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# Spokane Intercollegiate Research Conference 2014

Gonzaga University

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**Spokane Intercollegiate Research Conference**  
**Gonzaga University**  
**April 26, 2014**

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This year's Spokane Intercollegiate Research Conference is sponsored by the following:

The Office of the Dean of the College of Arts and Sciences  
The Office of the Academic Vice President of Gonzaga University  
The Office of Sponsored Research and Programs

## WELCOME FROM THE PRESIDENT OF GONZAGA UNIVERSITY

Dear Conference Participants:

Greetings and welcome to the 12<sup>th</sup> Annual Spokane Intercollegiate Research Conference! On behalf of the Gonzaga community, I would like to thank all students—from Whitworth, Eastern Washington University, Washington State University, the Community Colleges of Spokane, and Gonzaga—for your participation in this conference. I am pleased and proud that Gonzaga is hosting this gathering as we celebrate the remarkable achievements in student inquiry, creative activity, and scholarship. I would like to extend a particular welcome to those students from the five regional colleges and universities participating in the grant project from the Independent Colleges of Washington: Saint Martin's University, Seattle Pacific, Heritage University, Pacific Lutheran University, and Walla Walla University.

I would like to extend my sincere thanks and appreciation to Gonzaga's College of Arts and Sciences—particularly Dr. Ann Ciasullo, Mrs. Carolyn Von Muller, and the faculty planning committee—for organizing the event. As has been the case in the past, I am impressed by the quality and diversity of student applications—ranging in subject from Biology, Communication Arts, Math, Philosophy, Political Science, Psychology, to Special Education, Art, Literature, Environmental Studies, Sociology and more—and I am energized by the wealth of distinguished, original student research that will be presented at this conference. I am also grateful to the faculty members from the participating institutions who have mentored the student presenters, as well as to those who are giving their time to chair presentation sessions during the conference.

I'd also like to express thanks to the many people who have organized and will be leading the lunch time workshops, all of which are aimed at helping students take advantage of post-baccalaureate professional opportunities. From the Career Center's information tables about jobs and internships to the faculty-led sessions on publishing, applying to graduate school, and participating in service learning, SIRC will be providing you with valuable resources for professionalization and networking. I hope you will take advantage of these resources.

Students, thank you for the hard work you invested in preparing your research; it is your dedication and passion that makes this such a valuable event. This is a wonderful opportunity to hear about excellent scholarship from a variety of fields, to see what other students and researchers are working on, to get experience presenting your own work to an audience, and to get feedback from outside sources. We know that undergraduate research, especially in conjunction with faculty mentors, is one of the high-impact practices that result in deeper learning and lead to student success in college and beyond. That makes this conference a valuable support for your scholarly development.

I wish the participants and organizers of this event all the best, and I am very happy that Gonzaga can play a role in supporting and celebrating student scholarship.

Sincerely yours,

A handwritten signature in blue ink, reading "Thayne M. McCulloh". The signature is fluid and cursive, with a long horizontal line extending to the right.

Thayne M. McCulloh, D.Phil.  
President

## **2014 Spokane Intercollegiate Research Conference (SIRC) Mission Statement**

SIRC is committed to promoting excellence in undergraduate research from all disciplines.

SIRC serves as a venue for undergraduate researchers from any discipline to present their scholarly research to their fellow students and scholars in and beyond their discipline.

SIRC provides disciplinary-specific guidelines to help undergraduate researchers develop their conference presentations.

SIRC fosters meaningful mentoring relationships between faculty and undergraduates.

SIRC fosters collaboration among Spokane area universities and community colleges.

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## **2014 Spokane Intercollegiate Research Conference ICW Grant**

As a result of a grant from the Independent Colleges of Washington, this year's SIRC includes participants not only from the immediate region but also from the west side of the state. Students from St. Martin's University in Lacey; Heritage University in Toppenish; Pacific Lutheran University in Tacoma; Seattle Pacific University; and Walla Walla University are joining presenters from local universities and colleges.

The ICW project addresses the target areas of enhancing public awareness of the value of an independent college education and increasing student opportunities for undergraduate research with faculty mentors. Undergraduate research has been identified by the National Survey of Student Engagement as one of ten high-impact educational practices. Faculty-mentored research plays an important part in student education across all disciplines. The role research plays in advancing learning can be seen in degree attainment and in retention of diverse students in historically underrepresented fields. High school seniors often feel that they will not be able to participate in research unless they are at a Research I university when in actuality the opposite is true. According to the National Survey of Student Engagement, "Students at independent colleges and universities are more likely than their peers at public institutions to have the opportunity to work with faculty members on relevant research in their field outside of course or program requirements." The statistics speak for themselves: 25% of seniors surveyed at non-doctoral independent colleges reported faculty-mentored research experiences versus only 18% in public non-doctoral universities.

Congratulations and welcome to the ICW participants.

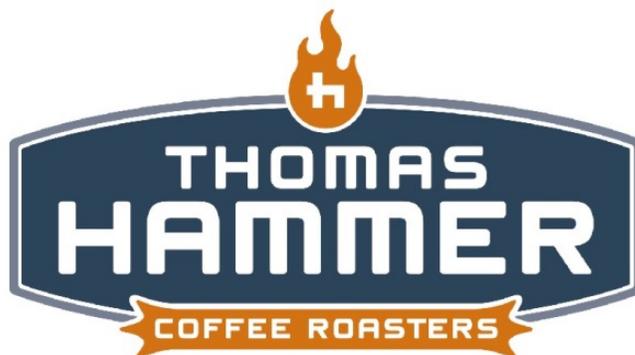
**SPOKANE INTERCOLLEGIATE RESEARCH CONFERENCE  
GONZAGA UNIVERSITY, APRIL 26, 2014  
Conference Schedule**

<b>Session 1:</b>	<b>4:00 pm – 6:00 pm, Friday, April 25</b>		
Session 1	Walla Walla University Showcase	Herak Club Room	Pages 7 - 8
<b>Conference Registration/Check-in: 8:00 a.m.-2:00 p.m.</b>		Jepson Lobby	
<b>Sessions 2-10: 9:00 am – 10:15 am</b>			
Session 2	Creating a Modern Sustainable Community	120 Jepson	Pages 8 - 9
Session 3	Development Economics, Problems and Potential - One	103 Jepson	Page 9
Session 4	Disparities, Differences Loyalties: State and Society Today	104 Jepson	Page 10
Session 5	Fabulous Foils in the Fiction of 18th-century Britain	111 Jepson	Pages 10 - 11
Session 6	Historical Methodology of the Past	113 Jepson	Pages 11 - 12
Session 7	Looking at the World through a Philosophical Lens	122 Jepson	Pages 12 - 13
Session 8	Performative Art	Magnuson Theatre	Pages 13 - 14
Session 9	Sociology of the Family	123 Jepson	Pages 14 - 15
Session 10	The Technological Revolution: Privacy, Surveillance, and Anonymity	127 Jepson	Page 15
<b>Sessions 11-21: 10:30 am – 11:45 am</b>			
Session 11	Development Economics, Problems and Potential - Two	103 Jepson	Page 16
Session 12	From Electrons to Applications: The Behavior and Analysis of Molecules	111 Jepson	Pages 16 - 17
Session 13	Historical Methodology of the Present	104 Jepson	Pages 17 - 18
Session 14	A Close Look at Hook-Up Culture	113 Jepson	Page 18
Session 15	Is Seeing Believing?: Representations of the Real and the Desired in Popular Film	120 Jepson	Page 19
Session 16	Mathematical Models and Natural Systems	122 Jepson	Page 20
Session 17	Power Plays: Access To and Appearance of Power in Literature	123 Jepson	Pages 20 - 21
Session 18	Public Morality and "Private" Behaviors	124 Jepson	Pages 21 - 22
Session 19	Creating the Self in Creative Nonfiction	127 Jepson	Pages 22 - 23
Session 20	Statistical Theory in Social Sciences	126 Jepson	Pages 23 - 24
Session 21	Technology and Society	017 Jepson	Pages 24 - 25
<b>Posters 43-84</b>	<b>Poster Session One</b>	107, 108, 109	Pages 42 - 52
<b>Lunch Panels: 11:45 am – 1:00 pm</b>			
Lunch (by previous reservation) for participants, faculty sponsors, and guests		Jepson Lobby/Various Rooms	
<b>Sessions 22-32: 1:15 pm – 2:30 pm</b>			
Session 22	Breaking Boundaries with Transgressive Characters: Examining Gender	127 Jepson	Page 25
Session 23	Bringing the Past into the Present: The Art of Translation	103 Jepson	Page 26
Session 24	Crime, Deviance, and Social Control	104 Jepson	Pages 26 - 27
Session 25	Critical Perspectives on Education	111 Jepson	Pages 27 - 28
Session 26	Critical Perspectives on Media	113 Jepson	Pages 28 - 29
Session 27	Ecological Systems	122 Jepson	Pages 29 - 30
Session 28	Psychology of Religion and Interpersonal Attraction	120 Jepson	Pages 30 - 31
Session 29	Social Justice in Society	123 Jepson	Page 31
Session 30	Sociology of Sex and Intimacy	124 Jepson	Pages 31 - 32
Session 31	Sociology of the Body	126 Jepson	Pages 32 - 33
Session 32	The Makings of Modernism	017 Jepson	Pages 33 - 34
<b>Sessions 33-42: 2:45 pm – 4:00 pm</b>			
Session 33	An Exploration of Gender in Society	124 Jepson	Pages 34 - 35
Session 34	An Exploration of Social Behaviors	126 Jepson	Page 35
Session 35	Biological Systems	127 Jepson	Page 36
Session 36	Cultural and Narrative Psychology	103 Jepson	Page 37
Session 37	Dynamic Algorithms	104 Jepson	Pages 37 - 38
Session 38	History: Rome to Harper's Ferry	111 Jepson	Pages 38 - 39
Session 39	Perceptual Effects on Cognition and Emotion	120 Jepson	Pages 39 - 40
Session 40	Statistics in the Modern World	113 Jepson	Page 40
Session 41	The Monstrosity of Humankind: Violence and Tragedy in the Early Middle Ages	122 Jepson	Page 41
Session 42	Psychological Considerations for College Campuses	123 Jepson	Pages 41 - 42
<b>Posters 85-132</b>	<b>Poster Session Two</b>	107, 108, 109	Pages 52 - 63

## **Lunch Panel Presentations: Your Future and a Slice**

Complimentary lunch is being provided by David's Pizza, a local eatery. Their truck will be located outside of Jepson, rain or shine, by 11:30 a.m. Please grab a couple of slices of pizza and a soft drink after the morning sessions. Then, head to one of the lunchtime panels below. These informal discussions are aimed at providing SIRC presenters with important information about post-graduate opportunities and possibilities for professional development.

- Session 1: Applying to graduate school in the humanities and social sciences (Room 122)**  
A workshop with Dr. Vik Gumbhir, Associate Professor of Sociology
- Session 2: Applying to graduate school in the natural sciences (Room 123)**  
A workshop with Dr. Jeff Watson, Assistant Professor of Chemistry and Biochemistry, and Dr. Gary Chang, Assistant Professor of Biology
- Session 3: Applying to law school/careers in law (Room 124)**  
A presentation by Kevin Tavares, graduate of the University of Washington Law School and associate at Lukins & Annis; Dr. Inga Laurent, Assistant Professor, Gonzaga University School of Law; and Ben Blohowiak, third-year student, GU School of Law
- Session 4: Finding fruitful internships (Room 103)**  
A discussion led by Chris Ryman, Internship Manager, Gonzaga University
- Session 5: Learning about professional opportunities in K-12 teaching and administration (Room 104)**  
A presentation by Dr. John Traynor, Assistant Professor of Teacher Education
- Session 6: Publishing your research in the humanities and social sciences (Room 111)**  
A presentation by Dr. Linda Tredennick, Associate Professor of English, and Dr. Erik Schmidt, Associate Professor of Philosophy
- Session 7: Working in the service sector: Peace Corps, Jesuit Volunteer Corps, and Teach for America (Room 113)**  
A discussion led by Jennifer Day, Peace Corps; Catherine DiSarno, Jesuit Volunteer Corps; and Anna Krzyminski, Teach for America
- Session 8: "Selling" SIRC: How to talk about SIRC in cover letters and on resumes (Room 114)**  
A workshop led by Brittany Leland, Training Manager, Career Center & GAMP, and Mary Ritter Heitkemper, Ph.D., Director, Career Center & GAMP
- Job Fair: Local employers will be available to discuss job opportunities (Jepson Lobby)**



Thomas Hammer Coffee Roasters, located on the lower level of Jepson, will be open from 7:30 a.m. to 1:30 p.m. during the conference.

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**Funding and administrative support for this year's SIRC has been provided by:**

Gonzaga University's Office of the Dean of Arts and Sciences  
Gonzaga University's Associate Academic Vice President  
Gonzaga University's Office of Sponsored Research and Programs  
Gonzaga University's Office of the Academic Vice President  
Gonzaga University's Department of Marketing and Communications

**The SIRC Planning Committee would like to thank the following for their donations/services:**

Gonzaga University Bookstore  
Gonzaga University Alumni Office  
Gonzaga University Theater Department  
Thomas Hammer Coffee  
David's Pizza  
The Garland Theater  
Atticus Coffee/Boo Radley's Gifts

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**The 2014 Spokane Intercollegiate Research Conference was planned by the following faculty and staff:**

Ann Ciasullo, Gonzaga University  
Caroline Fu, Gonzaga University  
Corinne Gould, Gonzaga University  
Vikas Gumbhir, Gonzaga University  
Kris Morehouse, Gonzaga University  
Katey Roden, Gonzaga University  
Patricia Terry, Gonzaga University  
Michael Treleavan, Gonzaga University  
Carolyn Von Muller, Gonzaga University  
Christy Watson, Gonzaga University  
Jeffrey Watson, Gonzaga University

**SPOKANE INTERCOLLEGIATE RESEARCH CONFERENCE**  
**APRIL 26, 2014**  
**GONZAGA UNIVERSITY CAMPUS**  
**Session Summaries**

**SESSION 1: WALLA WALLA PANEL**  
**Faculty Moderator: Dan Lamberton, Walla Walla University**  
**Friday, April 25, 4:00-6:00 p.m., Herak Club Room**

1A - How Does Chia Affect the Murine Immune System?

**Cedric Thiel, Walla Walla University**

Chia (*Salvia hispanica*) is touted as a “superfood” in today’s dietary-supplement market, but there is little scientific research to substantiate the claims made about it. Existing research indicates that chia may inhibit proliferation of rapidly dividing cells, but the work has been limited to cancer cell lines. One non-cancerous source of rapidly dividing cells in mammals is the immune system, a key component in allergic reactions. Chia has been cited as a treatment for allergies, and to evaluate this claim we fed chia to mice for six weeks, after which one aspect of the murine immune system, T-cell replication, was evaluated. Our results show a short-lived decrease in T-cell replication. Because T-cells are necessary for the initiation of an allergic response, a reduction in T-cell replication might inhibit allergic reactions.

*Faculty Sponsor: Joan Redd, Walla Walla University*

1B - Getting Authority to be Female and Violent from the Bible: Elizabeth I as Deborah and Jael

**Marie Barnett, Walla Walla University**

My project focuses on gender and women’s studies and religious studies relating to early modern English history during Elizabeth’s reign. Protestant writers and ministers in sermons and books frequently compared Elizabeth I and the Biblical Deborah and Jael, women who ruled or killed for their nation and God. I conclude that these comparisons served primarily to defend Elizabeth’s authority by enhancing her authority to rule religiously and civilly, by giving her a God-ordained destiny, and by justifying her right to be involved in war, as a female. The Deborah and Jael/Elizabeth comparison is well-known in this field, but all discussions of it that I have found are book chapters, not full projects.

*Faculty Sponsor: Greg Dodds, Walla Walla University*

1C - Pride and Prowess: The Destruction of General George B. McClellan’s Career

**Matthew Hagele, Walla Walla University**

Though General George B. McClellan’s West Point courses and later experience in both martial and civil engineering projects created an astute engineer, his engineering training was preceded by upper-class social training where he was made to feel beyond reproach. McClellan, one of the few authorities in his trade, would not tolerate being questioned. With this outlook, McClellan made enemies of his superiors throughout his life. Historians note McClellan was a success in the railroad industry, but was attacked for failing to communicate with his superiors. In the Civil War, McClellan formulated grand plans, but his failure to communicate them to his superiors caused him to lose his military command. Throughout his professional life, McClellan demonstrates why engineers must be able to communicate with those around them. Had he been able to clearly and appropriately express his ideas, he would possibly have changed the progress of the Civil War.

*Faculty Sponsor: Dan Lamberton, Walla Walla University*

1D - Changing the Model of Gatekeepers: The Egyptian Riots of the 2011 Arab Spring

**Eric Weber, Walla Walla University**

Social media has become an integral part of most people’s daily lives. Used for a variety of purposes, social media has lately become more and more of a source of news. No longer only a place of miscellaneous posts, it has become an inside source, giving the public different platforms to relay first-hand information like never before. In my paper I will be using the Egyptian riots of the 2011 Arab Spring as a case study to explore how the traditional Communication Theory model of media gatekeepers has changed from an agenda-setting model to a new model where the public can influence the agenda through social media. My methodology will involve analyzing Aljazeera’s coverage of the 2011 riots for any indication of the Egyptian protestors’ influence on the outlet through Twitter, YouTube, various blogs, and Facebook.

*Faculty Sponsor: Deborah Silva, Walla Walla University*

1E - An Examination of Modern Asian Female Stereotypes through the Perspective of Robert van Gulik's *The Chinese Nail Murders*

**Acacia Chan, Walla Walla University**

Twentieth-century scholar and Sinologist Robert van Gulik wrote several detective stories based on the ancient Chinese character of Judge Dee. The female characters in these stories reflect traditional stereotypes of Asian women. The three specific stereotypes which will be introduced in this paper are the bookworm, the docile homemaker, and the dragon lady. This paper uses the characters in Gulik's book *The Chinese Nail Murders* as analytical tools to critically discuss the stereotypes of Asian females in modern Asian-American culture.

*Faculty Sponsor: Dan Lamberton, Walla Walla University*

1F - The Role of Selective Protein Degradation in the Transition from Growth to Development

**Emily Franklin, Walla Walla University**

Ubiquitin-mediated processes are important for a variety of cellular activities, yet their function at the growth-to-development transition is still poorly understood. We use *Dictyostelium* as a model to understand this phenomenon. When *Dictyostelium* cells starve, they stop growing and initiate a developmental program where cells aggregate and form fruiting bodies. UbpA, a ubiquitin protease, is required for this growth-to-development transition. When ubpA cells starve, they accumulate ubiquitin-containing species that likely include proteins that must be degraded for the transition to occur. We tentatively identified these proteins by affinity chromatography and mass spec analysis. Among the putative ubiquitin conjugates was PsmC5, a proteasome subunit. Ubiquitination assays confirm that PsmC5 is ubiquitinated. Experiments to identify interacting proteins suggest that PsmC5 interacts with LmcA, which is involved in nutrient sensing. These results will lead to a better understanding of the mechanisms cells use to sense starvation and respond by making the growth-to-development transition.

*Faculty Sponsor: David Lindsey, Walla Walla University*

## **SESSION 2: CREATING A MODERN SUSTAINABLE COMMUNITY**

**Faculty Moderator: Karen Gutowsky-Zimmerman, Seattle Pacific University**

**9:00-10:15 a.m., Room 120**

2A - A Modern Sustainable Community: Gathering a Collective Narrative - Part One

**Lydia Blair, Lindsey Meyer, and Michael Lund, Seattle Pacific University**

Society today faces multi-layered challenges rooted within the Industrial Revolution. Many have acknowledged that it's time to begin again, to revolve, take what we've learned and start to redesign the modern community. The research behind our project is an attempt to do just that. The proposed community is intended to combine sustainable farming with renewable energies, educational outreach, resilient construction, and support for creativity and healthy living. The goal of our research is to understand the complex issues around these topics; how users will engage in this community; and the types of messages needed to communicate to key stakeholders. Because this community will be dependent on supportive investors, it requires extensive research to develop a comprehensive narrative, which addresses concerns of key stakeholders. This presentation will outline the research process and the methods of content development to be used in investor presentations and graphic material.

*Faculty Sponsor: Karen Gutowsky-Zimmerman and Beth Marie Miller, Seattle Pacific University*

2B - A Modern Sustainable Community: Gathering a Collective Narrative - Part Two

**Charlotte White, Shelby Sprake, and Kristi Holley, Seattle Pacific University**

In this collaborative process, students worked in multidisciplinary teams and used the research that was collected for the narrative for the proposed Modern Sustainable Community. The information was then used to help shape the graphic narrative and visual assets. Students identified messages that conveyed core values of the Modern Sustainable Community to key stakeholders as part of their graphic development. Additional research was conducted, to understand how written narratives translated effectively into specific visual messages. Students developed a variety of graphic assets necessary to communicate core values to key stakeholders such as logos; maps; signage; and packaging. Students also developed a presentation template to communicate a cohesive visual message to stakeholders. This presentation outlines the process and methodology of research, investigation and application needed to convey a comprehensive visual message to an intended audience.

*Faculty Sponsor: Karen Gutowsky-Zimmerman and Beth Marie Miller, Seattle Pacific University*

2C - Foley Field 2.0

**John Beattie, Ben Covino, Mollie Picha, and Richard Graham-Bruno, Gonzaga University**

Foley Field is a plot of land on Gonzaga University's campus that measures out to about a half an acre. It is located between the Crosby Center, the COG, and the Foley Library. Due to this accumulation of stagnant water, students avoid Foley Field, aside from those who traverse through the thick sludge, and activities cease until the ground thaws and the wet season ends. The proposal is on how effective are native plants on redeveloping and reclaiming land which is not usable for most of the portion of the year. To continue this research proposal, there would need to be further research on methods and techniques of native plant success, which are working on our campus and other campuses. If Foley Field, or another plot on campus, were engineered into becoming a natural, native plant field, then this would allow for better landscaping techniques because the native plants are already adapted to this region and the region's weather climate.

*Faculty Sponsor: Greg Gordon, Gonzaga University*

### **SESSION 3: DEVELOPMENT ECONOMICS, PROBLEMS AND POTENTIAL - ONE**

**Faculty Moderator: Erica Johnson, Gonzaga University**

**9:00-10:15 a.m., Room 103**

3A - The Meaning of Production and Credit in Pre-Capitalist Societies: Implications for Contemporary Microfinance

**Domonkos F. Vamossy, Whitworth University**

This study explores the dynamics of production and commodity exchanges in pre-capitalist societies in order to analyze economic development strategies that would complement the informal markets inherent in these societies. Although many societies have achieved substantial economic development in a market economy environment, there are developing societies that still operate in the context of the pre-capitalist mode of production and exchange. If this is the case, development initiatives such as microfinance may not be appropriate for such economic systems. This study uses Bangladesh as a case study to make an empirical connection between pre-capitalistic conditions and the more recent economic state of rural Bangladesh.

*Faculty Sponsor: Vange Ocasio, Whitworth University*

3B - How Does GDP Translate to Green?

**Josslyn Clews, Gonzaga University**

I am researching the question: "Does a higher GDP lead to lower rates of pollution?" My previous research in ecology and economic development indicate that many developed nations with high GDPs, including Norway and France, have emphasized domestic and international investment in green projects. Meanwhile, some developing nations, like Costa Rica with a significantly lower GDP, have maintained remarkably low rates of pollution. The purpose of this empirical paper was to apply statistical tools and regression analysis to my data in order to better understand the correlation (if any) between a country's GDP and the pollution in that country. I ran two regressions; my dependent variable in the first is air pollution, the second is water pollution. Each regression considers an array of developed and developing nations. Other explanatory variables I include in the model, which may contribute to lower levels of pollution, are: investment in green/conservation/sanitation projects and national savings.

*Faculty Sponsor: Erica Johnson, Gonzaga University*

3C - Effectiveness of Official Development Assistance to Developing Countries Relating to Long-Term Foreign Direct Investment

**Meagan Fischer, Gonzaga University**

Official Development Assistance (ODA) measures the amount of aid given to a country with the intention of promoting economic development and welfare. It has received substantial criticism due to the risk that countries will become dependent on the funding and fail to create sustainable self-reliance. One way to analyze the effectiveness of ODA is to look at Foreign Direct Investment (FDI) in countries that receive ODA. If ODA is successful, one could expect to see a positive correlation between amount of assistance and FDI. Theoretically, ODA should improve economic conditions, which would make a country more attractive to outside investors. To test this hypothesis, I will create a model that lists Foreign Direct Investment as a function of Official Development Assistance, while addressing other variables such as GDP growth, Commitment To Development Index (CDI), and industry growth.

*Faculty Sponsor: Erica Johnson, Gonzaga University*

**SESSION 4: DISPARITIES, DIFFERENCES, LOYALTIES: STATE AND SOCIETY TODAY**  
**Faculty Moderator: Michael Treleavan, Gonzaga University**  
**9:00-10:15 a.m., Room 104**

4A - Wealth Disparity in America

**James A. Lumia, Gonzaga University**

A written paper that focuses on wealth disparity in the United States of America will support my oral/slide-deck presentation. The three main points of my paper and presentation will be: 1. Defining wealth disparity and discussing where our nation currently stands with this issue. 2. Examining the multiple factors that have led to present state of America's wealth disparity. 3. Projection of future issues that will arise if wealth disparity continues unchecked; ultimately delivering a call to action. My sources will include a multitude of written and electronic publications, studies, and expert opinions covering a variety of American social issues clearly related to wealth disparity.

*Faculty Sponsor: Michael Treleavan, Gonzaga University*

4B - No Servant Can Serve Two Masters: The Allegiances of Elected Public Officials in the United States

**Justin Botejue, Whitworth University**

The majority of our public servants affiliate themselves with Christianity, but where does their allegiance lie? Is it to God or to the people that elected them to their position? This research project looks at the responses to these questions by surveying the scholarly literature and reporting the prescriptions that public intellectuals offer. While Christian identity politics are usually confined to private lives, this presentation will give insight to the challenges faced by Christian politicians, with consideration to the fields of political science, theology, and philosophy. This is an independent project to shed light on an important issue for Christians considering a career in public service.

*Faculty Sponsor: Karin Heller, Whitworth University*

4C - French Republicanism, Nationalism, and the Othering of the Immigrant

**Luke Olsen, Whitworth University**

Immigration in France is currently a controversial and polarizing issue. This research examines the ways in which difference is otherized in France and how the immigrant functions as the Other. Using Benedict Anderson's theory of "imagined communities," it traces the construction of French national identity, politically, culturally, and religiously, and examines the ways in which the immigrant interacts with and challenges this imagined community--in the education system, in the banlieues, and, perhaps most significantly, in the Church. Finally, it will examine two contemporary French responses to this problem: a post-republican multiculturalism and a revamped neo-republicanism. It offers an understanding of this current issue in a French context which provides an important perspective for other countries, like the United States, who, due to immigration and globalization, are grappling with their own changing national identities.

*Faculty Sponsor: Bendi Benson Schrambach, Whitworth University*

**SESSION 5: FABULOUS FOIL IN THE FICTION OF 18TH-CENTURY BRITAIN**

**Faculty Moderator: Pamela Parker, Whitworth University**

**9:00-10:15 a.m., Room 111**

5A - Market Competition: The Impact of Marriage on Competition in *The Female Quixote* and *Sense and Sensibility*

**Mary Schmick, Whitworth University**

In Charlotte Lennox's *The Female Quixote* and Jane Austen's *Sense and Sensibility* the rivalries between the foil characters are a commentary on the expectations of women to marry well in eighteenth century England. While Miss Glanville and Lucy Steele are both flawed characters, in the context of the time period their actions are rational, and their motives and behavior speak more to the social pressure placed on marriage than it does on their individual character. Education, wealth, class, and beauty all are assets that determine how valuable a commodity a woman is in the marriage market. Moreover, the nature of the marriage market in the eighteenth century makes it so that in the two novels, female friendships are prevented from forming and instead rivalry is encouraged. The heroines in both novels are not faultless, but rather they have more advantaged circumstances than their foil characters.

*Faculty Sponsor: Pamela Parker, Whitworth University*

5B - Mean Girls: Female Rivalry of the Marriage Market of *Tom Jones*, *The Female Quixote*, and *Sense and Sensibility*

**Laryssa Lynch, Whitworth University**

Woman versus Woman, female rivalry, is a timeless social tension and effective narrative conflict utilized in literature. In Henry Fielding's *Tom Jones*, Jane Austen's *Sense and Sensibility*, and Charlotte Lennox's *The Female Quixote*, the establishment of competing female characters is the product not only of authorial intent, but of 18<sup>th</sup> century gender norms and societal expectation. Each of the three novels provides implicit and explicit commentary on marriage as an element of primogeniture, patriarchal economic system. Thus driven by necessity to compete for limited resources, a woman's most profitable investment was her capacity for successful courtship. Fielding's Molly Seagrim, Austen's Lucy Steele, and Lennox's Charlotte Glanville are all disadvantaged in their rivalry, outmatched in terms of beauty, education, and propriety. In light of this historical and textual context, Molly, Lucy, and Charlotte should be examined not as villains, but as strategic survivalists.

*Faculty Sponsor: Pamela Parker, Whitworth University*

5C - On Terms of Equality: Marital Negotiations in *The Female Quixote* and *Sense and Sensibility*

**Lauren NuDelman, Whitworth University**

In "On Terms of Equality: Marital Negotiations in *The Female Quixote* and *Sense and Sensibility*," the rhetorical and cultural significance of female foils are explored. As seen in their respective texts, Charlotte Glanville and Lucy Steele are vilified for reasons that are far outside their control. They are products of a deep social inequity that disadvantages them to traditional heroines, yet they are forced into prescriptive and antagonistic roles. This paper explores the implications of this problematic double standard. In doing so, it looks at the limits of female agency in Lennox's *The Female Quixote* and Austen's *Sense and Sensibility*, specifically at the issues of economics, female education, and traditional feminine traits.

*Faculty Sponsor: Pamela Parker, Whitworth University*

5D - Misreading Romance

**Rowanne Fairchild, Whitworth University**

In my essay "Misreading Romance," I examine the ways Charlotte Lennox and Jane Austen restructure the audience's perception of male and female virtue through their novels *The Female Quixote* and *Sense and Sensibility*, respectively. Both texts share similar themes of gender values and romantic ideals, and seek to restructure the audience's expectations of both subjects. The two novels argue for balance between reason and emotion in women, and restructure masculine virtues to promote the value of faithfulness over chivalry. Both authors seek to temper unrealistic expectation through the employment of their characters and the romantic relationships they entertain. In addition to challenging the audience's expectation of male and female virtues, I will address how Lennox and Austen argue for improved ideals in both sexes. In this essay I propose the characters be perceived as rhetorical devices utilized not only for the function of entertainment, but for the didactic purpose of correcting the audience's improper perception of virtue.

*Faculty Sponsor: Pamela Parker, Whitworth University*

## **SESSION 6: HISTORICAL METHODOLOGY OF THE PAST**

**Faculty Moderator: Vikas Gumbhir, Gonzaga University**

**9:00-10:15 a.m., Room 113**

6A - Universal History

**Anne Dhanens, Whitworth University**

Universal History is the methodology that attempts to fit all of human history into one overarching historical narrative. This paper will explore what defines Universal History and the different ways this historiography has manifested itself, as well as the critiques aimed at it. As various universal historians such as Jacques-Bénigne Bossuet and Harry Watson are examined, this paper will attempt to determine whether a true universal history is possible. Referencing the ideas of Frederick von Schiller and Benedetto Croce, it will also investigate the flaws in the idea of the greater historical narrative championed by the universal historians. Ultimately, after examining various universal historians and critiques of the historiography, it becomes clear that, while universal history has its place in the theoretical study of history, it is impractical and nearly impossible to implement in its truest form as a methodology, rendering it less relevant in academic circles.

*Faculty Sponsor: Dale Soden, Whitworth University*

6B - Are Relations to Production Everything? An Examination of the Validity and Relevance of Marxist Historiography

**Heather Glady, Whitworth University**

The central question of this paper is whether or not a Marxist interpretation of history is still a valid method of historical understanding despite its dismissal by the post-modern schools of historiography. First, it examines Karl Marx (1818-1883) and Friedrich Engels' (1820-1895) original theories of historical progression and historiography found in texts such as the *Communist Manifesto* (1848) and *Capital* (1867). Next, the paper addresses the primary arguments against the school such as Sir Isaiah Berlin's claim that Marxist historiography is too deterministic. Subsequently, the paper refutes each point, utilizing the works of scholars such as H.B. Acton to do so, and ultimately, it is concluded that Marxist historiography should actually be one of the main methods used to interpret history in the present age because it can provide historians a broader and more structured system of interpretation than can be found in post-modern historical schools of interpretation.

*Faculty Sponsor: Corliss Slack, Whitworth University*

6C - Le rôle de Rousseau et son Contrat social sur l'influence de la Révolution française

**Sarah Gambell, Whitworth University**

Translated from its original form in French, this paper shows the extent of Jean-Jacques Rousseau's influence preceding and during the French Revolution and the repercussions of his literature in the emerging Napoleonic age. Though the analysis of some of his most influential works, *Julie, ou La Nouvelle Héloïse*, *Émile, ou De l'éducation*, and his arguably most influential work, *Contrat social*, it is possible to see the growing political and social cults of Rousseau which rendered his ideology of the General Will and the role of the government some of the most persuasive and motivating for revolutionaries. Also discussed is the social and political environment of France during this époque which readied French citizens for the period of change proposed by Rousseau's writings.

*Faculty Sponsor: Bendi Benson Schrambach, Whitworth University*

6D - Revealing a Strange and Unsettling Modernity

**Sarah O'Hare, Eastern Washington University**

In examining a hierarchy of fears, specifically the fear of man, death and truth, within the context of Friedrich Nietzsche's and G.W.F. Hegel's philosophies, the strange and unsettling nature of modernity is revealed. Part one discusses the foundational fear, the "Fear of Man" with regards to the Nietzschean slave revolt in morality. Part two examines the secondary fear, the "Fear of Death" from the perspective of commentators Walter Kaufmann and Stephen Houlgate. Part three focuses on the highest fear, the "Fear of Truth." Nietzsche's inescapable inquiry into modernity's fondness for truth is linked to the Hegel's theory of self-consciousness's epistemological enrichment witnessed at its confrontation with experience. The conclusions drawn suggest an alternative ethic which has the potential to eradicate these fears as they stand now, for a stronger future.

*Faculty Sponsor: Thomas Hawley, Eastern Washington University*

## SESSION 7: LOOKING AT THE WORLD THROUGH A PHILOSOPHICAL LENS

**Faculty Moderator: Dan Bradley, Gonzaga University**

**9:00-10:15 a.m., Room 122**

7A - The Problem of Systemic Evil

**Elliny Hiebert, Eastern Washington University**

This presentation deals with the most perfect of worlds theory, as presented by Modern Philosopher Leibniz, as well as with the concept of evil, most specifically in relation to Hannah Arendt's question of the banality of evil. Since evil is so systemic and ingrained into the structure of modern-day society, it is getting increasingly harder to not only evaluate an individual's acts as evil but to be able to detect evil acts as well. This presentation will address the deficiencies in the most perfect of worlds theory in relation to the current state of systemic evil.

*Faculty Sponsor: Kevin Decker, Eastern Washington University*

7B - The Demands of Disagreement: A Case for Conciliationism

**Jonathan Kim, Whitworth University**

Disagreements abound in virtually every sphere of intellectual inquiry, be it philosophical, religious, or political. Furthermore, many of these disagreements involve persons of comparable intelligence and learning. Thus the question of

how to respond to such disagreements is one of significant importance. Accordingly, the philosophical literature on this topic has been growing, offering a variety of views that advise the appropriate way to respond. One of these views is conciliationism, which states that in the face of such disagreements one is rationally required to reduce confidence in one's belief. The success of this view can entail wide skeptical implications, and unsurprisingly it has generated much controversy. This controversy has spawned various challenges to the view, the most worrisome of which I believe is the objection that it is self-defeating. In this paper I advocate a strong version of conciliationism and offer ways in which the conciliationist can respond to the self-defeat objection.

*Faculty Sponsor: Nathan King, Whitworth University*

7C - Nozick Defended: The Inviolability of Individual Property Rights

**Sam Director, Whitworth University**

In *Anarchy, State, and Utopia*, Robert Nozick argues that a state more extensive than a minimal state is morally illegitimate. This claim is the eventual logical implication of his key premise: the existence of inviolable individual property rights. Nozick's critics agree that his argument is valid, but they have attacked the soundness of his proof by arguing that he fails to justify his key premise. In this presentation, I defend Nozick from this accusation by arguing that there is reason to grant this premise and thus reason to view his argument as logically sound. Thus, my goal is to provide justification for the existence of inviolable individual property rights. I will 1. outline Nozick's argument, 2. explain the above-mentioned objection (as developed by Thomas Nagel), and 3. defend Nozick from this objection by providing an argument to support the inviolability of individual property rights.

*Faculty Sponsor: Nathan King, Whitworth University*

7D - Berry, Dewey, and Communion

**Justin Burgard, Gonzaga University**

The idea of community is critical to Wendell Berry and John Dewey; yet Dewey understands community to be able to reach across space while Berry understands it only as a group of people who can know each other. This presentation argues that Dewey's conception of community can no longer sustain his philosophy and a project like Berry's must be embraced. Democracy and education, as mainstays of Dewey's thought, must be reexamined in light of the smaller community. Berry's approach to land and community provides a grounding to interpret Dewey and allow his idea to contribute fresh insight to the world.

*Faculty Sponsor: Dan Bradley, Gonzaga University*

## SESSION 8: PERFORMATIVE ART

**Faculty Moderator: Suzanne Ostersmith, Gonzaga University**

**9:00-10:15 a.m., Magnuson Theatre, College Hall**

8A - The Journey: One Dancer's Transition from Classical Ballet to Contemporary Modern

**Hannah Wentz, Gonzaga University**

This project follows the cultural and historical progression of dance history from the traditionally theatre-based art form as it develops and expands out into the world, from traditionally classical ballet through organic modern and into contemporary movement. Comprised of four distinct movements, "The Journey" follows a dancer's experience in each of the choreographed pieces as she adapts to the new styles. Several phrases of movement echo throughout the project, as the pieces of choreography dynamically alter and grow depending on the style being performed. I hoped to create something meaningful and educational with this project. People do not always realize that dance can be used to educate, to communicate, and to inspire, but I want to change that - I want to share something that I love with the world in a way that resonates with the people it reaches.

*Faculty Sponsor: Suzanne Ostersmith, Gonzaga University*

8B - One Piece: A Choreographic Study of the Benefits of Nonsexual Physical Human Connection

**Laura Shellooe, Gonzaga University**

Think about how many of us pass by each other without any recognition that we are all connected to a larger human community. Additionally, we usually do not sustain healthy physical contact with each other unless it is in a sexual way. Healthy physical nonsexual contact is meaningful in building up human relationships since it requires us to be open to others in the human community. I was given the opportunity to explore these ideas through choreography in Gonzaga

University's choreography class and in leading Gonzaga's Informal Dance Company which will be performing at the American College Dance Association (ACDA) Northwest Dance Conference. The dance piece that will be performed during this talk explores how dancing contact improvisation, a form of nonsexual physical human contact, helps human beings to learn to work together as a group.

*Faculty Sponsor: Suzanne Ostersmith, Gonzaga University*

8C - Dysfunctional Comedy: An Intertextual Performance

**Nate Strain, Seth Flanders, and Kyle Johnson, Whitworth University**

An exploration through performance of the fine line between comedy and satire, and bullying and abuse. Through the use of found texts, movement, and music, three actors explore the dark side of comedy when "good fun" is taken to the extreme. Intertextual performance is a means of using theatre to explore the complexities of an idea or issue in creative ways.

*Faculty Sponsor: Diana Trotter, Whitworth University*

### **SESSION 9: SOCIOLOGY OF THE FAMILY**

**Faculty Moderator: Patricia Terry, Gonzaga University**

**9:00-10:15 a.m., Room 123**

9A - Fostering Care for Foster Children - DNA Doesn't Make a Family, Love Does

**Arlene Chandra, Gonzaga University**

Foster care is notorious for handling an overwhelming workload. The Child Welfare League of America observed that caseworkers were responsible for 55 children, even though the League recommended a caseload of no more than 15 children. Thus, the child welfare system is unable to address the primary issue contributing to child abuse, neglect, and removal: lack of attachment (Foster Care 2014). This research focuses on why and how foster parents and the child welfare system as a whole, should focus on establishing a caregiver-child relationship (Berneanu 2013; Jones and Morris 2012). More specifically, this research examines previously researched qualitative and quantitative data provided from foster parents and children. The data suggests that the quality of caregiver-child relationships is predictive of future adjustment, developmental, internal and external problems (Jones and Morris 2012). By establishing rapport, a child will soon rely on caregivers for love and support, even if it is temporary.

*Faculty Sponsor: Marguerite Marin, Gonzaga University*

9B - Love Outside the Box: Polyamory and Equality

**Corrine Stocking, Gonzaga University**

Polyamory (poly) is a subgroup within non-monogamy, literally translating to "many loves." Polyamorous relationships do not have a distinct configuration, but rather have common themes within the relationships, including love, honesty and disclosure, consent, and equality (Klesse 2011; Wilkins 2008). How do these polyamorous relationships negotiate and define equality? In order to understand the equality aspect of poly relationships, I will conduct in-depth interviews with self-identified poly individuals to hear their stories. Participants were recruited initially from a polyamorous meet up website by the coordinator of the group, who then forwarded the information of the study to other poly people, creating a snowball sample of participants. To understand how self-identified poly people define equality, I will ask them about their perceptions of first and current relationships, their ideal relationship, boundaries within relationships, and how they view and solve conflict within relationships.

*Faculty Sponsor: Nicole Willms, Gonzaga University*

9C - Two Negatives Equal A Positive: Exploring How Middle-Class Young Adult Children of Divorce Benefit in Relationships

**Lauren Ferguson, Gonzaga University**

A significant amount of research exists regarding divorce and its effects on children. Previous findings consistently prove that divorce presents many obstacles to children; however, existing literature neglects to delve into how people make the best of the experience. This project adds to the current knowledge surrounding divorce by looking beyond its costs in order to understand its benefits. This study focuses on the meaning of divorce to middle-class young adults, specifically in terms of its impact on their relationships. Using in-depth interviews, I ask young adult children of divorce to recount experiencing divorce. I also ask participants to share attitudes about relationships and perspectives on romantic and familial relationships. This study explores the perceived benefits divorce provides to middle-class young adults and more

importantly it looks at divorce as more than just a cause and effect, but rather a significant event that influences how children of divorce navigate relationships.

*Faculty Sponsor: Vikas Gumbhir, Gonzaga University*

## **SESSION 10: THE TECHNOLOGICAL REVOLUTION: PRIVACY, SURVEILLANCE AND ANONYMITY IN THE NEW WORLD ORDER**

**Faculty Moderator: Sean Swan, Gonzaga University**

**9:00-10:15 a.m., Room 127**

10A - The Role of Anonymous Online Student Speech in the University Setting

**Katie Vincent and Lindsie Trego, Whitworth University**

Anonymous speech has been a part of the United States' civic landscape since the early years of the Republic, giving citizens the ability to speak on political and other subjects without fear of retribution. The established right to anonymity, though, is constantly balanced against other values such as reputation, informed democracy, and truth. The right to free speech for students is similarly complicated. Though it is established that students do not lose their First Amendment freedoms when they arrive at school, these freedoms are held in a similar balancing act against values such as peer safety and maintaining the educational environment. This presentation will explore the unique challenge of anonymity in the postsecondary environment, with a particular emphasis on online speech. This project examines the legal status of anonymity as well as the role administrator perception may have on the ability for anonymous speech to exist on college campuses.

*Faculty Sponsor: Erica Salkin, Whitworth University*

10B - The Age of the Whistleblower

**Alice Christenson, Gonzaga University**

The development of the digital age and the hackers that come with it has led to a new definition of privacy, not only for civilians, but for governments as well. The United States government experienced this phenomenon first hand through multiple incidents of leaked documents, the most infamous coming from Julian Assange, Bradley Manning, and Edward Snowden. These three men represent a faction of hacker vigilantes who have arisen with the Internet age. Because of these three men and the technological innovations that allowed them to accomplish what they have, a new discussion has arisen in society. This discussion revolves around the concept of privacy, and whether it should apply to the United States government. Some see these men as champions of transparency; others see them as a new brand of terrorist. However it cannot be denied that these men radically changed the political landscape of the United States.

*Faculty Sponsor: Sean Swan, Gonzaga University*

10C - Technology, Surveillance and a Panoptic Society

**Alison Houlihan, Gonzaga University**

Technology puts access to any kind of information at the tips of our fingers, through our mobile phones, computers, and televisions. Although modern technology has brought with it the democratization of information and progress, it has also brought the ability for governments and companies to track what individuals are doing at every moment, follow where they are going, and access everything they look up or buy. Through security cameras, computers and mobile phones, the very things that we see as luxuries, the government can watch us at every turn. Has the society that we live in become a panoptic society therefore changing our behaviors? I have looked at Michel Foucault's book, *Discipline and Punishment*. Within the study Foucault analyzes the prison structure and its function of embedding fear within a society and thus changing social status, displaying the facts of how citizens are surveyed and what the implications of this surveillance are on freedom and governments.

*Faculty Sponsor: Sean Swan, Gonzaga University*

10D - The Unsinkable Pirate Bay

**Mathew Langley, Gonzaga University**

The Pirate Bay is one of the most controversial and longest lasting BitTorrent sites on the internet, and well-known for their copyright infringements and claims of freedom of information. What is it that has allowed this well-known pirate ship to keep sailing the waves of the World Wide Web? The goal is to better understand the reasoning, success and direction of this unique organization and analyze why this torrent site over other file sharing sites has had not only longevity but unprecedented influence across the globe compared to similar sites.

*Faculty Sponsor: Sean Swan, Gonzaga University*

## SESSION 11: DEVELOPMENT ECONOMICS, PROBLEMS AND POTENTIAL - TWO

Faculty Moderator: Michael Treleavan, Gonzaga University

10:30-11:45 a.m., Room 103

11A - A Christian Response to Genetically Modified Organisms

**Kevin Gleim, Whitworth University**

Though GMOs remain controversial in many developing countries around the world, their use is imperative to countries faced with widespread starvation. Christians concerned about food security are left unable to decide the appropriate course of action to take. However, a holistic view of the global state of GMOs with a Christian perspective is missing from the research used to shape policy decisions. Several scholarly articles, written by both Christian and non-Christian authors, were examined to discover the broad arguments present in this debate. Christians should not support the banning of GMOs because they are able to serve as a resourceful short-term solution to world hunger if the abuse of power by corporations and cautious consumer-driven countries is repressed. With the help of Christians, NGOs should urge governments of developing countries to facilitate the addition of GMOs to their developmental structure in order to give them the autonomy to terminate famine.

*Faculty Sponsor: Julia Stronks, Whitworth University*

11B - Christian Perspectives on Water Security Efforts in Sub-Saharan Africa

**Kristina Grossman, Whitworth University**

Sub-Saharan Africa has faced poverty for decades, and many Americans have responded by giving resources to charity. Christians are concerned with the poverty in the region, but disagree about whether private charity or government solutions work best. However, the Christians' perspective is missing on the most effective solution Christians should contribute to in order to best support poverty alleviation efforts. Scholarly articles and reports were researched, by both non-Christians and Christians, in order to discover the most effective way to tackle poverty. My findings suggest that water insecurity is arguably one of the largest problems contributing to poverty in the region. In focusing on this one issue, Christians can do the most good in helping alleviate poverty holistically.

*Faculty Sponsor: Julia Stronks, Whitworth University*

11C - Globalization and the Informal Economies of Sub-Saharan Africa: Integrating Labor and Production Through Global Value Chains

**Anne Louise Acker, Gonzaga University**

This paper explores how forces of globalization, through increased competition, affect the informal economies of Sub-Saharan Africa. Focusing on the integration of the informal economy into global value chains and their subsequent distribution channels in the developed and developing world, topics of trade and types of labor and production are discussed. A specific case of a Sub-Saharan Africa informal agricultural economy's integration into a global value chain and the global economy is presented. I conclude that while the availability of informal labor is beneficial for large firms and improves the lives of informal workers relative to previous unemployment status, in the long run the use of informal labor in global value chains has a negative impact on growth in the developing world and will contribute to an expanding global wealth gap.

*Faculty Sponsor: Annie Voy, Gonzaga University*

## SESSION 12: FROM ELECTRONS TO APPLICATIONS: THE BEHAVIOR AND ANALYSIS OF MOLECULES

Faculty Moderator: Jeff Watson, Gonzaga University

10:30-11:45 a.m., Room 111

12A - The Qualitative Analysis of Commonly Found Aromatic Hydrocarbons in Gasoline by Gas Chromatography-Mass Spectrometry (GC-MS)

**Kelsey A. Morrison, Eastern Washington University**

A gas chromatography-mass spectrometry (GC-MS) instrument was used for the qualitative analysis of a number of commonly found aromatic hydrocarbon compounds found in gasoline. Many aromatic hydrocarbon compounds such as naphthalene, toluene, and benzene can be found readily in gasoline, and are considered to be hazardous air pollutants (HAP) under the Clean Air Act Amendments (CAAA). This qualitative study was done in an effort to develop an experiment for educators to facilitate the incorporation of qualitative GC-MS techniques into the undergraduate instrumental analysis

laboratory. Although used extensively, GC-MS has yet to be fully integrated into undergraduate instruction laboratories for the qualitative analysis of organic aromatic hydrocarbon compounds using the standard practice of target and qualifying ions. With that in mind, this experiment provides undergraduate research students an opportunity to explore an interesting application with modern GC-MS techniques.

*Faculty Sponsor: Wes Steiner, Eastern Washington University*

12B - Isolation of Bovine Arylsulfatase B for Identification of Potential Chaperone Therapy Agents for Maroteaux-Lamy Syndrome

**Shannon James-Kozlovich, Whitworth University**

The decreased activity of arylsulfatase B (ASB) in those affected by Maroteaux-Lamy Syndrome (MSP VI) causes severe and possibly fatal side effects. To assist in the identification of a prospective ASB chaperone therapy agent, a kinetic test for the effect of praziquantel derivatives on bovine-ASB (b-ASB) was optimized. Optimization was achieved through UV-Vis detection of b-ASB acting on p-nitrocatechol sulfate that led to the identification of ASB inhibitors. Further research is required to assess the inhibitor's ability to act as chaperone therapy agents for human ASB.

*Faculty Sponsor: Trisha Russell, Whitworth University*

12C - Heat Transfer during Evaporation of Surface Tension-Driven Liquid Thin Films on a Surface with Microchannels

**Taylor Kunke, Gonzaga University**

Evaporation of thin liquid films is a complex phenomenon but central to many heat transfer technologies. A better understanding of this phenomenon has the potential of providing solutions to challenges faced by thermal engineers. In this work, heat transfer during evaporation of thin liquid films formed by the capillary force on a metallic surface with multiple parallel microchannels was investigated. The highly wetting liquid was delivered to the surface in droplets that instantaneously spreads and penetrates into the microchannels. Distributed temperature measurements indicated that the local heat transfer efficiency at the location where the liquids are delivered has a maximum value as a result of combination of sensible heat transfer and the liquid evaporation. A transient thermal ANSYS computational model was developed and the results from the model had a reasonable agreement with the measurements. The results obtained in this research provide insights into the physical mechanism underlying the heat transfer during evaporation of thin liquid films.

*Faculty Sponsor: Tailian Chen, Gonzaga University*

### **SESSION 13: HISTORICAL METHODOLOGY OF THE PRESENT**

**Faculty Moderator: Sean Swan, Gonzaga University**

**10:30-11:45 a.m., Room 104**

13A - Future Prospects of Pirate Parties

**Donald Knickmeyer, Gonzaga University**

The purpose of this research paper is to analyze the past successes and failures of pirate parties in countries such as Iceland and Sweden in order to speculate on their future prospects. It is important to understand what causes these parties to resonate with voters in different countries. Then it is necessary to look at these past events and to see if any of the same situations might apply in the future. That will make it possible to predict what whether or not these parties will continue to have small to moderate electoral successes, or if they are just a passing ideal that fades away.

*Faculty Sponsor: Sean Swan, Gonzaga University*

13B - Can China Get its Mojo Back?: Consumptions as the Solution for China's Growing Problem

**Jackson G. Steimel, Gonzaga University**

My project addresses the recent downward trend in GDP growth in China. This downturn comes after thirty years of rapid growth and has been a central concern for Chinese lawmakers and international analysts. First, I identify the causes of the slowdown. Then, I identify reforming the Chinese economy to favor domestic consumption as the solution for China's growth problem and as a strategy for consistent, sustainable future growth. Finally, I offer a number of specific areas in which the Chinese government could focus reforms in order to save their economy, specifically reducing the dependence on investment in construction and heavy industry for growth, improving the social security network, breaking up state monopolies, favoring new industries and private banks, and reducing value-added and income taxes. This project combines insight into the Chinese government and Communist Party with an in-depth analysis of the foundations and future of the Chinese economy.

*Faculty Sponsor: Michael Connolly, Gonzaga University*

13C - The Rise of a Meme - The Guy Fawkes Mask

**Jason Slaybaugh, Gonzaga University**

The rise of the Guy Fawkes mask meme over the last decade is a fascinating phenomenon. Born of the internet, what had long been recognized as a symbol of “epic fail” transformed into the embodiment of justified defiance and resistance to corrupt larger powers. Through the exploration of online communities and news sites, the surprising metamorphosis of this notorious meme appears to be substantially linked to the release of the movie *V for Vendetta* and the rise of the hacker group Anonymous. As a result of these two forces, this meme has since enjoyed a much broader recognition in society and an enduring existence in popular culture. Its influence on the Occupy Wall Street movement is a testament to its continual relevance to society. The Guy Fawkes mask meme’s rise to popularity and resilience suggests that fictional events can have a very real cultural and societal impact. Consequently, the links between and effects of the online culture on society should be studied more extensively.

*Faculty Sponsor: Sean Swan, Gonzaga University*

#### **SESSION 14: A CLOSE LOOK AT HOOK-UP CULTURE**

**Faculty Moderator: Molly Kretchmar-Hendricks, Gonzaga University**

**10:30-11:45 a.m., Room 113**

14A - The Relationship between Catholicism, Views on Sexuality, and Sexual Activity among Emerging Adults

**Alyssa Logan, Gonzaga University**

Religious background can be a strong influence for emerging adults who are making decisions about and exploring their sexual activity in the context of American culture. Catholicism is particularly strict in its views on sexual matters. The purpose of this qualitative report was to observe possible connections between Catholic religious background and views on sexuality and sexual activity in emerging adulthood. Six emerging adults who attended a Catholic University participated in semi-structured interviews, and data-analysis of digitally recorded interviews identified common themes. The impact of Catholicism on views on sexuality and sexual activity was evident in various forms; as it was manifest in feelings of guilt and disconnection, ideas about healthy sexuality, religiosity, and romantic and sexual decision making. Part of the identity exploration of this time period for Catholic emerging adults appears to involve determining the degree to which they identify with the Catholic Church.

*Faculty Sponsor: Molly Kretchmar-Hendricks, Gonzaga University*

14B - Motivations and Attitudes towards Hookups Among Emerging Adults

**Elizabeth Catalano, Gonzaga University**

The concept of a “hookup” is common in pop culture, yet the literature surrounding this sexually normative culture in which emerging adults are living is severely lacking. While various quantitative aspects of this culture have been well-documented, little is known about motivations for pursuing hookups. Still less is known about how these interactions may play a role in the development of emerging adults’ identity. Four participants were recruited for an interview-based research study. After qualitative data analysis, several themes emerged. Hookups have largely replaced dating as a main way to investigate potential romantic partnerships. The main motivation for pursuing hookups appears to be to engage in identity exploration. The main source of emotional trauma is due to miscommunications about intentions. A call for a shift in societal approaches is discussed. Different educational approaches are necessary, and conversations about sex as an emotional act to be celebrated are desperately needed.

*Faculty Sponsor: Molly Kretchmar-Hendricks, Gonzaga University*

14C - Hook-Ups: Build You Up Or Tear You Down?

**Sarah Tilghman, Gonzaga University**

Hook-up culture is a constant reality for college students. This project explores the relationship between hook-up culture and self-esteem in young adults. Four college students (ages 18-19) were interviewed about their experience involving hook-up culture and self-esteem. Using qualitative analysis, interviews were analyzed for themes and patterns, in order to explore in more depth the impact of hook-up culture on self-esteem (either positively or negatively).

*Faculty Sponsor: Molly Kretchmar-Hendricks, Gonzaga University*

**SESSION 15: IS SEEING BELIEVING?: REPRESENTATIONS OF THE REAL AND THE DESIRED IN POPULAR FILM**

**Faculty Moderator: Brian Cooney, Gonzaga University**

**10:30-11:45 a.m., Room 120**

15A - They're Coming to Get Us: The Evolution of the Cultural Myth of Zombies

**Jay Gunter, Eastern Washington University**

The cultural myth of the “zombie apocalypse,” where dead bodies become re-animated and rise en masse as an overwhelming force against humanity, has grown steadily over the last two decades. However, the original zombie myth concerned a form of supernatural slavery where corpses were reanimated for labor, and was not at all apocalyptic in nature. The writer of this article asked the question, how did such a radical change in a cultural myth come about? Examining a number of texts, especially the 1968 film, *Night of the Living Dead*, the writer conducted a qualitative cultural study in an attempt to pinpoint the changes that transformed the zombie from a powerless slave to a powerful figure of chaos and death in the postmodern world. Specific changes were found in zombie films from the late 1970’s to today. The study raised questions about the fluidity of cultural myths over time.

*Faculty Sponsor: Jeffrey Stafford, Eastern Washington University*

15B - “What Are You Looking At?”: Visual Pleasure in *The Bourne Identity*

**Ceilan Hunter-Green, Gonzaga University**

This paper offers a feminist reading of the 2002 film *The Bourne Identity*, drawing on Laura Mulvey’s landmark essay “Visual Pleasure and Narrative Cinema.” The James Bond movie *Casino Royale* is explored as a point of comparison for the action genre. Analyzed through Mulvey’s theory of a cinematographical male gaze and her integration of Lacanian psychoanalysis, *The Bourne Identity* shows itself to have an atypical view both of the appropriate gendered roles of the main characters and also of the romantic relationship between them. Using film and psychological theories that elaborate on Mulvey’s ideas, the paper will show the ways in which Bourne sets itself apart.

*Faculty Sponsor: Ann Ciasullo, Gonzaga University*

15C - The Rabbit Inside: Psychoanalysis in *Donnie Darko*

**Victoria Smith, Gonzaga University**

The 2001 sci-fi psychological film, *Donnie Darko*, explores the life and the mental state of the title character over the course of 28 days. There are many psychoanalytic elements shaping and influencing Donnie and his life, and this paper will use research in psychoanalytic theory to illuminate the meaning of the film. Specifically, there are elements of Jacques Lacan’s theory of lack and longing and Sigmund Freud’s ideas of the phallus. Through these theories, I will explore what keeps certain people in this movie in the Imaginary, pull others into the Symbolic, and create a desire within some to return to the Real. Additionally, I will use research in other aspects of critical theory and film theory to study and analyze the deep psychoanalytic themes and undertones knit throughout this film.

*Faculty Sponsor: Ann Ciasullo, Gonzaga University*

15D - Knocking Out Nihilism: A Nietzschean Exegesis of *Fight Club*

**Vladimir V. Titkov, Eastern Washington University**

19th century philosopher Friedrich Nietzsche believes that the life-affirming qualities of Greek Myth and Attic Tragedy are rooted in their ability to mitigate the life-negating effects of nihilism by stimulating the activation of the Will to Power; ancient Greek culture is exemplary for being able to cope with the ontologically deadening qualities of existence. In contrast to the ancient Greeks, Nietzsche’s epidemiography reveals that the “Death of God” coupled with the post-Socratic search for Truth and its disdain for the expression of the Will to Power, is fundamentally responsible for the sickly onset of nihilism in modernity. I argue that the themes presented in David Fincher’s 1999 film *Fight Club* (based on a 1996 novel by Chuck Palahniuk with the same name) serve as an effective example of how moderns can utilize Nietzschean life-affirming modes of response to the nihilist psychic condition of an “all too human” post-Socratic civilization.

*Faculty Sponsor: Thomas M. Hawley, Eastern Washington University*

## SESSION 16: MATHEMATICAL MODELS AND NATURAL SYSTEMS

Faculty Moderator: Greg Gidofalvi, Gonzaga University

10:30-11:45 a.m., Room 122

16A - The Use of Natural Orbitals in Predicting Molecular Properties

**Evan Jahrman, Gonzaga University**

Pragmatic modeling of a chemical system requires a method that produces accurate results while avoiding excessive computational costs. In general, as the number of orbitals in the chosen basis set increases so does the accuracy of the method. Unfortunately, this increase in accuracy comes with severe memory and time requirements. It is possible to truncate the number of orbitals and defray costs, while retaining a high level of accuracy, if an appropriate type of orbital is chosen. While it seems reasonable to choose a molecular orbital basis optimized with regards to energy considerations, their slow convergence when modeling the instantaneous repulsion between electrons makes them effete for truncation purposes. Alternatively, it is simple to ascertain the importance of a natural orbital in the electron wave function. Our work focuses on the design and implementation of these natural orbitals within the General Atomic and Molecular Electronic Structure Suite.

*Faculty Sponsor: Greg Gidofalvi, Gonzaga University*

16B - Numerical Inversion Techniques

**Steven Beres, Gonzaga University**

The Laplace transform is a mathematical tool that has extensive applications within the fields of mathematics and physics. Often times the usefulness of the Laplace transform relies on the user's ability to invert the transform. Unfortunately, the process of inverting a Laplace transform is typically a much more arduous endeavor than taking the original transform. This is partially due to the fact that the inverse of a transform does not necessarily have an exact representation in terms of elementary mathematical functions. For this reason, various methods have been devised for approximating inverse Laplace transforms numerically. The purpose of this presentation is to explore some of these numerical inversion techniques.

*Faculty Sponsor: Bonni Dichone, Gonzaga University*

16C - A Determination of the Primordial Helium Abundance

**Stewart Spencer and David Rodriguez-Perez, Gonzaga University**

Three minutes after the Big Bang, the light elements deuterium, helium, and lithium are synthesized. Therefore, measurements of this primordial helium abundance offer us a window into the early universe. Using Markov Chain Monte Carlo, we determine the helium abundance of Blue Compact Dwarf Galaxies from the Sloan Digital Sky Survey. Comparison with predictions from the Cosmic Microwave Background Radiation provides insight into standard models of Cosmology and Particle Physics.

*Faculty Sponsor: Erik Aver, Gonzaga University*

## SESSION 17: POWER PLAYS:

### ACCESS TO AND APPEARANCE OF POWER IN LATE MEDIEVAL AND EARLY MODERN LITERATURE

Faculty Moderator: Heather Easterling, Gonzaga University

10:30-11:45 a.m., Room 123

17A - Knights in White Satin: An Exploration of Medieval Image and Social Class

**Kelli Hennessey, Whitworth University**

This paper explores the connection between self-expression and economic status during the many societal and economic shifts that occurred in medieval England, with particular emphasis placed on clothing. Clothing is the most outward and obvious symbol of class and wealth, and the sumptuary laws that attempted to prevent the middle class from gaining power, as well as the push back against those regulations, is a fascinating lens to use when exploring the class dynamics of the time. Using literature of the time including Chaucer's *Canterbury Tales* and *Sir Gawain and the Green Knight*, this paper brings focus to those societal and economic issues.

*Faculty Sponsor: Doug Sugano, Whitworth University*

17B - "Whom He Created": Satan's Rhetorical Duplicity in Milton's *Paradise Lost*

**Amy Pollard, St. Martin's University**

In Books I-III of Milton's *Paradise Lost*, Satan boasts of his own power and denies that God is the creator. In Book IV, however, Satan admits that God is the creator. At first glance, Satan's admission may seem to indicate a moment of humility. However, I propose that Satan's admission serves a calculated purpose: to blame God for his fall from grace. In this presentation, I will examine Satan's strategic use of rhetoric in his Book IV monologue and in Books I, V and IX. Once we realize that Satan seeks to implicate God, we realize that an evil will results in not only rhetorical duplicity but also the deterioration of logic. At the core of *Paradise Lost* is not a self-begot, self-raised hero but rather an envious, accusatory fallen angel whose evil will eventually destroy his rational capacity.

*Faculty Sponsor: Jeff Birkenstein, St. Martin's University*

17C - Moll Cutpurse: Re-appropriating the Notion of Doing Gender

**Brittney Abad, Gonzaga University**

This paper examines the societal role that Moll Cutpurse portrays as a character in Thomas Dekker and Thomas Middleton's play, *The Roaring Girl*. By using articles that have contributed to the modern academic conversation revolving around Moll, this paper argues that Moll is neither a subversive nor a submissive character, but rather a masterless figure who was able to maintain her freedom by temporarily conforming, but not completely assimilating, to traditional gender roles throughout the play. Through this conformity, Moll is able to move through both public and private spaces, which affords her the freedom to live without being dependent on a patriarchal figure. By exemplifying how critics have unintentionally pigeonholed Moll as either a subversive or a subservient character, they have taken on the role of the society in the play who try to police her into the gender binary that society is comfortable with. Instead, this paper reevaluates her as a character that uses gender, not as a social construct, but as a fluid way to perform in society.

*Faculty Sponsor: Heather Easterling, Gonzaga University*

17D - The Purpose of Pluto and Proserpine's Presence in "The Merchant's Tale"

**Tyler Wroblewski, Gonzaga University**

In this presentation, I will discuss the role of Pluto and Proserpine in Chaucer's "The Merchant's Tale," arguing that despite the Merchant's misogynist introduction and the seemingly antifeminist meaning of the tale, the presence of the Classical gods instead justifies May's actions and counteract traditional misogyny. As a reflection of Proserpine's abduction by Pluto, May's marriage to January can be seen as a form of rape. Therefore, May's adultery, as well as Proserpine's assistance in the garden, becomes a just method of fighting back against their husbands who have severely wronged them. Additionally, the scene establishes a sort of Pagan Fall, which exposes the culpability of men in a poor marriage, as well as the weaknesses in using flawed religious figures as support for the oppression of women.

*Faculty Sponsor: James Thayer, Gonzaga University*

## **SESSION 18: PUBLIC MORALITY AND "PRIVATE" BEHAVIORS**

**Faculty Moderator: Julia Stronks, Whitworth University**

**10:30-11:45 a.m., Room 124**

18A - Sexting and Child Pornography

**Hailee Meyers, Whitworth University**

The law can sometimes lag behind the advancement of society and technology. This discrepancy becomes apparent when we address issues such as sexting, the sending of explicit text messages or pictures to one or more recipients. The emergence and spread of sexting as a new form of both relationships and bullying creates a specific tension between the law and technology, particularly with minors where the law has been forced to play the role of mediator in situations where sexting becomes public. The question becomes is it plausible to make sexting illegal as distribution of child pornography? In my analysis, I address the history behind current child pornography laws, current sexting cases, sociological perspectives behind sexting, and whether or not a ban would be possible within the constraints of those laws. I assess the new laws of two states, making a recommendation about the best legal policy for this new challenge.

*Faculty Sponsor: Julia Stronks, Whitworth University*

18B - Jesus Crashes a City Council Meeting: Legislative Prayer and the Establishment Clause

**Heidi Biermann, Whitworth University**

The long-standing issue of the constitutionality of prayer before a legislative session has been revitalized in the case of the Town of Greece v. Galloway, currently before the Supreme Court. This research will examine the history of the relationship between the church and the state, which has been seen as a dichotomous relationship. Although in some instances this has been true, there are examples that show the intermingling of religious and political practices. This research will look at this Supreme Court case through the precedents set by previous cases regarding legislative prayer. It will then predict how the Supreme Court will respond to this case as well as how the Court should act. Examining the judicial history of prayer in the United States will evaluate the place of religion in the U.S. today and provide guidelines for viewing the relationship in the future.

*Faculty Sponsor: Julia Stronks, Whitworth University*

18C - Examining Lewd Speech in K-12 Public Schools: Easton Area School District v. B.H.

**Lindsie Trego, Whitworth University**

Currently pending petition to the US Supreme Court, Easton Area School District v. B.H. started when two middle school girls wore "I ♥ Boobies (Keep a Breast)" bracelets to school. The girls were disciplined for the "lewd" language featured on the bracelets. When the students questioned this disciplinary action in court, the Third Circuit court created a new test for applying pertinent precedent, and held that the First Amendment precludes the school from punishing the girls in this case because the language on the bracelets was not "plainly lewd." This presentation will examine the historical legal backdrop upon which the Third Circuit decision rests. It will also explore the possibility of the US Supreme Court granting petition for writ of certiorari in this case, as well as predict how the Supreme Court might handle the case if petition is granted.

*Faculty Sponsor: Julia Stronks, Whitworth University*

18D - Christians and Coal: How should we respond to coal trains?

**Olivia Godt, Whitworth University**

Throughout the United States' history, the use and export of coal has been central to a strong economy. However, as scientific research has improved and expanded, it has become clear that coal has deeply negative effects on the environment. With both clear economic gains and environmental losses, how should the US use its vast coal resources? Locally, Spokane is at the heart of this debate. Spokaneites are wrestling with potential economic benefits and likely environmental degradation of increased coal train traffic. This research explores this difficult question through a Christian perspective, tracing Christians' historical and modern attitudes toward the environment and linking them to the current coal train debate. It also explains alternatives to increased coal train traffic, and encourages Christians to resist coal trains because of a shared commitment to care for God's creation.

*Faculty Sponsor: Julia Stronks, Whitworth University*

### **SESSION 19: CREATING THE SELF IN CREATIVE NONFICTION**

**Faculty Moderator: Nicole Sheets, Whitworth University**

**10:30-11:45 a.m., Room 127**

19A - No Home But This

**Hannah Brenneman, Whitworth University**

"No Home But This" recounts the ways in which my two sisters and I would live, sleep, and play in the various rooms of our home in Colorado Springs. From watching Bible cartoons in the living room, to reading in the dim glow of our bedroom nightlight, to playing dress-up in the basement, my childhood is rife with memories that are particular to the places in which they occurred. To craft the essay, I took a cognitive stroll through the home of my childhood, and strained to recall every facet of the settings of my most cherished memories. Through this process, I learned how memory works; how a single detail can trigger a complex set of remembered moments, and how different versions can be preserved in the minds of those who experienced them. By unearthing and recording these snippets from my past, I came to realize that I truly have no home but this.

*Faculty Sponsor: Nicole Sheets, Whitworth University*

19B - Sehnsucht

**Lauren NuDelman, Whitworth University**

In "Sehnsucht," I explore the meanings of certain foreign or atypical words in context of my upbringing in Germany. Anthony Marra's statement that "inside us there is a word we cannot pronounce that is who we are" is perhaps the best way to frame my text. I format my essay using relevant quotations as section breaks, trying my best to use these phrases to encapsulate my childhood and the enduring power of nostalgia. "Sehnsucht" required research such as reading and analyzing many of C.S. Lewis's books, as well as exploring the etymology and cultural significance of certain words. It is meant to capture the profound longing of something long gone; as such, it is intended for anyone who has experienced loss or homesickness.

*Faculty Sponsor: Nicole Sheets, Whitworth University*

19C - An Analysis of Fear in Relation to Me

**Maggie Montague, Whitworth University**

"An Analysis of Fear in Relation to Me" is a creative nonfiction essay which explores the concept of fear. The word fear conjures up specific blood-curdling images for everyone, and for me, it brings to mind stickers, ladders and the great abyss of the unknown to name only a few. This essay is composed primarily of two elements: statistical and diagnostic research intertwined with my own dealings with fear. Statistical research provided the knowledge that unusual fears are more common than one would think, and even pittakionophobia, the fear of stickers, has a suggested treatment plan. I sought to combine the research and personal elements into one cohesive guide to understanding and coping with irrational fears, and explore the question: how does one overcome the fear of the unknown.

*Faculty Sponsor: Nicole Sheets, Whitworth University*

19D - On Dane, Death and Dead Fish

**Ryan M. Stevens, Whitworth University**

In part an homage to the larger-than-life character of Dane Baird, and an analysis of the kind of joy that can come from risk taking, this essay explores the relationship between best friends, and also how experiences define who we choose to be, and who we chose to surround ourselves with. The primary goals of the writing process were threefold: First and foremost, to entertain with nearly unembellished recounts of ridiculous decision-making. Second, to try and understand what links people together, especially two hilarious dudes. Third, to honor the profound influence of Dane on the lives of others. The largest challenge of adhering to nonfiction genre conventions was to present a story with sarcastic commentary that did not degrade, and to keep the narrative as accurate as possible. Ultimately, Dane's charisma, loyalty, and insatiable bravado prove enough for a hilarious story.

*Faculty Sponsor: Nicole Sheets, Whitworth University*

## **SESSION 20: STATISTICAL THEORY IN SOCIAL SCIENCES**

**Faculty Moderator: Patricia Terry, Gonzaga University**

**10:30-11:45 a.m., Room 126**

20A - Padhar Nursing School: Applying Engineering Research in an International Marketplace

**Brenna Brown, Emily Cronin, Henry Rodgers, and Damiano Seghetti, Gonzaga University**

Located in a rural and impoverished region of India, Padhar Hospital along with MSAADA, a nonprofit architecture and engineering firm, asked a team of four civil engineering students to produce preliminary structural system, wastewater treatment system, and storm water management system designs for a new nursing school facility. This presentation discusses the research of building codes, practices, and techniques in India and the United States in order for MSAADA to produce final designs for the nursing school. This presentation will also discuss the science behind the engineering systems selected for the nursing school and the research required to select these systems. Special emphasis is placed on using research to make educated assumptions in order to produce practical deliverables as well as using quantitative decision-making techniques to apply knowledge gained from research.

*Faculty Sponsor: Noel Bormann, Gonzaga University*

20B - Bridging the Gap

**Scott Davis, Gonzaga University**

Most Americans would not willingly admit to being illiterate. Unfortunately, the same cannot be said of math capabilities; "I'm not a math person" is thrown around far too often. The origin of the arts/sciences division traces back to the enlightenment when Descartes began modeling nature with mathematics. Centuries later, the division has widened, and people tend to align with just one side. If we were to teach them concurrently, I believe the gap could be closed. There are three primary levels of mathematic development: elementary (e.g. arithmetic), common courses (e.g. algebra), and advanced topics (e.g. number theory). Then, each level has two methods of combining the subjects: literature containing math concepts, or pulling math concepts out of preexisting texts. If we can get students as interested in math concepts as they are about literature, hopefully we can start to see a cultural shift with regards to the view on mathematics.

*Faculty Sponsor: Ann Ciasullo, Gonzaga University*

20C - Long Term Care in the Olympia Area and High Turnover in the CNA Population

**Gardenia Duran, St. Martin's University**

Certified nurse assistants (CNAs) are part of a hierarchical structure of care, where they encompass the largest portion at the bottom of this structure (Jervis 2001). Though the status of this job is low, the need is extreme. CNAs are the staff members who have the most interactive relationships with residents of long term care (LTC) facilities and are also part of the medical staff with the highest turnover rates (Craver and Burkett 2012). This study investigates occupational factors that contribute to high turnover, leading to this hypothesis: CNAs produce high turnover rates due to their low occupational satisfaction. This will be accounted for via a job satisfaction questionnaire, given anonymously to CNAs of long term care facilities in Olympia as an assessment of their occupational satisfaction.

*Faculty Sponsor: Jeff Birkenstein, St. Martin's University*

## **SESSION 21: TECHNOLOGY AND SOCIETY**

**Faculty Moderator: Vikas Gumbhir, Gonzaga University**

**10:30-11:45 a.m., Room 017**

21A - Interfaces: The Social Role of Software

**Charles Byers, Eastern Washington University**

Software interfaces are everywhere in our lives. Our interactions with them have rapidly brought about a unique new set of competencies and shared knowledge, and have changed the way we work, interact, and even identify ourselves. This project examines the social role of computer software, using sociological concepts from science and technology studies, media studies and the sociology of identity. In addition to drawing from published research, the project uses interviews with software developers and end-users to explore software as a site of communication, and to ask how this new technology may serve to challenge, or to reinforce, the existing structures of our social world.

*Faculty Sponsor: Todd Hechtman, Eastern Washington University*

21B - The Halo Effect: Perceptions of Popularity in Social Media

**Natasha Gulati and Melissa Villeneuve, Gonzaga University**

This experiment tested whether the Halo Effect can be applied to social media. Participants viewed two Twitter profiles with differing numbers of "Followers" meant to manipulate perceived popularity, and rated individuals in the profiles on ten positive traits. Results demonstrated that a Halo Effect was present for three traits.

*Faculty Sponsor: Gary Thorne, Gonzaga University*

21C - Translation Technology and its Social Effects

**Mollie Picha, Gonzaga University**

Since the invention of the computer, mechanical translation has been a pursuit of linguists, scientists, and others for use in translation of literature, scientific findings, legal documents and more. Mechanical translation takes an input of a writing selection in one language and produces an output in another language. Though useful in the sense that this technology can translate very quickly, mechanical translation is rarely as accurate as a human translation. In addition to this significant technical inadequacy, the use of mechanical translation can create an even further disconnect between the self and the other. Philosophers have been exploring the idea of the self and the other since the time of Plato and many have concluded the importance of the other in discovering the self. Technology, as a whole, has thwarted this endeavor and led

to alienation of the world and alienation between human beings. Specifically, mechanical translation technologies often reduce a language to a mere tool of written communication instead of a cultivating a respect for the complex social and cultural identities wrapped up in a language.

*Faculty Sponsor: Timothy Clancy, Gonzaga University*

**SESSION 22: BREAKING BOUNDARIES WITH TRANSGRESSIVE CHARACTERS:  
EXAMINING GENDER IN JANE AUSTEN AND CHARLOTTE PERKINS GILMAN**

**Faculty Moderator: Elizabeth Roewe, Gonzaga University**

**1:15-2:30 p.m., Room 127**

22A - An Accomplishment: Jane Austen's Rejection of Gendered Education in *Pride and Prejudice*

**Samantha Starkey, Whitworth University**

This essay is an examination of Jane Austen's use of voice and character to critique women's education during England's regency period. Austen's novel, *Pride and Prejudice*, represents several different styles of education for women. Her characters discuss the merits, and demonstrate the drawbacks of an education built of accomplishments. An accomplished lady was usually trained exclusively in the arts, had very little formal education, and no training in critical thinking. Austen's use of male characters who value educated women can open discussions about the roots of feminism, and gender equality in education.

*Faculty Sponsor: Laura Bloxham, Whitworth University*

22B - *Sense and Sensibility* and the Economics of Language

**Audrey Strohm, Whitworth University**

Jane Austen often draws specific attention to the wealth of her female characters to join the larger discourse of the economy's effect on England in the eighteenth century. In *Sense and Sensibility*, Mrs. Ferrars and Lucy Steele are women representative of the high and low end of the economic spectrum, respectively. Yet despite her economic instability, Lucy Steele is rich where Mrs. Ferrars is not within the novel's dialogue. By drawing attention to the economically proportioned dialogue of Mrs. Ferrars and Lucy Steele, the reader comes to understand the power that rhetoric holds within eighteenth century England's language-driven society. Lucy Steele's rhetorical prowess becomes her only tool to secure her economic status, thus serving as Austen's commentary on society's educational culture of accomplishments.

*Faculty Sponsor: Laura Bloxham, Whitworth University*

22C - Artistic Sins and Subversive Shadows: "The Yellow Wallpaper", Female Gothic, and the Monstrous Feminine

**Sarah Ybarra, St. Martin's University**

This paper studies the use and subversion of Female Gothic tropes in the short story "The Yellow Wallpaper" and analyzes how the story builds to an argument promoting subversion through self-expression as well as the benefits and limitations of escapism. A close reading of the text through psychological and feminist lenses reveals how Gilman uses the language of entrapment and isolation to illustrate the problematic and gendered power relations of the time. These power relations are multi-layered with relationships portrayed between men and women, husbands and wives, and doctors and patients. Given the popularity of the Female Gothic at the time, Gilman's intentional reinforcement of certain tropes and reversal of others takes on deeper meaning. Her subversion of the established formula, particularly in the ending, exemplifies a move beyond the simple escapism of the Female Gothic into a more subversive mode of self-expression in literature and in life.

*Faculty Sponsor: Jeff Birkenstein, St. Martin's University*

22D - Marrying for Love in *Pride and Prejudice*

**Mary Schmick, Whitworth University**

In Jane Austen's novel, *Pride and Prejudice*, none of the characters marry exclusively for love. The characters able to marry for love are those who already have an advantage of wealth and a stable place in society. Because Mr. Darcy is descended from well-known families and holds immense wealth at Pemberley, his aunt's disapproval of his marriage will not have alter his place in society. However, other characters, who begin with less wealth and a lower position in society, such as Mr. Collins and Charlotte Lucas, must sacrifice love in order to gain financial security and an elevated place in society. All characters in *Pride and Prejudice* consider wealth as a factor in marriage. Therefore, the characters that have the luxury to marry for love are those who already have a degree of security in wealth and rank.

*Faculty Sponsor: Laura Bloxham, Whitworth University*

## SESSION 23: BRINGING THE PAST INTO THE PRESENT: THE ART OF TRANSLATION

Faculty Moderator: David Oosterhuis, Gonzaga University

1:15-2:30 p.m., Room 103

23A - Cicero and Saint Aloysius: The Influence of Cicero on Renaissance Rhetoric

**Louis R. Cunningham, Gonzaga University**

Having been taught under the Jesuit *Ratio Studiorum*, which dictated a rigorous classical education with grammatical rhetoric largely taught from Cicero, Aloysius' rhetoric was heavily influenced by the style and manner that Cicero proposed in his major rhetorical works. This thesis will show how the Ciceronian influence of the *Ratio* influenced Aloysius' rhetoric and grammatical style as exemplified by his All Saints' Exhortatio found in the Jesuit hagiographical compilation known as the *Acta Sanctorum*. It begins with Renaissance rhetoric which then focuses on the Jesuit pedagogical work the *Ratio Studiorum*. Then, this thesis explains the rhetorical style of Cicero and finally shows how Aloysius' exhortation fits the model laid out by Cicero himself and the Renaissance textbooks from which Aloysius was taught.

Faculty Sponsor: David Oosterhuis, Gonzaga University

23B - Sigmatizing Tau: Lucian's Attitude Towards the -ῖῖῖ- in the *Judicium Vocalium*

**Taylor Ann Sims, Gonzaga University**

In the first to third centuries CE, orators of the Second Sophistic attempted to recreate some of the grammatical structure of Classical Athenian Greek. This style, referred to as Atticism, is an affectation that defies definition. Though Atticism's rules were vague, mistakes could be devastating--audiences were quick to judge, and orators were eager to attack one another. One interpretation of what made one a good orator appears in Lucian's *Judicium Vocalium*. The humorous courtroom-style attack depicts the letter Sigma suing the letter Tau for his theft of numerous words. While this is an obvious reference to the butchery of the -ῖῖῖ- in attempts at Atticism, the speech contains a more comprehensive attack on poorly executed Atticism than is initially revealed. The speech does focus on the -ῖῖῖ-, but Lucian it also goes further than that. By reading the *Judicium Vocalium* carefully, one realizes that the true masters are those who break the rules with style, not those who follow them with painfully disappointing accuracy.

Faculty Sponsor: David Oosterhuis, Gonzaga University

23C - The Art of Translation: Bringing Mistral to an Anglo Audience

**Karina Basso, Whitworth University**

A presentation on theories of translation as applied to my original translations of the poet Gabriela Mistral's from Spanish to English. My presentation will detail why Mistral's work is still relevant to a modern audience and how good translations of her poetry will render the work familiar as a well challenging to the reader. I will briefly detail the process of translation, justify various linguistic choices made in my translations, and finally read select pieces of my final translations.

Faculty Sponsor: Thom Caraway, Whitworth University

## SESSION 24: CRIME, DEVIANCE, AND SOCIAL CONTROL

Faculty Moderator: Vikas Gumbhir, Gonzaga University

1:15-2:30 p.m., Room 104

24A - Graphic Violence: Justice in Japanese and American Comic Books

**Philip Tostado, Gonzaga University**

The media does not merely reflect our society, but also actively contributes to it (Ferrell 1999; Philips and Strobl 2013). Comic books are no exception to this. American comics place personal justice over "legitimate criminal procedure," and portray law enforcement as lazy. Superheroes satisfy a desire for retribution, but see incapacitation as the correct response to crime. Justice themes within Japanese comics, or manga, have not yet been explored. Increased popularity of manga makes it imperative to study if manga has similar justice themes. In an analysis of 10 contemporary manga, I examined the criminal justice system, the hero's cause, who pursues justice, and how justice is achieved. I found that Japanese superheroes that perform "collective justice," corruption and organized crime are the most common issue encountered, and the criminal justice system remains ineffective. Vigilantes and other criminals are often viewed more positively than the systems that attempt to imprison them.

Faculty Sponsor: Vikas Gumbhir, Gonzaga University

24B - iPorn: An Exploration of College Students' Beliefs About and Experiences with Pornography

**Kathryn Carnell, Gonzaga University**

In the article "Teens, Porn and the Digital Age," author Todd Melby (2010) conceded that "porn has shifted from something shameful and morally reprehensible to an acceptable social activity." Further, sex researcher Al Cooper (1999), in trying to explain the effect of the Internet on porn consumption, has stated that the driving force behind this consumption is the "Triple-A engine of Access, Affordability, and Anonymity." Porn has become cheap, private and accessible; and now more than ever people are taking advantage of the thousands of videos and pictures offered to them via the Internet. This study will focus on pornographic consumption and make correlations between porn consumption and sexual behaviors, attitudes, and beliefs in undergraduate students. In addition, pornography consumption in conjunction with perceptions of porn normalization, the harms of pornography and porn in conjunction with sexual violence will be explored. My hypothesis is that frequent porn usage will directly correlate to certain sexual behaviors such as sexual violence or promiscuity. Overall, I predict that mild porn usage will have no profound effect on sexual behavior.

*Faculty Sponsor: Vikas Gumbhir, Gonzaga University*

24C - Examining University Students' Confidence and Comfort with Authority

**Scott Campanario, Gonzaga University**

Previous literature regarding public opinion of authority has primarily categorized opinion into the notions of authority efficacy (how capable an authority is) and authority image (whether the authority is morally good or bad). My research examined how and if this categorization exists in regards to student opinions of college authority figures. In addition, my research also examined student comfort levels with authority by measuring student anxiety with authority, even when students were innocent. Using randomly sampled survey data from an inland northwest university, I assessed student opinions of the efficacy, image, and comfort levels in regards to the resident assistants, campus security, and local police officers. The results indicate that student opinions of authority vary based on the type of authority figure as well as the student's demographic information. The student's race, gender, and previous experience with both crime and authority play a role in shaping student opinions of authority.

*Faculty Sponsor: Gary Thorne, Gonzaga University*

## **SESSION 25: CRITICAL PERSPECTIVES ON EDUCATION**

**Faculty Moderator: Ed Vacha, Gonzaga University**

**1:15-2:30 p.m., Room 111**

25A - Perceptions of Stuttering and the Impact of Education

**Tiffani Kittilstved, Eastern Washington University**

The purpose of this research is to determine how stuttering is viewed and whether education about stuttering will alter listeners' perceptions towards stutterers. A widely used therapy technique associated with stuttering is self-advertising, where stutterers notify their listener that they stutter. Studies have shown that listeners react more positively towards stutterers who self-advertise. My research takes this idea further, investigating how stuttering is perceived in groups who are educated about stuttering and groups who are not. To research this, I interviewed students and constructed a survey that I gave to a control group and an experimental group, which received education about stuttering prior to answering. The findings from these groups were compared to see if there is a significant enough difference to infer that simple education about stuttering alters perceptions about stutterers. The results of this study help us understand the stigma surrounding stutterers and how education can alter that.

*Faculty Sponsor: Julia Smith, Eastern Washington University*

25B - American Schools: College Bound for All?

**Mathew Langley, Gonzaga University**

The American public school system, one of the nation's oldest welfare programs, has long been guided towards the goal of educating all students to a certain level of math and reading skills as well as a proficiency in writing. It provides skills and capabilities while promoting an active lifestyle through sports and physical education classes aimed at conditioning students. However, the greater issue in today's modern society that many overlook is that the current education system is biased in favor of college bound students, leading to trade classes to being the first cut and taking away valuable opportunity to blue collar students not intent on entering college.

*Faculty Sponsor: Michael Treleaven, Gonzaga University*

25C - Learning Disabled in a Learning Community: Coping, Acceptance, and Stigma Management in a University Setting

**Sarah Yeend, Gonzaga University**

With recent increases in the availability of resources and accommodations being offered to learning disabled students in college, that population is experiencing a dramatic rise in university attendance. Research has shown that younger students often feel extreme stigma due to their inability to learn the same way as their peers and so hide their learning disabilities in school (Zhao, 2008). A concealing strategy that evidence shows can continue into adulthood (Skaalvik 2004). This study was conducted on self-identifying, learning disabled volunteers who were all students at a private university. As opposed to what a great deal of previous research had found all the interview subjects claimed to have accepted their learning disability as a part of themselves, admit to it openly and advocate education for the non-learning disabled community to attempt and reduce the stigma born from ignorance.

*Faculty Sponsor: Vikas Gumbhir, Gonzaga University*

25D - Teaching Grades 7-12 about the Holocaust

**Sharon McClintock, Eastern Washington University**

This presentation will include information gathered from top researchers of teaching The Holocaust, such as Samuel Totten, Stephen Feinberg, David Lindquist and the United States Holocaust Memorial Museum. The research paper argues for the best methods to teach adolescence in grades 7-12 about the Holocaust, and addresses some practices teachers should avoid. The purpose of the paper is to inform Social Studies and English teachers of some of the best practices in teaching the Holocaust, including the use of narratives, guest speakers, films, poetry, art, and Internet research.

*Faculty Sponsor: Beth Torgerson, Eastern Washington University*

#### **SESSION 26: CRITICAL PERSPECTIVES ON MEDIA**

**Faculty Moderator: Kris Morehouse, Gonzaga University**

**1:15-2:30 p.m., Room 113**

26A - What is "The Media?"

**Matthew Filpi, Gonzaga University**

In the modern day, this question cannot be answered with a simple definition. There are multiple factors that must be taken into account in this new modern era defined by technology and invasions of privacy. This research paper and presentation seeks to explore the state of the modern day media as it relates to politics and political mobilization. It will look into a number of different aspects of the media. It will look into how this new era of the media affects privacy. It will look at media aspects such as television and the internet and how it affects political mobilization. The research draws mostly from research journals and also from a few books. I hope to uncover the fact that this new version of the media is misleading and often times invades people's personal privacy to the point where it may violate the Constitution.

*Faculty Sponsor: Sean Swan, Gonzaga University*

26B - Just Another "Chick Flick": Gender, Denigration, and Contemporary Cinema

**Rachel Hammond, Gonzaga University**

Contemporary cinema is heavily gendered. Men occupy the primary roles in big budget blockbusters, and women are typically secondary characters (Cooper 2000; MacKinnon 2003). The films that place women in the forefront get separated into their own category: "Chick Flick." The term "chick flick" is recognized as more than just female-oriented film. Although geared towards half of the population, these films are often denigrated and trivialized (Cohen 2010). My study looks at women's and men's understanding of "chick flicks." In multiple focus groups, participants discussed how meaning is assigned to the term "chick flick," how films are categorized into this genre, and how participants reconcile their categorization when confronted with actual film examples. The results of this study are helpful in understanding the current state of gender relations and power, specifically in mainstream American media.

*Faculty Sponsor: Nicole Willms, Gonzaga University*

26C - How Modern is "Modern Family?"

**Sarah Varisco, Gonzaga University**

While the ABC sitcom "Modern Family" has been well received by audiences, television critics, and the industry, it has also been the target of considerable criticism. Specifically, activists and scholars have criticized the show for its portrayal of Mitchell Pritchett and Cameron Tucker as gay men, as well as their on-screen relationship. In this paper, I examine how the three couples in the show portray romance, intimacy, and sexuality. My goal is to measure the differences in the quantity of displays of affection (broadly defined), as well as describe in detail the key characteristics of Mitch and Cam's displays of affection. To evaluate these displays of affection, I am analyzing the first four seasons of "Modern Family." My preliminary analysis confirms that Mitch and Cam rarely engage in any physical displays of affection, and when they do touch, it is often a form of non-sexual teasing, scolding, or restraint.

*Faculty Sponsor: Vikas Gumbhir, Gonzaga University*

#### **SESSION 27: ECOLOGICAL SYSTEMS**

**Faculty Moderator: Gary Chang, Gonzaga University**

**1:15-2:30 p.m., Room 122**

27A - The Effects of Host Thinning on Stem-Mining Weevil Populations

**Braeden Van Deynze, Gonzaga University**

Dalmatian toadflax (*Linaria dalmatica*) is a perennial noxious weed with an invasive presence in northwestern North America. The stem-mining weevil (*Mecinus janthinus*) has been introduced as a biological control agent, and has had success in reducing the vigor and density of toadflax populations throughout the western rangelands. In addition, some land owners use mechanical control in the form of mowing to control toadflax populations, removing the stems but leaving the widespread root system behind. Because weevils require toadflax stems to reproduce, such mechanical control may have an effect on weevil populations in subsequent seasons. This relationship is examined by using experimental data from field sites throughout Spokane County. If cutting has a noticeable negative effect on weevil populations, mowing may be reducing the effectiveness of *M. janthinus* as a biological control agent.

*Faculty Sponsor: Gary Chang, Gonzaga University*

27B - An Evaluation of Human Activities on Water Quality within the Kimana-Kikaragot River and their Impacts on Local Communities

**Sydney Cejka, Gonzaga University**

This study assessed the water quality and vegetation surrounding the Kimana-Kikaragot River in Kenya. All farms and homesteads, as well as water pumping points and diversions, within 200m of both sides of the riverbank were recorded to assess the extent of human encroachment. The community's, as well as key informants', perceptions on water quality and riparian vegetation were obtained through interviews. Results indicated that human activities were degrading the riparian zone, which ultimately affected the water quality. Herbaceous and woody canopy cover on the left side of the river, where more farms were located, was significantly lower than on the right side. Results from the household interviews also supported these findings, as they indicated a decreased water quality and vegetation surrounding the river. It appears that a combination of causes, such as human settlement and agriculture, could be contributing to the water quality and riparian degradation within the study area

*Faculty Sponsor: John Warui Kiringe, School for Field Studies East Africa and Joanne Smieja, Gonzaga University*

27C - Frogs - They're Aren't 'Hoppy' About Chytridiomycosis

**Sarika Ann Khanwilkar, Gonzaga University**

Diseases, habitat loss, and climate change threaten biodiversity worldwide, and amphibians are the most threatened group of vertebrates. The chytrid fungus, *Batrachochytrium dendrobatidis* (Bd), is associated with amphibian declines, which is an especially disturbing trend in protected natural areas such as the Peruvian Andes in Manu National Park. Here, visual encounter surveys were used to collect frogs, and a fungal sample was taken using the swab method to measure the prevalence of bacterial infection. Our results indicated lower infection rate of Bd in habitats of lower elevation and higher temperatures. Conservation strategies should therefore prioritize species with limited, high elevation ranges. Current research is exploring the use of bio-augmentation. Certain bacteria within the microbiome that is naturally found on the skin of frogs have anti-Bd properties. To use this as an advantage, we must explore the most effective, and fiscally and

environmentally feasible, method of eradicating Bd. Regional differences in Bd will require an adaptive conservation approach to be taken.

*Faculty Sponsor: Steven Whitfield, Gonzaga University*

## **SESSION 28: PSYCHOLOGY OF RELIGION AND INTERPERSONAL ATTRACTION**

**Faculty Moderator: Gary Thorne, Gonzaga University**

**1:15-2:30 p.m., Room 120**

28A - Effect of Religious Imagery on Emotional Response

**Daniel Bell-Garrison and Elizabeth Catalano, Gonzaga University**

Religious devotion is a concept which is difficult to quantify, yet after three years of attending a Catholic Jesuit institution we became curious as to how such a subject could be broached. We have personally experienced religiously devout individuals being highly emotional upon viewing certain imagery, so we hypothesized that individuals with a greater religious devotion would yield a greater emotional response when exposed to religious imagery. Electrodermal activity quantifies the response by the sympathetic nervous system, which is indicative of the strength of an emotional reaction. When we ran our study, the opposite of our hypothesis was discovered: those with low religious devotion had a higher mean electrodermal response when exposed to religious imagery than did the more religiously devout. We postulate that our result was likely due to the normative nature of religious imagery within the highly religious individual's life, while the non-devout would be less accustomed to such imagery.

*Faculty Sponsor: Gary Thorne, Gonzaga University*

28B - The Effect of Prayer on Frustration

**Justin Garcia, Gonzaga University**

The purpose of this experiment is to test the effect of prayer and meditation on emotional suppression and frustration within individuals. The hypothesis tested states that prayer and meditation will have a significant effect on the level of frustration experienced by an individual. Participants will be asked to either pray or let their mind wander freely for five minutes. They will then be shown an emotionally arousing video and asked to suppress any emotional reaction. They will then be given and asked to solve a small puzzle in small time frame, used to arouse frustration. Participants will give their analysis of how frustrated they were during the exercise. It is hypothesized that the participants will feel less frustration if they were asked to pray before the exercise.

*Faculty Sponsor: Anna Marie Medina, Gonzaga University*

28C - Motivational Differences for Cohabitation between Genders

**Leo D DeBroeck, Gonzaga University**

The increase in the number of cohabitating couples over the past decade alone as resulted in a new wave of research into the happiness of these couples. The findings have shown most of these couples are not happier with their relationships than those who don't cohabit. The major theory behind this occurrence is that a couple may cohabit for conflicting motives. In this research, to test if cohabitation itself was causing the motivation differences, participants currently in a non-cohabitating relationship were surveyed in a similar fashion to previous research with currently cohabitating couples. Since currently cohabitating participants may have an altered motivation, this study used participants in a romantic relationship who are not cohabitating but would still consider doing so in the future. Through comparison of men to women self-reported reasons for possible future cohabitation, it was found that there is not a significant motivational difference to cohabit.

*Faculty Sponsor: Gary Thorne, Gonzaga University*

28D - Personality of Attraction Between Couples: Personality Trait Similarity Together and Apart

**Josie Camarillo and Amanda Roth, Whitworth University**

Though complementarity and similarity within romantic relationships has been widely studied, little to no research has been conducted on how the presence of one's partner affects the outcome of a personality inventory, which is what this study investigated. The hypothesis was that when working together, the couples would exhibit more similar personality traits than couples working apart. Couples took a survey that consisted of a 44-item personality inventory as well as approximately one dozen questions about demographics. Participants who collaborated on their personality survey showed higher average difference scores ( $M = 3.13$ ,  $SD = 1.36$ ) than participants who took their surveys independently ( $M = 1.67$ ,  $SD$

= 0.64). This difference was statistically significant,  $t(20) = -3.11$ ,  $p > .05$ ,  $d = 1.1$ , two tails. The separated partners' personalities were more similar than partners who took their inventories together.

*Faculty Sponsor: Elizabeth Campbell, Whitworth University*

#### **SESSION 29: SOCIAL JUSTICE IN SOCIETY**

**Faculty Moderator: Jeff Birkenstein, St. Martin's University**

**1:15-2:30 p.m., Room 123**

29A - Melquiades and the Nonwestern Ways of Knowing in Gabriel Garcia Marquez's *One Hundred Years of Solitude*

**Betty Ramirez, St Martin's University**

Based on my research, criticism of *One Hundred Years of Solitude* overlooks the Romani and Mestizo cultures in the novel. A close reading of Melquiades, the gypsy, as a parallel character to the Buendia Family unveils a new lens for reading and understanding the historical meaning of the Romani and Mestizo culture in the novel. Melquiades, similarly to the Buendia family, represents the subjugation of a culture that critics have failed to connect. By using the term magical realism, critics mislabel and undermine the spiritualism and cultural oppression of the Romani and Mestizo cultures in the novel. The paper triangulates among historical, cultural, and post-colonial theories to establish a new reading of *One Hundred Years of Solitude*. Using the post-colonial and nonwestern lens, this paper reinvents a new language for understanding the subjugation in the novel as well as the oppression of spiritualities that the term "magical realism" creates.

*Faculty Sponsor: Jeff Birkenstein, St. Martin's University*

29B - The Legacy of Cesar Chavez: On Current Conditions for Farm Workers in California and Washington

**Crystal Cardona, St. Martin's University**

My research focuses on farm workers in California and Washington. Drawing on published literature and interviews, my work shares the human experiences of people who work as farm workers. I examine how these people are at times pushed into the margins by ethnographic and phenomenological approaches. My research uses interviews to critically examine policies, practices, and laws in two states. This research considers whether the conditions of the farm workers have gotten worse or not after the campaigns of Cesar Chavez, and whether workers know their rights. I consider what policy changes are needed, and what causes workers to leave their homes as they pursue the American Dream and how workers see the oppression and corporate control increasingly dominating their work place.

*Faculty Sponsor: Jeff Birkenstein, St. Martin's University*

29C - Cultural Appropriation, Ratchet Culture and Women of Color in the Media: Pervasive & Problematic Themes in Popular Culture

**Deonna Smith and Chare Gilliam, Gonzaga University**

The issue of the misrepresentation of women in the media is something that our generation is relatively familiar with; however, the specific struggle of women of color is one that is distinct and underrepresented in contemporary studies of mass media. The elimination and generalization of female minorities in popular culture has been largely un-researched and its effects, though felt in the perspective communities, are still not present in surveys of sociology or psychology. A subset of the generalized view of women of color in the media is the existence of "Ratchet Culture" which not only is pervasive in popular media but has become a lifestyle movement. Closely paired with this the overwhelmingly prejudice culture is cultural appropriation, which has with the "native" trend and the popularity of Miley Cyrus become deeply integrated into the typical youth experience in both music, clothing, and social behavior. This presentation will investigate the overt and salient effects of these issues in our society.

*Faculty Sponsor: Ann Ciasullo, Gonzaga University*

#### **SESSION 30: SOCIOLOGY OF SEX AND INTIMACY**

**Faculty Moderator: Katey Roden, Gonzaga University**

**1:15-2:30 p.m., Room 124**

30A - Don't ask me, I'll ask you: Gender Ideologies and Dating Expectations

**Allan Farrell, Gonzaga University**

Going into a date, people hold general expectations about the actions that each person should take. Surprisingly, as gender norms continue to shift, these expectations have been remarkably stable over time. Yet, an interesting deviation in this

pattern, as pointed out by Korman, is that feminists were found to differ in the gender expectations for paying for and initiating dates (1982). This deviation brings up the question of whether gender ideology, defined by Hochschild as attitudes regarding men and women's expected roles, can affect a person's understanding of dating norms (1989). My study will investigate the gender differences in dating expectations between those who have an egalitarian gender ideology as opposed to those with a traditional gender ideology. It will utilize a survey of students at a private university in the Pacific Northwest containing a scale designed to measure gender ideology and questions about dating expectations.

*Faculty Sponsor: Vikas Gumbhir, Gonzaga University*

30B - Beyond The Pill: Race, Class, and Education: The Varied Use of LARC Methods Among Young Women

**Jaspreet Kaur, Gonzaga University**

The recent push for long acting reversible contraceptive (LARC) methods is becoming more prominent in both public health and medicine. What is unique about these methods is that they do not require daily administration; instead they continually act as birth control over the course of months and years just with a single administration. Unlike the contraceptive pill, whose failure rates are due to its lack of adherence, LARC methods eliminate patients' failure of compliance to the method. However, these contraceptives are also accompanied with adverse health effects. The LARC method, Depo Provera, has been under controversy not only because of its side effects, but also because of its use in minority groups as temporary sterilization method (Volscho 2011). This research will examine the varied use of LARC methods among teens based on race, class and education of parents. I will analyze data from the National Survey of Family Growth 2006-2010.

*Faculty Sponsor: Vikas Gumbhir, Gonzaga University*

30C - The College Hook-Up Culture of Mating, Dating and Waiting: Religion vs. Religiosity

**Arlene Chandra, Gonzaga University**

Collectively, sociologists have defined hooking-up as spontaneous, non-relational sexual encounters ranging from kissing to sexual intercourse, which usually occurs for only one night (Armstrong 2012; Fielder 2010; Fogarty 2009; McClintock 2010; Myers 2012). Personal religiosity, such as religious involvement and church attendance, delays sexual activity (Brynielsen 2011; Burdette 2009; Uecker 2007). This study examined the hook-up culture at a private, undergraduate Catholic university, in the Pacific Northwest. In particular, this research examined the conditions in which religiosity affects an individual's participation in the hook-up culture through the use of randomly sampled survey data. Furthermore, in order to measure personal religiosity I asked individuals how often they attended church, read religious texts, and prayed. I hypothesized that religiously devoted individuals would engage in the hook-up culture less frequently than those who are less devoted, justifying that religiosity, rather than religious affiliation itself, correlates with the hook-up culture.

*Faculty Sponsor: Nicole Willms, Gonzaga University*

### **SESSION 31: SOCIOLOGY OF THE BODY**

**Faculty Moderator: Nicole Willms, Gonzaga University**

**1:15-2:30 p.m., Room 126**

31A - Taming the Exotic Mane: Experiences of Pacific Island Women Through Their Perception of Hair

**Anette Aga, Gonzaga University**

It is a peculiar sensation...this sense of always looking at one's self through the eyes of others. For years, Eurocentric beauty standards have dictated the definition of good hair. People of color, especially women are taught that frizzy, kinky hair is a badge of shame. Women of color internalize the responsibility of taming their hair to meet the socially defined Eurocentric standards of beauty in order to advance themselves within the social hierarchy. Hair has the power to dictate how we feel about ourselves and how others will treat us. Existing literature regarding hair focuses on the perspectives and experiences of African-American women. I wish to expand upon prior research by evaluating the experiences of women whom belong to other minority groups, with a particular focus on Pacific Island women residing in the Continental U.S. Their voices, in response to the Eurocentric beauty standards of hair, are not often represented.

*Faculty Sponsor: Nicole Willms, Gonzaga University*

31B - Put Your Money Where Your Mouth Is: Social Class, Conceptions of Beauty, and Cosmetic Dentistry

**Ashley Marie Markwell, Gonzaga University**

The objective of this study was to explore young people's experiences with and perceptions of cosmetic dentistry in order to understand how individuals view their teeth in the context of overall their appearance. This study built upon existing research surrounding ideals of beauty and examined how teeth and the mouth are sites of beauty work. To understand how people think about teeth and the mouth as sites of "beauty work," focus groups and in-depth interviews were conducted. Participants were asked to share their thoughts and experiences with dentists and other oral specialists, to evaluate advertising that focused on teeth and the mouth, to discuss photos of unnerving dental scenarios, and to provide their general opinions on cosmetic dentistry. The results show an increased awareness of dental aesthetics, the division of class through the ability to access cosmetic dentistry, and a wider acceptance of cosmetic dentistry as a form of self-improvement.

*Faculty Sponsor: Nicole Willms, Gonzaga University*

31C - Why Put a Bumper Sticker on a Ferrari?: The Social Acceptability of Tattoos at a Private University

**Chelsea Hunt, Gonzaga University**

This project determines under what conditions tattoos are socially acceptable at a private university. The study focuses on the profile of the people who have tattoos, the perception of stereotypes regarding tattoos and the deviance associated with those who are tattooed. A general survey will be sent out to a body of students at a private university asking questions about whether students have tattoos, why they do not have tattoos, and their general opinions on tattoos. These and other questions in the survey will help me to form a profile based on who does and does not have tattoos, determine whether negative stereotypes about tattoos hold true at this university and if people with tattoos are more deviant than those without. This study seeks to show that the social acceptability of tattoos has increased among young adults at a private university.

*Faculty Sponsor: Vikas Gumbhir, Gonzaga University*

### **SESSION 32: THE MAKINGS OF MODERNISM**

**Faculty Moderator: Ingrid Ranum, Gonzaga University**

**1:15-2:30 p.m., Room 017**

32A - Debunking the "Booke Myth": A Death Drive Analysis of the 1914 Sonnets

**Erin Dempsey, Gonzaga University**

Soldier-poet Rupert Brooke was made famous in the First World War for his nationalistic sonnet cycle, the 1914 sonnets; namely, the famous poem, "The Soldier." This poem embodied the nationalistic ideal of military fervor, love of the homeland, and Englishness. Following his death on the Greek island of Skyros in 1915, Rupert Brooke's memory, biography, and posthumous publications were heavily influenced by a hero narrative of jingoism and militarism. In the decades following his immense popularity, critics turned traitor to Brooke's work, dismissing it as sentimental and simplistic. Such dismissals of Brooke's poetry are predicated upon an inherently biased and uncritical interpretation of his poetic project. In order to restore Brooke to his rightful place among the great voices of the war, I apply Freudian psychoanalysis to the 1914 sonnet cycle in order to reveal the underpinning similarities between Brooke's poetic project and the work of Owen, Sassoon, and Gurney.

*Faculty Sponsor: Ingrid Ranum, Gonzaga University*

32B - Women of a Certain Age: Victorian Subjects in the Modernist Novels of Virginia Woolf

**Ana Quiring, Whitworth University**

In this presentation, I examine two of Virginia Woolf's most iconic protagonists, Clarissa Dalloway and Mrs. Ramsay, and their complex position in the Modernist, interwar landscape of *Mrs. Dalloway* and *To the Lighthouse*. I consider Woolf's fascination with middle-aged women not insignificant, and in exploring their roles, unpack considerations of gender, empire, and culture in these novels. Since Mrs. Ramsay and Clarissa both represent an older, more Victorian sensibility, their presence in a literary landscape imbued with so many trappings of a changing, twentieth century world, from war veterans to booming technology, is central to the conflict of these novels. Through these characters, we can consider the plight of upper class women of another era, caught in a quickly evolving world.

*Faculty Sponsor: Charles Andrews, Whitworth University*

32C - The Sexuality of Violence in Great War Trench Poetry

**Corinne Gould, Gonzaga University**

In an effort to express the unprecedented violence of trench warfare in WWI, writers attempted to convey the visceral reality of the trenches and the emotional intensity of combat honestly. Within the charged verses of Wilfred Owen and Siegfried Sassoon, the physicality and passion of warfare are notably sexualized. Owen's "Greater Love" and "Arms and the Boy," as well as Sassoon's "The Kiss" and "Repression of War Experience" explore the complex intersectionality between sexuality and warfare. When read in tandem with critical theory concerning the male body, homoerotic themes, and the sensuality of battle, these patterns of language and imagery in Owen and Sassoon's trench poetry suggest participation in a new literary tradition which abandons the circumlocution of romanticized poetry to privilege truth over beauty in the depiction of the graphic eroticism of combat.

*Faculty Sponsor: Ingrid Ranum, Gonzaga University*

32D - Tension and Rupture in the Cultural Psyche: Cultural Shell Shock in *Death of a Hero* and *The Return of the Soldier*

**Haley Swanson, Gonzaga University**

The concurrent traumas of Victorian society adapting to Modernism and World War I created both comparably unstable historical moments in which to express this cultural change as well as a counterpart for medical shell shock in cultural shell shock. Just as war shifted into the era of mechanized warfare, Victorian culture moved into the Modern era. There is no definitive difference between internalized war trauma and internalized cultural trauma as both are traumas that cause inexplicable actions symptomizing a mental break. Cultural and medical shell shock are not necessarily debilitating, but rather the only way to truly escape from repressive ideology. Cultural shell shock is first illustrated in Richard Aldington's *Death of a Hero*, and then explored in Rebecca West's *The Return of the Soldier*.

*Faculty Sponsor: Ingrid Ranum, Gonzaga University*

**SESSION 33: AN EXPLORATION OF GENDER IN SOCIETY**

**Faculty Moderator: Nicole Willms, Gonzaga University**

**2:45-4:00 p.m., Room 124**

33A - Living in a Binary World: The Treatment of Intersex Infants

**Simeng Wang, Gonzaga University**

For five children born daily in the United States, the question "are you male or female" is a hard one to answer because they are born intersexed. The word intersex is an umbrella term used for many infants who are born with genitalia that is not typical for males or females. The usual medical treatment for infants who are born intersexed is corrective surgery which assigns a gender to these infants. This presentation critically examines the current medical treatment of intersex infants and informed patient consent from a feminist ethics perspective and questions society's gender norms and stereotypes. It also explores other cultures' ideas about gender categories and advocates for a more inclusive gender spectrum.

*Faculty Sponsor: Rose Mary Volbrecht, Gonzaga University*

33B - Be a Man: Masculinity, Danger and the Problem of Vulnerability

**Amanda Lomnicky, Gonzaga University**

Studies focusing on male fear of crime rarely try to understand how men view their vulnerability to crime. It has been established that men possess a fear (Haynie 1998), but how this manifests in their consideration of danger is understudied. Jo Goodey found that men are expected to experience lower levels of fear, in part because emotional vulnerability is not compatible with traditional notions of masculinity (1997). Building upon this research, my study is aimed at examining how men understand their vulnerability to crime and how they construct it in front of their peers. How do men of this age group present their opinions of exposure to danger, and what do they perceive the risks to be? Data will be collected in interviews composed of undergraduate men attending a private, Catholic university in the inland northwest. These men will be asked questions discussing experiences, perceptions, and fear of crime.

*Faculty Sponsor: Nicole Willms, Gonzaga University*

33C - "The Generic Man": Emotions and Vulnerability Sold Separately

**Kelly Van Lith, Gonzaga University**

My research focuses on the way college men navigate emotional vulnerability. Through in-depth interviews, I investigate how men navigate contradictions between masculinity and feelings or expressions of emotional vulnerability. The sociological literature widely recognizes masculinity as a fluid social construction. Connell (1995) presents the idea that multiple masculinities exist in relation to each other, and in contrast to femininity. Doing gender then, for men, becomes a process of acting in a way which perpetuates and potentially transforms expectations found in normative masculinity (West and Zimmerman, 1987). Generally, expectations of normative masculinity do not include expressions of tender or intense emotions (i.e. fear, sadness, compassion). In this context, men's opportunities to express emotional vulnerability can be limited by expectations embedded in constructions of masculinity. This paper examines how men recognize and sometimes challenge perceived masculine expectations which act as barriers and prevent the acceptance or expression of emotional vulnerability.

*Faculty Sponsor: Nicole Willms, Gonzaga University*

33D - "No One Wants a Male Server at a Wing Place": Negotiating Heteronormativity and Emotional Labor in a Sports Bar

**Taylor Kelley, Gonzaga University**

Service work requires emotional labor; a concept defined as the need to sustain outward countenance to produce a specific state in others and requires strategies of surface acting and deep acting to produce the desired state of the customer. In this way, personality and emotion have become something sold as capital in today's commercial economy, especially as it applies to restaurant and dining experiences. People are no longer looking for good food; they are looking for an experience of comfort. This study examines the performance of emotional labor and looks at the performance of gender roles by the wait staff in a local, sports-themed restaurant. Through the process of in-depth interviews and participant observation as a server, this study analyzes the effects of being a laborer in the service industry. The interviews include questions about coping strategies, how they perceive gender affecting their job, and discussing what customers want from their experience.

*Faculty Sponsor: Vikas Gumbhir, Gonzaga University*

#### **SESSION 34: AN EXPLORATION OF SOCIAL BEHAVIORS**

**Faculty Moderator: Vikas Gumbhir, Gonzaga University**

**2:45-4:00 p.m., Room 126**

34A - Maximization in Romantic Relationships

**Flannery Fox, Whitworth University**

Do people's desires to make the best possible choice in their romantic relationships influence communication in relationships? This study examined relational maximization and affectionate communication in romantic relationships. Relational maximization is a trait level variable defined by the desire to make the best possible choice in romantic relationships. We measured for the three components of relational maximization (alternative search, high standards, and decision difficulty) and for the expression of affection in romantic relationships. It was hypothesized that maximization is negatively related to affectionate communication. Results from a survey of 83 participants supported the hypothesis. However, while alternative search and decision difficulty were found to be negatively related to affectionate communication, high standards had no association with affectionate communication.

*Faculty Sponsor: Alan Mikkelsen, Whitworth University*

34B - Reasoning of Laughter

**Kassandra Raynor, Whitworth University**

Why do we laugh? Where does the sound, the feeling, come from? I am going to explore and explain the emotions behind laughter and the health benefits attributed with this simple act. Laughter is a genuine and natural reaction that can be completely voluntary or even spontaneous. We laugh at many things, each having our own reasoning behind it. It's not what makes us laugh that is as important as why we laugh and what it does to our bodies and mind. Each person experiences and benefits from the attributes of a laugh. We are engineered to respond to laughter and share in it. When we look deeper, it is realized that this often over-looked ability is actually a necessity to our lives.

*Faculty Sponsor: Nichole Bogarosh, Whitworth University*

**SESSION 35: BIOLOGICAL SYSTEMS**  
**Faculty Moderator: Brook Swanson, Gonzaga University**  
**2:45-4:00 p.m., Room 127**

35A - Source-Sink Statistical Model Analysis

**Corina Vasquez, Gonzaga University**

Through the use of the program "R," a statistical model has been created in order to model source-sink dynamics as observed in weevil migration between patches of toadflax. The model essentially predicts weevil abundance in the sink when changes to the rate of increase in the source and the sink. A connection can be drawn from the model's predictions to the influence of percent urbanization and distance from city limits of a particular habitat patch. The rate of increase in the sink models the percent urbanization, or the level of development, that a habitat patch is located in while the rate of increase in the source reflects the proximity of the habitat patch to city limits. An assessment on how well the actual data fits the model's predictions will be the main focus of the presentation.

*Faculty Sponsor: Gary Chang, Gonzaga University*

35B - The Evolution of High Performance Spider Silk

**James Matern, Gonzaga University**

Spider silk is a high performance biological material made almost entirely from proteins. Spiders use their silk for a variety of ecological purposes from constructing webs for prey capture, to wrapping their eggs for protection. In order to better perform these functions, many species produce silk with remarkable mechanical properties. While there are several hypotheses regarding the characteristics of silk that result in such mechanical properties, the underlying mechanism is unknown. Here, we present data from 52 species of spider from a variety of distantly related clades in an attempt to elucidate the protein characteristics that result in such high performance. Our results suggest that the relationship between protein characteristics and performance is more complex than previously hypothesized, and we present further questions for future research.

*Faculty Sponsor: Brook Swanson, Gonzaga University*

35C - Increasing the Pepsin Resistance of a Prolyl Endopeptidase: Lessons Learned in the Prediction of Mutations Sites

**Mark Klick, Michael Arnold, Andrew Dodge, Jared Miles, and Stephen Cooper, Whitworth University**

Gluten intolerance, also known as celiac disease, is one of the most common food intolerances worldwide. Prolyl Endopeptidases (PEPs) have the ability to cleave toxic gluten fragments and thus, if modified to withstand gastric conditions, may serve as an oral therapy for celiac patients. The goal was to engineer an enzyme with increased pepsin resistance. Previously, Cerebro was used to find mutations sites in a *Lactobacillus helveticus* PEPX found in Swiss cheese. Based on these results six mutations were chosen and activity assays were used to determine which of these mutations were successful. Not all of the chosen mutations were active. This research describes the modelling and analysis work done to investigate the reasons behind the successes and failures of the original version of Cerebro. The research also proposes changes for version 2 of the Cerebro algorithm.

*Faculty Sponsor: Kent Jones, Whitworth University*

35D - Collagen Counts in Cuts

**Sharon Henzler, Ryan Fraser, and Charlotte Trebilcock, Gonzaga University**

Collagen accumulation is an important indicator of wound healing in complex biological systems. Other vital indicators of wound closure include fibroblasts, inflammation, and pathogens. The primary focus of this research has been to investigate areas in which differential equations are used to predict real world behaviors in complex systems. Within the scope of this research collagen accumulation was studied alongside other complex biological systems that aided in the prediction of wound closures in various environments. The data was analyzed and compared to real world results which backed up the hypothesis that pathogens and inflammation retard wound closure. It was also found that altered fibroblast proliferation aided wound closure in nominal and more extreme cases than antibiotics.

*Faculty Sponsor: Bonni Dichone, Gonzaga University*

**SESSION 36: CULTURAL AND NARRATIVE PSYCHOLOGY**  
**Faculty Moderator: Vinai Norasakkunkit, Gonzaga University**  
**2:45-4:00 p.m., Room 103**

36A - Are American NEETs (Not Engaged in Employment, Education, or Training) Deviant in Their Motivational Styles?: Investigating the Psychological Consequences of Youth Marginalization

**Allison Cutuli and Brennan Champagne, Gonzaga University**

This study is a continuation of a cross-cultural study which explores motivation in relation to positive and negative feedback. Research was conducted in Japan to identify those who are at risk for becoming “Not engaged in Employment, Education, or Training” (NEET) and their deviant motivational styles and has now expanded to the United States. The study in Japan gave either positive or negative feedback to both high and low-risk students upon completing a difficult task. They found that consistent with the prototypical motivational pattern in Japan, low-risk Japanese students persisted longer on the challenging task given negative feedback. The opposite pattern was found for those who were high-risk for becoming NEET (Norasakkunkit and Uchida, 2012). We are currently replicating this study with students from the United States with the expectation that students at risk of becoming NEET in the U.S. will also present with a culturally deviant motivational style.

*Faculty Sponsor: Vinai Norasakkunkit, Gonzaga University*

36B - Cognitive and Personality Trait Contributors to Autobiographical Memory

**Danielle Simien and Jordan Love, Gonzaga University**

Recent research suggests that autobiographical memory is influenced by both general cognitive ability and personality traits. To examine whether such correlations exist for memory of interparental conflict and the parent-child relationship, we will have students complete a cognitive measure, a packet of questionnaires, and briefly describe a positive parent-child memory. Specifically, we will administer the Wechsler Adult Intelligence Scale -3rd Edition (WAIS-III) vocabulary subtest, a demographic sheet, the Ten-Item Personality Inventory (TIPI), the Children’s Perception of Interparental Conflict (CPIC) and the Parental-Acceptance and Rejection Questionnaire (PARQ, short form). The session will conclude by having students spend 10 minutes writing about a positive parent-child memory. Data is currently being collected on 60 participants.

*Faculty Sponsor: Anna Marie Medina, Gonzaga University*

36C - Associating Emotional Experiences with Self-relevant Motivations at the Implicit Level Across Cultures

**Matthew Upton, Gonzaga University**

Previous self-report findings suggest that in North America, people tend to focus on self-enhancing perceptions of self and attend to positive emotional experiences related to personal goals, whereas in East Asia people tend to focus on adjustment and self-improvement goals and attend to negative emotions related to interpersonal interactions. In this article, we go beyond self-report methods to see if these cross-cultural patterns can be confirmed at the implicit level. Fifty undergraduates in Japan and in the United States were recruited as participants. Participants were given an Implicit Association Test (IAT). The test involves associating cute animals and creepy animals with socially disengaging and socially engaging situations. We hypothesize that people in their respective cultures will associate pleasant stimuli most quickly with situations that are aligned with their culturally patterned self-perceptual motivations. Implications for how different cultures rely on different emotional experiences to achieve culturally shaped self-relevant goals are discussed.

*Faculty Sponsor: Vinai Norasakkunkit, Gonzaga University*

**SESSION 37: DYNAMIC ALGORITHMS**  
**Faculty Moderator: Shannon Overbay, Gonzaga University**  
**2:45-4:00 p.m., Room 104**

37A - Grammatical and Semantic Coherence as Related to N-Gram Size in the Brown Corpus

**Christopher Birmingham, Gonzaga University**

In 1951 a Bell Labs mathematician Claude Shannon developed a technique for “estimating the entropy and redundancy of a language” (Shannon, 1951). Jurafsky and Martin (2009) adapted Shannon’s technique to demonstrate that randomly generated sequences from Shakespeare show increased coherence as the size of the sequence increases. These sequences are known as N-grams, where N indicates the number of words in a sequence. Our work is an attempt to replicate this classic experiment. Using a subset of the Brown Corpus, we will generate all possible N-grams for N=1,2,3,4 and calculated

their relative probabilities. We will then randomly generate sentences based on these N-gram probabilities and test the coherence by submitting the resulting sentences to 25 speakers of Standard American English for ranking on a five point Likert scale. We expect that when N increases in size, the sentences will show increasing grammatical and semantic coherence.

*Faculty Sponsor: Paul De Palma, Gonzaga University*

37B - Book Embeddings:Using Polya's Enumeration Theorem to Minimize the Search Space for the Genetic Algorithm: Part 1  
**Lauren Joplin and Chauncy Cullitan, Gonzaga University**

A standard n-book is a line in 3-space (called the spine), together with n half-planes (the pages), joined together at the spine. A graph is embedded in a book by ordering the vertices along the spine and placing the edges within the pages of the book so that no two edges cross each other or the spine. The book-thickness of a graph G is the smallest number of pages needed to embed G in a book. For certain graphs, such as the complete bipartite graph  $K_{m,n}$ , the optimal book-thickness is unknown. We use Polya's Enumeration Theorem to greatly reduce the space of possible vertex orderings in hopes of improving upon known bounds for the book-thickness of  $K_{m,n}$ .

*Faculty Sponsor: Shannon Overbay and Paul DePalma, Gonzaga University*

37C - Book Embeddings:Using Polya's Enumeration Theorem to Minimize the Search Space for the Genetic Algorithm: Part 2  
**Myanna Harris and Luke Johnson, Gonzaga University**

The genetic algorithm is an optimization technique loosely based on Darwin's idea of natural selection. It was introduced in the late 1970s by John Holland at the University of Michigan. The book embedding problem is a well-known NP-complete optimization problem from graph theory. For a particular graph, we seek to embed it using the smallest possible book. Using the genetic algorithm and Polya's Enumeration Theorem to limit the search space we hope to improve upon best known book-thickness bounds for certain types of graphs.

*Faculty Sponsor: Paul De Palma and Shannon Overbay, Gonzaga University*

37D - Nonlinear Demand in the Real Estate Market

**David Hoff and Domonkos Vamossy, Whitworth University**

This presentation provides an in depth analysis of the U.S. housing market's dynamics. A system of discrete nonlinear equations is used to model the market's behavior. Additionally, several other methods of fitting the market's behavior were performed.

*Faculty Sponsor: Michael Rempe, Whitworth University*

### **SESSION 38: HISTORY: ROME TO HARPER'S FERRY**

**Faculty Moderator: Andrew Goldman, Gonzaga University**

**2:45-4:00 p.m., Room 111**

38A - The Rainbow of Discrimination

**Taylor Phillips, Eastern Washington University**

The purpose of this research is to identify the discrimination against migrant workers through the history of the United States and to see which groups that have previously been discriminated against are now the ones who are discriminatory. My presentation first identifies the groups of migrants (workers) that were discriminated against after the colonization of the United States and how the migrant working groups have changed as the United States expanded and slavery became abolished. These historical events will set up today's current problem with Mexican and other Spanish speaking migrant workers in the United States and how this is a fad issue that may have some relevance but is being misconstrued by modern propaganda and racism.

*Faculty Sponsor: Rob Sauders, Eastern Washington University*

38B - Cultural Reconstruction: Effects of China's One-Child Policy on the Welfare of its Citizens

**Brandon Emerson, Whitworth University**

For the world's most populous country, China, the need for population control became very apparent in the 20th century. This caused the Chinese Communist Party (CCP) to rethink their population control policies and on 25 September 1980, The Central Committee of the Chinese Communist Party released a public letter that included a plan for greater population control. Qian Xinzong provides a perspective on the population problem from within the CCP, Patricia Ebrey provides a

look at the late traditional Chinese family, and Leo F. Goodstadt provides population statistics. Susan Greenhalgh among others provides an immense amount of analysis on various ramifications caused by the policy. These varying sources discuss the treatment of families that do not fit the one-child family model, the changes in the population numbers over time and how that correlates to the evolution of the policy, along with the effects of the policy on the current generation.

*Faculty Sponsor: Anthony Clark, Whitworth University*

38C - Increasing Sectionalism in Antebellum America: The Response to John Brown's Raid on Harper's Ferry

**Margaret Thompson-Johnston, Gonzaga University**

This paper explores the sectionalism that existed between the North and the South during the antebellum era. It attempts to put into context the actions of John Brown at Harper's Ferry, Virginia, and connect this event with the growing tensions between the two sections of the United States. This is done by examining the reactions of both the North and the South to Brown's raid and the views that emerged because of it. Specifically, the paper addresses the reaction of pastors in the North to Brown's actions, largely hailing him as a martyr for the abolitionist cause, which in turn led the South to feel increasingly alienated from the Union. The South felt that their way of life was being attacked, based on the North's largely positive reaction to the Harper's Ferry raid.

*Faculty Sponsor: Timothy Clancy, Gonzaga University*

38D - The Importance of Topography to Roman Commanders in the Republic

**Roman Nugen, Gonzaga University**

The Roman army: the conquerors of most of Europe, Northern Africa, Asia Minor and parts of the Middle East. One associates the success of the Roman armies with discipline and training of the soldiers and the flexibility of the cohorts and legions. What about the tactical brilliance of the Roman commanders? This paper looks into the decisions made by these commanders that gave victory to the Roman army and more specifically how Roman Republic commanders took advantage of the topography to achieve victory against all odds. Many times the enemies outnumbered the Roman armies and that required a brilliant leader to lead them to the defeat of the enemy. The commanders' decisions determined the outcome of the battles and expanded the glory of Rome.

*Faculty Sponsor: Andrew Goldman, Gonzaga University*

### **SESSION 39: PERCEPTUAL EFFECTS ON COGNITION AND EMOTION**

**Faculty Moderator: Gary Thorne, Gonzaga University**

**2:45-4:00 p.m., Room 120**

39A - The Effect of Binaural Beats on Mood

**Alen Tersakyan, Gonzaga University**

When binaural beats are presented they may entrain brainwaves and consequently produce changes in states of conciseness. We conducted a within subjects experiment on 30 participants. The participants took a 25 minute vigilance task on 3 consecutive days. Each participant was placed into all 3 groups: control, Beta binaural beats (17 and 26 Hz), and Delta binaural beats (1.5 and 3 Hz). We found that the Delta condition group was associated with less negative mood after taking a 25 minute vigilance task.

*Faculty Sponsor: Anna Marie Medina, Gonzaga University*

39B - The Effect of Spacing on Reaction Time for Point, Curve, and Line Stimuli

**Catherine Victoria Nevius and Devon Isner, Gonzaga University**

In some theories of composition in art, pointed shapes, sometimes called tension points, are thought to attract visual attention. This research was intended to empirically verify this hypothesized effect. Participants saw a random series of briefly presented letters at fixation, each with a point, curve, or vertical line figure on the right or left. Spacing between letters and figures was randomly narrow, medium, or wide. The task was to identify the letters by pressing a key on a computer keyboard. We hypothesized that the time to identify the letters would be slowest when next to a point. We also hypothesized that the time to identify the letters would increase as spacing increased.

*Faculty Sponsor: Gary Thorne, Gonzaga University*

### 39C - The Effects of Music Modulation on Short-Term Memory Performance

**Jakeem Lewis and Joseph Little, Gonzaga University**

The purpose of this experiment was to test whether participants' short-term memory performance is affected by a break between the completion of two tasks. Participants did a memory task in which they had to recall as many letters in a series as possible. Then participants had a silent break, listened to a song in a slow tempo, or listened to the same song in a fast tempo. Then the participants in each of the conditions repeated the memory task that was done before the break. We hypothesized that the participants in the fast-tempo song condition would perform better on the short-term memory task after the break than the silent condition, and that the slow-tempo song condition would show worse performance after the break than the other two conditions.

*Faculty Sponsor: Gary Thorne, Gonzaga University*

### 39D - The Effect of Color Eliciting Emotion

**Scott Campanario and Mariel Rodriguez, Gonzaga University**

Previous research regarding the perception of color has supported the claim that the perception of warm colors, such as red, can increase one's aggression. This study tested this hypothesis, while also testing the hypothesis that cold colors, such as blue, may lead to calmer and more sympathetic emotional responses. Findings could add to the discussion of the effects of color perception on emotion and behavior. Volunteer participants were given two low-stress and two high-stress stories to read on either a red, blue, or white sheet of paper. They then responded to three questions per story. We hypothesized that reading the stories on blue paper will lead to lower anger scores and higher sympathy scores. We also hypothesized that the opposite pattern will occur for participants who read the stories on red paper. The results indicate that the color of the paper did not affect the participant's anger or sympathy score.

*Faculty Sponsor: Gary Thorne, Gonzaga University*

## **SESSION 40: STATISTICS IN THE MODERN WORLD**

**Faculty Moderator: Matt Bahr, Gonzaga University**

**2:45-4:00 p.m., Room 113**

### 40A - Momentum Swings in American Football

**Sam Wolkenhauer, Eastern Washington University**

In this empirical study, I analyze over 340,000 plays in NFL football to test for the presence of momentum, as colloquially discussed by media analysts and coaches. I construct a scoring potential model and win probability model to evaluate team efficiency. Using these tests and a Markov matrix model of football, I determine that no evidence of momentum swings exists in past NFL games.

*Faculty Sponsor: Nate Skuza, Eastern Washington University*

### 40B - The Statistics of Existence in the Modern World: Applying Binomial Distributions to as Many Subjects as Possible

**Cameron Healy, Gonzaga University**

Binomial Distributions are marvelous tools for if you know the probability of a pass/fail event, you have a set number of trials in your sample. I explain how they work. 1. Love: You may calculate the probability of dating a number of a randomly selected population if you have your population success rate. 2. Academia: One may calculate the number of classes they are likely to achieve a good grade in. 3. The proportion of questions on a religion exam you will get correct with variants of "Jesus" or "Christ" 4. Tastefulness: How many songs out of the next ten on any given radio station you will actually like? 5. Sports: What's the probability that the Jets have a winning record this season, considering their past records? What about the Seahawks? Patriots? Broncos?

*Faculty Sponsor: W. Y. Chan, Gonzaga University*

## SESSION 41: THE MONSTROSITY OF HUMANKIND: VIOLENCE AND TRAGEDY IN LITERATURE OF THE EARLY MIDDLE AGES

Faculty Moderator: J.D. Thayer, Gonzaga University

2:45-4:00 p.m., Room 122

41A - Peace-Weaving in *Beowulf*: A System of Both Failure and Triumph

**Kayla Plocher, Gonzaga University**

In Anglo-Saxon society, there is no doubt that gift giving plays a crucial role in forging the bonds between the lord and his retainers. In *Beowulf*, however, we are able to see that this cultural tradition extends beyond merely gold and treasures. This presentation will discuss a practice found in *Beowulf* known as peace-weaving, where women are included in the economy of exchange, and married off in hopes of uniting two formally or potentially hostile tribes. In this epic poem, the poet shockingly underscores both the flaws and the triumphs of this cultural practice. Through characters such as Hildeburh and Freawaru, it becomes apparent that beyond the misogynistic nature of this trafficking, attempts to weave peace through women are often inexorably doomed. With *Wealhtheow*, however, the poet also reveals that in certain situations, when women gain the means to fuse the domestic and the heroic worlds, peace-weaving can be successful.

*Faculty Sponsor: James Thayer, Gonzaga University*

41B - The Degradation of Brynhild

**Sean Riley, Gonzaga University**

The tale of "Sigurd and Brynhild" can be seen as a story as old as love. The tale may be told in different variations and forms, yet the essential structure of the story is retained, leading to a specific genre. The shapeless form, that is readily apparent from the micro-prospective, becomes elusive when seen in the macrocosm that is the literary study of the Age of *Beowulf*. The common motif of the "star-crossed lover" is seen over and over through characters such as Tristram and Yseult, Thorstein and Spes, Lancelot and Guenevere, Romeo and Juliet. When approaching these characters and their tales, it is common for the modern reader to look for a cohesive thread in which the entire narrative is held together. In the case of Sigurd and Brynhild, the main thread that weaves through all the stories is tragedy; manifested in the degradation of Brynhild as a character.

*Faculty Sponsor: James Thayer, Gonzaga University*

41C - Of Monsters and Men: Grettir as Hero or Monster in *Grettir's Saga*

**Megan Dempsey, Gonzaga University**

The titular character of *Grettir's Saga* noticeably fluctuates between the poles of hero and monster. In the saga, themes and motifs attempt to establish Grettir as a paradigmatic representation of either category. One such motif is Grettir's uncommonly positive relationship with women, a motif which suggests his heroic identity but also relates to his potential to be monstrous. The question of whether or not Grettir is a true hero or an infamous monster remains an overarching topic of investigation throughout this text.

*Faculty Sponsor: James Thayer, Gonzaga University*

## SESSION 42: PSYCHOLOGICAL CONSIDERATIONS OF COLLEGE CAMPUSES

Faculty Moderator: Molly Kretchmar-Hendricks, Gonzaga University

2:45-4:00 p.m., Room 123

42A - Gets the Money?: Non-Ethnic vs. Multi-Ethnic Organization Affiliation Influence on Undergraduate Scholarship Recipients

**Vanessa Delgado, Washington State University**

This study investigates the affect organizational and race affiliation has on a male student's ability to receive a scholarship. The first focus of this study is to encompass how society values traditional Caucasian organizations over multi-ethnic organizations. The second focus is to understand if race, specifically Caucasian versus Latino, is a determining factor for being a scholarship recipient. Research indicates that students affiliated with multi-ethnic organizations come from underrepresented backgrounds and are less likely to attend higher education. Therefore, it is important to understand how this affiliation with non-multi ethnic versus multi-ethnic organizations can impact the likelihood of becoming a scholarship recipient, a resource that increases one's ability to attend higher education. These findings will investigate whether or not a student's ability to receive a scholarship is determined based on their race and/or organizational affiliation.

*Faculty Sponsor: Julie Kmec, Washington State University*

#### 42B - Motives for On-Campus Involvement

##### **Dani Hall, Gonzaga University**

Involvement in on-campus organizations and activities is a major part of the four year college experience. This study aimed to find connection between motives for involvement and level of involvement and to distinguish between intrinsic versus extrinsic motives. Five undergraduate students age 18 to 22, with a broad range of levels of involvement, were interviewed. Using qualitative analysis strategies, interviews were analyzed for major themes and patterns. Results indicated that major intrinsic motivators were relationship building, desire to serve and a desire for productivity. Campus cultural pressure and benefits for employment were identified as major extrinsic motives. Ultimately intrinsic motivations emerged as the stronger and more prevalent, and an association between relationship building outcomes and level of involvement was identified. More research is needed to explore the role of relationships building as a motivation for involvement.

*Faculty Sponsor: Molly Kretchmar-Hendricks, Gonzaga University*

#### 42C - Ease of Adjustment to College Life for Students of Color

##### **Heather Diaz, Gonzaga University**

Previous research suggests that cultural background affects adjustment to college life. This qualitative research project further explores this question. Eight college freshmen (50% students of color) will be interviewed about their background, their influences, and whether those two aspects of life have helped them adjust to life as a college student. Using qualitative analysis, the interviews will be compared for major themes and patterns. I expect that students of color will experience a more difficult time adjusting to life away from home and a college culture that may clash with their own cultural values and norms. This research aims to identify specific adjustment issues for students of color as well as how those issues can be overcome.

*Faculty Sponsor: Molly Kretchmar-Hendricks, Gonzaga University*

#### 42D - Media's Role in Building Identity

##### **Monica Clark, Gonzaga University**

Because social media is so present and available in today's age, it is applicable to question how much one perceives it to affect one's own identity. Inspired by Erik Erikson's eight stages of development theory, this research project focuses on Erikson's 5th stage specifically involving identity formation taking place during adolescence. This research project will involve the participation of 4 to 6 Gonzaga University freshmen students, still considered to be in the late adolescent stage. These students will participate in a qualitatively based interview study, which will ask a series of questions intended to discover the student's own perception of how the media has influenced the shaping of his/her own identity. Expecting to find that the media is a considerable factor that shapes an adolescent's identity, this project aims to understand this relationship in more detail.

*Faculty Sponsor: Molly Kretchmar-Hendricks, Gonzaga University*

### **POSTER SESSION ONE**

**Faculty Moderator: Christy Watson, Gonzaga University**

**10:30-11:45 a.m., Rooms 107, 108, and 109**

#### 43 - Domestic Violence and Resources for Latino/A Communities: Cultural Competency and Resources Assessment of Domestic Violence Agencies in Washington State

##### **Vanessa Delgado, Washington State University**

This study focuses on two domestic violence agencies' ability to address Latina women's needs. Because of demographic shifts and growth from the Latino community, it is important to address if the services are following the demographic changes. This study assesses the services currently available in the Pacific Northwest, how those services were developed and how Latinas are/are not able to access those services. This study is to determine the relationship that domestic violence has to Latinas and the ability of agencies, in the Northwest, to meet the needs of Latinas. This study is geared towards understanding the availability of services that serve these particular women as well as mapping areas where services can be improved. There will be a close examination of how and if the domestic violence services and agencies adequately serve the Latino community and how the Latina women can create resistance against the violence in their communities.

*Faculty Sponsor: Linda Heidenreich, Washington State University*

44 - Effects of Model-Lead-Test on Handwriting Legibility for a High School Student with Autism

**Mika Aoyama and Emalia Steele, Gonzaga University**

The purpose of the present study was to evaluate the effectiveness of a Model-Lead-Test procedure on letter size and legibility for lowercase alphabetical letters. A multiple baseline design across three sets of letters to the midline, above the midline, and below the midline was employed to evaluate the efficacy of our intervention. The participant's ability to demonstrate appropriately size and form of lowercase alphabetical letters was found. Unfortunately, intervention on Set 3 did not occur. The procedures were easy to implement and employ in the classroom setting. Keywords: autism (ASD), handwriting, legibility, lower case letters

*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

45 - Shining a Light on the "Darkweb": Understanding TOR and the Networks Associated With It

**Tyler Loud, Gonzaga University**

My project will explore TOR (The Onion Router) network and the Darkweb associated with it. I will begin by looking at how TOR developed and the basics surrounding its functionality. I will look into the security of the network as well as the multitude of uses that TOR has been associated with. I will also examine the weakness surrounding the network and explore its safety going forward. After examining the functionality of the TOR network I will begin to look to the different underground communities and sites that have developed on TOR including the "Silkroad," "The Money Market," and "TOR Mail." I will examine these communities and their associations and look toward the emerging political themes, after which I will look to compare these themes to some major leading issues surrounding cyber politics today including Internet privacy, copyright, and security.

*Faculty Sponsor: Sean Swan, Gonzaga University*

46 - The Effect of a Direct Instruction Flashcard System for Increasing Performance of Basic Division Facts

**Michaelyn Bjordahl and Rebecca Talboy, Gonzaga University**

The purpose of this study was to evaluate the effects of a Direct Instruction (DI) flashcard system on the mastery, accuracy and fluency of basic division math facts (numbers 0-12) of an at-risk seventh grade boy, diagnosed with ADD within the classroom setting. The effects of the flashcard system were examined in a multiple baseline design across problem sets. The overall outcomes found large increases in student accuracy. The procedures were easy to employ in a middle school classroom setting. Keywords: math facts, ADD, DI flashcards, model, lead, and test, long division, middle school student

*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

47 - The Effect of the REWARDS Reading Program on Vowel Sounds, Word Part, and Prefix and Suffix Identification in Multi-Syllabic Words

**Isabelle C. Klee and Sarah M. Brasch, Gonzaga University**

Many studies have assessed the efficiency and success of various reading programs which have been developed to improve these areas of reading proficiency. The REWARDS Program is one such example. This program works to increase a student's ability to decode multisyllabic words using specific strategies including vowel sound, word part, and prefix and suffix recognition. REWARDS can be used as intervention elementary to high school, and with students in both general and special education settings. This study was performed by two undergraduate students at a high school in the Pacific Northwest and assesses the progress of a 14-year-old-female participant who was diagnosed with a specific learning disorder in reading skills. The study tracks the development of the participant's reading skills through the use of the REWARDS Program. Through this study, there was clear evidence that the REWARDS Program had a positive impact on the student's ability to decode multisyllabic words.

*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

48 - The Effects of a Direct Instruction Flashcard System for a Middle School Student with Learning Disabilities

**Skyler Jones and Caitlin LeBrun, Gonzaga University**

The effectiveness of employing DI flashcards for a single student with learning disabilities was evaluated. Three sets of math facts were developed. A changing criterion design was employed. The outcomes indicated large increases in math skills with DI flashcards were employed. The procedures were easy to implement and evaluate in a middle school special education classroom. Keywords: DI flashcards, math facts, learning disabilities, middle school student

*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

49 - The Effects of a Direct Instruction Flashcard System to Assist two students with Disabilities on Multiplication Facts

**Jeffrey Helling, Gonzaga University**

The study was conducted to see if the DI Flashcard procedure could help two students, who were not at their respective grade level standards, improve their math facts. One student was chosen with autism to see if the DI procedure would have an effect on children with autism. The second student was chosen with intellectual disabilities because the goal was to see if DI Flashcards could have a positive effect area on this student as well. By conducting this research on two Special Education students with very different disabilities, the results would show if DI Flashcards can be used to help improve other people with these same disabilities as well. The purpose of this study was to evaluate the effects of DI flashcard system on the multiplication facts of a 12-year-old boy and a 15-year-old girl in their respective special education classrooms.

*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

50 - The Effects of Implementing Model-Lead-Test to Assist a Preschool Student with Basic Rote Counting

**Torrey Finn and Aspen Edwards, Gonzaga University**

The purpose of this study was to evaluate the effectiveness of a model-lead-test paired with contingent rewards on the basic rote counting skills of a four-year-old girl on the floor in her home. She attended pre-school and lived in a very stable household with her mother, father, and older brother. Before the study began, the participant could not count to 15 without skipping numbers. When rewards and model-lead-test were employed, the participant's counting improved. The efficacy of employing model-lead-test in the home was discussed. Keywords: model, lead, test, rewards, rote counting

*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

51 - The Effects of the REWARDS Program on the Accurate Decoding of Multi-Syllabic Words by Two Fifteen-Year-Old High School Students with Learning Disabilities

**Sidney Volwiler and Clare Greaney, Gonzaga University**

The purpose of the study was to implement the REWARDS Intermediate Reading Program to improve the decoding skills of two 15-year-old high school freshmen with learning disabilities. Both were also several years below grade level in reading and were having difficulty with high school course work. A changing criterion design was employed to evaluate the effects of REWARDS on performance of sight words. Both participants improved their performance when the REWARDS curriculum was employed. The benefits of employing REWARDS were outlined.

*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

52 - *Atta cephalotes* Preference in Rainforest Habitat

**Alyssa McGee-Menzies, Sacha Clow, and Seth Flanders, Whitworth University**

The leaf cutter ants, *Atta cephalotes*, play an important role in rain forest ecology. The goal of this study was to identify their preference of forest area. This was done by taking measurements of nest size and trail length in three areas of forest: open habitat, reforested region, and selectively logged. The ants had larger nests in the reforestation and selectively logged regions compared to that of the open habitat. However, trail lengths tended to be similar between regions. This is an important topic because the Bijagual Ecological Reserve in Costa Rica is slowly being converted back to protected rainforest composed of native species and the ants can be detrimental to the regrowth.

*Faculty Sponsor: Grant Casady, Whitworth University*

53 - The Use of Photographic Interpretation to Determine the Compositional Volume and Nature of Mixed Magma from Basalt and Rhyolite Complexes at Yellowstone National Park

**Amber Haston and Drew Adams, Eastern Washington University**

Petrographic thin sections from the mixed magma complex at Grizzly Lake, Yellowstone National Park display complex mixing structures which make analysis extremely complicated. To address the complex nature of the slides, they were digitally scanned and analyzed using ImageJ software to determine relative composition and volume of the end members. These data were then compared to microprobe analysis obtained from a JEOL 8500F field emission electron microprobe, to determine the efficacy of the photographic interpretation. Such analytical processes could be used in larger scale situations, such as outcrop photos, to estimate volumes of visual end members (felsic and mafic constituents) in a mixed magma situation or metamorphic outcrops. Further, if refined, it could be a viable option in the analysis of fractality of the complicated structures displayed in the Grizzly Lake mixed magma complex

*Faculty Sponsor: Chad Pritchard, Eastern Washington University*

54 - A Determination of the Primordial Helium Abundance

**Stewart Spencer and David Rodriguez-Perez, Gonzaga University**

Three minutes after the Big Bang, the light elements deuterium, helium, and lithium are synthesized. Therefore, measurements of this primordial helium abundance offer us a window into the early universe. Using Markov Chain Monte Carlo, we determine the helium abundance of Blue Compact Dwarf Galaxies from the Sloan Digital Sky Survey. Comparison with predictions from the Cosmic Microwave Background Radiation provides insight into standard models of Cosmology and Particle Physics.

*Faculty Sponsor: Erik Aver, Gonzaga University*

55 - A Study of Halogenated Aromatic Compounds

**Shannon Daly, Whitworth University**

The interactions of binary mixtures of halogenated aromatic compounds can be studied using Differential Scanning Calorimetry (DSC). DSC is an analytical technique that records phase changes in compounds and mixtures and often is used to generate phase diagrams. In this research different mole fractions of compounds with varying dipole magnitudes were mixed together and then DSC runs were performed. The results of these runs were compiled to make phase diagrams in order to study the intermolecular interactions of these binary mixtures. Mixtures of compounds with dipoles of similar magnitude appear to result in congruent melting while mixtures of compounds with dipoles of significantly different magnitude resulted in eutectic/peritectic behavior. This experiment appears to generally support previous research done with fluorinated aromatic compounds.

*Faculty Sponsor: Karen Stevens, Whitworth University*

56 - Ain't No Shame in My "Selfie" Game: The Presentation of Self on Instagram

**Jaime Fischer, Gonzaga University**

My research focuses around Erving Goffman's notion on the presentation of self through a strictly visual social networking site, Instagram. Goffman describes this notion as how individuals express themselves in given ways in order to generate a desired response (Goffman, 1959). The goal of my research is to gain a better understanding of the practice of "selfies," or pictures of only oneself. There are two major aspects involved in the presentation of self: the individual and the audience that surrounds the individual. My study looks at how the audience of Instagram interprets and perceives the practice of selfies on Instagram by individuals. Through in-depth interviews, I explore the negative stigmas and positive functions of selfies through the perspective of the audience.

*Faculty Sponsor: Vikas Gumbhir, Gonzaga University*

57 - Analysis of Rhodoquinone Production in Knockout Strain Candidate Rru\_A3231 of *Rhodospirillum rubrum*

**Benjamin Titus, Gonzaga University**

Parasitic helminthes are the cause of millions of infections throughout the world, and they have become increasingly resistant to modern antibiotics. Parasitic growth within a host organism occurs anaerobically, and requires rhodoquinone (RQ). Since hosts do not make RQ, the mechanism for RQ production is a novel drug target. In this study, *Rhodospirillum rubrum* was used as a model for RQ biosynthesis, due to its high RQ production during anaerobic growth. Our lab has already identified a new gene, *rquA*, which has been shown to be crucial in RQ biosynthesis. Recently, we have identified additional RQ biosynthetic gene targets in *R. rubrum* using RNA sequencing and bioinformatics. In particular, Rru\_3231 and Rru\_1274, have been chosen as candidates. This project involves the knockout of these genes from the *R. rubrum* genome through homologous recombination. The quantitative analysis of RQ production in the mutants will be compared to wild type *R. rubrum*.

*Faculty Sponsor: Jennifer Shepherd, Gonzaga University*

58 - Analysis of Surface Temperature on a Hydrogen Storage Canister During Desorption

**Charlotte Trebilcock, Gonzaga University**

Hydrogen storage is an important aspect of current alternative energy technology development. Topics that are under research include the investigation of metal hydride compositions, and the operating conditions (pressure and temperature) for compositions and systems. The primary focus of this research has been to study equilibrium and nonequilibrium pressure and temperature conditions for a commercially available portable hydrogen storage canister. The canister was charged to full capacity with hydrogen, then allowed to desorb at ambient room temperature for 5 minutes while temperature readings were taken. The data was analyzed to establish a functionality for temperature and hydrogen mass

loss, and those respective parameter's dependencies on initial state of fill. There is a correlation between initial equilibrium pressure reading and amount of hydrogen desorbed from the canister during a five minute desorption. Pressure readings appear to be an indicator of hydrogen loss and/or leakage from the canister.

*Faculty Sponsor: Patrick Ferro, Gonzaga University*

59 - B-Alert System Sensor Headset Encephalography Used to Measure Brain Activity in Response to Playing *Halo 2* (videogame) and Solving Sudoku

**Helya Peyman, Whitworth University**

Sudoku and videogames have shown to be cognitively beneficial. This study observed the effect of a first person shooter (FPS) videogames on engagement, and looked at the mental engagement of the participant while playing *Halo 2*. Those results were then compared to cognitive engagement while solving a Sudoku puzzle. The B-Alert System Sensor is proven to evaluate engagement in mental workload, a term used to refer to the measure of the level of cognitive processing in the range of executive functions. EEG measures brain waves in response to High/ Low Engagement. The current study will use the B-Alert Sensor to observe the overall brain engagement while solving Sudoku compared to playing videogames. This study has found higher engagement in videogames, especially among participants who play videogames more often and participants < 20 years old have significantly more High Engagement in *Halo 2* than Sudoku when compared to participants >20.

*Faculty Sponsor: Michael Sardinia, Whitworth University*

60 - Bending Fatigue High Strain Rate Preliminary Results

**Mai Burke and Paloma Cruz, Gonzaga University**

As new economies commence utilizing hydrogen as an alternative energy source, the effects of material selection, environment, and stress exposure become a more significant area of research in understanding hydrogen embrittlement in degrading mechanical properties of metallic materials. Materials most susceptible to the reduction of ductility and loading bearing potential from embrittlement include high-strength steels, titanium, and aluminum alloys. This study focuses on the effects of hydrogen embrittlement on bending fatigue strengths of 304 SS at high strain rates. Samples groups are exposed to hydrogen in a vacuum environment for 7 days and 16 days and compared to unexposed samples using a rotating cantilever bending fatigue test at 500 RPM. Preliminary data suggests that higher hydrogen exposure decreased the amount of cycles until failure.

*Faculty Sponsor: Patrick Ferro, Gonzaga University*

61 - Cheney Fracture Zone

**Zach Arms and Austin Ulakovich, Eastern Washington University**

The Cheney fracture zone (Cheney, WA) is a cryptic structural feature that has been presented on geologic maps for decades, and yet very little is known about the origin of these structures. We explore if the Cheney fracture zone is manifested from deeper structures in the basement using geophysics and fracture analysis. Pictures of preserved faults indicate that motion was most likely lateral as vertical offset is not seen. The orientation of the Cheney fracture zone correlates with regional lateral faults. These fractures along with paleo-drainages may strongly influence local geohydrology as they may influence rates of infiltration of ground water.

*Faculty Sponsor: Chad Pritchard, Eastern Washington University*

62 - Comparison of Cervus, MasterBayes, and Colony for Assignment of Parentage in Acorn Woodpeckers

**Niles Desmarais and Brandon Norris, Gonzaga University**

For forty years the complex breeding behavior of the Acorn Woodpecker (*Melanerpes formicivorus*) has been studied at the Hastings Natural History Reserve in California. Acorn Woodpeckers are cooperative breeders: offspring from previous years will often extend their stay in their natal group and forgo breeding to help raise the next generation of offspring. These birds live in family groups of up to fifteen closely related individuals and exhibit polygynandry, where up to seven cobreeding males compete to breed with as many as four joint-nesting females. Demographic and behavioral data has been collected since the early 1970's and starting in the 1980's, blood samples were obtained to allow assignment of parentage. To determine the parents, genotypes were obtained using up to 19 microsatellite markers for nearly three thousand birds. These genotypes were put into a parentage assignment program, which uses likelihood analysis to determine the parents of each individual. Parentage results thus far have been produced using a program called CERVUS. There are several parentage programs that are often used that make different statistical assumptions for assigning parentage and may provide better

accuracy in estimates of confidence. The purpose of this study is to compare the parentage analysis based on CERVUS to results obtained from Colony and MasterBayes to quantitatively assign parentage in a multi-generational pedigree of Acorn Woodpeckers.

*Faculty Sponsor: Joseph Haydock, Gonzaga University*

63 - Comparison Study of the Prevalence of Zoonotic Internal Parasites Associated with Sheltered *Canis lupis familiaris* as well as *Felis catus* Relative to the Prevalence in Non-Sheltered *Canis lupis familiaris* and *Felis catus* of Eastern Washington  
**Chase Zuber, Whitworth University**

This study was done in order to determine the relative prevalence of zoonotic internal parasites associated with sheltered dogs (*Canis lupis familiaris*) as well as cats (*Felis catus*) when compared to the prevalence in non-sheltered dogs and cats in Eastern Washington. According to the American Humane Society between 37% and 46% of United States homes contain at least one dog and 30% to 39% contain at least one cat. An estimated 5 to 8 million dogs and cats enter shelter facilities each year (American Human Society, 2013). The hypothesis tested was that the prevalence of zoonotic internal parasitic organisms found in sheltered dogs and cats will be significantly lower than a similar sample size of domesticated dogs and cats due to standardized worming processes. This study showed to be in complete agreement with the hypothesis, speaking to the efficacy of the Humane Society worming program.

*Faculty Sponsor: Michael Sardinia, Whitworth University*

64 - Design and Synthesis of Dihexa Analogs for the Treatment of Alzheimer's Disease

**Brad Hopp, Audre Hyatt, John Koberstein, and Danielle Selleck, Whitworth University**

Dihexa, N-hexanoic-Tyr-Ile-aminocaproic amide, is a peptidomimetic compound derived from Nle1-AngIV with established procognitive effects in mice when administered orally. This compound shows potential as a therapeutic agent for the treatment of Alzheimer's disease. In this study seven Dihexa analogs were synthesized using solid phase peptide synthesis. Alterations to dihexa that affect the structure and hydrophobicity of the drug were utilized to derive the analogous compounds. Currently the isolated products are being purified using HPLC and in the future will be tested for physiological activity.

*Faculty Sponsor: Michael Sardinia, Whitworth University*

65 - Desymmetrized Boron Difluorides: An Investigation into Tunable Fluorescent Dyes

**Aleksey V Kozlov, Gonzaga University**

Highly efficient and tunable organic fluorescent molecules are a growing area of chemical interest as reflected by a significant push for their incorporation into a variety of materials applications such as organic light-emitting diodes (OLEDs), molecular and ionic sensors, and stains for biological markers. The 4,4-fluoro-4-bora-3a,4a,diaza-s-indacene core (BODIPY) is a notable example which exhibits remarkable qualities including intense UV-absorbing/emitting capabilities, high quantum yields, and insensitivity to various chemical environments. However, BODIPYs are functionally hindered by typical absorption/emission values between 500-530 nm and generally low Stokes shifts of 15-20 nm. This project aims to investigate how desymmetrization of the BODIPY core can be used to overcome such issues and promote energetically discrete ground and excited states beyond the blue/green region of the visible spectrum. By expanding the understanding of fluorophore design strategies, we seek to identify structural and electronic characteristics essential for maximizing Stokes shifts through detailed structure property relationship analysis.

*Faculty Sponsor: Daniel Chase, Gonzaga University*

66 - Determining the Surface Concentration Tunability of Core-shell Dendrimer Encapsulated Nanoparticle Palladium rhoDium Alloys Using X-Ray Photoelectron Spectroscopy

**Austin Winkelman, Whitworth University**

Because of their high ratios of surface area to metal volume, nanoporous palladium alloys are predicted to have applications as materials for high-performance hydrogen storage, chromatographic separation of hydrogen isotopes, electrocatalysis and catalysis. Dendrimer-encapsulated nanoparticle samples with core-shell palladium-rhodium alloys are seen as promising candidates for such storage because they are expected to have improved mass transport rates and cycle life compared to bulk materials. Further experiments were done this summer using X-Ray Photoelectron Spectroscopy to show that the surface concentrations of palladium alloys, specifically Pd0.5Rh0.5 alloys, are compositionally tunable, and that changing its electronic environment, along with the addition of heat, causes surface switching to occur on the sample. Heating the alloy in an oxidative environment brings more rhodium to the surface of the sample, and our most recent

experiment's results have provided more concrete data to further the research of these alloys and their hydrogen storage properties.

*Faculty Sponsor: Markus Ong, Whitworth University*

67 - Distribution of Bivalve Species Along an Altitudinal Gradient in a Sandy Beach Ecosystem in the Tropical Pacific: Playa Azul, Tárcoles, Gulf of Nicoya, Costa Rica

**Colby Davis, Tanner Scholten and Michael Swart, Whitworth University**

In 1985 the CoopeTárcoles was formed to protect the shores of Costa Rica in the Gulf of Nicoya from overharvesting by shrimp trawlers. Recently within the boundary, the fishermen of Tárcoles have seen an increase in numbers and biodiversity in the area. The goal of this research was to describe current distribution of bivalves along an altitudinal gradient using a belt transect from the high to low tide mark, and core sampling using a clam gun incrementally up the transect from low to high tide that was perpendicular to the swash line. This also initiated the beginning of future time series analyses for variation in species and abundance over the course of a year, and from year to year. In the results, two common species that had distinct ranges within the intertidal zone and an apparent dead zone across the beach where no bivalves were present.

*Faculty Sponsor: Grant Casady, Whitworth University*

68 - Effects of Caffeine on Reaction Time and Short Term Visual Memory in High and Low Caffeine Consumers

**Elke Neuenschwander, Elizabeth Fonken, and Sammi Santos, Whitworth University**

Short-term visual memory (STVM) and quick reaction speed are both crucial to daily living. Without the ability to adeptly see, process, and respond to the environment there is increased risk of anything from injury to poor academic performance. The object of this research is to investigate the effects of caffeine consumption on short-term visual memory retention and reaction time in high and low caffeine consumers. The presence of caffeine and placebo served as the independent variable while the reaction time and memory of the 15 subjects served as the dependent variable. Our research displayed no statistical significance between high and low consumers in both caffeine and placebo trial.

*Faculty Sponsor: Michael Sardinia, Whitworth University*

69 - Eosinophil Levels in Clydesdales as a Measure of Antihelmintic Efficacy

**Chelsea Mueller, Alina Reese, Lauren Whitney, and Samantha Wolf, Whitworth University**

Parasitic infections in horses have always been a concern for horse owners. However the regular deworming necessary to combat parasitic infections can lead to drug resistance. As a result, rotations of dewormers are employed as a preventative strategy, using fecal egg count reduction tests (FECRT) to confirm the elimination of parasites. However, studies have shown that horses can suppress parasitic egg production, rendering the FECRT results inaccurate. Research has shown a correlation between an increase in eosinophils and the presence of parasites. In our research we set out to address the question, when treating with ivermectin and moxidectin, can variation in eosinophil levels be observed in blood samples taken before and after deworming? We used eosinophil counts to assess the efficacy of ivermectin and moxidectin in two populations of Clydesdales. Our results showed that, in general, eosinophil levels were significantly lower after deworming than before in both populations of Clydesdales.

*Faculty Sponsor: Michael Sardinia, Whitworth University*

70 - Habitat Preferences of the Resplendent Quetzal (*Pharomachrus mocinno costaricensis*)

**Andriana Siefe, Graham Silcher, and Ingrid Sub-Cuc, Whitworth University**

Declining populations of the Resplendent Quetzal (*Pharomachrus moccino*) due to habitat loss and predation have created a genuine need for the study of necessary habitat requirements and nesting preferences. Past studies have suggested some trends observed in *P. moccino* nest sites (Lebbin 2007; Siegfried et al. 2010), but a large portion of selection guidelines remain unknown. Data collection occurred in the Los Santos Forest Reserve in San Gerardo de Dota, Costa Rica (9.552667, -83.806346) during January 2014. Data were collected on cavity-containing snags that were both used and unused by quetzals in order to discover and common ecological characteristics shared by the used snags and not by the unused snags. Number of cavities, height of snag, canopy cover and other significant habitat characteristics were measured for all snags in the study area. Much of the data were inconclusive, but some trends were observed between used and unused snags.

*Faculty Sponsor: Grant Casady, Whitworth University*

#### 71 - Heavy Metal Concentrations in Urban Soils

**Shyla A. Hatch, Ted M. Uecker, and Natasha R. Garland, Eastern Washington University**

Soils in urban areas may be contaminated with heavy metals due to the use of fertilizers, pesticides, wood preservatives, and construction materials. Soil samples were collected between October 2013 and March 2014 in Spokane, Washington in residential areas and protected urban wetlands that are home to a variety of wildlife and plant species. The area has been developed since the late 1800s, and is known to have contained orchards, lumber yards, railcar systems, and dumping grounds, but it is not registered as an action site by the EPA. Topsoil samples were collected, leached using trace metal-grade nitric acid and analyzed using an Inductively Coupled Plasma-Optical Emission Spectrometer (ICP-OES). The results indicate that concentrations were elevated relative to the crustal abundances for each element. For example, arsenic, lead, and cadmium concentrations were about ten, three, and two times higher in the urban soils than the crustal abundances, respectively.

*Faculty Sponsor: Carmen A. Nezat, Eastern Washington University*

#### 72 - Human NUDT16: A Nucleotide Pool Sanitizing Enzyme

**Heather Molvik and Natasha Peay, Eastern Washington University**

Any student that has taken an introductory course in biology probably has discussed the bases of DNA: adenine, guanine, cytosine and thymine. These bases are incorporated into the DNA as deoxyribonucleotides. However, it is not commonly known that there are alternate nucleotides such as inosine triphosphate (ITP). When ITP is incorporated into the genome in high enough quantity, it will cause chromosomal alterations that lead to fragmentations, rearrangements and mutations. These can have detrimental side effects such as cell growth arrest and cancer. The cell's strategy regarding abnormal nucleotides such as ITP is to synthesize enzymes which hydrolyze the triphosphates into their inactive monophosphate form. ITPase is the model enzyme in sanitizing DNA precursor pools while NUDT16 is a recently reported player which works on deoxynucleotide diphosphates. Our research project is centered on obtaining new data about NUDT16 by conducting biochemical and in-vivo assays. Our characterization will be discussed.

*Faculty Sponsor: Nicholas Burgis, Eastern Washington University*

#### 73 - Identification of Thermal Features in Paleo-Indian Archeological Sites

**Adam Calkins, Eastern Washington University**

While the Paleoindian archaeological record in North America includes a number of perplexing information gaps, perhaps none is greater than the nearly universal absence of definitive evidence for hearths and associated hearth activities. This paper will not only give an analysis of hearths, but provide techniques to better identify these features within a Paleoindian site. The site sample employed in this comparative analysis ranges from early to Late-Paleoindian manifestations and includes both specialized and non-specialized site records. The existence of hearths on sites within the Paleoindian period (c. 15,000-10,000 years ago) is presumed on the basis of survival requirements in the diverse, temperate environments of North America present during this timeframe. By using a comparative analysis of the techniques used on multiple Paleo-Indian sites within North America, data can be compiled to demonstrate the need for archaeologists to adjust their analysis of Paleo-Indian hearths/fire features

*Faculty Sponsor: Jerry Galm, Eastern Washington University*

#### 74 - Identifying Quenching Agents of the Manganese-Catalyzed Ethylacetoacetate Belousov-Zahbotinsky Oscillation Reaction

**Charden Wood, Whitworth University**

This research was conducted to identify possible quenching agents of the modified Manganese-catalyzed ethylacetoacetate Belousov-Zahbotinsky reaction. A number of quenching agents and their respective concentrations at which they successfully quenched the oscillation reaction were investigated including LiI, Li<sub>2</sub>SO<sub>4</sub>, Li<sub>2</sub>CO<sub>3</sub>, NaI, NaNO<sub>2</sub>, NaSO<sub>3</sub>, NaSCN, NaC<sub>6</sub>H<sub>5</sub>O<sub>7</sub>, NaC<sub>7</sub>H<sub>5</sub>O<sub>3</sub>, KI, KBr, KCH<sub>3</sub>CO<sub>2</sub><sup>-</sup>, CaBr, and CaCH<sub>3</sub>CO<sub>2</sub><sup>-</sup>. All successful quenching agents were found to have a negative reduction potential of the anion in mV, and other possible agents should be identified using this parameter to do further testing. It was also discovered that the cation had very little influence on the agent's ability to quenching the reaction. These findings will be applied to further research into the use of Lithium for treatment of people living with bipolar disorder.

*Faculty Sponsor: Karen Stevens, Whitworth University*

75 - Improving Pepsin Resistance of Prolyl Dipeptidyl Aminopeptidase (PEPX) for Activity on Gluten Peptides

**Seln Pyo, MacKenzie Wattenbarger, and Kristin Wucherer, Whitworth University**

Prolyl dipeptidyl aminopeptidases (PEPXs) are enzymes that hydrolyze peptide bonds specifically at proline residues and have been suggested as potential detoxifying agents of gluten peptides which are proline-rich. The PEPX from *Lactobacillus helveticus*, a bacterium present in Swiss cheese, has been cloned, expressed, purified, and characterized in a previous lab study. In hopes of utilizing the enzyme as a therapeutic aid for gluten intolerance in humans (Celiac Disease), six high-frequency pepsin cut-sites have been identified and targeted for mutational study. Six mutations (Y8H, F133W, W161Q, Y258T, W425G and L684H) were individually constructed and screened for activity, as well as in combinations of six, four, and three. A mutant with three combined mutations (F133W, W161Q, and L684H) was shown to have near w.t. activity and has been selected for further pepsin resistance studies.

*Faculty Sponsor: Deanna Ojennus, Whitworth University*

76 - Mother - Student Communication and College Adjustment

**Annette C. Perales, Washington State University**

This quantitative study explores communication between mother and student as the student moves away for college. This can be a difficult time for students and their families. Identifying factors that can impact student transitioning can help students more readily adapt to their new environment in a healthy way. The sample consists of 234 freshmen at Washington State University, 18-19 years old. Participants completed a questionnaire measuring communication frequency along the variables of closeness with mother, alcohol-consumption, and self-esteem. A significant finding revealed that on average, participants increased alcohol-consumption from pre-college to three months into their first semester. The relationship between communication frequency and alcohol-consumption showed that students with a high level of communication with their mothers had the greatest increase in alcohol-consumption. Future studies can focus on individual personality traits in relation to these factors and obtain a larger sample size to contribute to generalizability and more significant findings.

*Faculty Sponsor: Matthew Bumpus, Washington State University*

77 - Narcissism and Empathy: "It's All About Me"

**Katie P. Borden, Pacific Lutheran University**

Researchers have suggested that college students today, as members of the Millennial Generation (i.e., born between 1982 and 2000), are more narcissistic and less empathetic than those from Generation X (i.e., born between 1965 and 1981). Eighty undergraduates (79% of them being first-year students) completed the Narcissistic Personality Inventory and the Interpersonal Reactivity Index (a measure of empathy) in counterbalanced order. They also completed an abbreviated measure for the Five Factor Personality Model (TIPI) and a measure for attributional complexity. Sample data were compared with the hypothetical means from meta-analytic studies of narcissism and empathy using one-sample t tests. Discussion will focus upon generalizability of these results based upon developmental stages of university students and the role that educational institutions may play (e.g., emphasizing community service, teaching Millennial students empathy and critical thinking) in order to counteract undesirable trends.

*Faculty Sponsor: Christine Hansvick, Pacific Lutheran University*

78 - Peptide Substrate Backbone Stereochemical Requirements for Anthrax Toxin Translocation

**Kristin Wucherer, Whitworth University**

Translocase channels play a fundamental role in microbial pathogenesis as they catalyze the translocation of toxic substrate enzymes across membranes of host cells. Using anthrax toxin as a model system, we sought to understand what role substrate secondary structure and backbone stereochemistry play in the translocation mechanism. The channel-forming protective antigen of the toxin translocates enzymatic components into the host's cytosol by utilizing various polypeptide clamps. Current research predicts two conflicting models for translocation: a helix bound state substrate leads into and through the transporter, versus the substrate translocating as an extended chain. To further investigate, single-channel planar lipid bilayer electrophysiology was utilized to analyze the translocation of synthetic peptide substrates with defined backbone stereochemistry. Peptides with uniform stereochemistry were found to translocate most efficiently; we believe rather than forming a purely extended state during translocation, more compact chiral structures, are populated along the most efficient translocation pathway.

*Faculty Sponsor: Deanna D. Ojennus, Whitworth University*

#### 79 - Random Mutagenesis of a Bordetella Virulence Protein

##### **Rachel Retherford, Spokane Community College**

Pertussis is a highly contagious human respiratory illness caused by toxins released by the bacteria *Bordetella pertussis*. In animals, *Bordetella bronchiseptica* causes kennel cough, a similar respiratory illness. *B. bronchiseptica* is routinely used as a model system in pertussis research because it is easier to culture and does not typically cause illness in humans. Bordetella Type III Secretion System Effector A (BteA) is a virulence protein produced by members of the genus Bordetella. The BteA protein rapidly kills a wide range of mammalian cells, and appears to be important in the pathogenesis, yet the mechanism of cytotoxicity is presently unknown. The objective of this project is to perform random mutagenesis of the gene to determine which regions of BteA are responsible for cell death. *Bordetella bronchiseptica* isolates expressing mutagenized BteA will be screened for the non-cytotoxic phenotype. An enhanced understanding of BteA may lead to more effective therapies and vaccines.

*Faculty Sponsor: Suzanne Bassett, Spokane Community College*

#### 80 - Regeneration of Red Blood Cells as Measured by Hematocrit in Vegetarian and Omnivorous Diets

##### **Audre Hyatt, John Koberstein, and Elisabeth Spencer, Whitworth University**

A single blood donation consists of a loss of around 10% of the blood in the body. Recovery from the initial loss of red blood cells is suggested to take 4-8 weeks. Iron can be a limiting factor in the rate of red blood cell production. Research suggests that vegetarians receive equal or greater amounts of bioavailable iron from various non-meat sources. Two groups, one consisting of omnivores and one of vegetarians, donated blood and had weekly hematocrit measurements taken to track the progress of red cell regeneration. Hematocrit measurements for both groups showed a drastic decrease in PCV after donation. Subsequent tests showed a gradual return to baseline levels ranging from as little as 2 weeks to greater than 4 weeks. The initial data suggests that there is little to no difference between the red blood cell regeneration rate of vegetarians and omnivores.

*Faculty Sponsor: Michael Sardinia, Whitworth University*

#### 81 - Teresa Forcades: A Nun on a Narrow Theological Ridge

##### **Olivia Domini, Whitworth University**

This research examines the controversial feminist theology of 21st century Benedictine nun, Teresa Forcades. Particular attention will be given to her positions on patriarchy and abortion as well as to the Roman Catholic Church's response to Forcades' claims. This exploration confronts aspects of the Church's antiquated traditions and sheds light into the subtle process by which women are silenced and encouraged to take on stereotyped gender roles. A major research strategy will be a quantitative analysis of data stemming from interviews, newspapers, books, and published reports. The research analyzes the validity of Forcades' claims and explores the narrow ridge between theological transgression and progress. Although Forcades has received backlash from the Vatican, she is ultimately propelling change within the Roman Catholic Church.

*Faculty Sponsor: Karin Heller, Whitworth University*

#### 82 - The Effect of Perceived Sexual Orientation on Workplace Evaluation

##### **Amanda Thomson, Washington State University**

The primary goal of this study is to identify whether people acting in the capacity as an employer have underlying negative bias against individuals they perceive to be gay or lesbian. Studying the influence of sexual orientation in the work place is important because negative prejudice toward someone based on his or her sexual orientation could lead to discrimination in the workplace, discrimination that has negative economic consequences. Participants complete one of four versions of an online survey. Significant differences were found in how people rated those perceived to be gay versus lesbian. In addition, those perceived to be heterosexual, across the board, were rated higher in desirable traits. This indicates that negative prejudice toward non-mainstream sexual orientations is present in the workplace.

*Faculty Sponsor: Julie Kmec, Washington State University*

#### 83 - The effects of cocoa on stress induced by the Maastricht Acute Stress Test

##### **Kaitlyn Kadel, Rylie Gabehart, and Michael Swart, Whitworth University**

The general populous views chocolate as the "go-to stress food," yet there exists a paucity of scientific research supporting this claim. We began the experiment hypothesizing certain properties of cocoa would act to reduce stress, as measured by cortisol release. Testing consisted of measuring the salivary cortisol levels and blood pressure of 12 participants, 6 of whom

consumed dark chocolate prior to a stress test, while the remaining 6 consumed an equal caloric amount of caramel. The Maastricht Acute Stress Test served to induce stress. Collection of blood pressure (using Omron blood pressure cuff) and saliva samples occurred 45 minutes prior to testing, immediately following, and 25 minutes after for each participant. Salivary cortisol characterization occurred with enzyme immunoassays. Our results showed no significant differences in changes in blood pressure or cortisol in participants who consumed dark chocolate versus caramel. Therefore, we cannot support the claim that chocolate reduces stress.

*Faculty Sponsor: Michael Sardinia, Whitworth University*

84 - Possible Splay of the Spokane and Latah Fault Systems: Examination of a Thrust Fault in Hangman Valley

**Camie M. Bearup and Robin M. Daley, Eastern Washington University**

South of Spokane, Washington located along Hangman Creek is a thrust fault exposed by a cut bank. Plunge and trend of the exposed fault were utilized to determine the apparent dip of the fault. In light of the recently discovered Spokane fault as well as the possible Latah fault, awareness of seismic hazards in the densely populated area of Spokane is elevated. This investigation includes interpretation of the fault along Hangman Creek and its relationship to the Spokane fault and Latah fault systems. Photographs of the exposed fault, contributed by Eugene Kiver, along with LiDAR, provided by Spokane County, are used to estimate the length of shortening, offset and the degree and direction of apparent dip for the ramp. Apparent dip is applied in calculating several possibilities for strike and dip of the fault. Data from the calculations are compared to both the Spokane fault and the Latah fault. Determination of connection between the Spokane Fault and the Latah fault and the Hangman Creek thrust fault is derived from the possible geometric orientations of the fault-bend-fold. This thrust fault along Hangman Creek is a possible splay off the proposed Latah fault, potentially similar to the newly discovered Spokane fault.

*Faculty Sponsor: Chad Pritchard, Eastern Washington University*

#### POSTER SESSION TWO

**Faculty Moderator: Christy Watson, Gonzaga University**

**2:45-4:00 p.m., Rooms 107, 108, and 109**

85 - A Token Reward System to Reduce Talk-Outs Made by a 21-Year-Old Male

**McKenzie Lapke and Haylee Carnes, Gonzaga University**

The purpose of this study was to evaluate the effects of a token economy system to reduce the frequency of inappropriate talk outs for a 21-year-old male in a developmentally impaired classroom. An ABAB reversal design was used to evaluate the efficacy of the token program. The participant has engaged in a large number of talk-outs during baseline. A decrease in the mean number of talk-outs was found each time the token system was in effect. The token program was easy to implement and carry out.

*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

86 - Comparing Variety and Quantity of Internal Parasites in White-tailed Deer based on Average Humidity Levels in Washington and Illinois

**Sarah Walker, Whitworth University**

Illinois and eastern Washington are very similar in climate, displaying four seasons, harsh winters and warm summers, with the main variance being average humidity levels, Illinois being high year round (August average: 55-92%) with Washington dropping during the summer months (August average: 23-66%). To see if humidity is a contributing factor to variety and/or number of parasites in white tail deer, the parasite loads of deer from eastern Washington were compared to those of northern Illinois. The data suggests that while there is a slightly greater variance in Illinois deer, there is a higher rate of those parasites found in Washington deer. Based on high standard deviations compared to average values of all but the coccidia in the Illinois samples, it is hard to say conclusively to what degree the Washington deer have larger parasite loads.

*Faculty Sponsor: Michael Sardinia, Whitworth University*

87 - Effects of SRA Decoding Strategies on Learning Disabled High School Students

**Alyson Lykken and Julie Wakeman, Gonzaga University**

The purpose of this study was to evaluate the effects of SRA Decoding Strategies on word recognition for a ninth grade male with a learning disability. The student was enrolled in a high school special education resource room in a large urban school district in the Pacific Northwest in a direct instruction reading resource room. A multiple baseline design across three

sets of sight words was used to test the effectiveness of the Reading Mastery program. The overall results indicated that the program worked well for our participant. His decoding strategies generalized to novel words that he has not received any training. The efficacy of employing Reading Mastery with high school students with learning disabilities was discussed.  
*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

88 - Environmental Racism's Effect on African American and Latino communities

**Mikaila Leyva, Eastern Washington University**

My research follows the effects of environmental racism on African American and Latino communities within the United States. There are real world effects that follow the siting of toxic dump areas in predominantly African American and Latino communities. Both primary and secondary articles are being used to prove the effects of these toxic sites. This study also uses various reports, journals, and books which document the injustices of environmental racism. Although the research is still being conducted, I hypothesize that my findings will support my claim that toxic sites exhibit evident negative effects on their surrounding communities, which is primarily that of African Americans and Latinos. This study will educate people on a relatively unknown area of environmental justice which affects a large population of underrepresented groups within the United States.

*Faculty Sponsor: Dorothy Zeisler-Vralsted, Eastern Washington University*

89 - Formation of Basalt Rings in Odessa, WA

**Natasha Garland, Skye Schillhammer, Carly Sorensen, and Ted Uecker, Eastern Washington University**

Unusual basalt ring formations are located about 6 miles north of Odessa, WA as part of the expansive Columbia River Basalt Group. There are over 100 crater-like structures that range in size from 50-500 meters in diameter and span a 60 kilometer area of the channeled scablands. These structures are enigmatic due to the erosion of surficial features by the Missoula Floods, and due to their association with a magnetic anomaly as evidenced by an aerial geophysical survey. Since the 1970s, multiple geologists have proposed conflicting formational mechanisms for the rings, including hydrothermal explosions and sag flows. The purpose of this study is to present a new method of development for these rings based on structural data and geochemical discrimination. Our research team measured the stratigraphy of the craters and the surrounding rock and collected samples for XRF analysis. The data suggests that these structures formed by auto-intrusions of the Roza member of the Wanapum formation.

*Faculty Sponsor: Chad Pritchard, Eastern Washington University*

90 - Mapping of Tower Mountain/Rocks of Sharon

**Jason Pritzl, Eastern Washington University**

The Rocks of Sharon, at the top of Tower Mountain, are part of the Iller Creek Conservation Area just south of the Dishman Hills Natural Area and represent a bizarre assortment of igneous bodies that are in contact with high to low-grade, metamorphosed sedimentary rocks. The goal of this project is to determine if it is feasible to produce the pegmatites and fine-grained granites from the quartz-rich bedrock as partial melts, or if they must have been sills and dikes as presented by Derkey et al. (1999). Compositional data was collected by means of XRF and ICP analysis at the Washington State University Peter Hooper GeoAnalytical Laboratory. There are multiple outcrops along the ridge of Tower Mountain that contain quartzite and paragneiss outcrops which display complicated relationships to pegmatites and foliated granites and fine-grained granites. An additional goal of this project is to provide geologic mapping with the hope that further research will result in the installation of interpretive signs along the hiking trails in this area.

*Faculty Sponsor: Chad Pritchard, Eastern Washington University*

91 - Microfracture patterns in basalt cores as an analogy for the Cheney Fracture Zone

**Rex Lloyd, Eastern Washington University**

A series of basalt cores were tested to determine compressional strength and analyzed by petrographic microscopy. Microfracture patterns will be used in comparison to macro fracture patterns in the Cheney fracture zone and the Spokane fault. The experiment was conducted using basalt cores one inch in diameter in length and 2 inches in height. Samples underwent compressional testing using an AD-TEK 400k lbf hydraulic compression machine. Samples had a loose confining pressure to confine fragments and preserve fracture patterns for petrographic analysis. This experiment is being conducted to answer the following question: Are micro and macro fracture patterns fractal, if so what type and orientation of stress may have caused the Cheney fracture zone?

*Faculty Sponsor: Chad Pritchard, Eastern Washington University*

92 - Petrographic and Geochemical Analysis of the Camas Land Sill, Chelan County, Washington.

**Amber Haston, Eastern Washington University**

The Eocene Camas Land sill of Chelan County, Washington was studied to demonstrate whether cooling was accompanied by fractional crystallization. This coarse, hypabyssal, diabasic sill, variously exposed in a northwest trending syncline, intruded the clastic sedimentary rocks of the Swauk formation (Eocene). The sill is up to 500 feet thick in the northwest. Several samples were collected from a vertical quarry face for both petrographic and geochemical (XRF and ICP-MS) comparison. Modal mineralogy was estimated (using JMicroVision v.1.2.7) and shows that the rocks grade from fine grained, mafic at the base to coarser grained and felsic towards the top. Whole rock geochemical analyses from this study and others, as plotted on major element Harker variation diagrams, show linear trends suggestive of fractional crystallization. The major, trace and REE element compositions of the sill rocks have been compared to Teanaway formation basalts and basalt of the Columbia River Basalt province.

*Faculty Sponsor: Jennifer Thomson, Eastern Washington University*

93 - Play Behavior in Adult Male Chimpanzees

**Mary Kate Koch, Gonzaga University**

A group of semi-wild adult males at the Chimfunshi Wildlife Orphanage in Zambia were adventitiously observed and filmed for a two-week period from the hours of 8 am to 11:30 am. Adult males were filmed if observed engaging in play. On 26 instances, one male, Tobar, was recorded engaging in a variety of play behaviors, including play face, play walk, play bite, pirouette, tickling, wrestling, and open mouth kiss. He initiated the majority of his play encounters and his preferred play partners were juvenile chimpanzees. Laughter was less likely to be elicited in his play interactions than between juvenile playmates. Tobar's dominate play behaviors were open mouth kiss, tickling, and a distinctive play walk. These observations show robust play behavior as well as engagement with a variety of partners.

*Faculty Sponsor: Mark Bodamer, Gonzaga University*

94 - Possible extension core complex south of the Priest River Complex in Bonnie Lake, Eastern Washington

**Dallin P. Jensen, Eastern Washington University**

An island of schistose Precambrian belt supergroup pelitic basement rock is exposed at Bonnie Lake, Spokane County, Washington. The rocks composing this island dip west and are folded into inclined to recumbent, in gentle to isoclinal folds plunging approximately 30 degrees to the north. Oriented samples were collected, and a petrographic analysis was able to identify the confining assemblage of Cordierite-Biotite-Chlorite-Quartz-Sillimanite which indicates P/T conditions of 600-650 degrees C, and 2-4 kilobars of pressure during the metamorphism of this body. These values are comparable to conditions estimated for the Newport Fault Footwall near the Spokane Dome. Therefore, we test the hypotheses that this island represents a southern continuation of a core complex, similar to the Priest River Complex, possibly offset to the west by a continuation of the Lewis and Clark fault, which currently represents the boundary of the known extent of this body. Future research will investigate the possible presence of a metamorphic core complex located in Bonnie Lake.

*Faculty Sponsor: Chad Pritchard, Eastern Washington University*

95 - The Direct Effects of Communication Across Flashcards and Go Talk Application on an iPad for a High School Student with Cri-du-Chat Syndrome

**Kalli Heric and Sarah Morgan, Gonzaga University**

The purpose of this study was to compare the effects of flashcards and the Go Talk Application. Our participant was a fifteen-year-old student in a self-contained high school classroom. The target behavior was letter identification and ability to communicate correct responses across the use of the Go Talk Application on the iPad and flashcards. Since our participant was non-verbal, correct responses for the flashcards were defined as grabbing the flashcards and giving it to the researcher within two seconds. Incorrect responses for the flashcards was defined as 1. responding after two seconds, 2. touching the flashcard without handing it to the researcher, and 3. moving the flashcards around on the table. Both interventions were effective. In baseline, the participant's ability to correctly identify letters was low. The number of letters correctly identified for both the flashcards and iPad increased from baseline. The intervention was effective as the number of letters correctly identified for both the flashcards and iPad increased from baseline and stayed consistent throughout the entire study. Also, each intervention generated consistent outcomes for our participant.

*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

96 - The Effectiveness of the DI Flashcard Procedure on Multiplication Facts for a 13-Year-Old Girl with Learning Disabilities  
**Marissa Harvey and Sorcha Connor Boyle, Gonzaga University**

The purpose of this study was to evaluate the effects of Direct Instruction flashcard system on the basic multiplication facts of 14-year-old female student with a learning disability. She was enrolled in a middle school math resource room in a large urban school district in the Pacific Northwest. The number of correct math facts was the major dependent variable. A multiple baseline design across problem sets was implemented to assess the effectiveness of the DI flashcard procedure. The overall outcomes indicated an increase in student performance. The issues related to employing DI flashcards were discussed.

*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

97 - The Effects of Copy, Cover, Compare on Handwriting of a Second Grade Student with Severe Behavior Disorders  
**Ande Seines, Gonzaga University**

The purpose of this study was to evaluate the effects of copy, cover, compare (CCC) on the handwriting of a second grade student in an urban elementary school. CCC has been employed with a wide range of skills ranging from sight words, spelling, and learning math facts. CCC was found to increase the handwriting legibility for out participant. The ease of employing CCC was discussed.

*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

98 - The Effects of Direct Instruction Highlighting Procedure on the Reading Comprehension of a 9th-grade Boy  
**Molly McNulty and Gabrielle Rivera, Gonzaga University**

The purpose of this study was to evaluate the effects of the highlighting procedure on reading comprehension of a 9th grade boy at a 5th grade reading level in a functional skills classroom. When highlighting was employed, the participant's reading comprehension improved. The efficacy and ease of implementation of the highlighting procedure was outlined.

*Faculty Sponsor: Jennifer Neyman, Gonzaga University*

99 - The Effects of Direct Instruction REWARDS Program Strategies to Teach Separation of Complex Words to Two Children with Low Reading Levels

**Lauren Mullaney, Megan Baker, and Katie Rutherford, Gonzaga University**

The purpose of the present study was to evaluate the effects of the Direct Instruction REWARDS program on reading complex words of two fifteen-year-old boys in a reading resource room. Both participants had difficulty in reading and were diagnosed as learning disabled. During baseline, both participants had difficulty in syllabication. The results showed that through the REWARDS program and by promoting generalization in phonemic reading, the program was successful and efficient. The students had stated that they felt more comfortable towards the end of the intervention with the REWARDS program and produced drastic improvement in reading mastery from the start of the program to the end.

*Faculty Sponsor: Tim McLaughlin, Gonzaga University*

100 - The Differences in Acculturation Between Children of White Immigrants and Those of Non-White Immigrants  
**Yegyu Lee, Whitworth University**

This paper examines the cultural assimilation in children of immigrants in the United States. It specifically compares their assimilation and acculturation in terms of race. A total of eight children of immigrants were participated in a qualitative, face-to-face interview; four whites and four non-whites. Both groups were given a same set of questionnaires and asked to share their experiences. They were also asked to describe their attitudes, whether past or present, toward their ethnic identities. It was hypothesized that children of non-white immigrant parents have encountered more difficulties such as discriminations and stereotypes compared to those of white immigrant parents due to white privileges. The purpose of this study is to provide an insightful understanding of children of immigrants in the context of race and ethnicity. Throughout the methodological procedure, the findings did not entirely indicate that there was a strong correlation between race and acculturation. Participants overall encountered stereotypes and discriminations based on their ethnic statuses. However, when asked several questions solely about their racial identity, responses differed noticeably.

*Faculty Sponsor: Jason Wollschleger, Whitworth University*

101 - A Renaissance of Women?: Women in the Italian Workforce

**Molly Martin, Gonzaga University**

Although outdated, misogynistic beliefs have seeped into Italian culture, specifically its workforce. Men are considered more competent and capable of handling higher paying, upper-echelon jobs. Supposedly, the woman's realm remains at home, close to the stove and children. The percentage of women in the workforce in Italy is dramatically lower than that of other EU countries. Furthermore, the women that have jobs are underpaid, harassed, and often fired without reason. This phenomenon is having negative effects on the women of Italy. Women feel shunned and degraded by their own country. Oftentimes, they do not finish their education. If they do, many leave for other countries within the EU where they are afforded more opportunities and liberties when it comes to working.

*Faculty Sponsor: Torunn Haaland and Ted Nitz, Gonzaga University*

102 - An Investigation of the Origin and Social Status of Acorn Woodpecker

**Brock Nelson, Gonzaga University**

The Acorn Woodpecker is a communal breed of bird that is native to western North-America. They organize themselves into communities to more effectively survive and protect each other. These communities of woodpeckers have been studied for more than 40 years at the Hastings Natural History Reserve in Hastings, California. The birds are tagged after birth, and are then tracked and observed throughout their lifespan. However, some birds appear in these communities without identification and their origins go unknown and unrecorded. The purpose of this research project is to ascertain both the origin and the social status of these unknown birds using DNA microsatellite markers.

*Faculty Sponsor: Joseph Haydock, Gonzaga University*

103 - Chz1 Regulated Deposition of H2A.Z on Chromatin

**Michael Parra, Heritage University**

Nucleosome core particles are comprised of DNA tightly wrapped around a histone octamer (consisting of 2 copies of each of histones H2A, H2B, H3 and H4). Deposition of histones onto chromatin is a tightly regulated process. H2A.Z deposition and eviction in chromatin is under the control of a number of ATP-dependent remodelers and histone chaperones including Chz1. Though residues on H2A.Z that are important for interaction with Chz1, little is known about the reciprocal residues on Chz1. Additionally, little is understood about other biological role(s) of the Chz1 protein. This project aims to build on knowledge of H2A.Z deposition as it is regulated by Chz1. We will determine the regions on Chz1 that are important for its role in deposition of H2A.Z-containing nucleosome as well as the regions of Chz1 that are important for Chz1 function.

*Faculty Sponsor: Melvin Simoyi, Heritage University*

104 - COX-2 Inhibitors: Restoring Cell Adhesion in Cultured Epithelial Cells Expressing Truncated APC

**Tessa Anton and Kim Maurer, Gonzaga University**

The majority of patients with colorectal cancer possess mutations in the adenomatous polyposis coli (APC) tumor suppressor gene, resulting in a truncated protein. Epithelial cell migration and adhesion are altered by APC loss, thus promoting colorectal adenoma development. Preliminary experiments confirmed that cultured epithelial cells expressing truncated APC protein exhibited slower migration rates and vitiated adhesiveness between cells in both wound and dissociation assays. By treating epithelial cells expressing truncated APC with a cyclooxygenase-2 (COX-2) inhibitor to increase E-cadherin production, wild-type adhesion was restored. We hope to confirm these results performing further adhesion assays thus providing additional in vitro data. Through a better understanding of the APC-associated changes in migration and adhesion, we hope to advance the background necessary for the development of novel chemopreventive agents for human colorectal cancer. In the future, we hope to explore specific cell adhesion proteins involved in recovery of wild-type adhesion.

*Faculty Sponsor: Mia Bertagnolli, Gonzaga University*

105 - Decision trees, Incremental Decision Trees and Classification with Neural Networks

**Michael Pagela, Heritage University**

Decision Trees (DT) is one of the most popular techniques of data mining. A DT algorithm is created using probabilities (DTP), and the goal is to create on-demand an accurate DT from either data or a stable set of rules. An incremental Decision tree algorithm (IDTP) based on DTP has been developed. It can modify a DT with new data dynamically, without having to reconstruct the tree from scratch. A DT is equivalent to logic in disjunctive normal form (DNF). After the tree is generated it can be easily converted into rules of DNF. Finally, a Neural Network (NN) from a DT (NNDT), based on DTP and DNF, has

been developed for classification using the back-propagation algorithm. The superiority of NNDT over NN and the advantages, disadvantages of DTs and NNs are presented. Simulation results are provided.

*Faculty Sponsor: Melvin Simoyi, Heritage University*

106 - Detection Methods for *Streptococcus mutans*

**Emily Dellwo and Andrew Stewart, Spokane Community College**

*Streptococcus mutans* is commonly associated with infective endocarditis following oral procedures. The virulence factor that enables *S. mutans* to bind to heart tissue is the Collagen Binding Protein encoded by the *cnm* gene. We isolated DNA from *cnm*-positive and *cnm*-negative strains of *S. mutans*. Next, PCR was used to amplify the *cnm* gene. The initial goal was to become proficient enough at PCR to allow for detection of the *cnm* virulence gene in mixed microbial samples. This allows for testing students and faculty at Spokane Community College in order to determine the prevalence of the *cnm* gene in our population. Individuals who carry *cnm*-positive bacteria are more susceptible to bacterial endocarditis following dental procedures and would benefit by taking prophylactic antibiotics prior to every dental visit. Eventually, we hope to develop a rapid affordable testing mechanism that dentists and oral surgeons can use prior to various procedures.

*Faculty Sponsor: Erin Griffin, Spokane Community College*

107 - Displays of Media Captured Emotion During the 2014 Olympic and Paralympic Games in Sochi, Russia

**Sierra Stauffer and Marilyn Melgoza, Gonzaga University**

Using a cross-sectional design we will compare and contrast two male Olympic and Paralympic athletes who will compete in Nordic skiing. These two athletes will be juxtaposed and observed through the lens of emotion and how the media interprets and frames these displays of human emotion, observing each individual's emotional response in various situations during the 2014 Winter games in Sochi utilizing the internet to watch videography of the Nordic skiing events. Research questions we will gather qualitative data on: How does each athlete's emotional reaction compare or differ during respective opening ceremonies? How does each athlete's emotional reaction compare or differ confronted with a win or a loss? How do they interact with their competitors and their team mates? How does each athlete mentally and emotionally prepare for the games and how do they differ or show similarities?

*Faculty Sponsor: Nicole Willms, Gonzaga University*

108 - DNA Extracted from Eggs Allows Study of Sexual Selection in the Acorn Woodpecker

**Laura Seifert, Gonzaga University**

Acorn woodpeckers' exhibit cooperative breeding behaviors in complex social groups of up to fifteen adults, including up to seven males that compete for breeding in the social group (the remaining birds are non-breeding helpers that do not attempt to breed due to incest avoidance or female breeders). In order to evaluate female mate choice and reproductive competition among male breeders, our goal was to extract DNA from the sperm trapped on the perivitelline membrane of the egg. Avian eggs are expected to retain a record of mating because sperm are trapped on this membrane during fertilization. DNA was successfully extracted from quail eggs to test the validity of this protocol. Our current goal is to use this procedure on acorn woodpecker eggs, and by using microsatellites we can determine which males contributed sperm to the egg. We will then use these results to test alternative hypotheses concerning the mechanism governing reproductive partitioning in acorn woodpeckers.

*Faculty Sponsor: Joseph Haydock, Gonzaga University*

109 - Do Microsatellite Allele Frequencies Change Over Time?: Evidence for Selection

**Ekaterina Dasiuk, Gonzaga University**

I genotyped acorn woodpeckers at 18 microsatellite loci to study changes in genetic diversity in a population from 1983-2013. Acorn woodpeckers come from a population in Hastings, California and have been studied since 1971. Numerous behavioral discoveries about their family groups and their cooperative breeding style have been discovered in the many years of devoted research. Their family groups are formed and these have their own specific populations of breeding within the whole population which has been analyzed for genetic diversity. For my research, DNA was extracted from blood samples and used in PCR with microsatellite primers to determine allelic frequencies for each locus. It was hypothesized that the allelic diversity and heterozygosity would decrease due to population size. Genetic drift in small populations commonly affects by reducing diversity in a population. Immigration rates increase the allelic genetic diversity and emigration decreases it so these factors are also examined in determining allelic diversity. Selection for specific allelic traits

was assessed to determine how the diversity has changed. Heterozygosity decreased for most but not all loci, suggesting weak support for the hypothesis.

*Faculty Sponsor: Joseph Haydock, Gonzaga University*

110 - Drugs use by College Students: Type and Frequency in Terms of Major and Level of Stress

**Paige Brunett, Gonzaga University**

College students are among the highest users of recreational drugs. Motivations to use include social pressure, perception of social normality and strain, both academic and social, which lead to a need for escape or release. This study examines use of the four most common drugs on college campuses: Ecstasy, marijuana, prescription stimulants and cocaine, in relation to major field of study. It tests the assumption that students in more demanding majors are more likely to use with drugs in order to cope with their strain and that students in less demanding majors tend to be more experimental. The study is conducted through self-reported survey. A study of this nature is beneficial because it challenges societal norms regarding the definition of deviant behavior.

*Faculty Sponsor: Vikas Gumbhir, Gonzaga University*

111 - Effects of Glucose Supplement on Blood Glucose Clearance Rate in Males During Intense Exercise

**Jordan Saribay, Brodrick Hirai, and Bianca Rodriguez, Whitworth University**

The maintenance of glucose homeostasis during various states of exercise and rest is important for healthy human beings. In this study we tested the glucose clearance rate in 10 healthy adult males during exercise. Each individual underwent three trials. The first trial consisted of measuring glucose clearance rates without exercise after the consumption of the dextrose solution. The second trial was performed with 30 minutes of intense exercise with the ingestion of the same dextrose solution. Trial three consisted of the exercise period with the ingestion of a placebo. The results of our research produced an average twofold increase of the glucose clearance rate in trial two compared to trial one. A trend was observed correlating to higher clearance rates and increased height of an individual.

*Faculty Sponsor: Michael Sardinia, Whitworth University*

112 - Enhanced Real-Time PCR and Gel Electrophoresis Methods to Identify 5 Internal Feeding Tortricidae of Pome and Stone Fruits in North America

**Jennifer K. Delgado, Heritage University**

Apple, pear and cherry fruits are subject to quarantine regulations and inspection by trading partners to prevent establishment of exotic pests from the US and other countries. Morphological traits are used to identify fruit feeding moth larvae, but to identify smaller larvae, DNA analysis is required. Without clear identification of pests in infested fruit, exported products may be rejected. Using real-time polymerase chain reaction (PCR) protocol, we identified the five most common internal feeding pests (*Cydia pomonella*, *C. latiferrana*, *Grapholita molesta*, *G. prunivora* and *G. packardii*; Lepidoptera: Tortricidae) in North America. PCR primers were designed to be specific for each pest species and provide diagnosis in 3 ways: positive amplification of target, specific melt temperature of amplified product and distinct band sizes in gel electrophoresis. The first 2 categories provide extremely rapid results and the electrophoretic information can act as either confirmation or direct use in laboratories without real-time PCR capacity.

*Faculty Sponsor: Melvin Simoyi, Heritage University*

113 - Foster Youth in College and Associative Factors of College Success

**Jeanette Perales, Washington State University**

Foster youth face severe adversity in going through the foster care process and losing access to services upon turning 18 years old. This contributes to this population being significantly underrepresented in college. To investigate resilience among foster youth, associative factors to college success were explored among 4 former foster youths attending Washington State University. Using data from semi-structured qualitative interviews, results indicated several factors associated with college success including minimizing placements, supportive role models, internal locus of control (personality), financial stability, academic support, social stability, extracurricular activities, and former foster youth college programs. An implication to this study suggests that although foster youth utilize certain resources to succeed, an internal locus of control and positive intrapsychic processes are most crucial for college success in this population. This is especially important in facilitating college entrance for more underrepresented individuals.

*Faculty Sponsor: Olusola Adesope, Washington State University*

114 - Geological Field Research and Service Learning: The McKenzie Conservation Area, Spokane County, Washington

**Jennifer Peterson and Rich Watson, Spokane Community College**

The 421 acre McKenzie Conservation Area is part of the Spokane County Land Futures program and is located along the NW shore of Newman Lake in eastern Spokane County. Project goals included, mapping of the bedrock geology (and creation of a geologic map) along with a summary report highlighting field observations. The map and report are then submitted to the County Parks and Recreation Department for potential use in public education. Field mapping has identified one major bedrock unit, the Newman Lake Gneiss. The Newman Lake Gneiss is a well-foliated (and lineated) coarse-grained to megacrystic orthogneiss. Other features identified include ice-rafted erratics, spheroidal weathering, and groundwater springs. From this project, students gained valuable field experience. The submitted map and report are intended for use by the County towards the development of earth science educational opportunities via information displays, which could be viewed by the general public that utilize the park.

*Faculty Sponsor: Andrew Buddington, Spokane Community College*

115 - Heat Transfer during Evaporation of Surface Tension-Driven Liquid Thin Films on a Surface with Microchannels

**Taylor Kunke, Gonzaga University**

Evaporation of thin liquid films is a complex phenomenon but central to many heat transfer technologies. A better understanding of this phenomenon has the potential of providing solutions to challenges faced by thermal engineers. In this work, heat transfer during evaporation of thin liquid films formed by the capillary force on a metallic surface with multiple parallel microchannels was investigated. The highly wetting liquid was delivered to the surface in droplets that instantaneously spreads and penetrates into the microchannels. Distributed temperature measurements indicated that the local heat transfer efficiency at the location where the liquids are delivered has a maximum value as a result of combination of sensible heat transfer and the liquid evaporation. A transient thermal ANSYS computational model was developed and the results from the model had a reasonable agreement with the measurements. The results obtained in this research provide insights into the physical mechanism underlying the heat transfer during evaporation of thin liquid films.

*Faculty Sponsor: Tailian Chen, Gonzaga University*

116 - Helping Skills Assessment: Interrater Reliability of the LifeRAFT Model

**Katie Gary, Whitworth University**

This study examined the interrater reliability of a rating form used to evaluate an introductory helping skills training model. The model, called Life Relief through Actions, Feelings, and Thoughts (LifeRAFT), is a new method to train undergraduates in theoretically and empirically derived applied psychology helping skills. The LifeRAFT model requires validation of its training effectiveness before it can be broadly implemented. For this purpose, the LifeRAFT Observer Rating Form (LORF) was created. Fourteen undergraduate male and female college students completed two videotaped, role-play interviewing sessions: one prior to LifeRAFT training and one after. Three raters trained in the LifeRAFT model rated the quality of the videos using the LORF. The form obtained very good interrater reliability with a Chronbach's alpha of 0.83. Findings suggest that the LORF is a reliable estimate of LifeRAFT training and quality of helping skills. Implications for future research and helping skills training are considered.

*Faculty Sponsor: Elizabeth Campbell, Whitworth University*

117 - Hormone Levels in Salamanders

**Allison Fisher, Gonzaga University**

In salamanders, along with many other species, males and females are distinguishable by their sexual dimorphic traits. Salamanders are often distinguished by their head size. This trait is attributed to the vomeronasal organ (VNO) volume. We are analyzing 5 separate species (*Aneides flavipunctatus*, *Aneides hardii*, *Aneides lugubris*, *Aneides ferreus*, and *Plethodon elongatus*). By using the statistical modeling program R, we will be analyzing the typically male and female hormones, androgen and estrogen levels in terrestrial salamanders. We will then relate the salamander's hormone levels to their structural differences to help understand their transitions from monomorphic to dimorphic species.

*Faculty Sponsor: Nathaniel Burch, Gonzaga University*

118 - Identification of Multiple Active Forms of *Burkholderia cenocepacia* HMG-CoA Reductase

**Riley Peacock, Gonzaga University**

The 3-hydroxy-3-methylglutaryl coenzyme A reductase (HMGR) catalyzes the rate-limiting step in isoprenoid biosynthesis for most eukaryotic organisms. Interestingly, the opportunistic lung pathogen *Burkholderia cenocepacia* contains the genes

for HMGR, yet biosynthesizes isoprenoids using the DXP pathway. Because *B. cenocepacia* significantly deteriorates the health of cystic fibrosis patients, understanding the structure and function of BcHMGR may help identify the enzyme as a drug target. Our work notes that both enzyme and substrate concentration alter the kinetic activity of BcHMGR, and both ion exchange and size exclusion chromatography have shown that BcHMGR exists in multiple, active oligomeric states simultaneously. Our data suggests that BcHMGR matches the morpheein model of allostery, identifying the enzyme as an important, highly regulated asset to *B. cenocepacia*. Thus, this enzyme may be a notable drug candidate, and may also provide a possible avenue for disrupting the function of *B. cenocepacia* by inhibiting BcHMGR's changing, Morpheein nature.

*Faculty Sponsor: Jeffrey Watson, Gonzaga University*

119 - Influence of Vascular Architecture to Generate Variation in Translocation of *Candidatus Liberibacter solanacearum* in Potato

**Piedad E. Alcalá, Heritage University**

*Candidatus Liberibacter solanacearum* is a pathogen of solanaceous crops that causes zebra-chip disease of potato. This pathogen is phloem-limited in plants, and is transmitted among plants by the potato psyllid. We assessed whether vascular architecture influences translocation of *Liberibacter* from the initial site of infection to distant non-infected plant tissues. Plant vascular architecture of potato was mapped by excising the terminal leaflet of the second fully expanded leaf, inserting the petiole in 0.25% Rhodamine B, and observing the translocation of the dye from the cut petiole. For examination of translocation of *Liberibacter*, five *Liberibacter*-infected psyllids were confined to the terminal leaflet of the second fully-expanded leaf for 48 hours. After 3 weeks all leaves were tested for *Liberibacter* infection using PCR. Results of this study indicate that the redistribution of *Liberibacter* in potato is partly limited by vascular architecture. This knowledge should improve sampling to detect *Liberibacter* in asymptomatic plants.

*Faculty Sponsor: Melvin Simoyi, Heritage University*

120 - Influencing Colorectal Cancer Screening Through Health Education

**Avigail Galvan, Heritage University**

Colorectal cancer is the third most common cancer in the United States; also the third for highest mortality rate. CRC has a high chance of being treated successfully, with up to 90% of early cancers being successfully treated and/or prevented. In this study, we will ascertain if Hispanics and Native Americans are more likely to complete a colorectal cancer screening test after getting a tour of the large inflatable colon (CASPER). CASPER illustrates examples of healthy colon tissue, as well as polyps and colon cancer. The study uses a pre/post-test design. Pre-test and post-test questions ask basic questions to assess knowledge about colorectal cancer and attitudes about colorectal cancer screening. The results show significant changes in participant likelihood to have a CRC screening, CRC knowledge, perceived knowledge, and likelihood to talk to acquaintances about CRC screening. They also show that CASPER is an effective way to educate participants about CRC.

*Faculty Sponsor: Melvin Simoyi, Heritage University*

121 - Inhibition Effects of Praziquantel and Derivatives on the Arylsulfatase B Enzyme: Search for a MPS VI Treatment

**Victoria DePalma, Whitworth University**

Mucopolysaccharidosis VI is a glycogen storage disease that occurs in individuals that have a deficiency in the enzyme arylsulfatase B (ASB). This deficiency creates an overabundance of dermatan sulfate in lysosomes which creates physical problems in the host. Currently, there is no cure for MPS VI, but Pharmacological Chaperones (PCs) could be a viable method for therapy by binding to and stabilizing ASB. By finding inhibitors of ASB, scientists can begin to understand how ASB binds. Praziquantel is a potential inhibitor of ASB and has been researched to determine its effects on ASB at specific pHs. Lysosomes thrive in an acidic environment around pH 5. pH 4 assays show promise for future implementation. Praziquantel appears to work better as an inhibitor than praziquanamine, a derivative. Anacetyl chloride derivative was synthesized and noted to have inhibition trends at pH 4 and activator trends at pH 6. More testing is needed.

*Faculty Sponsor: Trisha Russell, Whitworth University*

122 - Marginal Metallophilic Macrophages and *Plasmodium chabaudi*

**Taylor Jordan, Gonzaga University**

Marginal Metallophilic Macrophages (MMM), which play a part in both phagocytosis and the presentation of antigens to B and T cells, are located on the inside of the splenic follicle. These macrophages are important for the control of malaria, and they are known to be depleted by CD8+ T cells. We aimed to study the role of beta-2-microglobulin ( $\beta_2m$ ) in the perforin

mediated killing of macrophages following infection. Immunohistochemistry (ICH) is an essential tool for analyzing the presence of specific cells within tissue via antibody markers. Through the use of immunohistochemical staining we analyzed the dynamics of MMM in the spleen following infection with *Plasmodium chabaudi*, a rodent malaria pathogen, in genetically altered mice. Through the examination of populations of MMM in these genetically altered mice we furthered our understanding of the pathways involved in the depletion of MMM following infection.

*Faculty Sponsor: Christy Watson, Gonzaga University*

123 - Predicting Salmon Habitat Opportunity Using Symbolic Regression

**Ermenejildo Rodriguez, Heritage University**

Habitable water for salmon is very important near the Pacific Northwest. Predicting those opportunities can be very difficult when using an extreme amount of data values. Addressing this problem, we implemented symbolic regression to evolve computer programs so as to discover a multi-variable mathematical expression for analysis and modeling. By implementing the Pyevolve and Anaconda modules, we constructed a symbolic mathematical function to model data taken for the water in and around the estuary between Oregon and Washington. Data was employed to determine salmon habitat opportunity (SHO) in support of the Columbia River management. Our results produced reasonable output of regression with salinity intrusion length, but not for SHO. More work must be done to find a good regression function for SHO. We will probably need to continue adjusting the parameters for SHO and possibly add more functions (i.e.,  $\cos x$ ) to the function set of SHO.

*Faculty Sponsor: Melvin Simoyi, Heritage University*

124 - Quenching Analysis of the Briggs-Rauscher Reaction using various Salts

**Michael Randall, Whitworth University**

The Briggs-Rauscher reaction is a well-known chemical system that utilizes hydrogen peroxide, iodate, manganese (II) sulfate, and malonic acid to produce an oscillating reaction. Oscillations are observed in cyclical patterns of color and electric potential. This project evaluated the effectiveness of various salts to quench the oscillations of the Briggs-Rauscher reaction. The concentration and the constituents of the salts were varied to determine the quenching effectiveness. Variations of the cation species used include sodium, lithium, potassium, magnesium, and calcium. The anion species used include, bromide, iodide, carbonate, bicarbonate, sulfate, sulfite, phosphate, phosphite, citrate, orotate, and acetate. Analysis of results showed the anion species was the primary factor in quenching; variance of the cation species appeared to have no effect on the reaction. Halogen anions appear to be the most efficient quenching agents requiring low concentrations to quench the oscillations effectively.

*Faculty Sponsor: Karen Stevens, Whitworth University*

125 - SEM Analysis of Fractographic Images of 304 Austenitic Stainless Steel Bending Fatigue Samples Subjected to Hydrogen Embrittlement Testing

**Kyle McLaughlin and Mike Phillips, Gonzaga University**

Two possible mechanisms responsible for hydrogen embrittlement are hydrogen-enhanced localized plasticity (HELP) and the lattice decohesion effect. The research, under the auspices of the hydrogen embrittlement project at Gonzaga University, seeks to investigate these theories through image analysis of fracture surfaces obtained using scanning electron microscopy. We are analyzing 304 austenitic stainless steel samples that have been failed under bending fatigue testing. Our samples have been exposed to differing amounts of hydrogen, including no hydrogen exposure (control), 1 week hydrogen exposure at 1 atm in the Gonzaga University Hydrogen Lab, and supersaturated exposure at Sandia National Laboratories. One possible result may be a correlation between higher areas of localized microscopic plasticity with a higher exposure to hydrogen. Another possible result may be a correlation of the presence of microvoids on the fracture surface to hydrogen exposure.

*Faculty Sponsor: Patrick Ferro, Gonzaga University*

126 - Stress Measurement on Bending Fatigue Specimens for Hydrogen Embrittlement

**Emily Petersen, Gonzaga University**

Bending fatigue research has been a focused area of hydrogen research at Gonzaga University since 2009. The objective of the research program is to contribute to a greater understanding to materials degradation effects caused by hydrogen exposure, for future alternative energy technologies designs. Austenitic stainless steel specimens are tested in bending fatigue under a range of stress and hydrogen exposure conditions. Results have shown that hydrogen exposure decreases the bending fatigue life, correlated to the level of hydrogen exposure. The purpose of the present investigation is to

measure the strain on bending fatigue specimens at the maximum displacement condition during fatigue. Strain gauges were used to measure the strain on specimens under a range of displacements. The calculated maximum stresses were compared to estimated stresses from finite element modeling and from hand calculations using elasticity theory. The effect of location of the strain gauge on the specimen is an important parameter in strain gauge measurements for the present investigation. Future work includes an analysis of failure location on fatigue specimens.

*Faculty Sponsor: Anas Delane, Gonzaga University*

127 - Structural Analysis and CRBG stratigraphy of the Palouse Falls area, eastern Washington

**Shyla A. Hatch and Alexandria J. Faulds, Eastern Washington University**

Fractures in the Palouse Falls area have influenced erosion from the Missoula Floods, captured the Palouse River, and helped guide the recessional cataract that formed the Palouse Falls. Origin of the fractures has been ascribed to folding and crustal lengthening, though conjugate angles are present in map view, suggesting lateral motion. If structures in the underlying basement resulted in fractures that penetrate through the Columbia River Basalt Group (CRBG), then the fractures may be a dominant influence on groundwater hydrology in an arid agricultural area. This study includes six stratigraphic controlled samples used for geochemical discrimination of the CRBG in the Palouse Falls area. By measuring fractures from aerial photos and using fracture analysis we evaluate the hypotheses that fractures originated from 1. folding, 2. normal faults, or 3. transpressional structures. The orientation of the fractures correlates with other fracture zones within the State of Washington and regional geologic structures.

*Faculty Sponsor: Chad Pritchard, Eastern Washington University*

128 - Tensile and Fatigue Testing of 304 Stainless Steel After Gaseous Hydrogen Exposure

**Estefen Luna and Michael Beckett, Gonzaga University**

Samples of 304 stainless steel were subjected to a range of hydrogen exposure conditions including one week at 1 atm, and up to three weeks at 138 MPa. Samples were subjected to bending fatigue and tensile testing. Increased hydrogen exposure was correlated with loss of fatigue life for bending fatigue. Samples were subjected to fractographic imagery to observe the effect of grain direction and hydrogen on the fracture surface. Tensile test data appears to show increased strain rate sensitivity after exposure to gaseous hydrogen at 1 atm pressure for one week as well as 138 MPa for three weeks.

*Faculty Sponsor: Patrick Ferro, Gonzaga University*

129 - The Effects of Cross-Linkable Sites on Dielectric Properties of Cyanolated Silica Sol-Gel Films

**Nicholas Anderson, Whitworth University**

Capacitors are high performance energy storage devices. Their energy storage capability, however, can be limited due to low permittivity, electrical loss, and premature breakdown. One way to overcome these issues is to improve the properties of the sol-gel film, which is a promising dielectric material. The film being investigated was made from 2-cyanoethyltrimethoxysilane (CNETMS) by a sol-gel reaction, and blends were made with differing concentrations of either 2-cyanoethylmethyl dimethoxysilane or tetraethyl orthosilicate. Studies were done to see the effects of altering the film's density and how it relates to the cyano group's ability to align with the electric field. These other two precursors affected the amount of cross-linkable sites and led to a change in the free volume of the films. After testing devices made from these blends, it was discovered that the free volume in the film for the cyano groups had no significant impact on the capacitor's permittivity.

*Faculty Sponsor: Trisha Russell, Whitworth University*

130 - The Formation of Derivatives of Sucralose under Basic Conditions

**Melissa Ryskamp, Whitworth University**

Sucralose, the main sweetening agent in Splenda, is being used in an increasingly large amount of foods and beverages. This presents a need for further investigation into the potential formation of sucralose derivatives when using Splenda for cooking. Sucralose was refluxed with various bases in either acetonitrile or water to examine its reactivity. Two derivatives were discovered and analyzed using NMR spectroscopy. One sucralose derivative, 3,5-anhydro-1-chloro-1-deoxy- $\beta$ -D-fructofuranosyl 4-chloro-4-deoxy- $\alpha$ -D-galactopyranoside, formed when sucralose was refluxed with either sodium carbonate or sodium bicarbonate in acetonitrile. When sucralose was refluxed with sodium carbonate in water, a second derivative formed.

*Faculty Sponsor: Trisha Russell, Whitworth University*

### 131 - The Geology of Mirabeau Point Park

**Travis Taylor, Eastern Washington University**

Mirabeau Point Park is located in the central Spokane valley, along the southwest bank of the Spokane River. The park has numerous walking trails with abundant outcrop exposures, which ultimately make for an excellent field study site for both students and the public. This project was conceived as a cooperative between the City of Spokane Valley and Spokane Community College. The bedrock geology here is composed primarily of Newman Lake Gneiss, a Mesozoic-aged granitic orthogneiss which contains extensive pegmatite veining. In essence, the park is part of a larger bedrock island within the Spokane Valley, surrounded by a thick sequence of Missoula flood deposits. This undergraduate service-learning research project was developed to create earth science awareness and education opportunities for the general public that utilize the park. Our research will allow for the development of informational displays, a guided walking tour, and potential lesson plans for K-12 field trips.

*Faculty Sponsor: Andrew Buddington, Eastern Washington University*

### 132 - Towards More Sensitive Fluorescence-Based Detection of RDX and Other Explosive Chemicals

**Hanh Nguyen, Whitworth University**

Motivated by recent advances in fluorescence-based detection using conjugated polymers, we studied the non-covalent interactions of these explosives with triphenylbenzene and related phenyl-substituted arenes using density functional theory (DFT). Using B97-D/TZV(2d,2p), we computed the binding energy of gas-phase electronic structures of explosive chemicals with substituted triphenylbenzenes, triphenyltriazine, and triphenylborazine. We showed that the addition of the hydroxyl (-OH) and methyl (-CH<sub>3</sub>) substituents to the central benzene ring improves binding of RDX, and should provide a framework for more sensitive RDX-detecting conjugated polymers. Furthermore, the binding energy of  $\pi$  stacking dimers between 1,3,5-triphenyl borazine and DNT, TNT, PA and Tetryl exceeds those of the corresponding dimers with triphenylbenzene. Currently, we are running symmetry-adapted perturbation theory (SAPT) computations in order to further understand the trends in stacking energies.

*Faculty Sponsor: Trisha Russell, Whitworth University*

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Matt Bahr, *Gonzaga University*  
Jeff Birkenstein, *St. Martin's University*  
Dan Bradley, *Gonzaga University*  
Gary Chang, *Gonzaga University*  
Brian Cooney, *Gonzaga University*  
Heather Easterling, *Gonzaga University*  
Greg Gidofalvi, *Gonzaga University*  
Andrew Goldman, *Gonzaga University*  
Vikas Gumbhir, *Gonzaga University*  
Karen Gutowsky-Zimmerman, *Seattle Pacific University*  
Erica Johnson, *Gonzaga University*  
Molly Kretchmar-Hendricks, *Gonzaga University*  
Dan Lambertson, *Walla Walla University*  
Kris Morehouse, *Gonzaga University*  
Vinai Norasakkunkit, *Gonzaga University*  
David Oosterhuis, *Gonzaga University*  
Suzanne Ostersmith, *Gonzaga University*

Shannon Overbay, *Gonzaga University*  
Pamela Parker, *Whitworth University*  
Ingrid Ranum, *Gonzaga University*  
Katey Roden, *Gonzaga University*  
Elizabeth Roewe, *Gonzaga University*  
Nicole Sheets, *Whitworth University*  
Julia Stronks, *Whitworth University*  
Sean Swan, *Gonzaga University*  
Brook Swanson, *Gonzaga University*  
Patricia Terry, *Gonzaga University*  
J.D. Thayer, *Gonzaga University*  
Gary Thorne, *Gonzaga University*  
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Edward Vacha, *Gonzaga University*  
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Jeff Watson, *Gonzaga University*  
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Trisha Russell, *Whitworth University*  
Erica Salkin, *Whitworth University*  
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Jeffrey Stafford, *Eastern Washington University*  
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