growth are related to job satisfaction, organizational commitment, and turnover intentions. The career ladder was a highly suggested program that many healthcare facilities used to increase retention. Implications for management: Leadership strategies that empower healthcare workers for professional growth may be helpful in preventing workplace burnout, and ultimately, retain more employees.

Information about the Author:
The author, Natalie Bittles, is passionate about employee satisfaction and continuing education to better the entire work place. She is a student in the 4+1 Masters of Health Care Administration program.

Faculty Sponsor: Jeffrey Coto

Student Contact: natalie.bittles@valpo.edu

Implementation of Compost Trash Cans on Valparaiso University's Campus

Natalie Bittles

Departmental Affiliation: Health Care Administration

Across the nation, college institutions are turning to decreasing waste to cut financial costs. Valparaiso University is a viable collegiate candidate for campus waste reduction. The university dining hall has already implemented many programs geared towards waste and carbon footprint reduction with an emphasis on minimizing everyday expenses. Students, however, are unclear on the amount of waste they are accumulating during meal time. The idea for this project came from an environmental health class. Literature has shown that proper programming (i.e. composting) can help raise awareness for waste accrual and decrease the carbon footprint in larger institutions. For college students, the learning environment should shape students in and out of the classroom. These real life learning experiences can help shape future generations to be more resourceful in reducing their waste. By implementing these compost trash cans, students can not only see the decrease of waste but also the need to reduce, reuse, and recycle for now and in the future.

Information about the Author:
The author, Natalie Bittles, is passionate about employee satisfaction and continuing education to better the entire work place. She is a student in the 4+1 Masters of Health Care Administration program at Valparaiso University. Future aspirations include joining a large children's hospital and working to increase patient satisfaction and lower health care costs without compromising excellence.

Faculty Sponsor: Candace Florence

Student Contact: natalie.bittles@valpo.edu
Lean Six Sigma Leadership in Health Care Organizations

Natalie Bittles

Departmental Affiliation: Health Care Administration

The reason for choosing this topic was the want to change the current employee settings in Health Care Organizations. Using Lean Six Sigma Leadership has been a proven method to increasing staff satisfaction and empowering life long learning. The research for Lean Six Sigma ideologies came from reputable sources of literature, actual Lean Six Sigma training, and other publications. The want for providing information on the benefits of using this leadership program comes from future problems in Health Care Administrators communicating to clinical staff and other employee bases. The findings were significant enough to create a compelling argument for the benefits of entire program in health care organization settings.

Information about the Author:
The author, Natalie Bittles, is passionate about employee satisfaction and continuing education to better the entire work place. She is a student in the 4+1 Masters of Health Care Administration program at Valparaiso University. Future aspirations include joining a large children’s hospital and working to increase patient satisfaction and lower health care costs without compromising excellence.

Faculty Sponsor: Rhonda Volk

Student Contact: natalie.bittles@valpo.edu

College Students’ Perceptions and Use of Marijuana

Ellie Ashbrook, Bradley Adkins, Andrea Pertl, Jennifer Mitchell, Samantha Salvador, Kelly Wilkins, Madissen Brookshire-Green

Departmental Affiliation: Nursing

Marijuana is the most prevalent illicit drug used on college campuses today (Johnston, O’Malley, Bachman, & Schulenberg, 2012), with 19.4% reporting use within the last 30 days (Suerken, Reboussin, Sutfin, Wagoner, Spangler, & Wolfson, 2014). Marijuana use has been increasing in recent years with young adults often initiating use during college (Suerken et al.) and is associated with high risk behaviors, such as smoking cigarettes and increased use of alcohol (Caldeira, Arria, O’Grady, Vincent & Wish, 2008). Consequences associated with marijuana use include enrollment disruptions and lower college completion rates (Fergusson & Boden, 2008).

The main objectives of this study were to assess perceptions and use of marijuana among undergraduate students at a faith-based, midwestern university and identify aspects that are associated with use on the college campus. Quantitative and qualitative methods were used to collect data. Quantitative data were collected using an investigator-developed questionnaire administered via SurveyMonkey®. Items were adapted from the Core Alcohol and Drug Survey: Long Form (Core Institute of Student Health Programs, 1994), which asks detailed questions about substance use behaviors. Additional questions specific to marijuana were developed from a study completed by Suerken, Reboussin, Sutfin, Wagoner, Spangler, & Wolfson (2014). Qualitative data were collected through four focus group sessions relating to students’ perceptions of marijuana use. A total of six consistent questions were used to guide the discussions.

Following IRB approval, all undergraduate students (N = 3,269) during the 2016-2017 academic year were invited to participate in an online survey. A total of 1,624 students responded and 1,522 completed the questionnaire, yielding a 49.7% response rate. The majority of respondents were freshmen (29.4%), female (59.8%), white, non-Hispanic (80.5%), in the college of Arts and Sciences (49.5%), and living on campus (61.5%).

Results showed that 87.2% of students reported that marijuana use has become more common in recent years; however, 88.3% students indicated that marijuana use does not make peers more popular. The majority (59.6%) believed marijuana should be legalized for recreational purposes, and 90% believed marijuana should be legalized for medical purposes. When asked if they think legalizing marijuana would benefit society as a whole, 51.1% agreed; 34.7% indicated they would use marijuana more frequently if it was legal.

Of all respondents, 18.3% (n = 274) used marijuana in the last 30 days with a mean of 10.3 (SD = 10.7) times. The top three reasons for using marijuana were “to experiment” (43%), “to have fun” (26.3%), “I was encouraged to try it” (7.3%). There were differences in marijuana use based on gender with 25.7% of males using marijuana compared to 13.3%
of females ($X^2 = 37.026, p < .001$). There were no significant differences based on year in school ($X^2 = 3.164, p = .539$). Regarding Greek affiliation, 31% of fraternity members used marijuana compared to 16.6% of nonmembers ($X^2 = 21.073, p < .001$). Conversely, 16.3% of sorority members used marijuana compared to 18.5% of nonmembers ($X^2 = 0.522, p = .470$). Of students who participate in NCAA sports, 19.7% of athletes reported using marijuana compared to 18% of non-athletes ($X^2 = 0.308, p = .579$).

Use of marijuana on this campus is similar to the national average with the highest use in males involved in Greek life. The primary motivator for first use of marijuana was “to experiment.” The majority of students believe marijuana use should be legalized, and nearly all believe it should be legalized for medical purposes. Analysis of the focus groups is currently being completed to provide detail about students’ perceptions of the safety and use of marijuana for recreational and medical purposes. Findings from this study may be used to inform administrators about the current prevalence of and attitude towards using marijuana for policy development and educational programs.

**Information about the Authors:**
The research team from Valparaiso University’s College of Nursing and Health Professions includes Bradley Adkins (junior), Ellie Ashbrook (junior), Madissen Brookshire-Green (sophomore), Jennifer Mitchell (senior), Andrea Petrl (junior), Samantha Salvador (sophomore)*, and Kelly Wilkins (senior).

**Faculty Sponsor:** Terry Kessler

**Student Contact:** ellie.ashbrook@valpo.edu

*In memory of Samantha Salvador, a valued and loved member of our research team.*

---

### Beyond the Volcanoes

**Erica Marske, Katie Bahn**

**Departmental Affiliation:** Nursing

**Background:** Health inequities related to gender, ethnicity, socioeconomic status, and geography exist in rural Nicaragua due to various causative factors. One of these factors is the exposure of indoor air pollution to women and children from cooking over open fire stoves resulting in increased rates of respiratory infections. The purpose of the ongoing research project of Beyond the Volcanoes is to combat this particular additive to the global burden of disease and improve health equity in rural Nicaragua through social transformation using community-based participatory action research. Methods: Prochaska’s Transtheoretical Model provides the theoretical foundation for the use of community-based participatory research methodology. This methodology involves six phases: partnership, assessment, planning, implementation, evaluation, and dissemination. Results: Since 2007, the research team has implemented 200 stoves over 58 collective trips to the community in Nicaragua. Data reveals that the women in the community are anecdotally expressing improvements in health outcomes related to eye irritation, cough, chest illness, shortness of breath, and headache. Conclusions: The results show that installing chimney-ventilated cook stoves has decreased symptoms previously experienced by community members who cooked over open fire stoves in the home.

**Community, cookstove, global, public health, partner, air pollution**

**Information about the Authors:**
Erica Marske is a nursing major at Valparaiso University and wanted to expand her experience in health-related issues beyond the United States. She joined the research team because she was interested in partnering with the community in Nicaragua and educating them about interventions to improve their respiratory status. This is her second year on the research team and first year traveling to the community in Nicaragua.

**Faculty Sponsor:** Amy Cory

**Student Contact:** erica.marske@valpo.edu
Creative Work and Research Committee
Student Undergraduate Research Grant Recipients

Undergraduate Research Grants are awarded by the Valparaiso University Creative Work and Research Committee (CWRC) two times a year. Funding for the grants is provided by the University Guild’s Student Research Endowment Fund. The University Guild is an organization that was created in 1931 with the sole purpose of providing an enhanced learning experience for current Valpo students. Members of the Guild include alumni and current and former parents of Valpo students. Each year, the Guild funds campus gift grants, student research grants, and scholarships. Students generally use Undergraduate Research Grant funds for equipment purchases, supplies, photocopying, or other research needs or travel, meals, or lodging to present their findings at conferences.

The following Valparaiso University students were awarded Undergraduate Research Grants from the Creative Work and Research Committee during the 2016-2017 academic year.

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Year, Department</th>
<th>Faculty Sponsor</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>John MacNeil</td>
<td>Senior, Music</td>
<td>Dan White</td>
<td>Acoustic Treatment to Enhance Speech Intelligibility in Classrooms and Lecture Halls</td>
</tr>
<tr>
<td>Christopher Morrissey</td>
<td>Senior, Physics and Astronomy</td>
<td>Haiying He</td>
<td>Reduction of Nitrobenzene to Aniline Using Silicene as a Nonmetal Catalyst</td>
</tr>
<tr>
<td>Grace Roman, Beata Ramza</td>
<td>Seniors, Geography and Biology</td>
<td>Bharath Ganesh Babu</td>
<td>Relationship Between Canopy Gaps and Understory Vegetation in Northwest Indiana</td>
</tr>
<tr>
<td>Emily Scarsella</td>
<td>Senior, Mechanical Engineering</td>
<td>Reva Johnson</td>
<td>Elbow Exoskeleton</td>
</tr>
<tr>
<td>Eric Smith</td>
<td>Senior, Political Science</td>
<td>Jennifer Hora</td>
<td>Short and Focused: An Analysis of the Evidentiary Struggles of the International Criminal Court on Sex Crimes Prosecution</td>
</tr>
<tr>
<td>Regan Weber, Ashley Montelongo, Candace Watters</td>
<td>Seniors, Art</td>
<td>Liz Wuerffel</td>
<td>Studio Art Thesis Projects</td>
</tr>
<tr>
<td>Grace Freigang</td>
<td>Junior, Electrical &amp; Computer Engineering</td>
<td>Dan White</td>
<td>Cooperative Ground Segment Scheduling for SatNOGS Applications</td>
</tr>
<tr>
<td>Kathryn Harrold</td>
<td>Junior, Mechanical Engineering</td>
<td>Craig Goehler</td>
<td>Developing Statistical Metrics of Joint Mechanics for Use in Assessing Risk of Injury: A Follow-up Study</td>
</tr>
<tr>
<td>Jacob Larson</td>
<td>Junior, Mechanical Engineering</td>
<td>Craig Goehler</td>
<td>Developing Statistical Metrics of Joint Mechanics for Use in Assessing Risk of Injury: A Follow-up Study</td>
</tr>
<tr>
<td>Inga Majewska</td>
<td>Sophomore, Psychology</td>
<td>Andrew Butler</td>
<td>The Effect of Emotional Auditory Information on Specific Visual Recognition</td>
</tr>
<tr>
<td>Sidney Noble</td>
<td>Junior, Geography &amp; Environmental Science</td>
<td>Bharath Ganesh Babu</td>
<td>Ecological Change in Indiana Dunes State Park</td>
</tr>
<tr>
<td>Jay Slone</td>
<td>Senior, Kinesiology</td>
<td>Kelly Helm</td>
<td>Grip Strength Comparison of College Students to National Norms</td>
</tr>
<tr>
<td>Rafael Valbuena</td>
<td>Junior, Mechanical Engineering</td>
<td>Craig Goehler</td>
<td>Comparing Inertial Measurement Unit and Optical Infrared Passive Marker-Based Motion Capture Systems for Injury Prevention</td>
</tr>
</tbody>
</table>
The annual Academic Showcase is a celebration of undergraduate, graduate, and faculty work. It features an amazing range of achievements at Valpo, while showcasing the cross-disciplinary collaborations that happen both inside and outside the classroom.

You’re invited to celebrate this exciting event by attending the following:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
<th>Time</th>
<th>Sponsoring Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 1</td>
<td>Valparaiso University Scholarship and Creative Works Reception</td>
<td>CCLIR – Community Room</td>
<td>4:30 p.m. – 5:30 p.m.</td>
<td>Christopher Center for Library Services</td>
</tr>
<tr>
<td>May 2</td>
<td>Student Art Purchase Award Reception</td>
<td>CCLIR – 2nd Floor Fireplace Lounge</td>
<td>4:30 p.m. – 5:30 p.m.</td>
<td>Christopher Center for Library Services</td>
</tr>
<tr>
<td>May 4</td>
<td>Symposium on Undergraduate Research and Creative Expression (SOURCE)</td>
<td>Harre Union Ballrooms</td>
<td>9:00 a.m. – 4:00 p.m.</td>
<td>Provost and Office of Sponsored and Undergraduate Research</td>
</tr>
<tr>
<td>May 4</td>
<td>Graduate Academic Symposium</td>
<td>Harre Union Ballrooms</td>
<td>1:30 p.m. – 5:00 p.m.</td>
<td>Graduate School</td>
</tr>
<tr>
<td>May 6</td>
<td>Engineering Design Expo</td>
<td>Gellersen/ Fites Classrooms</td>
<td>10:00 a.m. – 1:00 p.m.</td>
<td>College of Engineering</td>
</tr>
<tr>
<td>Student Name</td>
<td>Page No.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>----------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adkins, Bradley</td>
<td>43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ahlden, Jennifer</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alejos, Alejandra</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aljobeh, Leena</td>
<td>10, 14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Almanza, Brian</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amarasingh, Chaminhu</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>An, Yeongseo</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arloff, William</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ashbrook, Ellie</td>
<td>43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bahena, Maria</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bahn, Katie</td>
<td>44</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bailey, Raenah</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baker, Alice</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandyk, Luke</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bauer, Jordan</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bittles, Natalie</td>
<td>42, 43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bouman, Janelle</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bouman, Nathaniel</td>
<td>11, 25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brandenburg, Rachel</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Braun, Kelly</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bridgmon, Kenneth</td>
<td>7, 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brookshire-Green, Madissen</td>
<td>43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bruick, Victoria</td>
<td>4, 23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bruno, Adam</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carmel, Moriah</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caves, Kayla</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chamness, Sarah</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisneros, Jonathan</td>
<td>28</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cook, Kelli</td>
<td>7, 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dabertin, Jr., Thomas</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dillon, Benjamin</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edmonds, Jessica</td>
<td>32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emeka, Chinedu</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evans, Christopher</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fares, Bayan</td>
<td>29</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fate, Abigail</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foster, Kylee</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fritz, Leighton</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garcia, Alexandra</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilliam, Megan</td>
<td>34</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greenhagen, Chase</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greenhagen, Jesse</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grover, Maxwell</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hanson, Jessica</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Henning, Benjamin</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Henry, Jason</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hire, Ashley</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hoeniges, Jack</td>
<td>40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Houp, Kayla</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunter, Felicia</td>
<td>30</td>
</tr>
<tr>
<td>Isajczuk, Nicholas</td>
<td>36</td>
</tr>
<tr>
<td>Iselin, Samuel</td>
<td>22</td>
</tr>
<tr>
<td>Jagvaral, Yesukhei</td>
<td>10, 25</td>
</tr>
<tr>
<td>Janesheski, Troy</td>
<td>8</td>
</tr>
<tr>
<td>Jewell, Cullan</td>
<td>13</td>
</tr>
<tr>
<td>Johnson, Adali</td>
<td>13</td>
</tr>
<tr>
<td>Johnson, Dejah</td>
<td>29</td>
</tr>
<tr>
<td>Jones, Chase</td>
<td>7</td>
</tr>
<tr>
<td>Jones, Kaycie</td>
<td>30</td>
</tr>
<tr>
<td>Jones, Kyle</td>
<td>18</td>
</tr>
<tr>
<td>Kalwasinski, Isabella</td>
<td>31</td>
</tr>
<tr>
<td>Kiger, Marcy</td>
<td>32</td>
</tr>
<tr>
<td>Kim, Taegyuin</td>
<td>26</td>
</tr>
<tr>
<td>Klapman, Matthew</td>
<td>21</td>
</tr>
<tr>
<td>Koby, Hannah</td>
<td>23</td>
</tr>
<tr>
<td>Kopping, Samantha</td>
<td>40</td>
</tr>
<tr>
<td>Kotte, Daniel</td>
<td>41</td>
</tr>
<tr>
<td>Kunkle, Emily</td>
<td>31</td>
</tr>
<tr>
<td>Kwieciński, Nicholas</td>
<td>11</td>
</tr>
<tr>
<td>Labanowicz, Cody</td>
<td>34</td>
</tr>
<tr>
<td>LaCroix, Meghan</td>
<td>24</td>
</tr>
<tr>
<td>Larson, Blake</td>
<td>6</td>
</tr>
<tr>
<td>LeCaptain, Jennifer</td>
<td>15</td>
</tr>
<tr>
<td>Leinard, Megan</td>
<td>30</td>
</tr>
<tr>
<td>Lewandowski, Benjamin</td>
<td>13</td>
</tr>
<tr>
<td>Lewandowski, Nicholas</td>
<td>22</td>
</tr>
<tr>
<td>Lewis, Jessica</td>
<td>38</td>
</tr>
<tr>
<td>Long, Donald</td>
<td>16</td>
</tr>
<tr>
<td>Luth, Jessica</td>
<td>34</td>
</tr>
<tr>
<td>MacNeil, John</td>
<td>40</td>
</tr>
<tr>
<td>Mahan, Nathan</td>
<td>39</td>
</tr>
<tr>
<td>Majewska, Inga</td>
<td>29</td>
</tr>
<tr>
<td>Marske, Erica</td>
<td>44</td>
</tr>
<tr>
<td>Matthews, Elisha</td>
<td>37</td>
</tr>
<tr>
<td>McCormick, Autumn</td>
<td>32</td>
</tr>
<tr>
<td>Meyer, James Robert</td>
<td>32</td>
</tr>
<tr>
<td>Mitchell, Jennifer</td>
<td>43</td>
</tr>
<tr>
<td>Montelongo, Ashley</td>
<td>6</td>
</tr>
<tr>
<td>Morris, Charles</td>
<td>11</td>
</tr>
<tr>
<td>Morrissey, Christopher</td>
<td>26</td>
</tr>
<tr>
<td>Mueller, Andrew</td>
<td>11</td>
</tr>
<tr>
<td>Noble, Sidney</td>
<td>16</td>
</tr>
<tr>
<td>Ochsendorf, Marcus</td>
<td>27</td>
</tr>
<tr>
<td>Owens, Emily</td>
<td>17</td>
</tr>
<tr>
<td>Patzer, Lauren</td>
<td>34</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peebles, Takia</td>
<td>36</td>
</tr>
<tr>
<td>Pertl, Andrea</td>
<td>43</td>
</tr>
<tr>
<td>Petreska, Natasa</td>
<td>7, 8</td>
</tr>
<tr>
<td>Prentice, Samantha</td>
<td>9</td>
</tr>
<tr>
<td>Pressler, Paige</td>
<td>9</td>
</tr>
<tr>
<td>Rafanelli, Anna</td>
<td>35</td>
</tr>
<tr>
<td>Ramza, Beata</td>
<td>16</td>
</tr>
<tr>
<td>Rayner, Kelly</td>
<td>35</td>
</tr>
<tr>
<td>Reyes Figueroa, Hector</td>
<td>16, 22</td>
</tr>
<tr>
<td>Ridgeway, Shea</td>
<td>12</td>
</tr>
<tr>
<td>Riethmeier, Bethany</td>
<td>35</td>
</tr>
<tr>
<td>Roderick, Noah</td>
<td>36</td>
</tr>
<tr>
<td>Roman, Grace</td>
<td>16</td>
</tr>
<tr>
<td>Russ, Vincent</td>
<td>22</td>
</tr>
<tr>
<td>Salvador, Samantha</td>
<td>43</td>
</tr>
<tr>
<td>Sanchez, Andrea</td>
<td>15</td>
</tr>
<tr>
<td>Schalk, Annaliese</td>
<td>18</td>
</tr>
<tr>
<td>Simpson, Ashley</td>
<td>32</td>
</tr>
<tr>
<td>Skinner, Alonzo</td>
<td>36</td>
</tr>
<tr>
<td>Smallwood, Jesse</td>
<td>7, 8</td>
</tr>
<tr>
<td>Smith, Eric</td>
<td>5</td>
</tr>
<tr>
<td>Smith, Savannah</td>
<td>11</td>
</tr>
<tr>
<td>Snyder, Dylan</td>
<td>13</td>
</tr>
<tr>
<td>Soltis, Ella</td>
<td>19</td>
</tr>
<tr>
<td>Sorvaag, Isaiah</td>
<td>12</td>
</tr>
<tr>
<td>Stallter, Kelsey</td>
<td>31</td>
</tr>
<tr>
<td>Steel, Cody</td>
<td>10</td>
</tr>
<tr>
<td>Strachota, Michelé</td>
<td>14</td>
</tr>
<tr>
<td>Sukowicz, Brian</td>
<td>10</td>
</tr>
<tr>
<td>Swanson, Randall</td>
<td>39</td>
</tr>
<tr>
<td>Topp, Joshua</td>
<td>19</td>
</tr>
<tr>
<td>Torres, Angelica</td>
<td>37</td>
</tr>
<tr>
<td>Trimoski, Bill</td>
<td>10</td>
</tr>
<tr>
<td>Uchekwe, Henry</td>
<td>11</td>
</tr>
<tr>
<td>Vandermolen, Hannah</td>
<td>35</td>
</tr>
<tr>
<td>Vasilje, Alessandro</td>
<td>20</td>
</tr>
<tr>
<td>Wallace, Clarence</td>
<td>11</td>
</tr>
<tr>
<td>Wasim, Omar</td>
<td>13</td>
</tr>
<tr>
<td>Watters, Candace</td>
<td>6</td>
</tr>
<tr>
<td>Weber, Kelsey</td>
<td>9</td>
</tr>
<tr>
<td>Weber, Regan</td>
<td>6</td>
</tr>
<tr>
<td>West, Sarah</td>
<td>35</td>
</tr>
<tr>
<td>Wheeland, Teresa</td>
<td>22</td>
</tr>
<tr>
<td>Wichlinski, Abigail</td>
<td>37</td>
</tr>
<tr>
<td>Wilkins, Kelly</td>
<td>43</td>
</tr>
<tr>
<td>Willenbrink, Kathryn</td>
<td>27</td>
</tr>
</tbody>
</table>
## INDEX OF FACULTY SPONSORS & AUTHORS

<table>
<thead>
<tr>
<th>FACULTY SPONSOR NAME</th>
<th>PAGE NUMBER(S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atchison, Amy</td>
<td>28</td>
</tr>
<tr>
<td>Bouyer, Patrice</td>
<td>7, 8</td>
</tr>
<tr>
<td>Brugh, Lorraine</td>
<td>23</td>
</tr>
<tr>
<td>Bugajski, Kristi</td>
<td>7</td>
</tr>
<tr>
<td>Capaldi, Alex</td>
<td>20, 21</td>
</tr>
<tr>
<td>Carlson, Kieth</td>
<td>28</td>
</tr>
<tr>
<td>Carter, Heath</td>
<td>17</td>
</tr>
<tr>
<td>Cory, Amy</td>
<td>44</td>
</tr>
<tr>
<td>Coto, Jeffrey</td>
<td>42</td>
</tr>
<tr>
<td>Florence, Candace</td>
<td>42</td>
</tr>
<tr>
<td>Ganesh Babu, Bharath</td>
<td>16</td>
</tr>
<tr>
<td>Gibson-Even, Adam</td>
<td>26</td>
</tr>
<tr>
<td>Glass, Michael</td>
<td>10</td>
</tr>
<tr>
<td>Goyne, Thomas</td>
<td>10</td>
</tr>
<tr>
<td>He, Haiying</td>
<td>25, 26</td>
</tr>
<tr>
<td>Helm, Kelly</td>
<td>18, 19, 20</td>
</tr>
<tr>
<td>Holt, Jennifer</td>
<td>9</td>
</tr>
<tr>
<td>Houl-Saros, Stacy</td>
<td>14</td>
</tr>
<tr>
<td>Hrivnak, Bruce</td>
<td>27</td>
</tr>
<tr>
<td>Jha, Sanjeev</td>
<td>39</td>
</tr>
<tr>
<td>Kessler, Theresa</td>
<td>44</td>
</tr>
<tr>
<td>Kolba, Tiffany</td>
<td>12, 20, 21, 22</td>
</tr>
<tr>
<td>Larson, Carol</td>
<td>41</td>
</tr>
<tr>
<td>Lavin-Loucks, Danielle</td>
<td>33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FACULTY SPONSOR NAME</th>
<th>PAGE NUMBERS (S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuhehi, Shahin</td>
<td>41</td>
</tr>
<tr>
<td>Ostoyich, Kevin</td>
<td>17</td>
</tr>
<tr>
<td>Palumbo, Robert</td>
<td>40, 41</td>
</tr>
<tr>
<td>Pati, George</td>
<td>38</td>
</tr>
<tr>
<td>Peller, Julie</td>
<td>8</td>
</tr>
<tr>
<td>Potter, George</td>
<td>14</td>
</tr>
<tr>
<td>Ringenberg, Matthew</td>
<td>29, 30, 31, 32, 33</td>
</tr>
<tr>
<td>Rosasco, Nicholas</td>
<td>11, 12</td>
</tr>
<tr>
<td>Schmitt, Karl</td>
<td>13</td>
</tr>
<tr>
<td>Schoer, Jon</td>
<td>9, 41</td>
</tr>
<tr>
<td>Schuette, Allison</td>
<td>5</td>
</tr>
<tr>
<td>Simpson, Alfred</td>
<td>18, 19</td>
</tr>
<tr>
<td>Stanislaus, Shirvel</td>
<td>24, 25, 27</td>
</tr>
<tr>
<td>Szaniszlo, Zsuzsanna</td>
<td>22</td>
</tr>
<tr>
<td>Telligman, Megan</td>
<td>5</td>
</tr>
<tr>
<td>Tomasik, Timothy</td>
<td>15</td>
</tr>
<tr>
<td>Trexler, Melanie</td>
<td>38</td>
</tr>
<tr>
<td>Uhde, Katharina</td>
<td>23, 24</td>
</tr>
<tr>
<td>Venstrom, Luke</td>
<td>40, 41</td>
</tr>
<tr>
<td>Volk, Rhonda</td>
<td>43</td>
</tr>
<tr>
<td>Western, David</td>
<td>4</td>
</tr>
<tr>
<td>Wetherell, Geoff</td>
<td>29</td>
</tr>
<tr>
<td>White, Dan</td>
<td>40</td>
</tr>
<tr>
<td>Wuerffel, Liz</td>
<td>6</td>
</tr>
<tr>
<td>Yogan, Lissa</td>
<td>34, 35, 36, 37</td>
</tr>
</tbody>
</table>