

WINTHROP UNIVERSITY UNDERGRADUATE SCHOLARSHIP 2014 Book of Abstracts



**“Tell me and I forget, teach me and I may remember,
involve me and I learn.”**

Benjamin Franklin

**“Confidence, like art, never comes from having all the
answers; it comes from being open to all the questions.”**

Wallace Stevens (1879-1955)

Poet & Insurance Executive

University College proudly presents the third Undergraduate Scholarship at Winthrop University Book of Abstracts, which chronicles the scholarly accomplishments of students throughout all five academic colleges in the university: College of Arts and Sciences (CAS), College of Business Administration (CBA), College of Education (COE), the College of Visual and Performing Arts (CVPA) and University College (UC). The book also highlights the students who have completed Honors Theses, applied for Nationally Competitive Awards, and were selected as McNair or WISE Scholars.

The Book of Abstracts, which contains the work conducted by students in collaboration with their faculty mentors, reflects the great depth and variety of projects these students were engaged in. Their success illustrates how effective undergraduate research is at providing valuable learning experiences to students and why it is recognized as one of the high-impact educational practices that increase the rates of student retention and engagement. Participating in undergraduate research can help students prepare for professional and graduate programs and enhance their professional and academic credentials to support applications for scholarships, awards, career employment, and graduate and professional schools. Moreover, students have the opportunity to contribute to the creation of new knowledge on the cutting edge of their academic disciplines and apply that knowledge to real world problems.

We congratulate the students for the quality of their work and their willingness to share this work with the academic community through publications in refereed journals and presentations at regional, national, and international meetings. We also recognize and appreciate the quality of the mentoring by our faculty who teach the students the art and science of asking questions, how to interpret the results, and how to disseminate the knowledge and creative activities at a professional level.

The production of the book itself is an undergraduate project undertaken by the class of Associate Professor Jason Tselentis. We thank Andrea Perkins, a visual communication design major, for designing the cover and composing the book's interior, as well as Devon Holmes, a visual communication design major, and Rose Fenton and Wyatt Minton, digital information design: interactive media majors, for composing the book. We also thank the graduate assistant in the Undergraduate Research Office, Patrick Bryant, for editing the abstracts.

We hope you enjoy our Book of Abstracts.

Dr. Dwight Dimaculangan

Director of Undergraduate Research

Dr. Gloria Jones

Dean of University College

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Winthrop University

Undergraduate Research Initiative

The Winthrop University Undergraduate Research Initiative (WUURI) supports a student-centered learning environment that fosters student research, scholarship, and creative activities. The Initiative encourages students and faculty mentors to collaborate in the design and implementation of projects and the dissemination of results.

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Publication Abstracts

“Aggressive Disintegration in the Individual”: A Lacanian Study of Signification and Self in *King Lear*

Published in *The Sigma Tau Delta Critical Review*, Vol. 11, 2014

Presented at the 2014 NCUR, April, 2014

Winner of the Frederic Fadner Critical Essay Award for the top essay in the Sigma Tau Delta Critical Review, 2014

Student: Alexander Muller (2014)

Faculty Mentor: Matthew Fike, Ph.D.

CAS – Department of English

(ENGL 305 – Fike)

Although various scholars like David Willbern and Julia and Kenneth Reinhard-Lupton have addressed the issue of Cordelia's non-speech at the opening of Shakespeare's *King Lear*, few have connected it to the linguistic theories of the psychoanalyst Jacques Lacan. In fact, most of the current scholarship seems to be either Freudian or Jungian and focuses on the role of Lear as the Father-King and his Oedipal/incestuous relationship with his daughter(s). The present essay examines the ways in which roles are reversed, specifically in the act of Signification, in which the upper half of a binary member (the Signifier) imposes its meaning upon a lower binary member (the signified). Lear represents what Lacan calls the Symbolic Order, the patriarchal figure who wields the phallus-as-language in order to impose Signification upon his subjects. Yet, in the context of the play, Lear is also a signified subject: the title of “King” is precisely what alienates him. Through a reversal of the Signifier/signified binary, a new, non-patriarchal Signifier emerges in the form of Cordelia. This interpretation is not only an implication of Freud's early reading (1913) of Cordelia as a Death figure but also suggests a Lacanian connection, namely, that the phallus-as-language is a destructive force that ensures the “aggressive disintegration in the individual”—the causation of Lacan's theory of the fragmented self. In addition to problems of patriarchy related to language as a destructive tool, there is the potential reparative quality of female Signification through non-language, the reintegration of the fragmented body within the sleep of Death. Lacanian theory thus provides an alternative understanding of male and female power in *King Lear* through the study of Signification.

Preliminary Geologic Map of Ninety Six National Historic Site and Vicinity, Ninety Six 7.5 Minute Quadrangle, South Carolina

Published in *Geological Society of America Abstracts with Programs*, Vol. 45.7

Presented at the Geological Society of America Annual Meeting, October, 2013

Student: Christy Long (2014)

Faculty Mentor: Irene Boland, Ph.D.

CAS – Department of Chemistry, Physics, and Geology

(GEOL 551 – Boland)

This is the second report of an ongoing project to develop a detailed digital geologic map of Ninety Six National Historic Site (NSNHS) and vicinity for National Park Service and the USGS Geologic Resources Inventory. The first report provided a digital surficial geologic map of the area within the boundaries of NSNHS (White and others, 2012). The NSNHS resides in the southeastern part of the Ninety Six 7.5 Minute Quadrangle, South Carolina. The purpose of this report is to provide a digital bedrock geologic map of the southern half of the Ninety Six 7.5 Minute quadrangle. The quadrangle is part of the Charlotte terrane, generally interpreted as the plutonic axis of the Carolina terrane, remnants of a Neoproterozoic to Early Paleozoic exotic volcanic island arc accreted to southeastern North America during Paleozoic tectonic events that formed Pangaea. The surface topography of the quadrangle consists of gently rolling hills with a hundred feet or so of relief. The bedrock is deeply weathered and overlain in most places by a thick layer of soil. Exposures are found mainly in streams and deep road cuts. Unfoliated, tan to light gray, fine to medium grained biotite metagranite is the predominant rock type. The metagranite is cut in numerous places by small plugs and dikes of unfoliated, medium to dark gray, fine to medium grained hornblende metadiorite containing varying amounts of biotite and pyrite. Cross-cutting relationships suggest the metadiorite is younger than the metagranite. The metagranite and metadiorite generally display a xenomorphic-equigranular texture, which suggests they are metamorphic rocks. Metagabbro crops out in various places in the southernmost part of the quadrangle. Fine grained quartz-muscovite schist, variably tan to hematite red, crops out on high ridges within the city of Ninety Six and in the northeastern-most part of the quadrangle.

Honors Thesis Abstracts

The Honors Program at Winthrop University is designed to enrich the college experience for highly talented and motivated students. Through interactions with outstanding faculty and peers, a vital community of scholars is created that embraces the pursuit of knowledge for the enhancement of intellectual and personal growth. Founded in 1960, Winthrop's Honors Program is one of the oldest in the nation. Then President Charles S. Davis, realizing the importance of an enriched education for high-achieving students, appointed faculty member John S. Eells as the founding director of our Honors Program. Eells became a member of a national organization that was formed as a clearinghouse for information on honors activities, the Inter-University Committee on the Superior Student (ICSS). The ICSS received funding from the Carnegie Foundation, the National Science Foundation and the U.S. Office of Education to help establish honors programs at colleges and universities across the U.S. When the ICSS disbanded in 1965 for lack of external funding, several members of that group formed the National Collegiate Honors Council (NCHC), in 1966, which was committed to maintaining a professional association of honors educators. Eells was elected the fourth President of NCHC in 1970. Over the years, the Winthrop University Honors Program has continued to flourish, and in the early 1980s the program was divided into a program for the entering freshmen and a program for the upperclassmen. At that time, there was a national trend toward creating "learning communities" (see Gabelnick, 1986, for a review), and the Winthrop honors administration created the Clustered Learning Units for Educational Success (C.L.U.E.S) program in which new honors freshmen enrolled in a cluster of three honors classes together. This program later became the Freshman Honors Program. Seeing the need for a more cohesive honors experience, the honors administration under the leadership of then President Anthony J. DiGiorgio combined the programs in 1997. Today the Honors Program at Winthrop University enrolls approximately 200 students from each of the degree-granting colleges of the university. To graduate with an Honors Program Degree, a student must complete 23 hours of honors courses, which includes an honors thesis while maintaining at least a 3.30 grade point average. The honors thesis is the culminating experience for our Honors Program students in which they work collaboratively with a faculty director and two faculty readers to produce a project that evaluates knowledge, concepts and methodology, examines major issues, integrates complex information, and develops and appropriately defends an argument. While most students complete the honors thesis during the course of the senior year, some students complete the project earlier in their academic careers. The Honors Thesis Colloquium is an annual event designed as a venue for the student to celebrate this accomplishment. Now in its twelfth year, this year's colloquium will showcase sixteen students presenting their honors thesis research in the form of an oral presentation or poster. The Honors Program students and I would like to thank the faculty members who have worked as honors thesis directors or readers throughout this process. Their expertise, guidance and commitment should be highly commended on this auspicious occasion.

Kathy A. Lyon, Ph.D.

Director of the Honors Program

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Caregivers' Time Perspectives, Anticipatory Grief, Depression Levels, and General Knowledge of Alzheimer's Disease

Presented at the Southern Regional Honors Council Conference, March, 2014 and the Annual Meeting of the Southeastern Psychological Association, March, 2014

Student: Keisha Carden (2013)

Honors Thesis Committee: Merry Sleigh, Ph. D.; Tara Collins, Ph.D.; and Mary McKemy, Ph.D.

CAS – Department of Psychology

Participants were caregivers of Alzheimer's patients with a mean age of 47.93 (SD = 8.88). Past research has identified many factors associated with caregiver burden, including elevated stress levels, higher incidence of depression, and decreased quality of life (Pluck et al 2008). Our participants responded online to the Zimbardo Time Perspective Inventory (Zimbardo and Boyd 1999), the Anticipatory Grief Scale (Marwit and Meuser 2002), the Alzheimer's Disease Knowledge Test (Dieckmann et al 1988), the Beck Depression Inventory (Beck et al 1961), and questions about their caregiving experience. Caregivers scored a mean of 80.18% on the knowledge test, reflecting greater levels of knowledge than was reported for previously tested caregivers (Dieckmann et al 1988). Results revealed that the higher caregivers' knowledge of AD, the higher their Past Negative score, $r = .37$, $p = .04$ —indicating that they reflect on their lives in a negative manner—and the higher their Present Hedonistic score, indicating a focus on the pleasures of the moment, $r = .41$, $p = .02$. Higher knowledge was also associated with lower BDI scores, $r = -.50$, $p < .01$. The higher the anticipatory grief score, the lower caregivers' Past Negative score, $r = -.88$, $p < .01$, the lower the Present Hedonistic score, $r = -.59$, $p < .01$, and the lower the Present Fatalistic score, $r = -.77$, $p < .01$. Higher anticipatory grief was also associated with a higher BDI, $r = .84$, $p < .01$. These relations suggest a pattern of dissatisfaction and an inability to enjoy the present for caregivers' in the process of anticipatory grief. However, higher anticipatory grief also predicted higher Future, $r = .66$, $p < .01$, and higher Past Positive, $r = .56$, $p < .01$. In other words, participants might have been grieving, but they were able to reflect positively on the past and to look forward to the future. The more emotionally difficult caregivers felt their situation was, the less anticipatory grief, $r = -.44$, $p = .015$, and the lower their BDI, $r = -.46$, $p = .01$, perhaps suggesting that they were too occupied with caregiving to deal with their own emotions.

Critical Reading, Thinking, and Writing: Transforming the High School English Classroom

Presented at the Southern Regional Honors Council Conference, March, 2014

Student: Lauren Clark (2014)

Honors Thesis Committee: Evelyne Weeks, M.A.; Jane Smith, Ph.D.; and Amy Gerald, Ph.D.

CAS – Department of English

As standardized and state tests increasingly become the focal point of public education, there is a higher need for critical thinking, reading, and writing instruction in the high school classroom. Having had experience as a pre-service high school English teacher, it is evident to me that there is a need for critical thinking instruction. Not only do standardized and state test preparations hinder students' abilities to think critically, they are actually moving students in the opposite direction. It is the goal of all teachers to help their students think critically, to think for themselves and be confident in their own reasoning. In this paper, I will support the assumption that if critical thinking strategies are taught and emphasized in high school and in college, then there will be a higher student success rate in high school, college, and the job market. In this paper I will argue for the value of critical thinking instruction

in the high school classroom and discuss how to incorporate critical thinking strategies at the secondary level, specifically in the English classroom. Critical thinking scholar, Gerald Nosich, in his book *Learning to Think Things Through: A Guide to Critical Thinking Across the Curriculum*, provides several strategies for critical thinking applications that can be utilized in secondary instruction. Through the use of these critical thinking strategies, teachers can move away from a memorization based learning environment to a more successful and engaging learning environment for all students.

Antecedents and Consequences of Intra-Psychic and Interpersonal Dimensions of Forgiveness

Presented at the Southern Regional Honors Council Conference, March, 2014

Student: Molly Crocker (2014)

Honors Thesis Committee: Donna Nelson, Ph.D.; Kathy Lyon, Ph.D.; and Tara Collins, Ph.D.

CAS – Department of Psychology

(HONR 450 H – Nelson)

This project will explore variables that may be linked to two distinct aspects of forgiveness. Public (interpersonal) forgiveness involves a victim expressing to the transgressor that they have forgiven them—or forgiveness is communicated through the victim's behavior, and the victim is no longer seeking revenge (Exline, Baumeister, Bushman, Campbell, and Finkel 2004). Private (intra-psychic) forgiveness involves a victim forgiving the transgressor internally but not necessarily communicating that to the transgressor, and the victim no longer has negative feelings towards the transgressor (Exline et al 2004). We will examine several possible predictors of public and private forgiveness including self-esteem, intrinsic and extrinsic religiosity, and whether or not an apology was received. We will also investigate consequences of public and private forgiveness including distress, relationship outcomes, and subjective well-being. We predict that self-esteem will be positively linked to public and private forgiveness and that it will have a greater effect when no apology is given. Furthermore, we expect low self-esteem to be linked to concerns about costs of forgiveness, while high self-esteem will be linked to a focus on benefits of forgiving. We also expect that intrinsic religiosity will be linked to private forgiveness, while extrinsic religiosity will be linked to public forgiveness. We expect that distress about the event will be negatively linked to private forgiveness and that relationship well-being will be linked to public forgiveness. To test these hypotheses we will administer a questionnaire to assess different aspects of forgiveness and the aforementioned predictor and outcome variables.

Characterization of Copper (I) Binding to Various Small Molecules

Presented at the Southern Regional Honors Council Conference, March, 2014; the 65th Southeast Regional Meeting of the American Chemical Society, November, 2013; the Big South Undergraduate Research Symposium, April, 2013; and the Ivy Plus Symposium, October, 2012

Supported by a SC INBRE II grant

Winner of the First Place Undergraduate Oral Research Presentation at the Southeastern Meeting of the American Chemical Society and the First Place Oral Research Presentation in Chemistry at the Big South Undergraduate Research Symposium

Student: Destinee Johnson (2014) (McNair Scholar)

Honors Thesis Committee: Nicholas Grossoehme, Ph.D.; Takita Sumter, Ph.D.; Robin Lammi, Ph.D.; and Clifton Calloway, Ph.D.

CAS – Department of Chemistry, Physics, and Geology

Copper (I) is essential for several biochemical processes within enzyme active sites such as electron transfer, dioxygen binding, catalysis, and structural activity. Although the cuprous ion is the physiologically relevant oxidation state of copper, *in vitro* experiments have in large been focused on copper (II), because it is stable under typical laboratory conditions. Furthermore, under anaerobic conditions, copper (I) participates in a disproportionation process that favors copper (II) by a factor of approximately 1000 relative to copper (I). As such, careful experiment design is necessary to alleviate these complications. This research aims to provide the necessary experimental foundation to directly measure the thermodynamic forces associated with cuprous ion binding energy using isothermal titration calorimetry. To avoid the potential of copper (I) oxidation, all colorimetric and calorimetric experiments were conducted in a Coy Lab glove box. Additionally, acetonitrile was used as a stabilizing ligand to abrogate the disproportionation equilibrium of copper (I). The spectrophotometric data verified that the expected 2:1 bicinehoninic acid Cu(BCA)₂ complex was formed under these experimental conditions. The colorimetric data provided a methodical background for subsequent calorimetric experiments which determined thermodynamic parameters of copper (I) binding. In Tris buffer (pH 7.5), the average binding constant was $K = 2.2 \pm 0.2 \times 10^6 \text{ M}^{-1}$. The average enthalpy value was $\Delta H = -28 \pm 0.3 \text{ kJ/mol}$ of BCA, and the average reaction stoichiometry (*n*) was 2.1 ± 0.05 . In bis-tris buffer (pH 7), the average enthalpy was $-34 \pm 0.4 \text{ kJ/mol}$ of BCA, and in HEPES buffer (pH 7), the average enthalpy was $-37 \pm 0.5 \text{ kJ/mol}$ of BCA. These results show that the thermodynamic parameters of the Cu(BCA)₂ complex formation are buffer dependent.

Age Differences in Knowledge of Alzheimer's Disease and Generalized Health Anxiety

Presented at the Southern Regional Honors Council Conference, March, 2014 and the Annual Meeting of the Southeastern Psychological Association, March, 2014

Honorable Mention for the Psi Chi Regional Research Award

Student: Kristen McLaurin (2014)

Honors Thesis Committee: Merry Sleight, Ph.D.; Mary McKemy, Ph.D. and Kathy Lyon, Ph.D.

CAS – Department of Psychology

We examined how knowledge differed between older and younger adults, as well as whether knowledge was related to concerns about general health and personal acquisition of Alzheimer's disease. Adults (*n* = 122) responded to questions that measured knowledge of Alzheimer's disease symptoms (Cherry et al 2000) and to a general health anxiety scale (Zung 1971). Additional questions assessed knowledge confidence, family history, health concerns, and

sources of Alzheimer's disease knowledge. We compared participants who were under 25 to participants who were over 50 using an independent t-test. Results revealed that older adults had utilized more scientific resources and also knew more about Alzheimer's disease than younger adults. One hundred percent of our older adults had investigated Alzheimer's disease through websites or health seminars, whereas about 10% of young adults had done so. Young adults, whose knowledge was less accurate, were more likely to report that their knowledge source was personal experience or information from friends. Knowledge of Alzheimer's disease was not related to general health anxiety. Instead, knowledge was predicted by higher age and education. In contrast, the younger and less educated adults were, the more they experienced general health anxiety. Without a breakthrough in research, Alzheimer's disease is expected to become an epidemic by 2050 (Brookmeyer et al 2007). Thus, young adults are particularly vulnerable to being affected by this disease, and our research indicates that they may be characterized by a combination of little knowledge combined with health anxiety, at least in comparison to older adults.

Supply Chain Management Practices of Small Businesses in the Charlotte Area

Student: Claudia Morante (2014)

Honors Thesis Committee: Emma Riddle, Ph.D.; Cara Peters, Ph.D.; and Stephanie Lawson, Ph.D.

COB – Department of Accounting, Finance, and Economics

A supply chain includes all activities related to the flow and transformation of raw materials to the final customer, as well as the associated flow of information. Supply chain management (SCM) is the coordination of business functions within a company and its supply chain working towards meeting demand efficiently and effectively. For this research, the owners of three small businesses in the Charlotte area were interviewed about their SCM practices. This sample included a restaurant, a condiments company, and a clothing distributor. It was found that SCM practices were generally informal and customized to the type of business. Demand forecasting was based on either experience, intuition, or customer feedback. Except in companies that accepted online orders, the use of information technology was limited. The SCM practices of these businesses appeared to be effective enough to maintain their current level of business. As these businesses grow, they are likely to need more structured supply chain management processes and better forecasting methods. With higher revenues, these companies might be able to reduce costs by investing in more information technology.

In the Shape of Language: Motets and Other Poems

Presented at the Sigma Tau Delta International Convention, February, 2014; the Annual Winthrop University English Department Creative Showcase, March, 2014; and the Southern Regional Honors Council Conference, March, 2014

Supported by a Geraldine Trammel Hurley Fellowship

Student: Alexander Muller (2014)

Honors Thesis Committee: Evelyn Weeks, M.A.; Kelly Richardson, Ph.D.; and Jane Smith, Ph.D.

CAS – Department of English

My honors thesis is a collection of nearly 40 original poems composed and revised over the past three years in poetry workshop classes, independent study, and a residency at the Bordeneuve Retreat for Artists and Writers in Boussens, France. Specifically, this collection centers on the form of the motet, which I have recently invented. The motet is a poetic form that contains moveable lines and may be read multiple ways. The poetic motet is based on the Medieval music of the same name, in which Monks would modify existing Gregorian chants by adding other vocal lyrics that were meant to be sung simultaneously, creating one of the ear-

liest forms of polyphony. Following this tradition, the poetic Motet is at once both inherently dissonant and disjointedly harmonic; likewise, it displays reverence of language as a musical medium while questioning its mythological development and the idea that it is ever entirely “fixed.” The concerns of the Motet form are concerns of other poems in this collection as well, as the poet explores the personal mythology of family, national perspective, and the idea of time, concluding that these things are beautiful in their fractured, non-linear states.

‘Mother, Maker, and Silent Leader’: Women in the Indian National Movement

Presented at the Southern Regional Honors Council Conference, March, 2014

Student: Amber Schilling (2014)

Honors Thesis Committee: Gregory Crider, Ph.D.; Virginia Williams, Ph.D.;
and Kathy Lyon, Ph.D.

CAS – Department of History

When Mohandas Gandhi completed his Salt March to kick-off India’s Civil Disobedience Movement, he called for women to come out of their homes and contribute openly to the struggle for independence. Women had already found a small place in some aspects of the Indian national movement, but Gandhi’s call to action and his belief that women were the perfect champions for peaceful protest drew women further into the movement. This paper examines the relationship between women and the Indian national movement. Women made significant contributions to the movement as moral figureheads and leaders on the ground, and the movement offered women a space to participate in public life with limited reproach from India’s patriarchal society. While Gandhi encouraged women’s participation, he remained a firm patriarchal voice, contending a woman’s morality and ability to suffer and endure made her a perfect candidate for civil disobedience. This paper utilizes previous scholarship to flesh out this complicated relationship, as well as primary sources like letters from female nationalist leaders and Gandhi’s own writings on women to put these events in the proper context.

Meeting Abstracts

The Effects of Ibuprofen on Growth Cone Collapse of Chicken Retinal Axons

Presented at the Synapse Conference, March, 2014

Supported by a SC INBRE grant

Student: Adaeze Aninweze (2016)

Faculty Mentor: Eric Birgbauer, Ph.D.

CAS – Department of Biology

Damage to the CNS and the spinal cord is irreversible. There is minimal nerve regeneration at the site of the injury, but it is not enough to reverse the injury. Recently, Fu et al (2007) found out that ibuprofen promoted nerve regeneration at the site of injury in dorsal root ganglion cells of mice. Furthermore, they proposed that ibuprofen causes nerve regeneration by inhibiting RhoA. In the retinal axons of chicken, the lysophospholipid LPA causes axonal growth cone collapse by activating the RhoA pathway. If ibuprofen promoted axonal regeneration through RhoA inhibition in dorsal root ganglion cells of mice, growth cone collapse of chicken retinal axons by LPA should be inhibited by ibuprofen. We used ibuprofen at 500 μ M and 50 μ M, which were similar to concentrations used by Fu et al, and below the lethal dose, to test inhibition of growth cone collapse by LPA. Using time lapse microscopy, live events were recorded as the retinal axons were treated with ibuprofen and/or LPA. At concentrations of 500 μ M of ibuprofen, some growth cone collapse occurred before the LPA treatment. Furthermore, treatments done with LPA showed significant growth cone collapse even when pretreated with ibuprofen. Our results showed that ibuprofen did not prevent growth cone collapse, which did not correlate with the findings of Fu et al, suggesting a more complex role for ibuprofen in nerve regeneration.

Class and the Female: Women's Struggles in Medieval Estates Hierarchy

Presented at the Longwood University Medieval Undergraduate Research Conference, March, 2014

Student: Samantha Baker (2014)

Faculty Mentor: Josephine Koster, Ph.D.

CAS – Department of English

(ENGL 512 – Bickford)

Medieval literature tends to focus on men and their chivalric actions. Sir Gawain and King Arthur are just two examples of a literary age full of knights and quests. Women seem content to stay backstage, observing the adventures and rewarding the conquering hero upon his return. In this paper, however, I will focus on the literary works that feature women who are not content with just watching. The characters of the *Lais of Marie de France*, *The Book of Margery Kempe*, and *The Katherine Group* bravely and cunningly test the boundaries of their gender and class. The *Lais* feature women and lovers combating social immobility in medieval society, although usually unsuccessfully. The failures seem to serve as a warning to readers—a plea to conform to the social norms associated with gender and class. The *Book of Margery Kempe* details a woman who, although pious and religious, uses her intelligence to ascend her social ladder and gain power not usually possible for a woman. The *Katherine Group* exemplifies the most creative escape from gender constraints by arguably showing virginity as a distinct gender of its own, therefore outside the bounds of traditional male-female

systems. I argue that each of these works tells of different attempts by women to escape their subservient roles to men in the medieval estates hierarchy and embrace their own powers, and that the existence of these works should alter our stereotyped picture of male-female relations in medieval literature.

The Oppressive Economy of Babies: Marxism in Atwood's *The Handmaid's Tale*

Presented at the 2014 NCUR, April, 2014

Student: Samantha Baker (2014)

Faculty Mentor: Leslie Bickford, Ph.D.

CAS – Department of English

(ENGL 300 – Bickford)

Although criticism about Margaret Atwood's acclaimed novel *The Handmaid's Tale* is varied and rich, Marxist analysis remains markedly absent from the conversation. I argue that the Commanders in Gilead take advantage of the declining birth rate to intentionally create a new set of ideologies and form an economy that adds reproduction to traditional production in the society's base, creating a unique "economy of babies." This forces the Handmaids into ambiguous social positions where they live simultaneously as bourgeoisie, proletariat, and mere machinery in the new economy, whose prime product is infants. The hegemony of Gilead did not develop naturally as social structures do in many cultures, such as capitalist America. The hyper-Christian hegemony was instead carefully constructed and systematically introduced to New England, affirming Louis Althusser's theory that the superstructure influences the base instead of being created by it. The members of this hand-crafted society undergo rapid interpellation, accepting the beliefs of Gilead and their own roles with surprising readiness. Moreover, the Handmaid Offred is not merely exhibiting the outward behavior expected of her. Within her narration, she exposes her thorough indoctrination through her unusual reactions to what were once normal life occurrences and particular attention to fertility symbols. The indoctrination is so intense that it physically affects the Handmaids, especially on Ofwarren's Birth Day, which is also the clearest example of "alienation of labor" in Gilead; the Handmaids must endure the labor of birthing a child but are allowed only limited interaction with the baby afterward. This alienation objectifies the Handmaids because they are not allowed to own the product of their labors, much like a man in a car assembly line is not given a car. An understanding of the complex economic positions of the Handmaids can help the reader more easily sort through Offred's jumbled thoughts and actions and place other classes into a more clearly defined social relationship with the Handmaids. Since *The Handmaid's Tale*, like all dystopian literature, is intended to be a social critique, perhaps we can even take our understanding from this study and search, warily, for the same structures in our world.

Impulsive Trust in Romantic Relationships: The Correlational Effect of Parental Influence

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Winner of the Psi Chi Regional Research Award

Students: Katelynn Belliveau (2015); **Kayla Brown** (2015);
and **Christian Shedrick** (2015)

Faculty Mentor: Tara Collins, Ph.D.

CAS – Department of Psychology

(PSYCH 302 – Collins)

Trust is a complex concept and has many factors contributing to it. One factor is attachment style. Attachment is the connection or bond that forms between people. It is believed that the attachments people make in childhood carry over into adulthood. There are multiple types of trust, such as impulsive trust, which is the unconscious form of trust. Previous research has shown that trust can be significantly impacted by the experiences, interactions, and observations individuals receive from parents. Through the current project, we hope to add to the existing literature by examining the relationships between interparental conflict, attachment, general trust, and impulsive trust. We hypothesized that individuals who were exposed to negative parental interactions, such as frequent arguments, would have a lack of general trust and a small capacity for impulsive trust within their own romantic relationships. Through a survey, we assessed impulsive trust using a word completion task as well as the general trust with questions from the Relationship Scale Questionnaire. The parent child relationship was examined using the dyadic trust scale, while interparental conflict was examined with the Child's Perception of Interparental Conflict (CPIC) scale, and attachment styles with the adult attachment measure. Two multiple regression analyses were conducted to predict general trust and impulsive trust (i.e., number of trust words from the word completion task) from attachment and CPIC. The overall multiple regression analysis predicting impulsive trust was not significant. However, attachment and CPIC did significantly predict a general lack of trust. Specifically, the avoidant and anxious forms of attachment and the frequency of interparental arguments all positively predicted general lack of trust. From these results we can conclude that attachment style can effectively predict an individual's lack of general trust but not impulsive trust. We can also conclude that the frequency of parental arguments can predict an individual's lack of general trust but not impulsive trust. These results show the importance of how the attachment styles we develop from an early age as a result of the interactions between our parents can impact our ability to trust people, like romantic partners, in adulthood. Future directions/limitations are discussed.

The Personified Environment in Jean Rhys's *Wide Sargasso Sea*

Presented at the 2014 NCUR, April, 2014

Student: Chelsea Bergmann (2014)

Faculty Mentor: Leslie Bickford, Ph.D.

CAS – Department of English

(ENGL 300 – Bickford)

Few scholars have attempted to explore the environment in Jean Rhys's *Wide Sargasso Sea* in regards to how the characters within the novel push for the respectful treatment of the land. Literary critics such as Jaclyn Mallan and Elaine Savory focus on how the environment affects the characters of the novel, but rarely do they discuss how *Wide Sargasso Sea* can be viewed as an appeal for the betterment of the environment. I have conducted and compiled extensive research focusing on the ecocritical lens to support the claims laid out in this analysis. An im-

portant source for the research comes from Susan Rowland in her book *The Ecocritical Psyche: Literature, Evolutionary Complexity and Jung*, where her pull from a Jungian perspective helps me to explain why Rochester treats the environment like he does and how in his fears he perceives the environment and his wife to be one entity united against him. After a thorough analysis of the novel, I conclude that the environment portrays its own unique likes and dislikes for the beings that inhabit it. Hence, by personifying Nature in *Wide Sargasso Sea*, Antoinette and Rochester characterize it as either protective and nurturing to those who are native and respectful or apprehensive and hidden to those who are foreign and threatening to the land. The implications of this analysis lead to a big picture view of the environment. Using Rhys's masterpiece and the lens of ecocriticism, I am able to prove that a cry for help is bellowed from the heart of Nature through the powerful connection the environment has with Rhys's protagonist, Antoinette. The reality of how the environment is treated today is also revealed through the actions of Rochester. An environmentalist agenda radiates through the pages and demands a change in how Nature should be respected.

“To Lord Byron” and “Dandelion”

Presented at the Ninth Annual Winthrop University Department of English Undergraduate/Graduate Research Conference, March, 2014

Student: Margaret Adams (2017)

Faculty Mentor: Mary Martin, Ph.D.

CAS – Department of English

Two original poems were performed.

A Record of Success: Journaling in the Secondary English Classroom

Presented at the 2014 NCUR, April, 2014

Student: Chelsea Bergmann (2014)

Faculty Mentor: Amy Gerald, Ph.D.

CAS – Department of English

(WRIT 350 – Gerald)

Henry David Thoreau recognized the value of self-discovery when he wrote, “What lies behind us and what lies ahead of us are tiny matters compared to what lives within us.” Writing is one avenue humans take toward understanding themselves, and journaling takes that writing and stretches its potential across concepts of learning, strengthening skills in writing and helping people find their own voices. Early journals were a means of recording history and also a means of self-expression, where people discussed how personal experiences prompted thought, actions, and writing itself. In today's English classroom, the technique of journaling puts a more in-depth focus on strengthening student writing by providing students with an ideal invention aid, a means of communication with the teacher, and an opportunity to review writing concepts learned in class. Journaling has sometimes been dismissed because it has been criticized for opening doors into students' personal lives and into the ethical situations that can arise from these discoveries. Yet the research conducted on journaling affirms its validity for strengthening the writing skills of students. By looking into the history of journaling itself and the theory of writing as a mode of learning, the credibility of journaling is shown and proves how student writing is improved in fluency, organization, and voice. Sources such as Toby Fulwiler's *The Journal Book* provide invaluable methods and support for journaling in the classroom. Overall, this research has implications for the high school English teacher. Using journals as a model for teaching the invention process of writing, as a means of communication that provides supporting feedback, and as a way of reviewing writing concepts will offer students both confidence and familiarity with their writing, which

is desperately needed in the English classroom. Through journaling, a new caliber of learning for students is established and lays the foundation for newfound appreciation for their own writing processes.

The New Pyrrhus: *Hamlet*, the Players, and Acts of Compromise

Presented at the 2014 NCUR, April, 2014

Student: Tyler Brooks (2014)

Faculty Mentor: Matthew Fike, Ph.D.

CAS – Department of English

(ENGL 305 – Fike)

The purpose of this paper is both to interpret reasons behind the inclusion of the mythological figures in William Shakespeare's *Hamlet, Prince of Denmark* and to determine the extent to which Hamlet commits acts of compromise. Some Freudian critics argue that "Hamlet can act only because his mother is dead," but Paul Emmett and William Veeder claim that "Hamlet's symbiotic jealousies [do not] prevent him from sending Claudius to mother" ("Freud in Time" 232). I believe that Hamlet hesitates, but I look at why he delays, at why he commits his acts of compromise, by focusing on his interactions with the players. Very little has been done to explore the connection between the mythological characters that Hamlet and the players reference and Hamlet's hesitancy in killing Claudius. Shakespeare uses Hamlet and characters borrowed from Virgil's *The Aeneid* to show both the true nature of Hamlet's character and how Hamlet engages in what Sigmund Freud terms an act of compromise. To Freud, acts of compromise are "substitutive actions which recompense the impulse for what has been forbidden," and these actions "come nearer and nearer to the original and forbidden act" (*Totem and Taboo*). An examination both of psychoanalytic and of Shakespearean critics suggests that Hamlet wrestles with himself over whether he should commit the taboo act of regicide or whether he should listen to his moral being and defy the ghost of his dead father. Hamlet hesitates in his search to avenge the death of his father. The ghost of his father commands Hamlet to kill the king. However, Hamlet is reluctant to obey the order and thereby commits an act of compromise. He desires to kill the king, but he chooses to wish for it to come true rather than taking an active approach. Instead of behaving like Pyrrhus and enthusiastically avenging his father's death, Hamlet acts like Hecuba and Dido in that he discusses what he wants and eventually causes his own death. His refusal to act causes the death of the king, but Hamlet does not achieve the revenge in the way in which he was taxed.

The Effects of Drawing, Listening, and Writing on Mood Change

Presented at the McNair Scholar's Research Symposium, June, 2013

Student: Leah Brown (2015) (McNair Scholar)

Faculty Mentor: Merry Sleigh, Ph.D.

CAS – Department of Psychology

This study compared the effectiveness of four mood management strategies. Young adults (n=136) were primed to be in a negative mood via a three minute writing exercise. Participants then completed the PANAS (Positive and Negative Affect Scale Watson, Clark and Tellegen 1988) to evaluate the effectiveness of the negative mood prime. Groups of participants were randomly assigned to a control condition or one of four mood management conditions: listening to self-selected music, listening to provided nature sounds, engaging in a written re-framing exercise, or being asked to draw. Participants engaged in this secondary exercise for three minutes. Immediately afterward, participants completed the PANAS a second time to assess mood change. The priming exercise was effective in soliciting a similarly negative mood across all participants. In terms of decreasing a negative mood, the results showed that music

emerged as the most powerful strategy. In terms of increasing a positive mood, music and writing were equally effective, but music was even more powerful. Drawing, nature, and the control experience were similar to each other, with drawing being slightly more effective than the other two strategies. Nature was the least effective in influencing mood. We can feel confident that mood did not simply change as a function of time, because the control condition had the lowest change scores. Music changed participants' moods and participants accurately perceived the greatest mood change in the music condition. Participants also exhibited inaccurate perceptions. The control changed the least in actual mood change scores but perceived that they changed as much as participants in the music condition. Similarly, participants in the writing condition underestimated their mood change. When participants were asked about usefulness of strategies in real-life, they ranked music as their top choice, reflecting some everyday usage of this helpful strategy. Participants ranked "being part of nature" as valuable for mood control; however, listening to nature sounds was not influential in this study. Perhaps listening to nature sounds in an indoor setting is not the same as participating in nature. In sum, this study suggests that young adults use these mood management strategies in everyday life but might have differential impacts.

Replacement of a Conserved Arginine at Position 25 in High Molarity Group A1 Proteins Affects DNA Binding Affinity

Presented at the McNair Scholar's Research Symposium, June, 2013

Supported by an INBRE grant (P20RR-16461), a NSF-RIG grant (MCB055810542242), and a NIH-AREA grant (1R15CA135720-01)

Student: Kendra Bufkin (2015) (McNair Scholar)

Faculty Mentor: Takita Sumter, Ph.D.

CAS – Department of Chemistry, Physics, and Geology

Chromatin binding proteins-HMGA1a/b, possessing a characteristic Arginine-Glycine-Arginine (RGR), selectively binds AT-rich DNA to initiate transformation. HMGA1 proteins are master regulators in cancer initiation and are subject to covalent modifications that may serve as prognostic markers. Because of their DNA binding ability, they can regulate gene expression of cancer-causing genes, likely providing new targets for cancer treatments. In cancer, R within the characteristic sequences has been chemically modified from its native state although the function is unclear. This modification likely changes the protein's structure and modulates DNA binding. We are evaluating the DNA binding of an HMGA1 variant whereby an Alanine (A) is substituted for R (R25A) in order to determine if the absence of Arginine impacts DNA binding of HMGA1. We hypothesized that the Arginine 25 residue within the first AT-hook of HMGA1 is important to the interaction between HMGA1 and AT rich DNA sequence. Better understanding the role of chemical modification of HMGA1 is critical to better cancer-targeted therapies. Our preliminary fluorescence data confirms previous studies in which DNA binding is compromised upon substitution of R25.

Body Language and Androgyny in the Writing Center: Nonverbal Communication and the Interaction of Gender Normative Behavior

Presented at the Southeastern Writing Center Association Conference, February, 2014

Student: Laura Jane Burgess (2014)

Faculty Mentor: Jane Smith, Ph.D.

CAS – Department of English

(WRIT 500 – Smith)

Nonverbal communication is an essential part of the tutorial session because communication is continuous; even when the student and the tutor are silent, they are constantly sending messages and cues to each other through nonverbal communication. In the Writing Center, nonverbal communication can impede or facilitate the student's learning and how receptive he or she will be to what the tutor is saying. To an extent, the presence, prevalence, and indications of nonverbal cues are dependent upon the gender of the sender and the gender of the recipient. The gender differences that exist in nonverbal communication are the product of societal and cultural expectations for appropriate sex-role behaviors. The American behavioral paradigm establishes that there are appropriate behaviors enacted by women and men. Tutorial sessions in Writing Centers are societal interactions that are, to some degree, regulated by gender normative behavior. An effective tutor should be cognizant of the implications of nonverbal cues, specifically immediacy behaviors, the nonverbal cues which encourage participation and relay messages of involvement. The enactment of these nonverbal cues requires tutors to break free from gender normative behavioral tendencies and expectations that are not conducive to the tutorial session in lieu of an androgynous nonverbal approach.

English and the Imposition of the Gender, Sex, and Sexuality Binary

Presented at the 2014 NCUR, April, 2014

Student: Laura Jane Burgess (2014)

Faculty Mentor: Josephine Koster, Ph.D.

CAS – Department of English

(ENGL 507 – Koster)

The transition of the English language from utilizing grammatical gender to imposing “natural” gender, and consequently separating entities into a binary of explicitly disparately sexed categories, has structured modern societal conceptualizations of gender, sex, and sexuality. If language is a key to demystifying American culture, perhaps a connection exists between the English language “naturally” sexing words into a binary, the reliance on a fixed binary, and the subsequent hostile attitude taken toward those who either physically cannot situate themselves within a binary sex system, such as intersexed individuals—those whose gender identity is not neatly located in either category of the dual gender system. This shift in the English language has inevitably contributed to the gendering of pronouns, characteristics (grammatical modifiers), and inanimate objects. And this transition has perhaps established a gender and sex binary that has perpetuated the hierarchical dualism of male and female and imposed an understanding of sexuality favoring heteronormativity. If gender is, in part, a linguistic construction whereby the society's understanding and conceptualization of gender is visible in the lexis and the discourse surrounding gender, sex, and sexuality, then examining the transition of the English language from a system that employed grammatical gender to a system of symbols that rely on a structure, then using natural gender is necessary, because it

bridges structuralist and sociolinguistic examinations of language and elucidates the mirror effect present in American language usage. American societal conceptualizations of gender, sex, and sexuality are revealed by the language used to establish and describe limited and definite conceptualizations that are in essence abstractions of tangible manifestations in the physical realm, and thus the language employed reflects how societal notions of acceptable representations of gender, sex, and sexuality are informed by language. Utilizing a queer approach, recalling the writings of Judith Butler and Anne Fausto-Sterling, and building off the relationship of grammar to gender as established by Dennis Barron, this paper furthers the understanding of the field of sociolinguistics by deconstructing the underlying heterosexual assumptions of natural gender in the English language.

Rethinking Molyneux Thirty Years Later in the Context of Intersectionality Theory

Presented at the Southern Political Science Association Annual Meeting, January, 2014

Student: Laura Jane Burgess (2014)

Faculty Mentor: Jennifer Disney, Ph.D.

CAS – Department of Political Science

It has been 30 years since Maxine Molyneux published her groundbreaking work on women's gender interests in her article “Mobilization without Emancipation? Women's Interests, the State, and Revolution in Nicaragua” in *Feminist Studies*. In her analysis of women in revolutionary Nicaragua, Molyneux established what has become one of the most often cited distinctions accepted by feminist scholars theorizing third world women's movements: practical and strategic gender interests. In this article, we intend to revisit Molyneux's categories of practical and strategic gender interests within the context of the burgeoning development of intersectionality theory. First, we will begin with an overview of how other theorists have used Molyneux's categories. Then, we will provide an internal critique of Molyneux on her own terms, making the following three arguments: 1. the mutually exclusive distinction between the practical and the strategic is more imagined than real, as the practical is actually strategic and the strategic is actually practical; 2. the conceptualization of gender interests is not sufficiently intersectional; and 3. gender in the work of Molyneux (and so many others) is too often deployed as not only a synonym for woman, but for a particular type of woman (heterosexual and child-bearing). After examining the discourse that has taken place since 1985 on the practical/strategic distinction and how it shapes the way we understand both women's interests and women's organizing, we will discuss how more recent understandings of gender and how it operates intersectionally weaken the value of the practical/feminine strategic/feminist framework and compel us as feminist theorists and practitioners to develop alternative terms.

Coordinating Technologies in Online and Hybrid Courses to Stimulate Engagement and Retention

Presented at the ACM Conference on IT Education and IT Research, October, 2013

Sponsored by the Winthrop University Research Council

Student: David Burlinson (2014)

Faculty Mentors: Marguerite Doman, Ph.D. and Nicolas Grossoehme, Ph.D.

COB – Department of Computer Science

Development of electronic educational artifacts for online instruction has become a major goal of many universities. These materials include question/answers (data), lecture (video), problems (textual input), and others. The instructional delivery of an online course can overlap many of these artifact types. These artifacts, designed to heighten student involvement, can clutter the screen adding distraction. There is a challenge in concurrently presenting simi-

lar concepts of different artifacts in a meaningful way. The temporal constraint of stored or streamed video is managed differently than the retrieval of data for question/answer data type. To address this concern, we propose an ontological coordination of various and complementary course content artifacts in the online delivery.

The Face in the Window: Original Fiction

Presented at the Ninth Annual Winthrop University Department of English Undergraduate/Graduate Research Conference, March, 2014

Student: Rachel Burns (2016)

Faculty Mentor: Amanda Winar, M.A.

CAS – Department of English

(WRIT 307 – Winar)

My short story, “The Face in the Window,” was written as part of an assignment for Writing 307, Fiction Writing, at Winthrop University, in which students were to create their own versions of an iceberg story—a form employed by Ernest Hemingway in “Hills like White Elephants.” Iceberg fiction emphasizes dialogue or detail to build tension between characters, though the reader is never fully initiated into the struggles of the characters themselves: some of the story rests above the surface, but the majority lurks in subtext and small hints. The piece was not submitted for peer review in the class itself, but it was revised with outside assistance from the professor. During the revision process, I focused on the verbs and the colors present for each character. Cornell fills his dim shop with uncommunicative shrugs and sighs, while Cassie invades the dark space, introducing variation and wildness with everything from her plum lips to her roving eyes. She possesses a bohemian sense of freedom, while Cornell maintains the boundaries of the shop and of his emotions. Overall, the piece itself is a dialogue between two concepts, romanticism and realism, which cannot exist without the other—to do so would bring distress and pain to both—yet, neither can reach its fullness in the presence of the other, as is shown at the end of the piece.

Effects of Time Pressure and Avoidance Orientation on Conformity

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Finalist for the CEPO Research Award

Student: Symone Calhoun (2014) (McNair Scholar)

Faculty Mentor: Donna Nelson, Ph.D.

CAS – Department of Psychology

(MCNR 300 – Fortner-Wood)

We conducted an experiment to examine situational conditions and trait-like predispositions that may increase conformity to social norms. Norms serve a variety of social and psychological functions including providing predictability, a basis for quick decisions and a buffer against risks or hazards (Murray and Schaller 2012). It follows that situations that pose possible threats or require individuals to respond quickly and with little thought may promote the adoption of conformist attitudes and behaviors. One such situation could be the experience of time urgency. Persons experiencing high time pressure have been found to rely on readily accessible sources of information, such as stereotypes, when forming social impressions (De Dreu 2003). Time pressured persons may also rely on accessible social norms as a basis for quick judgments and actions. This may be particularly likely for individuals who possess sensitivity to signs of threat or punishment, because social norms provide quick answers about safe or appropriate responses. The personality trait, avoidance orientation (Gray 1972 and 1981) seems especially relevant. Persons high on this dimension have a heightened

awareness of potential negative outcomes and stimuli (Elliot 2008). We expected individuals rating high in avoidance orientation to be more prone to exhibit conformity as a means of avoiding social risk, especially when experiencing pressure to respond quickly. We designed an experiment to test the joint effect of situational time pressure and dispositional avoidance orientation on conformity. As predicted, time pressure increased conformity in our study, particularly for individuals with sensitivity to risk or threat. Our results suggest that social norms provide easy answers as to correct behavior and therefore may be seen as attractive to persons concerned with avoiding trouble. This may be especially true when they face the stress of a situation requiring quick action. These findings add to the literature on conformity and expand our understanding of conditions that promote conformist attitudes and behavior. Time pressure is a common occurrence, and it is noteworthy that social norms may have a more powerful influence when individuals are in a hurry.

Mechanistic Insights into Small-Molecule Inhibitors of Amyloid- β Aggregation

Presented at the 65th Southeast Regional Meeting of the American Chemical Society, November, 2013

Supported by an NIH-INBRE grant

Student: Keisha Carden (2014) (McNair Scholar)

Faculty Mentor: Robin Lammi, Ph.D. and James Hanna, Jr., Ph.D.

CAS – Department of Chemistry, Physics, and Geology

Amyloid- β (Abeta) is a peptide of 39-43 amino acids that self-associates into neurotoxic aggregates implicated in Alzheimer’s disease (AD). Inhibiting its aggregation is therefore a primary research focus in AD prevention and treatment. We previously reported the synthesis and characterization of 3,3',4,4'-tetrahydroxybiphenyl (3,4-BPT), which effectively inhibits aggregation at stoichiometric concentrations. Previous evaluations of inhibitor efficacy employed standard Congo red (CR) and Thioflavin T (ThT) dye-based assays, which exploit dye binding to beta-structured aggregates to indirectly monitor Abeta aggregation. We have now complemented these with a dye-free, circular-dichroism (CD) based approach to directly measure peptide secondary structural transitions. Simultaneous CD and ThT measurements show nearly identical time courses for Abeta aggregation, including a single transition from random coil to beta-sheet that tracks closely with dye binding. Preliminary TEM results suggest that the beta-structured species formed in the presence of inhibitor are structurally distinct from the fibrillar assemblies observed in control samples.

How Do Teachers Define Teacher Quality?

Presented at the McNair Scholar’s Research Symposium, June, 2013

Student: Amanda Cavin (2015) (McNair Scholar)

Faculty Mentor: Cheryl Fortner-Wood, Ph.D.

COE – Department of Curriculum and Pedagogy

My work contributes to the development of adequate measures of teacher evaluation. I set out to determine what teachers believe the key characteristics of a quality teacher should be. I also seek to determine if teacher candidates and experienced teachers differ on the characteristics that they think are the most important. I identified key characteristics from a review of literature on the topic and developed a survey. 275 teachers and 83 candidates responded to the survey. Another 11 teachers participated in focus groups. Teachers and candidates differed on some characteristics they thought were most important. The results of the survey suggest one absolute requirement for teaching and one absolute non-requirement for teaching.

Inhalation

Presented at the Ninth Annual Winthrop University Department of English Undergraduate/Graduate Research Conference, March, 2014

Student: Lauren Clark (2014)

Faculty Mentor: Evelyn Weeks, M.A.

CAS – Department of English

This presentation of three poems samples a larger collection of poetry that revolves around my experience studying abroad in Ireland, my grandmother, and my strange fascination with smoking. These poems focus on specific memories that truly grasp both my experience studying in another country and the battle that is having a family member with Alzheimer's.

Old Robin Hood of England: Robin Hood and Marxist Alienation in Shakespeare's *As You Like It*

Presented at the 2014 NCUR, April, 2014

Student: Lauren Clark (2014)

Faculty Mentor: Matthew Fike, Ph.D.

CAS – Department of English

(ENGL 305 – Fike)

The purpose of this paper is to advance the critical debate about the connection between Shakespeare's comedy *As You Like It* and the myth of Robin Hood using the Marxist concept of alienation. While critics, such as A. H. Thorndike, argue that there is a distinct connection between Robin Hood and *As You Like It*, this interpretation can be developed even further using Marx's concept of alienation. In this paper, I will argue that the Forest of Arden in *As You Like It* represents Robin Hood's forest, due to Shakespeare's several allusions in the play to the myth of Robin Hood. The Marxist concept of alienation enhances this interpretation in that the Forest of Arden acts as an escape for the characters who are alienated from the oppressive court and eventually leads to the characters' discovery of their true identities in the forest. Viewing both the myth of Robin Hood—more specifically a ballad entitled "A Gest of Robyn Hode"—and *As You Like It* through the concept of alienation reveals the connection between the two regarding the alienation of the characters from society and their own identities. These Marxist concepts are specifically the estrangement of man from man and the estrangement of man from human identity, which clearly apply to the Robin Hood myth and *As You Like It* (XXIV). Through this Marxist lens, it is obvious that Robin Hood and the characters in *As You Like It*, such as Duke Senior and Celia, are alienated from society. Therefore, alienation and loss of identity drive them to flee to the forest for protection from the oppressive courtly society.

We're Not Stupid Y'all: Disproving the Misconception of Southern Stupidity and the False Connection between Dialect and Intellect

Presented at the 2014 NCUR, April, 2014

Student: Lauren Clark (2014)

Faculty Mentor: Josephine Koster, Ph.D.

CAS – Department of English

(ENGL 507 – Koster)

The American Southern dialect is commonly stereotyped as portraying unintelligence. The purpose of this paper is to expand on previous research regarding the Southern dialect and to

use that research to disprove the label of unintelligence that many place on those who speak with a Southern dialect. In this paper, I will argue that the stereotype of Southern linguistic stupidity can be proven false through the explanation of the origin of the Southern dialect, the phonological differences of the Southern dialect from other English dialects, and the depth of thought in "southernisms" and Southern idioms. Although the Southern dialect is typically associated with linguistic stupidity or laziness, there are several reasons why this association is false. Robert Hendrickson, a scholar in the area of American dialects, asserts that, phonologically, the Southern dialect is very similar to, and derives from, the British dialect that we so commonly associate with high intelligence. In regards to Southern idioms, or "southernisms," there is a vast amount of thought and intelligence that goes into the creation of single words that represent a broad idea or an entire group of words. Through the analysis of the Southern dialect and Southern idioms, it is clear that the Southern dialect is simply a variation of Standard American English like any other dialect and in no way expresses unintelligence.

Absolved From Evil: Theodicy in the Jewish Tradition

Presented at the 2014 NCUR, April, 2014

Student: Sarah Cohen (2014)

Faculty Mentor: Greg Oakes, Ph.D.

CAS – Department of Religion and Philosophy

(RELG 490 – Oakes)

The problem of evil is perhaps one of the oldest theological conundrums of our time. This paper looks most specifically at the response to evil known as theodicy, or defending the goodness of the divine despite the evil in the world. More specifically this paper examines the importance of successful theodicy in maintaining a religious tradition. To exemplify this point the research done in this work centers on two major shifts in theodicy within the Jewish religious tradition, after the Babylonian exile and after the Holocaust.

Religion and Women's Movements: The Impacts of Fundamentalism on Women's Freedom

Presented at the Southern Political Science Association Annual Meeting, January, 2014

Student: Sarah Cohen (2014)

Faculty Mentor: Jennifer Disney, Ph.D.

CAS – Department of Political Science

Despite the large amount of research that exists showing the impact that religious ideology has on the women's movement within religious groups, little research exists on the impact that all fundamentalist religious ideology has on the women's movement as a whole. Where most research focuses on one religion, this paper focuses on both the largest religion (Christianity, specifically Catholicism) and the fastest growing religion (Islam) and contends that even though they are different, in their fundamentalist forms they take on very similar attributes when concerning the women's movement. The research in this paper concludes that fundamentalist religion of any kind is often most on the rise in times of economic hardship, when men are less likely to have wage earning jobs. This observation begs the question of whether or not fundamentalist religion is less for spiritual purposes and more for purposes of dominance over women. This paper will argue that since many fundamentalist beliefs are either not found in the original holy book of either religion or are taken out of context, it is more likely that fundamentalist religion is more for purposes of dominance over women than for spiritual purposes. This paper then focuses on what tangible impact fundamentalist religion has had on the political scene and women's movements in four countries (Iran, Pakistan,

Brazil, and Poland). This tangible impact comes in the form of abortion laws, dress code laws, and other public policy. The conclusion of this focus, and ultimately the entire paper, is that fundamentalist religion is a form of patriarchy that stifles women's political freedom.

Young Adults' Risk Taking Tendencies and Sexualization of Cross-sex Friendships

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Honorable Mention for the Winner of the Psi Chi Regional Research Award

Students: Chandler Cox (2015); **Jami Lee** (2015); **Earl Martin** (2015); and **Shartaysia Rogers** (2015)

Faculty Mentor: Merry Sleigh, Ph.D.

CAS – Department of Psychology

(PSYC 302 – Sleigh)

A “friends with benefits” (FWB) relationship is characterized by two non-romantic partners, often casual acquaintances, who mutually agree to have a non-binding sexual relationship (Fruman and Shaffer 2011). Participants were 95 young adults, with a mean age of 19.93 (SD=2.12). Participants completed the Risk Taking Scale (Keinanand Meyer 2012), the Revised Sociosexuality Orientation Inventory (Lewis et al. 2012), the Romantic Jealousy-Induction Scale (Mattingly, Whitson, and Mattingly 2012), and questions regarding perceptions of FWB relationships from Lehmilller, Vander, Drift, and Kelly (2011). Participants who were more likely to agree that they had participated in FWB, had higher sexual risk taking scores and were more likely to try to make their partners jealous. FWB was not significantly associated with overall risk taking scores. People who had engaged in FWB relationships were also willing to do so in the future, had lower GPAs, and rated themselves as more attractive. Participants who reported being willing to engage in FWB relationships had higher risk taking scores, higher sexual risk taking scores, higher jealousy scores, and greater willingness to lie to induce jealousy. There were no gender or race differences related to openness to FWB or participation in FWB. We then examined how men and women responded to questions about FWB relationships. Both men and women agreed that the female partner is more likely to be emotionally hurt and hope that the relationship will become permanent. The two genders also agreed that a continuation of a friendship with the FWB partner “may or will” cause problems in future romantic relationships. We also compared participants who had participated in a FWB relationship with those who had never done so. Young adults who had participated scored higher on sexual risk taking and jealousy scores. Interestingly, these two groups perceived friendships that did not involve a sexual component in very similar ways. In sum, those higher on the sexual risk taking scale were more likely to be willing to participate or had already participated in a FWB relationship. These data suggest that FWB relationships, which are becoming increasingly common in today's society, are associated with unhealthy and potentially harmful elements. Women may be even more vulnerable to unhealthy outcomes in these relationships than men.

The Effects of Perceived Difficulty on Procrastination

Presented at the McNair Scholar's Research Symposium, June, 2013

Student: Dwana David (2013) (McNair Scholar)

Faculty Mentor: Matthew Hayes, Ph.D.

CAS – Department of Psychology

Research on procrastination using behavioral manipulations and self-report measures has yielded mixed findings on the causes of procrastination. Some studies found that the more interesting a task, the less likely people are to procrastinate (Thakkar 2010), while others

have shown that task difficulty does not affect procrastination (Janssen and Carton 1999). However, these studies could not establish whether procrastination was due to actual or perceived task difficulty. The present study examines whether perceived task difficulty affects procrastination. Students were given instructions to complete an online task, and there were two conditions: half of the participants were told that the task was difficult, while the other half was told that the task was easy. Results indicated that the perception of difficulty did not affect whether participants completed the task, nor did it affect procrastination duration for those that did complete it.

Autonomous Women's Organizing: Strategies Inside and Outside of the State

Presented at the Southern Political Science Association Annual Meeting, January, 2014

Student: Kayla Davis (2014)

Faculty Mentor: Jennifer Disney, Ph.D.

CAS – Department of Political Science

Globally, women's groups have had to face separate though similar challenges in dealing with their respective governments in their struggle for rights and representation, as well in their struggle for autonomy within the context of globalization in areas outside government. The state, I will argue, legislates the continuation and legitimization of patriarchy as a national interest in response to activism on the part of women, while global civil society, dominated by the Global North, limits the autonomy of many grassroots women's groups located in the Global South. This paper examines the strategies employed by both the state and women in combating the obstacles they present to each other, as well as the effects of globalization on this process. While there are many cases of governments being hostile or unresponsive to women's movements, there are just as many drawbacks to mobilizing outside the state in an increasingly Westernized global civil society. For women to successfully mobilize, strategies must be employed that are not totally reliant on the complicity of either the state or global civil society, as both of these areas can be problematic in terms of autonomous goal setting, methods of engagement, and purpose for women's groups.

Pre-Patriarchal Persephone and the Appropriation of the Female Trinity

Presented at the Annual Meeting of the South Carolina Political Science Association, March, 2014

Student: Kayla Davis (2014)

Faculty Mentor: Michael Lipscomb, Ph.D.

CAS – Department of Political Science

(PLSC/WMST 553 – Lipscomb)

This paper examines the appropriation of the female trinity, beginning with the myth of Persephone and its changes in Hellenic Greece. The early renderings of Persephone have been analyzed as a singular embodiment of the female trinity—The Mother, The Maiden, and the Crone. This paper connects her myth and its evolution to the patriarchal appropriation of the female trinity more broadly, specifically within Christianity and its use of the “Father, Son, and Holy Ghost” male trinity. This paper argues that with the solidification of Hellenic Greece came the diminution of Persephone as a mythical figure of power, and that this diminution of Persephone is part of a continuing history of destroying the female trinity (and by association women) as a symbol and actor of spiritual, religious, and political power.

The Redemption of the *Fisher King*

Presented at the Southern Regional Honors Council Conference, March, 2014 and the Ninth Annual Winthrop University Department of English Undergraduate/Graduate Research Conference, March, 2014

Student: Jessica Doscher (2017)

Faculty Mentors: Josephine Koster, Ph.D.; Kathy Lyon, Ph.D.; and Amanda Hiner, Ph.D.

CAS – Department of English

(ENGL 307 H – Koster)

The Fisher King tale has captured the minds of countless generations. But why has this story been so memorable? This is because of the archetypal desire for redemption that echoes through each Fisher King tale. The story of the Fisher King has remained significant because of the core story of redemption from one's past transgressions. This archetypal redemption aspect holds true not only in the case of Perceval and the King but also in the extension to the King's land itself. The Fisher King in Chrétien de Troyes' *Perceval* serves as a device for the redemption of Perceval from his sins. In Wolfram von Eschenbach's *Parzival*, it is both the Fisher King and Parzival who are in need of redemption. Both of these works hold a religious aspect, but the idea of redemption in its base form remains the same. T. S. Eliot's poem *The Waste Land* focuses on the possibility of the land's redemption, drawing from Jessie Weston's writing. Terry Gilliam's film *The Fisher King* puts the legend in modern day New York City, giving the two main characters elements of both Perceval and the Fisher King and showing redemption for each. *Criminal Minds* puts a different spin on it, making the Fisher King the antagonist and Perceval an agent on the squad searching for him, and Perceval's redemption again takes center stage here. This discovery implies the significance of themes in literature, especially those that are as deeply connected to basic humanity as redemption. Even though the characters have evolved and changed as time has passed, the most consistent factor remains the idea of redemption, highlighting its importance in our lives, even today.

A Mathematical Model of Treatment of a Cancer Stem Cell Network with Immunotherapy

Presented at the MAA Southeastern Sectional Conference, March, 2014

Supported by the Mathematical Association of America (MAA), the National Science Foundation Division of Mathematical Sciences (NSF-DMS), and the National Security Agency (NSA)

Student: Gabrielle Epelle (2015)

Faculty Mentor: Zachary Abernathy, Ph.D.

CAS – Department of Mathematics

Using the work of Shelby Wilson and Doron Levy, we develop a mathematical model to study the growth and responsiveness of passive and aggressive tumors to various immunotherapy treatments. In our aggressive tumor case, we show that remission is only achieved after combination treatment with TGF-beta inhibitors and a peptide vaccine. Our model predicts that because stem cell population is not completely eliminated, the cancer reoccurs by day 300. Additionally, we show that combination treatment has limited effectiveness on low antigenicity aggressive tumors and that vaccine treatment is not effective for either low or high antigenicity passive tumors. This research was conducted during summer 2013 as a part of Winthrop's National Research Experience for Undergraduates Program (NREUP).

Emoticons and Emojis: Understanding the Nonverbal Communication of the Future

Presented at the 2014 NCUR, April, 2014

Student: Tiffany Fillion (2014)

Faculty Mentor: Josephine Koster, Ph.D.

CAS – Department of English

(ENGL 507 – Koster)

Technology has completely transformed the English language. However, many professionals argue that computer mediated communication—any kind of conversation that takes place through some form of technology—lacks one of the most important aspects of communication: nonverbal cues. This paper looks at the development of the English language through technology, focusing on emoticons and emojis as filling the need for nonverbal cues in computer mediated communication. Emoticons are symbols that are formed by using the keys on a keyboard; the most common emoticon is a smiley face that is formed by using a colon placed beside a parenthesis. Emojis are small pictures that draw out a smiley face; they usually are more realistic than emoticons. This research seeks to prove that emoticons and emojis function as morphemes. As morphemes they can be both bound to the sentence and other characters around them or free and able to have meaning on their own. This paper discusses the functions of hieroglyphics in ancient times and compares their functions to the functions of emoticons and emojis in present day American society. This research is essential to understanding and embracing the changes that are taking place in our language. Emoticons and emojis enhance computer mediated communication by adding a nonverbal element that is essential to effective conversations. Additionally, emoticons and emojis further display the fluidity and complexity of the English language in a way that should be appreciated, even though they do not fit the conventional idea of how language should be used.

The War in the Schools: San Francisco Bay Area High Schools and the Antiwar Movement, 1965-1973

Presented at the Phi Alpha Theta Biennial Convention, January, 2014

Student: Aaron Fountain (2014) (McNair Scholar)

Faculty Mentor: Andy Doyle, Ph.D.

CAS – Department of History

(MCNR 300 – Doyle)

In October of 1967, over 100 high school students in Berkeley walked out of school and marched to Oakland to participate in an antiwar demonstration. During the Vietnam War, a vocal minority of San Francisco Bay area high school student activists mounted a vigorous campaign of antiwar activism. Students linked antiwar activity with student rights and saw it as a way of making the educational process more relevant to their needs in a rapidly changing society. Teachers' support or opposition was strongly correlated with age, and most administrators regarded it as an issue of law and order, but their attitudes eventually evolved with the changing times. Many of the social upheavals of the 1960s played out in public schools, and while scholars have examined antiwar activity among particular groups and on college campuses, public schools receive brief examinations. Drawing from local dailies and high school newspapers, interviews, and unpublished documents, this paper will show the activism of high school students and administrators' efforts to accommodate students' desires.

Boycotts and Shutdowns: Black Student Activism, Racial Violence, and Reconciliation in San Francisco Bay Area Public Schools, 1966-1970

Presented at the Place of Education in African American History and Culture Eighth Annual New Perspectives Conference, March, 2014

Student: Aaron Fountain (2014) (McNair Scholar)

Faculty Mentor: Andy Doyle, Ph.D.

CAS – Department of History

(MCNR 300 – Doyle)

In September of 1968, high school students in East Palo Alto held a 26 hour sit-in that forced the resignation of their principal, who was later replaced by a black principal. Similar incidents were a regular occurrence between 1966 and 1970 in San Francisco Bay area public schools. Politicized by the Black Power movement, black students demanded greater curricular diversity and created student unions to enhance their profile on campus. Spurred by a fear of black nationalism, school administrators quickly succumbed to their demands. Latino and white students sometimes formed alliances with black students, but in numerous incidents they often reacted negatively, and interracial brawls often occurred as a result. Harried school officials often dismissed students early and even suspended school operations for days at a time. In response, administrators held mandatory discussions to ease tensions. Many of the social upheavals of the 1960s played out in public schools, and while scholars have examined the Black Power movement at the local level, public schools receive brief examinations. Drawing from local dailies and high school newspapers, interviews, and unpublished documents, this paper will show the activism of black students and teachers, and administrators' efforts to maintain tranquility in their schools.

Effects of Attachment Style and Accessible Memories on Attitudes about Virtual and Face-to-Face Relationships

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Finalist for the CEPO Research Award

Student: Chelsea Gilmore (2014) (McNair Scholar)

Faculty Mentor: Donna Nelson, Ph.D.

CAS – Department of Psychology

Researchers interested in interpersonal relationships have often relied on attachment theory (e. g. Bowlby1988) as a framework for understanding. Empirical work suggests that early attachment relationships predict behaviors and feelings in later romantic relationships. Evidence indicates that anxious and avoidant attachment tendencies are negatively linked to disclosure, closeness, satisfaction, and optimism in romantic relationships (Wei et al 2007, Li and Chan 2012). Our objective was to test whether attachment tendencies would impact preferences about engaging in face-to-face versus online romantic relationships. We expected individuals with avoidant and anxious attachment tendencies to rely excessively on the internet for romantic exchanges, thereby exhibiting problematic internet use. This is consistent with recent research demonstrating that individuals with social and psychological vulnerabilities report greater confidence interacting in virtual relationships because of perceptions that online relationships provide increased control and less social risk (Fioravanti et al 2012). We also expected avoidant and anxious attachment individuals to display less intimacy in their romantic relationships (disclosing less) and report relatively low optimism about future romantic relationships. A final goal was to determine whether a positive recollection intervention may help those with avoidant and anxious tendencies to feel more optimistic about future relationships. Prior research has demonstrated that accessing positive memories from one's past can reduce negative emotions such as anxiety and improve self-efficacy in an

academic performance domain (Nelson and Knight 2009). We hoped that in the context of romantic relationships, a positive recollection task could raise optimism for individuals who might otherwise focus on negative thoughts or emotions. Our findings provide evidence supporting our hypothesis that those with avoidant attachment style would display problematic internet use. They reported a tendency to rely excessively on the internet for romantic exchanges as a means of reducing risk. They also were less optimistic and disclosed less in their face-to-face romantic relationships. We also found evidence that a positive recall intervention can raise optimism about future face-to-face relationships. We did not find support for the predicted effects of anxious attachment. Future research should explore the differential effects of avoidant and anxious attachment tendencies.

Mommy and Daddy's Favorite: Birth Order and Social Factors

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Students: Courtney Gray (2014); Thomas Edwards (2015); Charles Lindsay (2015); and Tanner Sullivan (2015)

Faculty Mentor: Tara Collins, Ph.D.

CAS – Department of Psychology

(PSYC 302 – Collins)

This study was designed to see if the order in which individuals were brought into their family (e.g., first, middle, last) is related to their perceptions of parental favoritism and if this affects need for social validation. Social validation, as we defined it, is the finding of approval of oneself in others. This need for validation manifests itself in several ways—through the individual's compliance with others, how willing they are to conform or yield in order to gain social acceptance, and also how susceptible they appear to be when confronted with peer pressure. First-born children have been shown to conform more often than later born children. Another study found that the child who felt that they were the favorite of the family had higher self-esteem than children who did not feel as if they were the favorite. Participants were recruited in classrooms and voluntarily participated in the study. College undergraduates took our questionnaire in a classroom setting. The questionnaire consisted of three surveys that measured one's need for social validation, perceived parental favoritism (i.e., to what degree they felt as though they were their mother's and their father's favorite) and birth order (i.e., only child, first born, middle born, or last born). After excluding only children, 105 participants remained. We analyzed the difference between first, middle, and last born participants on perceived parental favoritism through a one-way analysis of variance (ANOVA). There were no significant differences between the birth order levels (first, middle, or last born) on perceived favoritism from their mothers or fathers. The correlations between perceived parental favoritism (mother or father) and need for social validation were not significant. However, we did find that those who believed themselves to be favored by one parent felt favored by both. From our results, we can conclude that other factors contribute to a person's need for approval from society. Additionally, feeling favored by one parent is positively related to feeling favored by the other parent. Limitations and future directions are discussed.

Solidarity or Dissonance Within Occupy Charlotte: 99% or .004%?

Presented at the Annual Meeting of the South Carolina Political Science Association, March, 2014

Student: Brandi Geurkink (2015)

Faculty Mentors: Stephen Smith, Ph.D.; Michael Lipscomb, Ph.D.;
and Jennifer Disney, Ph.D.

CAS – Department of Political Science

(PLSC 490 H – Smith and Lipscomb)

My paper contributes to the literature surrounding the Occupy movement by documenting and analyzing the Occupy Charlotte movement that began in 2011 in Charlotte, North Carolina. Noting that there has been no published scholarly analysis of Occupy Charlotte, my research explains how the trajectory of Occupy Charlotte contributed to the development of other leftist movements in Charlotte such as the Moral Monday protests, actions of the North Carolina Student Power Union, and the Coalition to March on Wall Street South. My goals in documenting and analyzing Occupy Charlotte are twofold. First, I situate the political goals and actions of Occupy Charlotte participants within the *Principles of Solidarity*, a document published by a collective of Occupy Wall Street participants. Understanding the ways in which Occupy Charlotte fits within these *Principles* is the practical application of a larger research question: how do the localized/subnational political goals of social movements help to shape the larger demands and public perception of the movement on a global/national scale? My second goal in understanding Occupy Charlotte is to show how Occupy has contributed to the energy, participation, and coalition-building of other leftist movements in Charlotte and surrounding areas in North Carolina. Understanding both the structure and function of sociopolitical grassroots organizing as well as the specific political reform agenda pursued by leftist movements in North Carolina helps to identify the specific necessities of leftist activists in the southern United States. Noting that most of the research conducted on leftist movements/social organizing since the turn of the millennium has been from a global perspective or concentrated in the northeastern United States, my research assists activists and scholars alike in understanding the unique opportunities and challenges presented by leftist social and political organizing in the southern United States.

The Effect of an Individual's Religious Beliefs on an Observer's Self-Monitoring

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Student: Krysten Guyton (2016)

Faculty Mentor: Merry Sleight, Ph.D.

CAS – Department of Psychology

(PSYC 302 – Sleight)

Adults (n = 113) were randomly divided into one of four survey conditions in which a fictitious person was described. The descriptions differed only in the following descriptors: a devout Christian, who seems quite genuine in their beliefs; a Christian, who does not seem genuine in their beliefs; a devout atheist who seems quite genuine in their beliefs; no mention of religion. Immediately following the description, participants responded to statements that assessed the participants' perception and expectations of the person described, to two scales that assessed their level of stereotyping for atheists and Christians, and to the Religious Commitment Inventory-10 (Worthington et al 2012). We compared the responses to the four surveys using an ANOVA and LSD post-hoc analyses. Participants were likely to agree that they wanted to be friends with the no-religion-person more than any other survey condition, and that they would be less comfortable being themselves around the atheist than around the devout Christian or the no-religion-person. Participants reported that they would be more likely to monitor their language around the devout Christian compared to the atheist

and non-genuine Christian. Participants believed that the no-religion-person and the devout Christian would respect them more than would the atheist or the non-genuine Christian. Participants were most likely to agree that the atheist and devout Christian would attempt to "push their beliefs." Compared to all other conditions, the atheist was perceived as the most offensive, and the least likely to elicit respect. There were no differences on how much participants would monitor their actions or expect the described person to be judgmental. In general, the devout Christian and the no-religion-person resulted in similar perceptions. Perhaps our participants, who primarily self-reported to be Christians, assumed Christianity in the absence of information. The religion of the described stranger affected how individuals perceived them; however, participants did not report that they changed their own actions as a result of religious cues. This could be because religion really does not affect the way people act around others, or it could mean that people are unaware of their own self-monitoring.

Role of Forkhead Transcription Factors in Endothelial-Cardiac Myocyte Co-Cultures

Presented at the 2014 NCUR, April, 2014

Supported by an NIH grant (1R15HL104587-01) and a SC EpsCor/IDeA grant

Student: Hannah Hadaway (2014)

Faculty Mentor: Heather Evans-Anderson, Ph.D.

CAS – Department of Biology

The goal of this project is to elucidate the role of the Forkhead transcription factors family O (FoxO) in the interaction between the endothelium and the myocardium during cardiovascular development. Previous work has shown the importance of FoxO1 in endothelial lineages during heart development (Sengupta 2013). Specifically, loss of FoxO1 in endothelial cells leads to reduced proliferation in cardiac myocytes during heart development. The interactions between the endothelium and the myocardium during development are known to occur via cell-cell interactions as well as via diffusible cell signaling factors; however, the mechanism regulating cardiac myocyte proliferation is unknown. In order to replicate the *in vivo* phenotype, we used RNA interference (RNAi) to silence FoxO1, FoxO3, FoxO4 gene expression in cultured endothelial cells. Once transfection efficiencies using RNAi constructs were optimized, we used western blot analysis to validate altered gene expression. Our results show that FoxO protein production was significantly reduced in transfected cells. RNAi-treated endothelial cells were combined with cardiac myocytes in an *in vitro* co-culture model system in order to replicate cell signaling events during development. Diffusible growth factors such as IGF1 will be used to treat co-cultures and differences in cell proliferation and apoptosis will be determined via endothelial- or myocyte-specific Phosphohistone H3 and TUNEL assays. The development of a co-culture model system for endothelial cells and cardiac myocytes will aid in the identification of the specific cell signaling factors involved in endothelial-myocyte interactions, which will provide valuable information that will have a greater impact on further research projects.

Determining Growth Factor for Signaling Pathways in Endothelial Cells Treated with RNAi to Silence FoxO Transcription Factors

Presented at the 2014 NCUR, April, 2014 and the ABRCMS, November, 2013

Supported by a NIH grant (1R15HL104587-01) and a SC EpsCor/IDEa grant

Student: Katrina Harmon (2014)

Faculty Mentor: Heather Evans-Anderson, Ph.D.

CAS – Department of Biology

The goal of this project is to elucidate the role of Forkhead transcription factors family O (FoxO1, FoxO3, and FoxO4) in cell signaling events between the endothelium and the myocardium during cardiovascular development. Previous work has shown the importance of FoxO1 in endothelial lineages during heart development (Sengupta 2013). Specifically, loss of FoxO1 in endothelial cells leads to reduced proliferation in cardiac myocytes during heart development. The interactions between the endothelium and the myocardium during development are known to occur via cell-cell interactions as well as via diffusible cell signaling factors; however, the genetic mechanisms regulating these interactions are unknown. The specific aim of this project is to determine the gene expression levels in endothelial cells that have been treated with RNA interference (RNAi) to silence FoxO gene expression. The growth factors Neuregulin and insulin-like growth factor 1 (IGF1) are known mediators of cardiac myocyte proliferation; however, it is not known whether FoxO1 in endothelial cells regulates the expression and/or activity of these growth factors to influence endothelial-myocyte cell signaling. We hypothesize that the PI3K/AKT/IGF1 and Neuregulin/ErB pathways are altered in endothelial cells that have disrupted FoxO function and that alteration of these signaling pathways will disrupt endothelial-myocyte interactions. We have successfully transfected endothelial cells with FoxO, FoxO3, and FoxO4 RNAi and we have designed specific primers to quantitatively measure gene expression levels via real time RT-PCR. Preliminary results have confirmed expression of all of our target genes in nontransfected cells. Currently we are testing RNAi-treated cells to measure differences of nine different genes targets in the PI3K/AKT/IGF1 and Neuregulin/ErB signaling pathways. Once the gene expression differences are determined for RNAi-treated endothelial cells, then these genes will also be assessed in an endothelial-cardiac myocyte co-culture model system. Determination of the specific genes that are altered in response to loss of FoxO function in endothelial cells and how these influence cardiac myocytes in co-cultures will help to elucidate the interactions between the endocardium and myocardium during heart development.

Separating the Sea from the Symbols: Psychological Wholeness in Ernest Hemingway's *The Old Man and the Sea*

Presented at the 2014 NCUR, April, 2014

Student: Andrew Harris (2014)

Faculty Mentor: Leslie Bickford, Ph.D.

CAS – Department of English

(ENGL 300 – Bickford)

As with much of the work of Ernest Hemingway, *The Old Man and the Sea* is rooted in a simple structure that leaves plenty of room for the author's inner meaning to gleam through the literal text. Through his classic use of simple sentences and introspective dialogue, Hemingway creates yet another testament to his "less is more" ideology. If one applies a basic understanding of the classically existential and Jungian psychology as well as a uniquely Eastern approach, it is possible to reduce each element of Hemingway's brief novel to their basic psychological function and greater place within society. After applying the structures of

archetypal analysis and nihilistic existentialism, one is able to read *The Old Man and the Sea* for what it is: a statement about the nature of futility and coexistence in our rhythmically churning world. As Santiago drifts along the currents of the Gulf Stream, he drifts toward an unreachable horizon lined with more isolation. Shifting his thoughts from the dry world he has left behind, Santiago drifts into the sea without human contact or presence. His place at sea is one of deep reflection and natural bonding. Many critics have acknowledged Santiago as a Christ figure who constantly suffers for the generality of suffering. He is also commonly viewed as a prime example of Hemingway's "fighter" mentality, as a character who will continue to battle no matter the cost—even if it means loss. I propose a third alternative. Santiago is a character that has failed to individuate himself in the grand scheme of his psychology and therefore lacks the tools to fully address his surroundings. Santiago's interaction with the broader world as a result of his deep connection with his lost Marlin and the sea around him, allows him to come face to face with the realization of his fantasy only to have it snatched from him in a sort of nearly epic failure.

Shakespeare's Prospero: A Rehabilitated Faustus

Presented at the 2014 NCUR, April, 2014

Student: Andrew Harris (2014)

Faculty Mentor: Matthew Fike, Ph.D.

CAS – Department of English

(ENGL 305 – Fike)

How does Prospero in Shakespeare's *The Tempest* present a moral alternative—a kind of correction—to Marlowe's Doctor Faustus? While Harold Bloom discusses Prospero's masque, and John Demaray addresses the theme of chastity, little has been written to compare the two characters, and no one has considered them together in relation to the theme of chastity. The comparison is justified because "Prospero" is the Italian form of the name Faustus, and both characters are magicians. My thesis is that Prospero's emphasis on chastity in his remarks to Ferdinand and in the masque highlights his differences from Marlowe's Faustus who indulges inappropriately in lust. In the Early Modern period, chastity was defined more inclusively than it is today. In that period, chastity denoted both virginity and "married chastity." Whereas Faustus's statements and actions (like the conjuring of Helen of Troy) violate the principle of chastity, Prospero lectures his future son-in-law Ferdinand on the importance of resisting lust. The masque's mythological figures drive home the point: Isis, Ceres, Juno, and the absent Venus and Cupid all fuel Prospero's argument that preserving virginity leads to a happy and fruitful marriage. Whereas Faustus debases himself by having sexual contact with a demon, Prospero asserts his moral superiority by driving home the importance of virginity in courtship and fruitful fidelity after marriage. The paper concludes that, in terms of chastity, Prospero is an anti-Faustus.

Young Adults' Use of Music in Response to Experimentally Induced Emotions

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Students: Kaitlin Hawkins (2015); **Sheila Farrar** (2015); **Steven McDuffie** (2015); **and Michael Green** (2015)

Faculty Mentor: Merry Sleight, Ph.D.

CAS – Department of Psychology

(PSYC 302 – Sleight)

Much of the previous research assumes that young adults use music to improve mood. There is some evidence, however, that adults may use music to maintain moods (Vuoskoski and Eerola 2011). We examined this notion by experimentally inducing mood states in young adults

and allowing them to listen to music of their choosing. Participants were 88 young adults randomly divided into one of three conditions. One group was instructed to write for three minutes about a very stressful situation in their lives. One group wrote about a tragic event and one group about a joyful event. Participants then completed the Positive and Negative Affect Scale (PANAS; Watson, Clark, and Tellegan 1988). Immediately afterward, participants were instructed to listen to any song of their choosing on their personal MP3 player and to report the song. Participants then completed the PANAS a second time to assess mood change. We compared the three priming conditions (negative, positive, and stressful) using an ANOVA. There was no difference in positive mood change (mood following the writing exercise compared to mood after listening to the self-selected song) across conditions. However, there was a significant difference in change scores for the negative mood. Participants who wrote about a positive event and then listened to music of their choosing did not change their negative mood, but participants who wrote about a negative or stressful event and then listened to music of their choosing became less negative. Despite the significant difference in negative mood change, participants across the three conditions did not differ in how much they reported their mood had changed. We compared the three groups on how they described the music to which they were listening and found that the group that was asked to write about a happy experience reported listening to happier music than did the group that was asked to write about a negative event. In sum, we found that listening to self-selected music seems to make people less negative but not necessarily more happy. Young adults were more accurate in noticing a change in negative mood than noticing a change in positive mood.

Hamlet, Luther, and the Protestant Hero

Presented at the 2014 NCUR, April, 2014

Student: Matt Higdon (2014)

Faculty Mentor: Matthew Fike, Ph.D.

CAS – Department of English

(ENGL 305 – Fike)

Literary criticism of Shakespeare's play *Hamlet* suffers from a light treatment, or a relative absence, of its title character's association with Protestantism. The purpose of this paper is to propose a fresh connection between Prince Hamlet and the Protestant champion Martin Luther. Only two books draw specifically Protestant parallels: John Curran Jr.'s *Hamlet, Protestantism, and the Mourning of Contingency: Not to Be* and Roland Mushat Frye's *The Renaissance Hamlet*. The former argues that Hamlet, by adopting a kind of fatalistic Calvinism, loses his possibility to act within the possibilities of choice. The second explores Hamlet's use of religious themes, including Protestant themes, and observes similarities between some of Hamlet's words and some of Luther's. These sources demonstrate how *Hamlet* has on occasion been read through a pseudo-Protestant lens, pointing out similar motifs, but both fail to account for similarities of action and attitude that both Prince Hamlet and the earliest Protestant heroes share. Thus, my thesis is that as a type of Protestant hero, Prince Hamlet, through his final confrontation with King Claudius, lives up to the bold resistance of the great champion Martin Luther. The historical Martin Luther was known as a champion of Protestant faith through his brave resistance to the Catholic Church. The historical development of his confrontations with the Church establishes his heroic resistance. Second, *Hamlet* arranges six elements around its title character: 1. Hamlet's education in Wittenberg, 2. the way his soliloquy mirrors Luther's combativeness, 3. the way Hamlet's exile parallels Luther's excommunication, 4. Hamlet's "convocation of worms" and Luther's Diet of Worms, 5. the similarity of "readiness" in both Hamlet and Luther, and 6. the parallel confrontation scenes—Luther's at Worms, Hamlet's in the fencing match. Since the memory and myth of Martin Luther as a Protestant hero inform these six parallels, Hamlet eventually lives up to Martin Luther's brave/heroic resistance of Catholic authority. My paper thus suggests new possibilities for interpreting the relationship between the religious content in *Hamlet* and its characters.

The Great Gatsby, the Green Light, and the Metanarrative of Progress

Presented at the 2014 NCUR, April, 2014

Student: Matt Higdon (2014)

Faculty Mentor: Leslie Bickford, Ph.D.

CAS – Department of English

(ENGL 300 – Bickford)

The last generation of literary criticism on F. Scott Fitzgerald's *The Great Gatsby* is plagued by a general lack of reflection on the myth(s) of Jay Gatsby. The purpose of this paper is to propose that the title character's myth is actually more than just a "myth," that it is, in fact, an entire worldview—one which grows from an American concept of "progress" that continues to this day, and that Mr. Gatsby's worldview thus becomes more immediately relevant to our own progress-centered Western worldview. Only one article, Jeffrey Steinbrink's "Boats Against the Current: Mortality and the Myth of Renewal in *The Great Gatsby*," specifically addresses Mr. Gatsby's belief as a myth—namely, that he can remake himself. My paper argues that Gatsby's myth or worldview (not so much about perfecting himself, per Steinbrink's argument, as about acquiring Daisy Buchanan) tells him that he can and will "win" Daisy for himself through the sheer force of his cunning and efforts, and that this worldview reflects a larger societal meta-narrative. My thesis is that *The Great Gatsby* can function as a cautionary tale against the folly of pursuing the meta-narrative of progress. First, I review the American version of the modern Enlightenment movement. I explore the nearly 150-year history of its influence on American society before the 1922 world of booming economic progress in which Jay Gatsby lived and died. Second, I examine Gatsby as a character—his vantage point from one side of the bay, his singular pursuit of Daisy (who lives on the other side), and the methods and tactics he employs to bridge the gap and procure his dream, the goal toward which he thinks he is progressing. I then discuss possible reasons for his failure to achieve this goal. Third, I explore how this whole package—his overly grand vision, his tactics and their fallen outcome—serves as a warning against the short-sighted foolishness of pursuing utopian visions of "progress." My paper therefore holds up a new lens through which to clearly see Fitzgerald's cautionary intention and heed its wisdom.

The Effects of Mild, Moderate and Extreme Hypothermia on the Viability of Excised *Ciona intestinalis* Hearts

Presented at the 2014 NCUR, April, 2014

Supported by a NIH grant (1R15HL104587-01)

Student: Katherine Holloway (2014)

Faculty Mentor: Heather Evans-Anderson, Ph.D.

CAS – Department of Biology

(BIOL 300 – Evans-Anderson)

Ciona intestinalis are tunicates, which are a subphylum of Chordates. Currently, this species is the focus of many developmental biology and biogenetic research projects (Stolfi and Christiaen 2012; Joly et al 2007) and are used to glean insight into the highly conserved mechanisms of development in Chordates. Recent advances in genomics reveal that these organisms are the most closely related invertebrate to vertebrate species (Delsuc et al 2008). *Ciona* can survive varying conditions including a range of temperatures and salinities; however, the ideal temperature range for *Ciona* is between 18°C and 20°C and the ideal salinity is 35 ppm. The ability of *Ciona* to survive in various temperatures makes them an ideal candidate for hypothermia studies. Here, we examine the effects of mild (15°C), moderate (10°C) and extreme (4°C) hypothermia on excised *Ciona* hearts. The ability to maintain a physiologically

active heart in culture would be advantageous to studies focused on evolutionarily-conserved mechanisms of cardiac myocytes. We hypothesize that like vertebrate hearts, hypothermia will result in increased viability for excised Ciona hearts. Preliminary results show significant differences between the different temperature test groups. The hearts incubated at the highest and lowest temperatures (18°C and 4°C) had the lowest periods of viability, whereas, the longest periods of viability were observed in the hearts incubated at 15°C and 10°C. Notably, the 10°C heart continued to beat for seven days (168 hours) following excision. The periods of viability were analyzed using an ANOVA, and each of the individual groups were compared to each other using a Tukey HSD test. The period of viability for the 10°C treatment group was found to be statistically significant when compared to the other three groups (p-value less than 0.0001). Thus, we have developed a way to maintain excised hearts in culture for up to seven days. Future studies include a histological analysis of excised hearts compared to controls as well as analysis of altered metabolic gene expression to assess physiological differences between hearts.

Effect of Peppermint (*Mentha piperita*) Extract on Feeding Behaviors of Brown Marmorated Stink Bug, *Halyomorpha halys* (Hemiptera: Pentatomidae)

Presented at the 88th Annual Meeting of the Southeastern Branch of the Entomological Society of America, March, 2014

Winner of Second Place for Best Undergraduate Oral Presentation

Supported by the Winthrop University Research Council

Student: Michael Hull (2014)

Faculty Mentor: Paula Mitchell, Ph.D.

CAS – Department of Biology

The brown marmorated stink bug, *Halyomorpha halys* (Stål) is an invasive species that has been reported from 40 states in the U. S. and is an agricultural and nuisance problem in at least 13. They overwinter in houses and due to their polyphagous feeding habits could cause severe economic losses in many cash crops. Damage to soybean and tree fruits has been reported in the mid-Atlantic states. The objective of this study is to test the potential of peppermint extract (*Mentha piperita*) as a repellent or antifeedant for *H. halys*. Bugs were placed on green beans (*Phaseolus vulgaris*) treated with two concentrations of peppermint leaf extract (Gaia Organics) or a control, and video recordings were analyzed with Noldus Observer behavioral software. Exposure to mint increased the incidence of leg and antennal cleaning and the frequency of flying. The duration of labial dabbing, which is a pre-feeding behavior, was significantly reduced on mint-treated beans compared with the control; no differences were found between concentrations. Research is ongoing. Future studies using Observer will couple electrical penetration graphing (EPG) with video recordings to relate feeding behaviors to waveforms representing probing within the plant tissues.

Undergraduate Experiences that Motivate Students to Pursue Advanced Degrees in Computing-Related Disciplines

Presented at the Southeast Women in Computing Conference, November, 2013

Student: Chelsea Johnson (2014) (McNair Scholar)

Faculty Mentor: Patrick Owens, Ph.D. and Ellen Yezierski, Ph.D. (Miami University)

COB – Department of Computer Science and Quantitative Methods

This research looks at current graduate students in computing-related disciplines to determine whether certain undergraduate experiences positively influence graduate school aspirations and satisfaction and whether there are significant racial and gender differences in the influ-

ences of those undergraduate experiences on graduate school aspirations and satisfaction. Students enrolled in relevant graduate programs in five states were recruited to complete an online survey. By the end of the initial data collection period, 101 students had provided complete responses to the survey. Preliminary findings point to mentorship and undergraduate research programs as significant influences regardless of race and gender. These findings are being used to provide valuable information that can help contribute to the development of strategies for recruitment and retention of underrepresented students.

Sharpening Our Focus: Improving the Measurement of Secondary Chemistry Instruction with Observation Protocols

Presented at the 247th American Chemical Society National Meeting, March, 2014

Supported by the National Science Foundation Research Experience for Undergraduates at Miami University

Student: Destinee Johnson (2014) (McNair Scholar)

Faculty Mentors: Patrick Owens, Ph.D. and Ellen Yezierski, Ph.D. (Miami University)

CAS – Department of Chemistry, Physics, and Geology

Observer documentation of instructional practices and the complex discourse that occurs in secondary chemistry classrooms is very challenging. One solution has been to create observation protocols framed around research-based teaching practices, such as the Reformed Teaching Observation Protocol (RTOP) (Sawada et al 2002). Over the past decade a number of such protocols have been developed for science instruction; however, no chemistry-specific instrument has been created. As such, the goal of this project was to design and test an observation rubric that meets the unique needs of evaluating chemistry instruction and discourse in secondary classrooms. This rubric was devised to serve as a chemistry-specific addendum to an established K-12 mathematics and science observation protocol called the Electronic Quality of Inquiry Protocol (EQUIP) (Marshall 2009). Our rubric shows promise as a tool for researchers characterizing and evaluating the quality of chemistry instruction in secondary classrooms. Practitioners may also benefit from the rubric since it characterizes discipline-specific features of quality chemistry instruction. The observation rubric has been tested for validity and inter-rater agreement in the research context of evaluating the baseline instruction of teachers in a long-term professional development program. The design process for the rubric and results of its implementation will be presented.

Greek versus Non-Greek: Contingencies of Worth

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Students: Je'Lani Johnson (2014); **Zach Bowman** (2014); and **Kaitlyn Delallo** (2014)

Faculty Mentor: Merry Sleight, Ph.D.

CAS – Department of Psychology

(PSYC 302 – Sleight)

Participants were 100 college students, equally divided between men and women and Greek and non-Greek. Participants responded to the Contingencies of Self-Worth Scale (Luhtanen, Bouvrette, and Copper 2003) that assesses seven potential contributors to self-worth. Greeks were asked to focus on their Greek organization, while non-Greeks were asked to focus on an organization “that mattered a great deal to them.” With these groups in mind, participants responded to the scale to assess their continued commitment to the group (Simosi and Xenikou 2010). We compared Greeks to non-Greeks using an independent t-test. The two groups reported similar contingencies of self-worth. In other words, college students, regardless of Greek affiliation, seemed to have developed their self-esteem in similar ways. We split the file between Greek and non-Greek participants and first examined only

Greek participants. The higher the commitment score, the more participants felt pressured to represent their organization to the best of their abilities. The higher the GPA, the more the participants' identities depended on their virtue. The more Greek members' self-worth depended on academic accomplishments, the more their worth also depended on winning competitions. When we examined non-Greeks only, we also found that a higher commitment score predicted more pressure to represent the group well. The higher a position of leadership participants held, the more their appearance contributed to their self-worth, and the higher the GPA, the more the participants' worth depended on their academic accomplishments and family support. In sum, our hypothesis was not fully supported. Greeks and non-Greeks seemed to achieve self-worth through similar sources, and this was true even though Greeks reported higher levels of commitment to their groups. We did find differences related to college performance. Greek participants who found self-esteem in their virtue had higher GPAs, while Greeks who based their self-worth on their academic accomplishments also based their worth on competition. Perhaps Greeks have more opportunity to discuss grades in a manner that fosters such comparison and competition. In contrast, non-Greeks basing their self-worth on academics was related to having a high GPA, and having a high GPA was linked to finding self-worth through family identity. These results suggest that Greek membership may influence motives behind academic achievement.

Using Linear Cancer Networks to Model Photodynamic Therapy

Presented at the Southeastern Conference for Undergraduate Women in Mathematics, October, 2013

Sponsored by the Mathematical Association of America with a National Science Association grant (H98230-13-1-0270) and a National Science Foundation grant (DMS-1156582)

Student: Lynnique Johnson (2016)

Faculty Mentor: Zachary Abernathy, Ph.D. and Joe Rusinko, Ph.D.

CAS – Department of Mathematics

Photodynamic therapy (PDT) is a treatment used in the early stages of certain cancers which involves a localized injection of a photosensitizer followed by exposure to a light source that releases a cytotoxic agent, singlet oxygen, into surrounding cells. We create a set of eight ordinary differential equations that model PDT within a linear cancer network. The cancer network consists of cancer stem cells, which can either differentiate into tumor cells or create more stem cells. The model reveals three possible behaviors of the cancer: a stable equilibrium state of coexisting cancerous and healthy cells, an extended remission with eventual recurrence, or permanent remission. Stability and sensitivity analyses are performed to support numerical simulations.

The Role of the Urokinase and Protein C Systems in Prostate Cancer

Presented at the 2014 NCUR, April, 2014

Supported by an NIH-INBRE grant and the National Institute for General Medical Sciences

Student: Grace Jones (2015)

Faculty Mentor: Laura Glasscock, Ph.D.

CAS – Department of Biology

The progression of prostate cancer is dependent on angiogenesis and invasion. We investigated the role of urokinase (uPA), plasminogen activator inhibitor (PAI-1), and activated protein C (APC) in prostate cancer invasion and angiogenesis in vitro. uPA and APC are proteases that can be inhibited by PAI-1. It is widely known that uPA promotes tumor cell invasion and that PAI-1 can inhibit uPA activity. In ovarian cancer, the addition of APC sequesters PAI-1 away from uPA, allowing uPA to continue promoting invasion.

The role of these three proteins in prostate cancer has not been identified. We hypothesized that in prostate cancer, uPA and APC increase both tumor cell invasion and angiogenesis, and that PAI-1 alone will have no effect on either process. We also hypothesize that in the presence of APC, PAI-1 is sequestered from uPA as in ovarian cancer. To study angiogenesis, we established an in vitro angiogenesis assay using a new endothelial cell line in our lab. We determined that the ideal conditions for this assay are a low passage number, growth factor reduced Matrigel and a cell count of 30,000 cells per well. Using this system, we determined that elevated concentrations of uPA increase angiogenesis and that PAI-1 has no effect on angiogenesis. We are currently determining the function of APC in angiogenesis. To study invasion, we established an in vitro invasion assay using PC3 prostate cancer cells. The ideal conditions used for this assay were growth factor reduced Matrigel with serum free media, an incubation time of 16-20 hours and an optimal cell count of 1 million cells per well. Thus far, we have concluded that uPA increases the invasive ability of the cells, and we are currently determining the role of APC and PAI-1 in invasion. We are also repeating both of the assays in the presence of all three proteins to determine if APC sequesters PAI-1 from uPA inhibition, thus promoting invasion and angiogenesis, as in ovarian cancer.

The Relation between Friend Attractiveness and Friendship Qualities

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Students: Samantha Kelly (2014); **Ernesta Chavez** (2014);
and **Jasmine Jamison** (2014)

Faculty Mentor: Merry Sleight, Ph.D.

CAS – Department of Psychology

(PSYC 305 – Sleight)

Participants were 76 young adults with a mean age of 21.72 (SD= 3.68). Participants responded to the Cambridge Friendship Questionnaire to assess the quality of their friendships (Baron-Cohen and Wheelwright 2003) and questions developed by the researchers to assess participants' motives behind the establishment and perceptions of the friendships. We calculated a friendship score for each participant, with a higher number indicating better quality relationships with friends. Results revealed that the higher the friendship score, the more important attractiveness in general was to the participant and the more close friends the participants reported. The more attractive participants rated themselves, the more attractive they thought their friends were and the more important their friends' attractiveness was to them. The more attractive participants rated themselves, the more they believed that other people view them and their friends as attractive. Participants who saw themselves as attractive felt that they had "more to offer their friends." The more jealous participants were of their same-sex friends, the more they believed that their same-sex friends were jealous of them. The more unattractive friends a participant reported having, the more jealous they thought their friends were of them. The higher the college GPA, the less attractive participants perceived themselves to be and the less important they reported it was to have attractive friends. We compared men and women using an independent t-test and found similar perceptions of same sex friends. Compared to Caucasian participants, African-Americans felt it was more important that their friends were attractive and were more likely to believe that people viewed them and their friends as attractive. In sum, young adults who viewed themselves as attractive also had a tendency to focus on and value attractiveness in their friends. Feeling attractive was also linked to perceptions of jealousy in the relationships. These findings held true for both men and women. When we examined race, we found that African-Americans reported higher quality friendships and perceptions that their friends were attractive. Future research may want to examine whether these race differences reflect general confidence levels or unique friendship patterns.

Chastity's Triumph: Diana and Venus in *A Midsummer Night's Dream*

Presented at the 2014 NCUR, April, 2014

Student: Rachel King (2016)

Faculty Mentor: Matthew Fike, Ph.D.

CAS – Department of English

(ENGL 305 – Fike)

The purpose of this paper is twofold: first, to explore how the allusions to Diana and Venus in *A Midsummer Night's Dream* portray two distinct aspects of love, rational and irrational; and second, to argue that the allusions in the text suggest one of these forms of love is more powerful than the other. Paul A. Olson in his essay, "*A Midsummer Night's Dream* and the Meaning of Court Marriage," provides the distinction between rational and irrational love in the play's overall theme. He fails, however, to explore the concept within the context of the mythological allusions given in the play (95-96). The allusions to Diana and Venus in the play fulfill and support Olson's arguments regarding rational and irrational love. Juliet Dusinberre's theories on Protestant chastity and Shakespeare's plays expound upon the term "rational love" within the context of Renaissance love. In her book, *Shakespeare and the Nature of Women*, Dusinberre explains Protestant chastity as a distinct separation between two entities: physical virginity and chastity as a virtue. Her description of chastity relates to Olson's interpretation of the theme of love; the chaste marriage represents the rational nature of love, and unrestrained sensuality represents irrational love. In *A Midsummer Night's Dream*, Diana represents rational love, and Venus represents passionate, irrational love. The allusions to these mythological figures suggest that unrestrained passion is a lesser form of love than moderate love and Protestant chastity. In direct allusions, Diana outnumbers Venus. Based upon the numerical difference, the medieval idea of power's correlation with a greater number would suggest that Diana, and thereby Protestant chastity, is the greater of the two forces. Diana's powers also overcome Venus's powers throughout the play. Therefore, Diana, as a paragon of rational love, in overcoming Venus and Cupid, facilitators of uncurbed sexuality and irrational love, reveals that the greater force of love is the Protestant ideal of chastity.

Sexual Content in Popular Musical Genres

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Students: Kimberlie Kirkpatrick (2014) and **Megan Powell** (2013)

Faculty Mentor: Darren Ritzer, Ph.D.

CAS – Department of Psychology

(PSYC 302 – Ritzer)

Popular music has become more sexualized over the past six decades (Hall, West, and Hill 2012). While there is evidence that non-white male artists have a higher percentage of sexualized lyrics (Hall, West, and Hill 2012), popular female artists' music videos have also become more overtly sexual (Aubrey and Frisby 2012). The current study assessed specific sexual content in music lyrics over time (2002 versus 2012) and compared two different music genres (hip-hop/R&B versus country). We hypothesized that more recent songs and the hip-hop/R&B genre would contain more sexual lyrics. The top 20 most popular songs for 2002 and 2012 in both the hip-hop/R&B and country genres were obtained from www.billboard.com. Lyrics for these songs were collected from www.azlyrics.com. Songs were assessed for sexual content by counting the number of times the words "sex," "kiss," "touch,"

and "love" were used. An ANOVA was run on the 2 (genre) X 2 (year) design. There was no significant difference in sexual content between country and hip-hop/R&B [$f(1,76) = 1.33, p > .05$], no significant difference between 2002 and 2012 [$f(1,76) = .44, p > .05$], and no interaction between genre and year [$f(1,76) = 1.04, p > .05$]. There was a significant difference in the use of the word "sex" between genres [$f(1,76) = 8.60, p = .004$] with hip-hop/R&B using the word "sex" more than country songs. While the results suggest there is no difference in sexual content over time or between genres, it might be that our definition of sexual lyrics was too broad. The fact that popular hip-hop/R&B songs were more obvious in their sexual content (i.e. using the word "sex" more) might suggest a different style of sexual communication.

Power, Cattle, and Corruption in the United States' Public and Private Rangelands

Presented at the Annual Meeting of the South Carolina Political Science Association, March, 2014

Student: Lauren Lay (2015)

Faculty Mentor: Michael Lipscomb, Ph.D.

CAS – Department of Political Science

(PLSC 210 H – Lipscomb)

This paper explores cattle politics in the western United States, with a focus on the ability of large cattle ranching interests to promote their political and economic agenda. The paper more specifically analyzes the effects of that power on the broader ecology of the region, both as it affects human populations and the non-human environment.

A Mathematical Model of Cancer Networks with Radiation Therapy

Presented at the Southeastern Conference for Undergraduate Women in Mathematics, October, 2013

Sponsored by the NSA and the NSF Summer 2013

Student: Olivia Manley (2016)

Faculty Mentors: Zachary Abernathy, Ph.D. and Joseph Rusinko, Ph.D.

CAS – Department of Mathematics

Rather than the traditional explanation of cancer as the result of mutated genes that cause uncontrolled cell growth, a theory of mutated developmental control networks has been developed by Oxford scientist Eric Werner. This research examines one such developmental control network, a linear cancer network. A linear cancer network describes a system where cancerous growth is driven by cancer stem cells, which produce more cancer stem cells and other non-dividing tumor cells. A mathematical model is proposed that depicts the behavior that this new paradigm of cancer growth describes. Then, treatment in the form of radiation therapy is introduced, and the resulting effects on each cell population are explored. This research aids in the understanding of cancer, its growth, and how treatment may interact with it. The proposed mathematical model uses a non-linear system of three ordinary differential equations that describe the growth of cancer stem cells, tumor cells, and healthy cells. Equilibrium points are analyzed and interpreted to uncover the long-term behavior of the model. Numerical simulations of the system confirm the stability analysis and reveal behavior such as failed treatment, cure states, and tumor recurrence for varying levels of radiation effectiveness.

On Written Vernacular: Dialect, Code Switching, and Standard Written English in the Classroom

Presented at the Ninth Annual Winthrop University Department of English Undergraduate/Graduate Research Conference, March, 2014

Student: Courtney McGrath (2015)

Faculty Mentor: Amy Gerald, Ph.D.

CAS – Department of English

(WRIT 350 – Gerald)

There is a debate within our writing classrooms on where or even whether to draw the line between Standard English and Dialectal English. Should we as teachers strive to maintain the professional voice, Standard Written English, or should we embrace the beauty of the dialectal voice? This presentation explores the differing approaches to this problem and the ethical implications that each of these approaches has for our students. Understanding dialectal differences can help us provide a better education for our students. As writing teachers, we have many obstacles to overcome in the multi-dialectal classroom: social stigma, standardized tests, time constraints, and common core standards affect how we handle dialectal writing. Unfortunately, if we accept dialectal writing all the time, then our students are unprepared for the professional world; similarly, if we only accept Standard English writing, then we are failing to acknowledge their cultural integrity. The compromise to this problem is found in code switching. By utilizing both vernaculars in the classroom, students can become comfortable and proficient writers within each dialect. Students are more engaged and less stressed in the prewriting and drafting process when they are given the option of writing it in their home vernacular; by converting to standard written English in the final stages of a paper, students are confident and focused enough in their ideas that writing in this dialect does not hinder their creative process or take away from their content. I believe that student writing can be greatly improved by emphasizing the differences in these two vernaculars and using both of them to enhance student writing skills.

Effects of Zinc and Cloquinol on Amyloid- β Oligomer Distributions

Presented at the 65th Southeast Regional Meeting of the American Chemical Society, November, 2013

Sponsored by the National Science Foundation

Students: Kristen McLaurin (2014); **Emily Amenson** (2014); and **Abigail Bradner** (2014)

Faculty Mentor: Robin Lammi, Ph.D.

CAS – Department of Biology

Amyloid- β peptide (A-beta) self-associates into neurotoxic assemblies linked to Alzheimer's disease; increasing evidence shows that even the smallest oligomers—dimers and trimers—cause memory deficits when they are recruited to synapses, perhaps due to zinc release during neurotransmission. We have employed single-oligomer fluorescence methods to examine effects of zinc on the earliest oligomers, and their potential reversal via chelation with cloquinol. We found that zinc promotes increased oligomerization, perhaps due to its significant restriction of dimer structural dynamics. Addition of cloquinol reduces association, but does not restore the structural flexibility characteristic of metal-free samples. Comparing metal-free samples in the presence and absence of cloquinol, we further confirmed that cloquinol does not inhibit or reverse A-beta association in the absence of zinc. Collectively, these studies provide new insights into zinc's role in promoting A-beta association and the utility of metal chelation in Alzheimer's prevention and treatment.

Who's Hooking Up? Influences on the Growing Number of Casual Sexual Encounters between Friends, Acquaintances, and Strangers

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Students: Allison Morris (2014) and **Dawson Rice** (2015)

Faculty Mentor: Jean Haubert, Ph.D.

CAS – Department of Sociology

(SOCL 516 – Haubert)

Statistics and studies concerning the increasing acceptability of hooking up and the escalation in number of hookups have caught the attention of scholars as well as those in the mass media. The concept of “hooking up” is fairly new as a subject of study in the social sciences, and most studies have focused on only college students. It would be beneficial to look at the hookup culture in relation to those who have graduated and determine if hooking up is something specific to college students or if it continues after graduation. For the purposes of this study, hooking up is defined as a sexual act between two people in a non-committed relationship that involves vaginal, anal, and/or oral sex, though prior research on the subject may define hooking up differently depending on the researcher. Using data from the 2012 General Social Survey (GSS), this analysis focuses on determining possible influences on the frequency of casual sexual encounters and with whom non-married people are choosing to hook up with: friends, acquaintances, and strangers. The analysis examined the influence of age, level of education, sex, and media consumption on respondent's sexual behaviors. The analysis revealed the most significant findings in the dependent variables concerning frequency of sex had and sex had with a casual partner. Younger individuals are more likely to have sex with a casual hookup partner than older individuals and have sex more frequently than older individuals. Furthermore, individuals with a four year degree or more had less sex in the past year than those who did not complete as much schooling. Finally, women are less likely than men to engage in casual sex.

Decriminalization of Sex Work Proposal

Presented at the Annual Meeting of the Western Political Science Association, March, 2014

Student: Lauren Metcalf (2014)

Faculty Mentor: Michael Lipscomb, Ph.D.

CAS – Department of Political Science

(PLSC/WMST 553 – Lipscomb)

One of the most perplexing issues facing feminists today is deciding whether the decriminalization of sex work would empower or further exploit women. Although capitalist and patriarchal structures actively motivate sex work, such as exotic dancing and prostitution, the women that this paper analyzes have at least a formal choice of whether or not to engage in this work. The way feminism responds to sex work is by splintering off in the multiple directions of abolitionism, sex-positivity, and decriminalization. Finding a feminist solidarity among these viewpoints is the main objective of this paper.

Developmental Heart Valve Defects in a Mouse Model of LEOPARD Syndrome

Presented at the 2013 Medical University of South Carolina Summer Undergraduate Research Symposium

Sponsored by a NIH National Heart, Lung, and Blood Institute Grant (HL092611)

Student: Lauren Elizabeth Miller (2014)

Faculty Mentor: Kyu-Ho Lee, M.D., Ph.D.

CAS – Department of Biology

LEOPARD Syndrome (LS) is a rare, autosomal dominant disorder characterized by the findings of Lentiginosis, Electrocardiogram abnormalities, Ocular hypertelorism, Pulmonicvalvular stenosis, Abnormalities of genitalia, Retardation of growth, and Deafness. LS type I is caused by a mutation in the PTPN11 gene encoding the non-receptor protein-tyrosine phosphatase Shp2, a key regulator of cell proliferation and/or survival, adhesion and migration. In a previous study of the mouse model by Kontaridis et al., the LS mutant form of Shp2 was expressed constitutively in all cells throughout development. For this research project, we used three different litters of E 14.5 day mice to analyze cell proliferation and apoptosis in endothelial and myocardial cells. We examined 13 LS +/-, 7 LS ++ and 4 LS -/- to determine whether or not the LS symptoms recapitulated in the mouse model have an effect on the number of endothelial and myocardial cells that proliferate and/or undergo apoptosis. Preliminary findings detect no significant difference in ventricular myocardial proliferation rate overall, though regional differences may be apparent in septal regions.

Reported Income Tax Expense versus Reported Income Taxes Paid: An Empirical Analysis of Faithful Representation

Presented at the McNair Scholar's Research Symposium, June, 2013

Student: Justin Moore (2015) (McNair Scholar)

Faculty Mentor: Clarence Coleman, Ph.D.

COB – Department of Accounting, Finance, and Economics

(MCNR 300 – Fortner-Wood)

As the developed world seeks to solve their budget deficit problems through taxation or austerity, this research seeks to determine the relationship between a corporation's reported income tax expense and reported income taxes paid. By statistically analyzing a corporation's reported cash taxes paid and income tax expense we can determine whether their reported income tax expense, as defined in the FASB Accounting standards codification, faithfully represents reported income taxes paid. Our findings disclose that the models we have developed cannot explain 15% to 50% of the variation in reported cash taxes paid. These findings have led us to the conclusion that a corporation's reported income tax expense does not faithfully represent reported income taxes paid.

Synthesis, Purification and Analysis of Novel "Zone 4" Sphingosine Kinase-1 Inhibitors

Presented at the SERMACS, November, 2013; the SERMACS, November, 2012; and the Big SURS, April, 2011

Supported by a NIH grant

Student: Louise Mount (2014)

Faculty Mentors: Christian Grattan, Ph.D.; Jason Hurlbert, Ph.D.; and Aaron Hartel, Ph.D.

CAS – Department of Chemistry, Physics, and Geology

Sphingosine Kinase I (SK1) is a lipid kinase that catalyzes the formation of sphingosine-1-phosphate. This enzyme has been found to be over-expressed in tumor cells causing the cells to proliferate instead of going through the natural cycle to apoptosis. Sphingosine Kinase is manifested from ceramidase converting ceramide to sphingosine, which is when the sphingosine kinase comes in and phosphorylates the sphingosine to produce sphingosine-1-phosphate. To stop this process from happening, SK1 inhibitors are required. By way of a template molecule known to inhibit sphingosine-kinase 1 in vitro, we have designed novel derivatives hoping to improve both bioavailability and efficacy through improved interaction with the enzyme. This project involved creating different synthetic derivatives of a naphthalene ring portion on the molecule. In its place, a simple phenyl ring was introduced with either a hydroxy or a methoxy group attached to either the second or third positions. By means of synthesis, purification, and analysis, it was found that these compounds were successfully made. These compounds have yet to be tested for bioavailability and interaction with the enzyme, which is the next step towards refining our template structure.

An Epic Simile: The Medium of Comics is Like Poetry!

*Presented at the Comics and Popular Arts Conference at Dragon*Con, September, 2013*

Student: Alexander Muller (2014)

Faculty Mentors: Nakia Pope, Ph.D. and Bradley Tripp, Ph.D.

CAS – Department of English

(HONR 204 – Pope and Tripp)

While poetry is undoubtedly considered "high art," it is often as misunderstood as the art of comics. Therefore, comparing these two mediums gives new insights to both, making poetry more accessible and comics more venerable. Following Scott McCloud's definition of comics as "Juxtaposed pictorial and other images in deliberate sequence intended to convey information and/or to produce an aesthetic response from the viewer," I argue that poetry can be read like comics through both mediums' similar use of words, images, and the transitions between the two. In particular, I examine visual techniques and typography by poets such as E. E. Cummings and Emily Dickinson in order to display how a poem may fit into McCloud's definition. Ultimately, poetry does not use visual elements in the same way that the medium of comics does; however, by exploring poetry in terms of comics, I hope to validate the craft of a "popular art form" by comparing it to the "established art" of poetry, thus creating a better understanding of both.

One Hundred Years of Solitude: Deconstructing the City Of Mirrors through Lacanian Theory

Presented at the 2014 NCUR, April, 2014

Student: Alexander Muller (2014)

Faculty Mentor: Leslie Bickford, Ph.D.

CAS – Department of English

(ENGL 300 – Bickford)

Gabriel Garcia Marquez's *One Hundred Years of Solitude* has been read primarily as a postcolonial text by critics such as Lorna Robinson, Elizabeth Spiller, and John Krapp, or as a cultural deconstruction by Andre Brink and others. The present essay seeks to synthesize these two theoretical approaches and to connect them to psychoanalytic theory, especially the ideas expressed by Jacques Lacan in his essays on the formation of the Self. The development of Marquez's fictional city of Macondo is tracked through Lacan's stages of development before its deconstruction is examined. The subject (in this case the collective Self of the city) exists in pure materiality until the following occurs: boundaries are established, the Self-Identity is realized within a mirror, the subject becomes indoctrinated into the Symbolic Order through language, and ultimately, the Symbolic Order creates a tension and fragmentation of the Self, promoting disintegration. Marquez's "city of mirrors," then, connects to Lacan's theory of the mirror as a formative stage in realizing the Self as well as the postcolonial idea that the mirror is a tool of the Colonizer, a "scientific" weapon that is used to show the colonized subject its identity through the means of the imposing culture. Likewise, Lacan's theory of the Symbolic Order language as the final stage of development and the catalyst for Self-fragmentation connects to the postcolonial theory that language is the ultimate weapon of the Colonizing culture, used to subjugate the culture of the colonized. The essay thus concludes that while postcolonial theory may be the best perspective from which to read this text, it is worthwhile to regard the work from the perspectives of other theories. Examining Marquez's novel in terms of psychoanalytic theory can support the postcolonial argument and enhance it as the subjectivity of the postcolonial identity is studied. The Self of postcolonial societies is constructed and, as Marquez and Lacan seem to suggest, often inevitably destroyed.

Yes, English Majors Can Find Jobs!: Utilizing Tutorial Experience in the Job Search

Presented at the Annual South Carolina Tutor's Retreat, September, 2013 and the

Southeastern Writing Center Association Conference, February, 2014

Students: Alexander Muller (2014); **Ashley Moore** (2014); **Laura Jane Burgess** (2014); **Melissa Gilbert** (GRADUATE, 2014); and **Joanna Tepper** (GRADUATE, 2014)

Faculty Mentor: Jane Smith, Ph.D.

CAS – Department of English

In this interactive workshop presentation, we discuss the ways in which tutorial experience can be used for effective resumes and confident interviews. We relate the revision process of resumes to that of an academic paper, explore how to write tutorial experience into resumes using powerful language, and show how tutorial skills translate to specific job applications.

Through the Moonlight: Examining Claude Debussy's Multiple Versions of 'Claire de Lune'

Presented at the Emerging Scholars and Teachers in the Arts Program, Winthrop University, March, 2014

Student: Alexander Muller (2014)

Faculty Mentor: Ian Pearson, Ph.D.

CVPA – Department of Music

(MUSC 306 H – Pearson)

Although the influence of the symbolist poets on Claude Debussy has often been explored, the majority of research seems to examine how Debussy set the text of these poems to vocal compositions. This essay deals specifically with a poem by Paul Verlaine that Debussy would set to music three times between the approximate years 1890 and 1905—twice for voice and piano in two versions of *Fêtes Galantes* and once for solo piano in the *Suite Bergamasque*. Synthesizing biographical texts by François Lesure and Edward Lockspeiser, as well as criticism involving Debussy and the Symbolist movement by Arthur B. Wenk and Roger Nichols, this essay seeks to establish a connection between the vocal and non-vocal versions of "Clair de lune" and the ways in which these versions connect with the original poem by Verlaine. Ultimately, this essay suggests that although Debussy's instrumental composition is not obviously set to Verlaine's text, several similarities exist between the two mediums to create an overall impression of the same scene, regardless of words. Furthermore, because "Clair de lune" spans such an interesting space in Debussy's career, it gives perhaps one of the best impressions of the movement from his early compositions into his mature work. Likewise, the changes he made to the settings of the poem may be seen as an outline of his navigation through the Romantic period and into the turn of the century as well as his progression toward the Symbolist ideal of suggestion.

Synthesis of Benzisoxazolo[2,3-a]Quinoxaliniumtetrafluoroborates

Presented at the 65th Southeast Regional Meeting of the American Chemical Society, November, 2013

Supported by a NIH-National Institute of General Medical Sciences grant and the Winthrop University Research Council

Student: Jamie Murakami (2015)

Faculty Mentor: James Hanna, Jr., Ph.D.

CAS – Department of Biology

Recently, researchers in the Hanna lab synthesized several novel benzisoxazolo[2,3-a]azinium-tetrafluoroborates and in collaboration with Dr. Takita Sumter, found that these compounds exhibited some activity against HCT 116 colon cancer cells. As part of a structure-activity study aimed at increasing the cytotoxicity of this new class of compounds, we are investigating the synthesis of the quinoxalinium analog. Using a modification of the direct arylation of azine N-oxides introduced by Fagnou et al., we have attempted to effect substitution on quinoxaline N-oxide using methyl-substituted o-bromoacetanilides, since methyl-substituted analogs within this family were found to have the most effect on cell proliferation of HCT 116 colon cancer cells. Previously in our lab, direct arylation of azine N-oxides has been successful employing microwave heating; a ligand, palladium acetate (3:1, 5 mol % Pd); and potassium carbonate in toluene. Reacting quinoxaline N-oxide under these conditions using DIPET (Di-isopropylphosphoniummethylammoniumbis(tetrafluoroborate)) as the ligand with a 4- or 5-methyl-2-bromoacetanilide gave the desired product in yields ranging from 59 to 83%. Hydrolysis of the 4-methyl direct arylation product gave the aniline in 93%

yield, which was smoothly diazotized and cyclized to the benzisoxazolo[2,3-a]quinolinium-tetrafluoroborate in 63% yield after recrystallization. However, during the hydrolysis of the 5-methyl direct arylation product, the desired aniline began to form according to GCMS, but prolonged heating seemed to cause product decomposition. This unexpected observation is currently under investigation in our lab. Upon development of a reproducible hydrolysis, additional methyl substituted o-bromoacetanilides will be reacted under direct arylation and then hydrolysis conditions. These compounds will then be cyclized and the resulting products evaluated for their anti-cancer activity.

Feminine Characteristics and the Animus in *Jane Eyre*

Presented at the 2014 NCUR, April, 2014

Student: Kaitlyn Murphy (2014)

Faculty Mentor: Leslie Bickford, Ph.D.

CAS – Department of English

(ENGL 300 – Bickford)

Emily Brontë's *Jane Eyre* is one of the most feminist texts of the Victorian Era. Theorist Sandra B. Gilbert believes Jane's character is one who undergoes the "difficulties [that] every woman in a patriarchal society must meet and overcome." While critics argue that Jane is the ultimate feminist, I believe that Jane is an androgynous character who ultimately fulfills female stereotypes. Using Carl Jung's theories regarding the manifestation of the Animus in women, or the masculine figure in a woman's psychology, I will explain Jane's struggle between the logical, masculine characteristics and the emotional, feminine qualities of her unconscious. Jung believes the Anima and Animus should be balanced, resulting in *syzygy* of the unconscious. If balance is not achieved and a woman's unconscious is dominated by the Animus, then she is at risk to lose her feminine characteristics. Consequently, a woman who does not rely on her Animus may become an Anima-type because they are able to conform to the characteristics that men deem ideal. Jane exhibits qualities that are manifested by both her feminine instincts and her Animus; however, she only reaches a balance between the two aspects of her unconscious momentarily. This balance occurs when Jane is able to rationalize her relationship with Rochester. She is able to understand that his loving actions are a result of undeveloped feelings for her. Ultimately, Jane resorts to allowing herself to become an Anima-type. Jane abandons her independent life and decides to live in seclusion with a disabled man. Far from being a feminist icon, Jane loses herself and resorts to becoming Rochester's ideal woman. Comparing Jung's theories regarding gender to Jane's unconscious reveals that Jane may not be the ultimate feminist that she is often praised for.

"The house of fiction has in short not one window, but a million": Post-Impressionism in *The Portrait of a Lady*

Presented at the Ninth Annual Winthrop University Department of English Undergraduate/Graduate Research Conference, March, 2014

Student: Kaitlyn Murphy (2014)

Faculty Mentor: Kelly Richardson, Ph.D.

CAS – Department of English

(ENGL 323 – Richardson)

Critics are able to agree that *The Portrait of a Lady* is truly a work of art that James is able to execute through his use of artistic techniques in his writing style. Viola Hopkins praises James for his ability to "[convey] a great deal by a single stroke" (566). There is no question that *The Portrait of a Lady* is a literary portrait; however, critics are in dispute over the type of artistic

style that James incorporates in his novel. In "From Impressionist Paris to Post Impressionist London: Henry James's and Virginia Woolf's Painting-in-Writing," Tzu Yu Allison Lin, an expert in visual art, verbal art, and writing, asserts that *The Portrait of a Lady* is written in a style that mimics Impressionistic art. Lin explains that an Impressionistic novel is one "that attempt[s] to represent life" and concludes that *The Portrait of a Lady* does just that. However, this assertion can be debated. Written in the early years of the Post-Impressionism movement, *The Portrait of a Lady* does appear to be made up of Impressionistic elements; however, James' experience with art as both a lover and as a self-proclaimed critic could have given him the knowledge and abilities necessary to incorporate new Post-Impressionistic techniques into his text. I will compare and contrast pieces of Post-Impressionistic art with the literary art that James creates in *The Portrait of a Lady*. Through a close examination of *The Portrait of a Lady*, I will describe the Post-Impressionistic techniques, such as cubism, pointillism, and experimentation with form that James uses to create a text that, like other pieces of Post-Impressionist art, does not simply have one interpretation.

The Influence of Peripheral Cues on Political Affiliation Judgments

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Student: Brady Nichols (2015)

Faculty Mentor: Merry Sleight, Ph.D.

CAS – Department of Psychology

(PSYC 302 – Sleight)

Participants were 89 young adults with a mean age of 20.16 (SD = 1.84). Participants received one of four photographs. Two photographs depicted a Republican African-American man and two photographs depicted a Democratic Caucasian man. One photo of each man had a bold rectangular border (BRB) while the other two pictures showed a narrow elliptical border (NEB). Participants were told that the picture they were viewing was of a politician, and were asked to evaluate the politician on several dimensions. Results revealed that the Caucasian politician was always perceived as more conservative than the African-American politician regardless of the border, $F(3, 86) = 6.42, p = .001$. However, the border influenced judgments of dominance and trustworthiness. The NEB Caucasian politician was perceived as most dominant, while the NEB African-American politician was perceived as least dominant, $F(3, 86) = 3.96, p = .011$. The BRB Caucasian politician was perceived as less trustworthy than both African-American politicians, while the NEB Caucasian politician was perceived as less trustworthy than the BRB African-American politician, $F(3, 86) = 3.54, p = .02$. In general, participants felt more confident regarding their judgments of the Caucasian, compared to the African-American politician ($p < .05$ in all cases). Results also revealed several trends concerning judgments, confidence and ideological beliefs in light of certain demographic variables. Compared to women, men rated the politicians as more open, $t(87) = 2.13, p = .036$, mature, $t(87) = 2.03, p = .046$, and likeable, $t(87) = 2.30, p = .024$. Additionally, compared to Caucasian participants, African-Americans reported more confidence in their judgments ($p < .05$ in all cases), and religious participants reported more confidence than did less or non-religious participants ($p < .05$ in all cases). These results taken together suggest that secondary visual cues may indeed play some role in facial processing, and more generally, that judgments based on non-reflective inferences, as well as belonging to certain demographic groups, hold a very real presence in the social and political judgment making process.

Political Reactions to Bitcoin

Presented at the Ivy Plus Symposium, March, 2014

Student: José Páramo (2014)

Faculty Mentors: Stephen Smith, Ph.D. and Scott Huffman, Ph.D.

CAS – Department of Political Science

The past thirteen years have seen a huge increase in the role of the internet along with multiple devices developed to access it. Today's younger generations have no clue of what life without the internet was like. Alongside the technology, one growing trend that may soon have a more prominent role in our lives is the increasing use of e-currency. According to the *Cambridge Dictionary Online*, "e-currency is a type of currency in electronic form that is designed especially for paying for goods and services bought on the internet." E-currency does not exist in the real, tangible world. It is nothing more than a program filled with algorithms that calculate the currency's value dependent on the number of people who use and mine it. Recently, the popularity of e-currency has increased by the use of a specific form known as "Bitcoin." Because of its high level of anonymity, Bitcoin has been an attractive form of currency for various types of people, including people who do not wish to be tracked by their government or people who may have criminal pursuits. However, it has also attracted a following among many other people in the global marketplace, allowing this flourishing enterprise to establish a Bitcoin ATM. More websites are also increasingly accepting the Bitcoin alongside a growing number of brick and mortar businesses. The Bitcoin has essentially allowed the currency transaction between two people to occur without the use of a middleman (in this case, a bank), as if it were a real-world cash transaction. This new form of currency may have advantages for the consumer, and there could be both benefits and threats to the global economy as well. In this research, instead of focusing on its infamous association to the New Silk Road Website and other criminal enterprises, I aim to study some of the benefits that this type of e-currency may promise. I focus on the reactions of the United States to Bitcoin on a state level and on the reactions from other countries around the world. I also focus on a comparison between the reactions of the United States and China to Bitcoin to determine if the differences in their respective governments (federalism and centralized) influence their different laws and overall acceptance of the e-currency.

Academic Environments and Racial Boundaries: Framing the Black/White Rapport in Writing Centers

Presented at the Southeastern Writing Center Association Conference, February, 2014

Student: Dasia Payne (2014) and **Maria DeLaquill** (2015)

Faculty Mentor: Jane Smith, Ph.D.

CAS – Department of English

(WRIT 500 – Smith)

Since American society fears open discussion of racial and cultural differences, good bi-racial rapport between persons in academic environments is neglected. Essential to a productive learning environment, this rapport is important in classrooms and essential in tutoring. Impediments to facing this rapport include dialect barriers, inherent mistrust, and racial stereotypes.

Purification and Characterization of the Nickel Uptake Regulator (NUR)

Presented at the McNair Scholar's Research Symposium, June, 2013

Supported by a RCSA Award (20160) and a Winthrop McNair Scholarship

Student: Denise Peppers (2015) (**McNair Scholar**)

Faculty Mentor: Nicholas Grossoehme, Ph.D.

CAS – Department of Chemistry, Physics, and Geology

Streptomyces coelicolor is a microorganism that is important in research for antibiotic production. In *Streptomyces coelicolor*, metal regulation is significant to maintain homeostasis within the cell. The Nickel Uptake Regulator (NUR) maintains levels of nickel within the cell. The goal of this research project is to purify NUR so that we may perform experiments to understand the relationship between DNA binding and metal binding to this protein. Our approach to this problem is to study the DNA and metal binding reactions independently using the wild type protein as well as a number of site-directed mutants.

Combinatorics of Quartet Amalgamation

Presented at the Winthrop University Summer Undergraduate Research Experience Symposium, September, 2013; the Winthrop University Summer Undergraduate Research Experience Poster Presentation, October, 2013; the Southeastern Conference for Undergraduate Women in Mathematics, October, 2013; the Regional Mathematics and Statistics Conference, April, 2014; and the 2014 NCUR, April, 2014

Supported by a National Center for Research Resources grant (5 P20 R016461), a NIH grant, and a National Institute of General Medical Sciences grant

Student: Emili Price (2016)

Faculty Mentor: Joseph Rusinko, Ph.D.

CAS – Department of Mathematics

We apply classical quartet techniques to the problem of phylogenetic decisiveness and find a value k such that all compatible quartet systems with at least k quartets are decisive. Moreover, we prove that this bound is optimal and give a lower-bound on the probability that an arbitrary collection of quartets is decisive.

Expression of FGF9/16/20 and Foxp1 in Juvenile and Adult *Ciona intestinalis*

Presented at the Society for Developmental Biology 73rd Annual Meeting, July, 2014; National Conference on Undergraduate Research, April 2014; the Annual Biomedical Research Conference for Minority Students (ABRCMS), November, 2013; and the Ronald E. McNair Postbaccalaureate Achievement Summer Research Program, July, 2012 and July, 2013

Supported by the Society for Developmental Biology and an NIH grant (1R15HL104587-01)

Winner of the Federation for American Societies for Experimental Biology (FASEB) MARC Travel Award for ABRCMS, November, 2013

Student: Brittany Prioleau (2014)

Faculty Mentor: Heather Evans-Anderson, Ph.D.

CAS – Department of Biology

Ciona intestinalis, commonly known as sea squirt, is a useful model system for studying developmental processes due to its close evolutionary relationship to vertebrate cardiac gene programs and conserved chordate features during heart formation. Two conserved genes that have a great impact on heart development in vertebrates are Foxp1 and FGF9/16/20. FGF9/16/20 is an important gene in heart development and Foxp1 is a transcriptional repressor that regulates myocardial growth, which is significant in maintaining proper function of the heart. Several studies have shown that Foxp1 and FGF9/16/20 have a direct relationship. FGF was shown to be a necessary factor in heart formation and knocking out this gene resulted in the disruption of the expression of heart lineage markers that facilitate heart formation. Other studies demonstrated that knocking out Foxp1 during heart development decreased the rate of cardiomyocyte proliferation. Based on the results from previous studies, our hypothesis is that Foxp1 and FGF9/16/20 also play an important role in heart development and regeneration in *Ciona*. Here, the expressions of these genes were examined via RT-PCR and quantitatively analyzed in the *Ciona* model. Preliminary results demonstrate FGF9/16/20 expression in the juvenile and in the adult heart; however, expression of Foxp1 was not found. Once the expression of both FGF9/16/20 and Foxp1 are detected with RT-PCR, real time RT-PCR will be used to quantitatively determine gene expression levels. Future studies include in situ hybridization studies to examine tissue-specific expression in juvenile and adult hearts using Digoxigenin-labeled RNA probes for FGF9/16/20 and Foxp1. Understanding the role of these genes will help elucidate conserved mechanisms of cardiac myocyte proliferation and heart development in chordates.

Silencing Cellular Expression of the High Mobility Group A1 (HMGA1) to Enhance Sensitivity to Chemotherapy

Presented at the McNair Scholar's Research Symposium, June, 2013

Supported by a NCI grant (1R15CA137520-01), a NIGMS grant (8 P20 GM103499), a NIH grant, and a National Science Foundation grant (MCB0542242)

Student: Derion Reid (2014) (McNair Scholar)

Faculty Mentor: Takita Sumter, Ph.D.

CAS – Department of Chemistry, Physics, and Geology

The overexpression and chromosomal rearrangements of the High Mobility Group A1 (HMGA1) gene are well-accepted hallmarks of various tumor types. The gene is alternatively spliced to yield two proteins, HMGA1a and HMGA1b, which play critical roles in trans-formation through mechanisms that are not well understood. Strong expression of HMGA1

occurs during embryonic development but there is typically no expression in adult normal tissues. Most human neoplasias have elevated levels of HMGA1, and its ectopic expression gene promotes malignant phenotypes *in vitro* and *in vivo*. Consistent with its oncogenic potential, HMGA1 is required for tumor-associated phenotypes in cancers including gastric, colon, prostate, and breast. In many tumors, HMGA1 expression correlates with invasiveness confirming its potential as a prognostic marker. Mice bearing the HMGA1 transgene develop intestinal polyps and the protein is overexpressed in mice bearing genetic truncations in the tumor suppressor, adenomatosis polyposis coli (Apc). These findings collectively suggest that HMGA1 proteins may act as cellular switches responsible for the conversion of normal colon tissues to the cancerous state. Moreover, overexpression of HMGA1 has been associated with resistance to certain chemotherapeutic drugs. The antineoplastic drug, 5-Fluorouracil (5-FU), is misincorporated into actively replicating DNA, eliciting DNA lesions and, eventually, death of colon cancer cells; however, its clinical efficacy is often limited by the development of acquired drug resistance. We believe that overexpression of HMGA1 may enable cancer cells to become resistant to 5-FU's effects. To better understand the significance of HMGA1 in resistance to 5-FU, we used small interfering RNA targeting HMGA1 to determine if its knockdown influences sensitivity of colon cancer cells to 5-FU chemotherapy. We infected HCT116 cells with siRNA targeting HMGA1 and quantitatively measured cell survival. Preliminary data suggests knockdown of HMGA1 decreases HCT116 cell survival and current studies are underway to further characterize these findings. These findings may shed light on an additional pathway by which cancer cells circumvent the effects of anti-cancer therapy. It is possible that the molecular cross-talk between oncogenes and other cellular pathways can be better understood to better develop targeted therapies with decreased potential for resistance.

The Interpretations of Avalon

Presented at the 2014 NCUR, April, 2014

Student: Connor Renfroe (2016)

Faculty Mentor: Josephine Koster, Ph.D.

CAS – Department of English

(ENGL 307 H – Koster)

The Isle of Avalon has appeared in hundreds of literary works, and with each interpretation the author changes some aspects to convey a different meaning. The mutability of the idea of Avalon has been exploited many times in literature and in pop culture to forward an author's message. This paper will trace the evolution of Avalon from the Celtic pagan idea, and some theories regarding its name, through to some of the more influential variations in the Arthurian tradition. My research includes philological articles, primary texts from Geoffrey of Monmouth, Marie de France, and Sir Thomas Malory, interpretive poetry by Alfred, Lord Tennyson and Sallie Bridges, contemporary novels by Marion Zimmer Bradley, and the lyrics of Cyndi Lauper. In this paper, I argue that these authors have changed Avalon to forward their own political and cultural messages—whether it is used to make an entire nation believe that their king is a descendant of Arthur, to highlight the feminist struggle against the patriarchy, or to promote the theme of Christianity versus paganism. I conclude that Avalon is an important tool because of how mutable it is and because its reflexive nature aids the continuation of the Arthurian tradition by existing as a malleable goal.

Comparisons of First-Generation and Non-First-Generation Students

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Students: **Giulietta Rizzo** (2014); **Charlie Clyburn** (2013); **Bree McClure** (2013); and **Molly Moore** (2015)

Faculty Mentor: Merry Sleight, Ph.D.

CAS – Department of Psychology

(PSYC 302 – Sleight)

Participants were 90 undergraduates with a mean age of 20.0 (SD = 2.90), representing a mixture of first-generation and non-first-generation students. First-generation college students have parents who did not attend college (Sanchez and Nichols, 2007). Participants responded to the Trait Guilt section of The Guilt Inventory (Jones, Schratte, and Kugler 2000), the Eysenck Personality Questionnaire (Francis and Ziebertz 2006), the 25-Item Resilience Scale (Wagnild and Young 2009), and a stress scale from Thompson-River University (2013). We first compared participants who did not have a parent graduate from college with participants who had one parent graduate and participants who had two parents graduate using a MANOVA. These groups did not differ on guilt, school stress, resiliency, or grade point average. We asked each group to report their ultimate educational goals and found that participants with two college-educated parents reported the lowest level of educational goals. This finding may reflect more realistic goals from those with two college-educated parents or an increased desire of first-generation students to take advantage of educational opportunities. Next, we examined only first-generation students and compared those in their first year to those in their fourth year using an independent t-test. First year students reported lower GPAs than their fourth year counterparts, $t(9) = -2.94, p = .016$. We then examined only non-first-generation students, compared first and fourth year students on GPA, and found no significant difference. However, fourth year students in both groups reported an average GPA of 3.3. In other words, first-generation students seemed to compensate for low grades in their first year by ultimately achieving senior year GPAs that matched non-first-generation students. We compared men and women using an independent t-test and found no differences on the variables studied, perhaps because the standard deviations were large. In sum, our hypothesis was not supported. We found few differences between first-generation and other college students. One possible explanation is that first-generation students are a diverse group. Another possibility is that the extensive resources provided to first-generation students at the school where the study was conducted ameliorated the effects of some typical obstacles faced by this group.

Facebook Monitoring of Ex-partners and Perceptions of Being Monitored by Current Partners

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Winner of the CEPO Research Award

Students: **Holli Ryan** (2015); **Katlyn Rutherford** (2015); and **David Orman** (2015)

Faculty Mentor: Merry Sleight, Ph.D.

CAS – Department of Psychology

(PSYC 302 – Sleight)

Participants were 97 young adults, with a mean age of 20.4 (SD = 1.93). Participants responded to the Facebook Jealousy Scale (Muise 2009), the Facebook Harassment of Ex-partners Scale (Lyndon 2011), and Knobloch and Solomon's Relational Uncertainty Scale (2002). We examined relations among variables using Pearson's correlations. The higher the Facebook Jealousy score, which indicated that participants thought their current romantic

partner was jealously tracking their Facebook use, the more participants reported monitoring ex-partners on Facebook. The more time participants reported spending on Facebook, the more they felt their current partners were monitoring their use and the less willing they were to share their password with their partner. Participants who reported monitoring their current partners were also less willing to share their password with that partner. Commitment did not relate to Facebook jealousy or Facebook monitoring; however, the more committed participants were, the more willing they were to share their passwords. Age also did not predict Facebook jealousy or Facebook monitoring. The older the participants, the more they agreed that their partners should share their passwords, and that they should share their passwords with their partners. We compared participants who reported that they would never share their personal password with participants who felt personal passwords should be shared. Participants who did not share their passwords had higher Facebook Jealousy scores, suggesting they believed their partner jealously monitored their Facebook use. We compared men and women using an independent t-test and found no differences. Overall, our hypothesis was supported. Participants who were monitoring their ex-partners through Facebook believed that their current partners were jealous of their Facebook use, and the more time participants spent on Facebook, the more they assumed their current partners were tracking their Facebook behavior. These perceptions might be accurate, or they might reflect a guilty conscience. Either way, young adults who were engaged in monitoring behavior were protective of their password. Young adults who felt they were being monitored were also more protective of their password. These patterns held true across gender and race and contribute to our evolving understanding of this popular social media and its impact on relationships.

Differences in State Level Support for Gay Marriage and Anti-Homosexual Hate Crimes

Presented at the Annual Meeting of the Southeastern Psychological Association, March, 2014

Students: **Rachel Schnitzer** (2014) and **Caroline Myers** (2014)

Faculty Mentor: Darren Ritzer, Ph.D.

CAS – Department of Psychology

(PSYC 302 – Ritzer)

Same-sex marriage is an increasingly important political and social topic. This archival study focused on anti-homosexual crime rates in the United States during 2011. We categorized the fifty states and the District of Columbia into three groups: states that legally accept gay marriage, states that do not allow gay marriage, and "gray" states that legally allow civil unions or domestic partnerships but not gay marriage. We hypothesized that states that allowed same-sex marriage and "gray" states that provided some protections would report lower crime rates towards homosexuals than states that did not recognize or legally protect same-sex couples. Data was compiled from The Hate Crime Statistics Program of the FBI's Uniform Crime Reporting for the year 2011. Of the reported crimes against homosexual people in 2011, 21% of those crimes were in states that allowed same-sex marriage, 32% came from states that did not support same-sex marriage at all, and 47% of the anti-gay crimes were from "gray" states that provided some legal protection for homosexuals. A Chi-Square test was conducted to assess statistical differences in percentage breakdown between the three categories. While the Chi-Square test was significant (Chi Square (2) = 6.15, $p < .05$), our hypothesis was not supported. The "gray" states were statistically different from the supportive and non-supportive states. Almost half of all crimes against homosexuals came from the 11 states that offer some legal support for gay marriage. There was no difference in anti-homosexual crime between states that allowed gay marriage versus states that did not allow gay marriage. One possible explanation is that states that have ambiguous standings on same-sex marriage (i.e. the "gray" states) are more dangerous than supportive or non-supportive states. The "gray" states may be characterized by a mixture of ideologies and ongoing disagreement that increases the

probability of hate crimes against homosexuals. On a larger level, it may also suggest that it is better to commit to a course of action (whether support or non-support) than to partially commit and create confusion and ambiguity.

Gender Revolutionary Politics: Women's Activism and Gender Emancipation in the Contexts of Chiapas and Oaxaca, Mexico

Presented at the Southern Political Science Association Annual Meeting, January, 2014

Student: Sarah Sladek (2014)

Faculty Mentor: Jennifer Disney, Ph.D.

CAS – Department of Political Science

This paper examines the impact of women's activism in social movements in Oaxaca, Mexico in reaction to Governor Ulises Ruiz Ortiz and widespread violence at the hands of the PRI party after 2006, as compared to women's activism in the Zapatista rebellion of Chiapas, Mexico, which is ongoing. I will be comparing the movements along the following dimensions: 1. women's ideological and organizational autonomy from the larger social movement, 2. indigenous cultural autonomy and what different degrees of autonomy mean for indigenous women, 3. the impact of having an articulated set of demands versus not having an articulated set of demands for the state and federal government, 4. having agenda-setting initiatives for changing civil society versus not having them and the consequences thereof, 5. clientelism and its impact on rural, indigenous women, and 6. the residual repercussions of land redistribution—including a discussion of ejidos versus communal land rights—after the Revolution of 1910 on the states of Chiapas and Oaxaca and how the land redistribution impacted indigenous peoples differently. I seek to understand how women's activism in social movements can turn into feminist strategy once women enter such a public sphere and understand how male domination impacts every aspect of their lives causing their focus to shift from more issue-based activism towards an intersectional feminist consciousness. This research is part of a larger comparative study of women's movements in Mexico and Russia that I plan on pursuing in my post-graduate career.

Machine Learning for Phylogenetic Invariants

Presented at the SIAM Conference on Algebraic Geometry, August, 2013; the Winthrop University Summer Undergraduate Research Experience, Symposium II, July, 2013; and the McNair Scholar's Research Symposium, June, 2013

Supported by an SC-INBRE grant

Students: Hannah Swan (2014) and **Emili Price** (2015)

Faculty Mentor: Joseph Rusinko, Ph.D.

CAS – Department of Mathematics

We build on Eriksson and Yao's work, which uses machine learning to optimize the power of phylogenetic invariants to reconstruct evolutionary trees. To do this, we solve a semi-definite programming problem, using GNU Octave and CSDP, a solver for semi-definite programming problems. Our method includes inequalities arising from the study of the real points on the phylogenetic variety into the metric learning algorithm. Previous work focused on selecting a good set of invariants for the construction of quartet trees, we extend this work to more taxa by testing the accuracy on twelve taxa trees.

Pell Grant Recipient Fears Financial Pain in Face of Government Shutdown

Presented at the 2014 NCUR, April, 2014

Student: David Thackham (2015)

Faculty Mentor: Guy Reel, Ph.D.

CAS – Department of Mass Communication

This in-depth journalistic piece delves into the recent issues of the government shutdown and what such dysfunction means for one Winthrop student. It paints a comprehensive picture of the student's financial situation and the choices she would have to make if the government experiences another shutdown in the near future. The article provides necessary viewpoints from university figures and political pundits, who give greater depth and perspective on the student's situation. The student profiled in the piece is a small example of the much larger student population that stands to lose much, especially if the government shutdown threatens the Pell grant. The piece was researched through consultation with government documents, online databases and in-person interviews. It provided a sense of understanding for Winthrop students from the fog of confusion that has emerged over government decisions in the past few months. In addition to several university officials, a number of students and a politician were interviewed as part of the research before compiling the information for the article that was published in Winthrop's student newspaper, *The Johnsonian*. The news article concluded that despite the recent government dysfunction, concerning the 2013 shutdown, Winthrop students need not be concerned that they will lose their federally funded Pell grants—at least not until the next semester. One official said that the situation would have been different and that the school would have had to make "tough choices" if the shutdown lasted through the spring. For now, however, college students can breathe easy on their federal funding.

Fresh Take on the Campus School Lunch Reform

Presented at the South Carolina Legislative Day, April, 2014

Student: Brenna Thomason (2015)

Faculty Mentor: Kareema Gray, Ph.D.

CAS – Department of Social Work

(SCWK 323 – Gray)

School lunches have long had the negative stigma of lacking both flavor and nutrition. However, with a new piece of legislation in South Carolina, school lunches in public schools throughout the state may soon change for the better. The voluntary policy under the Department of Agriculture calls for schools to partner with local farmers to establish healthy, locally grown lunches for the students. The policy will benefit not only students, providing them with a healthy meal while at school, but will also support local farmers and create a larger need for them; this ultimately creates more jobs and promotes the local economy. The policy will encourage healthy eating habits in children, which in turn will promote overall health and reduce obesity rates, which are extremely high in South Carolina (35%). Although the policy has many positive aspects, many local government officials worry that increased taxes for citizens and an increased budget for the Department of Agriculture are issues that outweigh the benefits of the program. Children are the future of the country; it is imperative that they are invested in both physically and emotionally. Beginning with a healthy diet is the perfect starting place. If children are ensured a healthy, locally grown meal once a day while at school, they will benefit greatly and begin to implement their own healthy habits that will ensure not only their health as they mature, but their success throughout life.

Effect of Ibuprofen on LPA-mediated Growth Cone Collapse of Embryonic Chicken Retinal Axons

Presented at the Society for Neuroscience Conference, November, 2013

Supported by the Winthrop University Research Council and a SC-INBRE grant

Winner of the 2013 Janice Chastain Houk Award for Undergraduate Research

Student: James Vinton (2014)

Faculty Mentor: Eric Birgbauer, Ph.D.

CAS – Department of Biology

There exists a significant need for clinical therapies that could promote central nervous system (CNS) nerve regeneration after traumatic injury. Fu et al (2007) and Wang et al (2009) found that treatment with ibuprofen promoted nerve regeneration after spinal cord injury in mice. Ibuprofen is a non-steroidal anti-inflammatory drug used to treat pain and inflammation through its inhibition of the cyclooxygenase (COX2) pathway. However, Fu et al (2007) suggested that ibuprofen, acting through a novel pathway, promoted nerve regeneration by reducing RhoA activation. RhoA is a GTPase known to regulate cellular morphology through actin cytoskeleton rearrangements in response to extracellular signaling molecules. Lysophosphatidic acid (LPA), a bioactive lysophospholipid, is an extracellular signaling molecule that is known to cause growth cone collapse via the RhoA pathway. Therefore, we investigated whether ibuprofen could inhibit LPA-mediated growth cone collapse of retinal neurons through the proposed inhibition of RhoA. Using embryonic chick retinal axons *in vitro*, LPA treatment produced a dose-dependent growth cone collapse that is blocked by inhibition of rho kinase (ROCK). Interestingly, treatment with ibuprofen did not block this LPA-induced growth cone collapse; rather, ibuprofen treatment enhanced growth cone collapse. In addition, high concentrations of ibuprofen (500 μ M) caused growth cone collapse independent of LPA, which was further increased by LPA. Time-lapse imaging demonstrated that LPA caused a typical growth cone collapse in the presence of ibuprofen, verifying the growth cone collapse assay data. Furthermore, biochemical analysis of active RhoA in retinal explant cultures showed that ibuprofen can reduce RhoA activation by LPA, in concordance with the proposed mechanism, while not significantly affecting baseline RhoA activation. In our embryonic chick retinal system, ibuprofen enhances LPA-induced growth cone collapse, even though it appears to reduce RhoA activation. Thus, although ibuprofen may facilitate nerve generation by reducing activation of RhoA, it does not block other inhibitory effects on axonal growth and possibly could exacerbate these inhibitory effects.

In Vivo Confirmation of LPA's Role in Axon Guidance by the Inhibition of Autotaxin Using siRNA in Embryonic Chickens

Presented at the Winthrop University Summer Undergraduate Research Symposium, August, 2013

Supported by the Winthrop University Research Council and a SC-INBRE grant

Student: James Vinton (2014)

Faculty Mentor: Eric Birgbauer, Ph.D.

CAS – Department of Biology

The main principle of axon guidance is to investigate the role of chemical cues in the guidance and termination of growing nerves, both during development and after injury. Lysophosphatidic acid (LPA) is a bio-active lipid that has exhibited characteristics, such as growth cone collapse and neurite retraction, of an axon guidance molecule *in vivo*. LPA is produced endogenously by the exo-enzyme autotaxin (ATX). Based on previous research, during certain stages of chicken development, autotaxin is expressed posterior to the optic tectum. Retinal

ganglion cell axons grow to and terminate at the optic tectum during the same stages of development that the expression of ATX was discovered. These findings suggest the possibility that the presence of autotaxin and the subsequent production of LPA could create a chemical barrier preventing the RGC axons from growing beyond the tectum. In order to confirm LPA's role in axon guidance *in vivo*, we obtained an siRNA for chicken autotaxin from Dr. Ohuchi in Japan. The ATX siRNA construct was cloned into an RCASB-GFP retroviral vector and transfected into a DF-1 cell line. The resulting virus was collected, concentrated using high speed centrifugation, and titered to determine efficiency. In order to test our hypothesis *in vivo*, experimental techniques and data acquisition procedures needed to be optimized. We determined, based on previous studies, the appropriate technique for the *ex ovo* culturing of embryonic chick embryos until E12 using embryo culture cups. Additionally, we successfully injected the control virus into the midbrain of E2 chick embryos and were able to confirm viral expression and further infection 5 days later. Furthermore, we were able to label the growing RGC axons of E6 chick embryos and detect the dye two days later as the axons were beginning to grow toward the optic tectum. Currently our results are promising; however, our data detection techniques still require further optimization. In the future, we would like to inject both the control and ATX virus into the midbrain and using 3D rendering detect any abnormalities in the termination, growth, or response of the RGC axons as they transverse to the optic tectum.

Synthesis and Evaluation of Biphenyltetrols as Amyloid- β Aggregation Inhibitors

Presented at the 65th Southeast Regional Meeting of the American Chemical Society, November, 2013

Supported by an NIH-INBRE grant

Student: Sarah Wicks (2015) (McNair Scholar)

Faculty Mentors: Robin Lammi, Ph.D. and James Hanna Jr. Ph.D.

CAS – Department of Chemistry, Physics, and Geology

Amyloid- β peptide (A-beta) is known to aggregate into neurotoxic oligomers and fibrils that are believed to be a major etiologic factor in Alzheimer's disease. As such, it may be therapeutic to inhibit A-beta aggregation. We have previously reported the synthesis and evaluation of biphenyl-3,3',4,4'-tetrol (3,4-BPT), and found it to effectively suppress aggregation of A-beta at stoichiometric concentrations. To further investigate the inhibitory effect of this class of compounds, we synthesized several isomeric biphenyltetrols which were evaluated for their efficacy toward inhibition of A-beta aggregation by means of the Thioflavin T assay. The 2,3- and 2,5- isomers of BPT seemed to largely inhibit aggregation as measured by this assay, while the 2,4-BPT was somewhat less effective. It appears that the arrangement of the hydroxy groups affects the extent of inhibition, perhaps by altering the way the inhibitor interacts with A-beta through hydrogen bonding.

Art, Beauty, and the Ideal in Late Imperial China

Presented at the Phi Alpha Theta Regional Conference, April, 2014

Student: Brierly Wills (2015)

Faculty Mentor: Chia-Lan Chang, Ph.D.

CAS – Department of History

(HIST 350 – Chang)

When approaching the study of women in the last one thousand years of imperial China (960-1911), Chinese art, specifically paintings, offers the primary lens by which we should view the position of women in the Song, Ming, and Qing dynasties. Across nearly one thou-

sand years of art, Chinese women are generally depicted in positions of servitude, reflecting the traditional livelihood of an imperial Chinese woman. The male discourse on women, the Chinese ideal of femininity, and the interwoven structure of the Three Teachings and artistic expression seem to strengthen this stereotyped image. However, I have identified key details within selected artwork that reveal more about gender psychology than social perpetuation alone. For example, the bodhisattva Guanyin appears in religious imagery that overlaps all Three Teachings, her specifically female form utilized to bridge the separate philosophies in a decidedly feminine fashion. In addition, the male artist holds a pivotal role in each dynastic interpretation of beauty and femininity, reflecting the positions and expectations of males in late imperial China. My research aims to uncover the psychological status of women in late imperial China with emphasis on male artisanship and influence.

Basil of Baker Street: Sherlock Holmes' Downstairs Neighbor

Presented at the Ninth Annual Winthrop University Department of English Undergraduate/Graduate Research Conference, March, 2014

Student: Brierly Wills (2015)

Faculty Mentor: Josephine Koster, Ph.D.

CAS – Department of English

(ENGL 200 – Koster)

With nearly 150 years of deduction, the *Sherlock Holmes* canon relies on familiar imagery to transcend Holmes into a variety of settings and plots. Many Holmes fans recognize the classic styling of the pipe, the deerstalker hat, the magnifying glass, and the detective's cape or coat. Although these traits seem uniquely Sherlock, many of these Holmesian tropes were codified by certain portrayals—specifically, the Basil Rathbone film series. Basil's adaptations became so popular that they inspired a book series, which was animated into the Walt Disney cartoon *The Great Mouse Detective*. While *The Great Mouse Detective* is billed as a *Sherlock Holmes* adaptation, the mouse detective Basil of Baker Street mirrors the Basil Rathbone adaptations, particularly when concerning characterization. In this way, Basil Rathbone becomes a separate entity from Holmes entirely—with separate quotes, personality tics, and cooperation with authority that does not appear in the original *Holmes* canon. The Disney film utilizes the Victorian gaslight setting in the tradition of *Sherlock Holmes*, but includes many uniquely Basil tropes in the characterization of the mouse detective and his contemporaries. Perhaps the most prominent distinction between Basil and Holmes is that Holmes appears as a proper figure within the film, a “violin-scraping silhouette (voiced by the late Basil Rathbone) who paces the upper floors of 221B Baker Street, telling Watson that he needs louder German music” (Barnes 71). This separation of Basil the mouse detective, and Holmes the human detective, simulates further distance from the Rathbone Holmes and Doyle's Holmes. Basil is an iconic image within the canon as Holmes himself, a ‘Basil-ized’ Holmes is familiar to modern audiences, especially the tropes of bumbling Watson and the phrasing of “Elementary.”

“Like a gypsy foundling”: Cultural Implications of the Countess Olenska in Edith Wharton's *The Age of Innocence*

Presented at the 2014 NCUR, April, 2014 and the Ninth Annual Winthrop University Department of English Undergraduate/Graduate Research Conference, March, 2014

Student: Brierly Wills (2015)

Faculty Mentor: Leslie Bickford, Ph.D.

CAS – Department of English

(ENGL 300 – Bickford)

Although isolated within the nineteenth century, *The Age of Innocence* cannot exist without the influence of the twentieth century. Wharton composed *The Age of Innocence* as a reaction novel, a commentary against old New York tradition with the knowledge she had garnered in a post-WWI society. T.S. Eliot has referenced a “literary rupture” occurring at the onset of the Modernist period that rendered “old literary modes... no longer adequately expressive” (Klimasmith 556). Critic Betsy Klimasmith argues that by incorporating modern theories of memory and time into a narrative of an era past, Wharton bridges this “literary rupture” and effectually creates the hybrid Realist-Modernist novel (Klimasmith 557). While Klimasmith narrows her thesis to capture philosophy within *The Age of Innocence*, I will argue that the influence of the twentieth century on Wharton's nineteenth century setting is best demonstrated through the characterization of the Countess Ellen Olenska, specifically interpreted through the eyes of protagonist Newland Archer. Olenska represents a shunned foreigner, a non-conformist, and a threat to the stability of old New York society. By studying old New York society, Wharton uncovers a vast universal unconsciousness that controls the elite, and she proceeds to experiment with her past by throwing a wrench in its stability—the Countess, the exotic non-conformist.

Political Theater in *Richard II*: Allusions to Queen Elizabeth that Inspired and Doomed the Essex Rebellion

Presented at the 2014 NCUR, April, 2014

Student: Brierly Wills (2015)

Faculty Mentor: Matthew Fike, Ph.D.

CAS – Department of English

(ENGL 305 – Fike)

The Earl of Essex commissioned Shakespeare's *The Tragedy of King Richard II* in order to fuel a rebellion against Queen Elizabeth. His strategy was an abject failure. While previous critics such as Genevieve Love have noted the great importance of the deposition scene, little has been written about the role of the scene's political theater in undermining Essex's intentions. My thesis is that, despite the apparent comparison of King Richard II and Queen Elizabeth, the Essex rebellion was ultimately unsuccessful because the political theater in the deposition scene creates, as New Historicists have argued more generally, a “pressure release valve” that defuses the emotions of the audience. Essex had hoped that the play itself would serve as a reminder of Elizabeth's deficiencies as queen; however, the elements of political theater within the deposition scene may have backfired for him. For example, there are parallels to Elizabeth in the scene's imagery, Richard's forced reading of his wrongs, and the contrast in style between him and Bolingbroke. To Essex, these references to the queen, coupled with the deposing by the Everyman-figure Bolingbroke, seemed perfect fuel for the fire of rebellion. In theory, such intense political theater should have worked to the rebels' advantage, but *Richard II* may actually have diminished the chances of a successful coup. The problem is that exag-

generating Richard's similarities to Elizabeth and styling Essex as a Bolingbroke-figure probably alleviated qualms that the audience may have had with her leadership provided what New Historicism calls a societal "pressure release valve." Thus the deposition scene, which works as political theater for the rebels in the play, was a failure for the real-life rebels who hoped to foment an uprising.

Other Student/Faculty Collaborations

Water Quality and Biomonitoring Comparison in Two Rock Hill Streams

Student: Shelby Bessette (2013)

Faculty Mentor: Peter Phillips, Ph.D.

CAS – Department of Biology

(ENVS 495 – Phillips)

A rural stream, Six Mile Creek, and an urban stream, Manchester Creek, were monitored to compare water quality. Water quality parameters, total bacterial coliforms, and macroinvertebrates were sampled weekly for six weeks. Parameters were compared between the two sites and with the water quality criteria set by the South Carolina Department of Health and Environmental Control (SCDHEC). Both Manchester Creek and Six Mile Creek's phosphorus levels exceed the state's standards, and the two sites are statistically different in terms of conductivity, pH, and numbers of Caddisflies.

Gun-Control in America: The Effect of the Federal Assault Weapons Ban and the Brady Bill on State Murder Rates and Mass Shootings

Student: Steven Buckingham (2014)

Faculty Mentors: Michael Lipscomb, Ph.D. and Stephen Smith, Ph.D.

CAS – Department of Political Science

(PLSC 490 – Lipscomb and Smith)

In the early 1990s murder rates across the country were reaching record highs, which led to the first significant gun-control legislation since 1986. In the nearly ten years since the federal assault rifle ban expired, several high profile mass shootings have called into question the need for a new ban. The purpose of this research paper is to examine the Federal Assault Weapons Ban (AWB) in terms of quantitative data measuring state murder rates before, during, and after the ban. A simultaneous examination of mass shootings defined as three or more victims—not including the shooter at one location—will further serve to either prove or debunk the usefulness of the AWB. Additionally, I will examine the effect of the Brady Handgun Violence Prevention Act of 1994 by exploring the quantitative data on gun purchases, background checks, and sales prevented in the last two decades to determine if there is any correlation between this bill and a decrease in murder rates or mass shootings across the country. An analysis of current research indicates little to no significant correlation between these two bills and a decrease in murder rates. Initial data findings indicate that while murder rates began to decrease following the 1994 passing of the bills, this downward trend has continued since the expiration of the AWB. There appears to be no change in the frequency of mass shootings either, indicating that the AWB and the Brady Bill have had no significant effect on either murder rates or mass shootings in America.

Gun Laws and Domestic Violence in South Carolina

Student: Sarah Cohen (2015)

Faculty Mentors: Michael Lipscomb, Ph.D. and Stephen Smith, Ph.D.

CAS – Department of Political Science

(PLSC 490 – Lipscomb and Smith)

This paper looks at the correlation between guns and domestic violence in South Carolina, hypothesizing that looser gun laws are related to the deaths of women at the hands of men in the state. As such, a reform of gun policy in South Carolina is needed to curb these deaths.

This paper examines the gun laws and rates of usage in domestic violence deaths in the top ten states for domestic violence against women to see if a similar pattern emerges of loose gun laws and high domestic violence death rates, and then it compares these results to the patterns of the ten best states. The paper then addresses gun laws in South Carolina to suggest precise reforms that could be made.

Identification and Characterization of FoxO-DNA Interactions in *Ciona* Intestinalis

Supported by an SC INBRE grant

Student: Spenser Cote (2014)

Faculty Mentor: Nicholas Grosseohme, Ph.D.

CAS – Department of Chemistry, Physics, and Geology

Recent research has identified *Ciona* intestinalis as a model organism for heart regeneration. FoxO is an important protein in the life cycle of *Ciona* intestinalis. Human FoxO1 and *Ciona* intestinalis FoxO1 share an area of high similarity in amino acid residues. This area corresponded to the Forkhead DNA binding region of FoxO1. Previous *in vitro* experiments in our lab have characterized the Protein-DNA interactions between FoxO and the known regulatory elements, insulin response element from humans and Daft-16 binding element from *Drosophila* melanogaster. However, these DNA sequences are not found in the *Ciona* genome. Therefore, we sought to identify the sequences of DNA that FoxO binds to *in vivo* and express FoxO endogenously. To do this we utilized the Chromatin Immuno-Precipitation Assay (ChIP Assay) to identify the sequences of the *Ciona* intestinalis genome that FoxO binds to. For the ChIP assay, we opted to make use of the readily available antibody that recognizes hexahistidine tagged proteins. While *Ciona* intestinalis naturally expresses FoxO, it is not hexahistidine tagged. Using standard cloning techniques, a hexahistidine tagged FoxO DBD was inserted into a pCes, *Ciona* expression system, expression plasmid developed by colleges at Stanford. Once confirmed by sequencing, the expression plasmids were then electroporated into *Ciona* intestinalis embryos. Once FoxO is successfully expressed by *Ciona* intestinalis a ChIP Assay will be performed.

Investigations of Inorganic Soil Development in the Peat of the Congaree Muck Swamp

Supported by a Dalton Endowment grant and the Winthrop University Research Council

Student: Spenser Cote (2014)

Faculty Mentor: Scott Werts, Ph.D.

CAS – Department of Chemistry, Physics, and Geology

Congaree National Park, near Columbia, South Carolina, is a floodplain forest that contains the United States' largest contiguous tract of old-growth bottomland forest as well as one of the highest natural canopies that remains on Earth. A portion of the park contains a ground-water fed muck swamp and is in the footprint of several ancient meanders of the Congaree River. Within one ancient meander lies an extensive peat deposit assembled over thousands of years from the formation of an oxbow lake. The aim of this study is to investigate the origin of an inorganic soil horizon forming near the surface of the peat at varying depths. Initial exploration of the muck swamp area suggests that the inorganic layer is varying in thickness throughout the swamp, becoming thicker in the center of the deposit. Because the layer is consistent through the area and lies a large distance from the river, we have been able to eliminate the possibility of flooding from the river and bioturbation as possible causes for the layer. Previous investigations into the stable isotopic signature of the carbon in the layer revealed consistent $\delta^{13}\text{C}$ values throughout that layer (-28.0 to -28.5‰), suggesting that the cause is likely not high levels of decomposition within this layer. The most likely cause of this loss of carbon is the seasonal fluctuation of the water table within this area. During the spring and summer, groundwater is drawn down due to the evapotranspiration processes of

the vegetation. During the fall and winter, the water table rises again due to the plants going dormant and not drawing any water. As the water table rises, it likely dissolves some of the organic carbon in the upper layers of the soil. As the water table lowers again, the dissolved carbon is removed from the upper portions of the soil and transported out in the groundwater to nearby Cedar Creek. This research will aid in clarifying a major portion of the carbon cycle within this area and provide insight into the altered landscape seen in the muck swamp area.

Effect of pH on the Morphology of Hydroxyapatite by Hydrothermal Synthesis

Student: Leighton Daniels (2014)

Faculty Mentor: Maria Gelabert, Ph.D.

CAS – Department of Chemistry, Physics, and Geology

(CHEM 551-552 – Sumter)

The research investigates the effect of pH on growth of hydroxyapatite crystals grown with hydrothermal methods. As the most compatible biomineral in human bone and teeth, hydroxyapatite ($\text{Ca}_5\text{OH}(\text{PO}_4)_3$) is the ideal choice for bone and tooth repair or growth. While there are established uses for hydroxyapatite, there is a lack of understanding in the aqueous chemistry of the hydrothermal synthesis of this crystal. Crucial components of the aqueous chemistry include nucleation rate, supersaturation, and the reaction conditions under hydrothermal synthesis. In general, high supersaturation leads to large nucleation rates, faster growth and consequently smaller crystals. Conversely, low supersaturation allows for fewer nucleation sites, slower growth and bigger crystals. Concentration, complexation chemistry and pH conditions can also affect crystal growth. Using stoichiometric quantities of calcium and phosphate, ethylenediaminetetraacetate was used as a chelating agent and calcium ion molality was maintained at 0.05 for pH 5-11. Supersaturation values were obtained with OLIAalyzer aqueous speciation software and experiments performed in Teflon-lined autoclaves. Crystals were imaged with compound optical microscopy. From this research, it is concluded that the needle formation, though often in clusters, of hydroxyapatite is dominant in the pH range of 5-11. It is also seen that growth of larger needles occurs between pH 7 and 8 due to slower growth rates predicted using the saturation plots.

The Reaction of O-Silylated Cyanohydrin Anions with Epoxides as an Alternative for the Enantio- and Diastereoselective Preparation of Aldols

Students: James Dean (2014) and Lissa DiSparano (2014)

Faculty Mentor: Aaron Hartel, Ph.D.

CAS – Department of Chemistry, Physics, and Geology

The aldol addition is one of the most important carbon-carbon bond forming reactions in chemical synthesis. The traditional form of this reaction, between an aldehyde or ketone and a second enolized aldehyde or ketone, results in the formation of a β -hydroxycarbonyl (often referred to as an “aldol product”). The reaction can result in the formation of up to two new chiral centers, and the absolute and relative stereochemistry of the product can be challenging to control. Modern variations, especially those of Evans and related strategies, have allowed for significant enantio- and diastereoselectivity in the reaction. These methods, while extremely useful, have several drawbacks, including poor atom economy, use of expensive auxiliaries, and the additional synthetic steps required to introduce and remove these auxiliaries. An alternative potential route for the enantio- and diastereoselective preparation of aldol products is the reaction of O-silylated cyanohydrins anions with epoxides. This method would take advantage of the wealth of excellent asymmetric epoxidation procedures available, providing an efficient method for the stereoselective formation of aldols. A critical step in this method is the desilylation of the initially formed adduct. Under basic conditions, the removal

of the silyl group triggers the expulsion of cyanide and forms the final aldol product. Unintended removal of the silyl group prior to the addition of the epoxide decreases the final yield and introduces many undesired side products. A variety of silyl groups have been explored with the goal of discovering one that is easily cleaved after the addition of the epoxide but is sufficiently robust to avoid premature cleavage. The trimethylsilyl (TMS), triethylsilyl (TES) and t-butyltrimethylsilyl (TBS) protected cyanohydrins of benzaldehyde have been prepared and treated with LiHMDS followed by 1,2-epoxybutane. The TMS group showed considerable decomposition during the reaction, but the adduct was easily cleaved with dilute NaOH to give the desired aldol product. Both the TES and TBS groups reacted cleanly without degradation during the reaction. The TES group could be cleaved with dilute NaOH, however the TBS group required the use of TBAF, a more powerful and expensive reagent.

Nietzsche’s Background: Heraclitus and the Doctrines of Eternal Recurrence and Will to Power

Student: Aaron Everhart (2014)

Faculty Mentors: Gregory Oakes, Ph.D.

CAS – Department of Religion and Philosophy

(PHIL 495 – Oakes)

The purpose of this paper is to argue that a significant philosophical influence upon Nietzsche’s metaphysical system, expressed through the dual doctrine of eternal recurrence and will to power, is that of Heraclitus. First, this paper outlines both doctrines and, following Heidegger, asserts that they comprise, together, Nietzsche’s metaphysics. Then the influences of two pre-Socratics, Anaximander and Heraclitus, are discussed with regards to eternal recurrence. It is argued that Heraclitus’ philosophy is more directly aligned with Nietzsche’s, and that Nietzsche’s writings concerning Heraclitus show proof of their similarity. From there, Schopenhauer’s influence on Nietzsche’s philosophy of will to power will be acknowledged, and then Heraclitus’ influence will be argued for as the more significant influence on the content of that idea as well. Thus in forming both ideas, it will be shown that Nietzsche takes significant influence from the philosophy of Heraclitus.

Where is Al Qaeda Now?

Student: Ryan Fiehn (2014)

Faculty Mentors: Stephen Smith, Ph.D. and Michael Lipscomb, Ph.D.

CAS – Department of Political Science

(PLSC 490 – Smith and Lipscomb)

Osama Bin Laden was pivotal in the realization of the extensive Al Qaeda terrorist network. Bin Laden was essential to the coherence of the whole network because most groups operated solely within a region. In the aftermath of Bin Laden’s death and two wars in the Middle East analysts are arguing whether Al Qaeda is expanding its influence through its franchises or, on the other hand, starting to die down due to its lack of central core leadership. This research looks into Al Qaeda’s shift from a core-centered organization to a more decentralized organization with many franchised groups. To the degree that Al Qaeda’s network has been operating through regional franchises that have influence over a region, this research will weigh their allegiances to their parent company’s core principles.

The Development of Pragmatism

Student: Brantley Fraser (2014)

Faculty Mentor: Gregory Oakes, Ph.D.

CAS – Department of Religion and Philosophy

(PHIL 495 – Oakes)

The topic of the essay to follow is the development of the pragmatism of William James through Richard Rorty. Josiah Royce, Charles S. Peirce, and Chauncey Wright significantly influenced James' pragmatism in their own ways, and they each left a noticeable impression on his pragmatic philosophy. In rendering his pragmatism we will have to understand the concepts of relativism, idealism, objectivity, subjectivity, and epistemology. However, William James leaves us with a version of pragmatism that is incomplete, and leaves concerning questions that have yet to be answered, particularly what justifies action and how his pragmatism fits into conventional philosophical discussion. In the 20th century, analytic philosopher Richard Rorty attempts to advance and solidify the inconclusive version of pragmatism that James explicates. The following essay will attempt to mend the disjunction between where James left his pragmatism and where Rorty completes his.

Genetic Connectivity among the Meiofauna

Supported by the Winthrop University Research Council

Student: Parisa Geranmayeh (2015)

Faculty Mentors: Julian Smith III, Ph.D.

CAS – Department of Biology

The marine meiofauna (small animals living between sand grains) have long puzzled biologists because of the relatively large number of apparently cosmopolitan species. This phenomenon, known as the "meiofaunal paradox," is not currently understood. How could such tiny animals maintain sufficient genetic connectivity along or across major ocean basins to avoid morphological divergence? Suggested explanations include very low rates of evolution, long-shore transport by waves and currents, anthropogenic transport in ballast water, and the existence of cryptic species. In order to test these hypotheses, we have undertaken a study of population connectivity in a predatory meiofaunal flatworm (*Gnathorhynchus caudafiliformis*) using inter-simple-sequence repeats (ISSR). As the name implies, the ISSR method amplifies short stretches of DNA between repeated regions (for example, GAGAGA). ISSR fragments are easily recovered by PCR and have provided a useful tool for studying genetic variation among populations in other systems; they have already had limited application in the meiofauna. As a given fragment can be treated as a dominant Mendelian allele, a unique pattern of fragments indicates genetic identity that is expected to be shared by members of an interbreeding population. We chose *Gnathorhynchus caudafiliformis* as it apparently has a cosmopolitan distribution, being reported from New Brunswick, Canada and also occurring at our sampling sites on the NC coast. In addition, this species appears in large numbers at a variety of ecologically different sites in March, implying seasonal active movement into the water column followed by current-mediated dispersal. Using a set of specimens collected at two sites 500m apart, we have chosen primers and optimized their annealing temperatures for PCR. This March, additional specimens will be collected from sites separated by distances up to 40km, and added to the analysis. Understanding population structure and rate of immigration will allow us to better understand the degree of genetic exchange among distantly separated populations of this species.

Aromatization of Fragrant Monoterpenes via Palladium Catalyzed Dehydrogenation

Student: Tymeshia Hill (2014)

Faculty Mentor: Aaron Hartel, Ph.D.

CAS – Department of Chemistry, Physics, and Geology

Terpenes (terpenoids) are a diverse class of naturally occurring compounds. Structurally, terpenes are comprised of repeating units of 'isoprene' (2-methyl-1,4-butadiene). The most common terpenes are formed from two isoprene units (monoterpenes), three isoprene units (sesquiterpenes), or four isoprene units (diterpenes). We have developed an experiment for an organic chemistry laboratory course in which familiar monoterpenes are aromatized via dehydrogenation to give familiar monoterpene products. Specifically, limonene (from lemon oil), carvone (from spearmint oil) and pulegone (from catnip) are aromatized to p-cymene (from oregano and thyme), carvacrol (from oregano) and thymol (from thyme) respectively. The starting monoterpenes were dissolved in ethanol and heated via reflux or microwave irradiation in the presence of Pd/C as a catalyst. The products were isolated after filtration and evaporation of solvent and then characterized using ¹H-NMR and GC-MS. Thus, carvone was converted to carvacrol with excellent purity and a 90% yield. Limonene was converted to a 3:1 mixture of p-cymene and menthane, with a total yield of 52%. Pulegone was converted to a 1:1 mixture of thymol and menthane, which could be separated via acid-base extraction to give impure thymol with a 46% yield.

Children's Attitudes toward Reading

Student: Kierra James (2013)

Faculty Mentor: Antigo Martin-Delaney, Ph.D.

CAS – Department of Psychology

This study examined third through fifth grade children's attitudes toward general, academic, and leisure reading. This study had five research questions: "What are children's attitudes toward reading," "How do attitudes toward reading affect children's perceptions about if they read well," "Are reading attitudes different for leisure versus academic reading," "Do these attitudes change as children grow older," and "Are there any gender differences in attitudes toward reading in children?" This research used a 30 item Likert-type questionnaire based on the Elementary Reading Attitude Survey. Three of the research questions were answered as expected based on the previous literature.

Hydrothermal Investigation of Calcium Carbonate

Supported by a SAN EPSCoR/IDeA grant

Student: Taisha Jones (2014)

Faculty Mentor: Maria Gelabert, Ph.D.

CAS – Department of Chemistry, Physics, and Geology

Hydrothermal synthesis is a method that uses hot, pressurized water for crystal growth. For this research, the hydrothermal method was used to produce calcium carbonate, an important biomineral. Some of the experiments for this research used a calcium ion complexing agent such as ethylenediaminetetraacetate (EDTA), L tyrosine, DL-aspartic acid, L-lysine and L-cysteine. The molar ratio of complexing agent to calcium was varied. For the experiments without complexing agent, pH was investigated. The morphology and the supersaturation value for the product was determined using microscopy and OLI Systems speciation software. Supersaturation, defined as the ratio between molality of a specific ion divided by the saturated solution molality, is a measure of the tendency towards crystallization such that any value greater than 1 is expected to produce crystals. Furthermore, supersaturation values closer to 1

generally result in larger crystals compared to supersaturation values that are much larger. For samples without ligand, experimental results indicate that the supersaturation values decrease as the pH increases, and imaged crystals correlate with an increase in size as pH increases. For the amino acid experiments, average supersaturation value for DL-aspartic acid was higher than the average value for the samples that used L-lysine, and the corresponding crystals for aspartic acid are smaller. In summary, experiments with these different amino acids and no ligand demonstrate that crystal sizes vary inversely with supersaturation, which is consistent with crystal growth theory.

Analysis of Meiofaunal Trophic Relationships via Diagnostic PCR

Supported by the Winthrop University Research Council

Student: Kyle McDaniel (2016)

Faculty Mentor: Julian Smith III, Ph.D.

CAS – Department of Biology

Although an understanding of trophic levels is critical to understanding the ecology of a community, the meiofaunal food web has been not been accurately and precisely described to this date due to the limited ability to observe and detect prey in the small animals' guts. Therefore, we have undertaken a project using diagnostic PCR to illuminate and describe the platyhelminth predators of Harpacticoida (according to protocols previously established). The main objective is to amplify only the prey DNA without simultaneously amplifying the large quantities of predator DNA in the sample. Prey-taxon-specific primers have been developed to identify to species level the harpacticoid prey of a number of meiofaunal flatworms. Using this method in future experiments will allow the trophic relationships among the meiofauna to be more clearly understood, which will allow hypotheses to be developed concerning both long- and short-term changes in this community.

The Many Faces of Gender Discomfort in Peer Tutorials

Student: Lauren Michelle Miller (2016)

Faculty Mentor: Jane Smith, Ph.D.

CAS – Department of English

(WRIT 500 – Smith)

Within the large realm of literature on gender differences in peer tutorials and the problems that can stem from gender differences, there has been little work done on the subject of gender discomfort. When a student has an existing cause to be uncomfortable with the gender of her tutor, this can inhibit the success of the tutorial greatly. This study looks exclusively at gender discomfort that exists in female students toward male tutors. The factors that can cause gender discomfort have been organized into three categories, ranging from the most extreme to the least noticeable; these categories are The Obstructed Tutorial, The Awkward Tutorial, and The Non-Effective Tutorial. In an attempt to help alleviate these problems, the study gives examples of what each of these tutorials could look like, analyzes the psychological aspects influencing the problems, and proposes possible treatment for each. This is done in the hope that both students and tutors alike can be better educated on this subject and avoid problems with gender discomfort within a tutorial.

Studies of the Hedgehog Signaling Pathway in *Stenostomum virginianum* (Platyhelminthes)

Supported by a SC INBRE grant

Student: Marquet Minor (2015)

Faculty Mentor: Julian Smith III, Ph.D.

CAS – Department of Biology

The purpose of this study is to distinguish the Hedgehog signaling pathway (Hh) in the freshwater flatworm, *Stenostomum virginianum*. The significance of this organism is that it is a primitive flatworm, which leads to the ability to gain more knowledge on the evolutionary association of cilia with Hh. The role of cilia in Hedgehog signaling varies among animals. Certain organisms are cilia-dependent in their Hedgehog signaling, while others conduct signaling independently of cilia. For example, both zebrafish and mice are known to be cilia-dependent, in order to conduct signaling. Conversely, fruit flies and planarians do not require cilia for signaling. As previously shown by Jonathan Nguyen in our lab, cyclopamine, which is a Hh pathway inhibitor, decreases both mitosis and fissioning in *Stenostomum virginianum*. This down regulation of cell-cycling is typical when Hedgehog signaling decreases. Cyclopamine treatment did not affect the motile cilia in this organism. The ciliated epidermis was unchanged, which suggests that Hh signaling is cilia-independent in this organism, and by extension, that cilia-independent Hh signaling is evolutionarily primitive condition in all flatworms. Proteins associated with the Hh pathway were identified in the transcriptome, including orthologues for Hedgehog, Kif 7 and multiple possible orthologues for Patched and Smoothened. The latter two are problematic because Patched is a paralogue of NPC-1 and Smoothened is a paralogue of Frizzled-family proteins. Primers have been designed and PCR used to verify the existence of the transcripts above. The orthologue of Kif 7 has been fully sequenced, and PCR products of the remaining transcripts have been prepared for sequencing. Next, qPCR primers will be designed and tested to analyze Patched expression. Patched is up-regulated when Hedgehog is activated, so cyclopamine treatment should decrease its expression; this technique will allow us to identify the correct orthologue of Patched among the three possible transcripts. Hh plays a critical role in development in many organisms, including humans. The importance of this study is to advance the comprehension of how cilia and Hh are intertwined. This can ultimately lead to control of abnormalities associated with both cilia and the signaling pathway, which can cause several disorders in humans.

Antimicrobial Properties of Common Mullein (*Verbascum thapsus*) on Selected Bacteria Strains

Student: Katherine Rigby (2014)

Faculty Mentors: Victoria Frost, Ph.D. and Kunsiri Grubbs, Ph.D.

CAS – Department of Biology

Common mullein (*Verbascum thapsus* L., Scrophulariaceae) has been used by the Catawba Indians to treat illnesses such as bronchitis, asthma, dry coughs, and other pulmonary issues. Earaches and inflamed skin conditions can be treated with an infusion of commercially available oil and mullein flower extract. There have been a number of reviews describing the use of plant extracts for medicinal purposes and some amount of published scientific data to verify the antimicrobial properties of this particular species of plant. The objective of this study was to further examine the possible antimicrobial activity of mullein leaf, flower, and stem extracts on five selected bacteria strains, including those in the genus *Mycobacterium*, using the disc diffusion method. The leaf extract was obtained by decoction and rotary evaporation while the flowers and stems were saturated in mineral, corn, and olive oils before being tested against the bacteria. Experiments were done in triplicate and zones of inhibition were measured and compared to antibiotic controls. Initial results have demonstrated that

the flower extract obtained by olive and corn oil saturation has some inhibitory effects against bacterial growth. The leaf extract was effective against *Mycobacterium smegmatis* and *Staphylococcus aureus*. Further analysis aims to identify if these results are statistically significant and may give further explanation as to why this plant has been traditionally used to treat lung and skin conditions.

Immunohistochemical Localization of Melatonin in *Stenostomum virginianum* (Platyhelminthes)

Student: Samuel Robinson, Jr. (2014)

Faculty Mentor: Julian Smith III, Ph.D.

CAS – Department of Biology

(BIOL 471 – Smith)

Melatonin is produced in a wide range of eukaryotic organisms and it may have originally functioned as an antioxidant. In vertebrates, melatonin is a hormone secreted by the pineal gland in the brain and serves to synchronize rhythms ranging from circadian activity patterns to reproductive cycles. An analogous role in circadian timing is seen in triclad flatworms, where melatonin is synthesized and stored in the brain at night and released from the brain during the day in response to illumination. Again in triclads, melatonin inhibits fissioning and mitoses during the photophase and suppresses both processes when added exogenously. Given this, it might be expected that melatonin would govern both fission and mitosis in the most primitive flatworms, the catenulids. Previous work done by Dan Stanton in our lab shows that exogenously-added melatonin suppresses both asexual fission and mitoses in the catenulid *Stenostomum virginianum*. However, the location(s) of synthesis and secretion of melatonin in this organism remain to be elucidated. Accordingly, we have begun developing a protocol for immunohistochemical localization of melatonin in *Stenostomum virginianum* during two opposite parts of the circadian cycle (ZT9 and ZT23) using rabbit anti-melatonin primary antibody and Cy3-labeled Donkey anti-rabbit secondary antibody with Alexa488/phalloidin and Hoechst 33342 being used for localization of muscles and nuclei respectively. This research will allow us to show the location of melatonin in relation to photoperiod.

Crash, Bang, Pow: How the Cold War Changed Comics in the United States and Mexico

Student: Amber Schilling (2014)

Faculty Mentor: Gregory Crider, Ph.D.

CAS – Department of History

(HIST 590 – Crider)

The comics industry reached a pinnacle in the mid-20th century. As a rich and influential medium for youth culture, comics reflected the conditions of the Cold War, in both the United States and Mexico. Drawing on previous scholarship as well as comics from the time, this paper illustrates how the culture and politics of the Cold War found their way into popular comics and how American and Mexican society responded to the medium. This paper examines how the Cold War influenced comics in these two nations in terms of creation, readership, and controversy. Comic book creators like Stan Lee and José Guadalupe Cruz drew from their surroundings to reinforce or rebut Cold War cultural norms. American and Mexican youths looked to comics not only for entertainment but also valuable cultural instruction. Parents and politicians in both nations grew alarmed with the

violence, sex, and political undertones within comics, resulting in a wave of controversy and censorship. This paper addresses these issues to give an overview of this popular medium at the height of its influence and success.

A Genealogy of Indigeneity

Student: Sarah Sladek (2014)

Faculty Mentor: Michael Lipscomb, Ph.D.

CAS – Department of Political Science

(PLSC 490 – Lipscomb and Smith)

This paper develops a genealogical understanding of the concept of “indigeneity” through articulating how the mechanism of an imperialist “othering” process has created a false dichotomy between “indigeneity” and “modernity” and is used to racialize production within the context of global capitalism. I discuss how western hegemony has negatively constructed indigeneity to justify the subjugation of ethnic groups globally. I discuss who and what institutions have produced this construction and to what end. Also discussed is the impact that this construction has on the material realities of indigenous people and how the structure of “indigeneity” limits the agency that the individual indigenous person and indigenous communities on the whole are able to exercise. Conversely, I describe the ways in which indigenous peoples have conceptualized their oppression and deconstructed, reconstructed, and reclaimed the identity of “indigenous” in order to mobilize around common interests.

“They say the best men are molded out of faults”: Angelo of Measure for Measure and Shakespeare’s Stand against Puritanism

Student: Jeanne Stroud (2014)

Faculty Mentor: Matthew Fike, Ph.D.

CAS – Department of English

(ENGL 305 – Fike)

This essay responds to the absence of Freudian criticism on Shakespeare’s *Measure for Measure* by using Sonnet 129 to explain how the parts of the psyche relate to the character Angelo. The correspondence between the sonnet and the divisions within Freud’s model of the psyche—superego, ego, and id—suggests that Angelo represents Shakespeare’s critique of Puritanism’s condemnation of the Elizabethan theater. Following a Freudian analysis of the sonnet, the essay finds that Angelo shifts from the superego to the id when he abandons his strict moral code for lust, becoming like the festering lily in Sonnet 94. The failure of Angelo’s ego to mediate between the superego and the id comments on Puritans’ objection to plays and play-going. In *Measure for Measure*, psychological health lies not in the Puritans’ emphasis on superego over id (or reason over desire) but in a harmonious balance of opposites mediated by the theater, which stands in for the ego.

OFFICE OF NATIONALLY COMPETITIVE AWARDS (ONCA)

Winthrop University's Office of Nationally Competitive Awards (ONCA) identifies and assists highly motivated and talented students to apply for nationally and internationally competitive awards, scholarships, fellowships, and unique opportunities both at home and abroad. ONCA gathers and disseminates award information and deadlines across the campus community, and serves as a resource for students, faculty, and staff throughout the nationally competitive award nomination and application process.

The ONCA Award Recognition Ceremony is an annual event recognizing the difficult and rewarding challenge taken on by Winthrop University students to apply for some of the most prestigious scholarships in the nation and the world. Win or lose, the *process* of personal reflection required to complete a nationally competitive award is often transformative in a student's life, and can be as important as the outcome. ONCA's Seventh Annual Award Recognition Ceremony (2013-2014) celebrates nationally competitive award applications for scholarships including the Rhodes Scholarship, the Truman Scholarship, National Science Foundation Fellowships, the Knowles Science Teaching Foundation Fellowship, and the Benjamin A. Gilman International Scholarship to study abroad.

Scholars who applied for these and other prestigious awards spent countless hours writing and revising Personal Statements, Policy and Research Proposals, essays, resumes, and answers to "short answer" questions on application forms (which are never short, and always challenging). In the process, I hope each student learned a little more about him or herself and his or her goals. I'd like to acknowledge and applaud your hard work and say how much I enjoyed getting to know each of you this year.

In addition to recognizing the work of each of our ONCA Scholars, I would like to thank each and every member of the Winthrop University community who has given a student an encouraging word, recommended a student for ONCA in person or through the online midterm reporting system established by Dean Gloria Jones, brought an ONCA presentation into the classroom, participated in an award selection or mock interview committee, or served on the ONCA Advisory Board. I would especially like to thank members of Winthrop faculty and administration who have written letters of recommendation for our students this year: this is an arduous undertaking, often resulting in a two- to three-page letter full of descriptive detail about our students, their capabilities, and their potential. For all of your time and effort, your students and I thank you.

Leslie Bickford, Ph.D.

Assistant Professor of English
Director, Office of Nationally Competitive Awards (ONCA)
Winthrop University
April 2014

OFFICE OF NATIONALLY COMPETITIVE AWARDS (ONCA)
SEVENTH ANNUAL AWARD RECOGNITION CEREMONY 2013-2014
SATURDAY, APRIL 26, 2014 10:30–11:00 a.m.

ONCA AWARD NOMINEES AND WINNERS 2013-2014

American Bar Foundation Montgomery Summer Research Diversity Fellowships in Law and Social Science for Undergraduate Students: The American Bar Foundation sponsors a program of summer research fellowships to interest undergraduate students from diverse backgrounds in pursuing graduate study in the social sciences. Each student will be assigned to an American Bar Foundation Research Professor who will involve the student in the professor's research project and act as mentor during the student's tenure. The students also will participate in a series of seminars and field visits to acquaint them with the many facets of sociolegal research and the legal system.

- Winthrop University Nominee: Andrew Harris

Benjamin A. Gilman International Scholarship Program: The Gilman scholarship awards 2,300 scholarships of up to \$5,000 per academic year for U.S. citizen undergraduate students of limited financial means to pursue academic studies abroad. Such international study is intended to better prepare U.S. students to assume significant roles in an increasingly global economy and interdependent world.

- Winthrop University Nominee: Rodger Bishop
- Winthrop University Nominee: Leslie Brown
- Winthrop University Nominee: Faith Cook (award pending)
- Winthrop University Nominee: Dana Farrior
- Winthrop University Nominee: Emily Hokett (award pending)
- Winthrop University Nominee: Melanie Jones (award pending)
- Winthrop University Nominee: Simone Mayers
- Winthrop University Nominee: Kyle McDaniel (award pending)
- Winthrop University Nominee: Chrystal Winzenried

The Barry M. Goldwater Scholarship and Excellence in Education: The Goldwater scholarship fosters, encourages, and rewards math, science, and engineering majors of outstanding potential with support for the completion of their undergraduate studies. Each scholarship covers eligible expenses for undergraduate tuition, fees, books, and room and board, up to a maximum of \$7,500 annually.

- Winthrop University Nominee: Jessica Logan (award pending)
- Winthrop University Nominee: Kyle McDaniel (award pending)
- Winthrop University Nominee: Mitch Schneider

The Elie Wiesel Prize in Ethics: The Elie Wiesel Essay Contest was established in 1989 as an annual competition designed to challenge college students to analyze the urgent ethical issues confronting them in today's complex world. Students are encouraged to write thought-provoking personal essays that raise questions, single out issues and are rational arguments for ethical action. There is a \$5000 first prize, \$2500 second prize, \$1500 third prize, and two \$500 honorable mentions for personal essays on ethics.

- Winthrop University Nominee: Alexander Muller

FIE Dublin Scholarship: Worth \$1,000, these scholarships are open to all students enrolled in FIE study abroad programs. Application is by competition. Students can choose from three application routes: an Importance of Study Abroad route, an Environmental Initiative route and a Charity Initiative route. These various pathways provide students with the opportunity to engage in meaningful cultural immersion and social responsibility projects and activities.

- Winthrop University Nominee: Lexi Barnhill (award pending)

Fulbright Award for Graduate Study Abroad: One of the most widely recognized academic honors, the Fulbright awards provide support for graduate students and young professionals to study abroad. Awards include full grants for an academic year of study or research, travel grants and teaching assistantships in English.

- Winthrop University Nominee, Graduate Study Abroad: Sigourney Woodfork (Finalist, award pending)
- Winthrop University Nominee, English Teaching Assistant Abroad: Amber Schilling

Jack Kent Cooke Foundation Graduate Arts Award: The Jack Kent Cooke (JKC) Graduate Arts Award recognizes and rewards America's promising up-and-coming artists from lower-income backgrounds with the nation's leading graduate scholarships in the visual arts, performing arts, and creative writing. The JKC Foundation identifies exceptional individuals who not only have exceptional artistic or creative promise, but also demonstrate academic achievement and the will to succeed in their chosen fields.

- Winthrop University Nominee: Lauren Clark
- Winthrop University Nominee: Alexander Muller

Knowles Science Teaching Foundation Fellowships: KSTF Teaching Fellows are young men and women who have received a bachelor's or advanced degree in science, engineering or mathematics and are committed to teaching high school science and/or mathematics in U.S. schools. The fellowship supports them professionally and financially for up to five years through a teacher preparation program to eligibility for tenure.

- Winthrop University Nominee: Matthew Neal (Finalist, award pending)

Marshall Scholarship: The British Marshall scholarship finances young Americans of high ability to study for a degree in the United Kingdom. At least forty Marshall Scholars are selected each year to study either at graduate or occasionally undergraduate level at an U.K. institution in any field of study. As future leaders, with a lasting understanding of British society, Marshall Scholars strengthen the enduring relationship between the British and American peoples, their governments and their institutions.

- Winthrop University Nominee: Jeanne Stroud

National Science Foundation Fellowships: The purpose of the National Science Foundation's Graduate Research Fellowship Program is to ensure the vitality of the human resource base of science and engineering in the United States and to reinforce its diversity. The program recognizes and supports outstanding graduate students in the relevant science, technology, engineering, and mathematics disciplines who are pursuing research-based master's and doctoral degrees, including engineering and computer and information science. NSF Fellows are expected to become knowledge experts who can contribute significantly to research, teaching, and innovations in science and engineering.

- Winthrop University Nominee: Kara Hardwick (award pending)
- Winthrop University Nominee: Hannah Swan (award pending)

National Society of Collegiate Scholars: NSCS offers nearly a million dollars in scholarships each year to help members attain their goals and commend them for their outstanding academic excellence as well their leadership and service achievements.

- Winthrop University Nominee: Dillon Bryant, First Gen Scholarship, Merit Award (awards pending)
- Winthrop University Nominee: Brandi Geurkink, Study Abroad Scholarship (award pending)

Phi Kappa Phi Graduate Fellowship: Every year, the Honor Society of Phi Kappa Phi awards fifty-seven Fellowships of \$5,000 each and three of \$15,000 each to members entering the first year of graduate or professional study. Each Phi Kappa Phi chapter may select one candidate from among its local applicants to compete for the Society-wide awards.

- Winthrop University Nominee: Alexander Muller (award pending)
- Winthrop University Nominee: Destinee Johnson (award pending)
- Winthrop University Nominee: Jeanne Stroud (award pending)

Phi Kappa Phi Study Abroad Scholarship: Phi Kappa Phi Study Abroad Grants are designed to help support undergraduates as they seek knowledge and experience in their academic fields by studying abroad. Thirty-eight \$1,000 grants are awarded each year.

- Winthrop University Nominee: Lexi Barnhill (award pending)
- Winthrop University Nominee: Dillon Bryant (award pending)
- Winthrop University Nominee: Brandi Geurkink (award pending)
- Winthrop University Nominee: Emily Hockett (award pending)
- Winthrop University Nominee: Brigitte Smith (award pending)

Rhodes Scholarship: The Rhodes Scholarship is one of the most competitive and prestigious awards available to students in the world. It includes all fees, travel expenses, and a yearly stipend for two years of study at Oxford University in the United Kingdom, with a possible renewal for a third year. Thirty-two Rhodes Scholars are awarded annually—winners must undergo interviews at the state and regional level.

- Winthrop University Nominee: Daniel Strokis

Sigma Tau Delta Senior Scholarship: Students who are currently in their senior year of undergraduate study are eligible to apply for this scholarship. Applicants must demonstrate both academic achievement and campus, community, or chapter service and explain the relevance of their program of study to fostering the discipline of English, including literature, language, writing, and literacy. Each chapter may nominate three members for this scholarship.

- Winthrop University Winner (full scholarship): Alexander Muller
- Winthrop University Nominee: Kaitlyn Murphy
- Winthrop University Winner (runner up): Jeanne Stroud

The Sunbelt Rentals Scholarship: The Sunbelt Rentals Scholarship is a means of recognizing the work done in the classroom, campus, and the community by students within the Big South Conference. Two scholarships are awarded in January at a value between \$2,000 and \$4,000 each. A committee made up of Big South Conference administrators, Sunbelt Rental executives, and institutional representatives from the Big South Conference institutions are responsible for determining the award.

- Winthrop University Nominee: Michael Byrd
- Winthrop University Nominee: Brittany Lawrence

Truman Scholarship: The Truman provides up to \$30,000 in funding to students pursuing graduate degrees in public service fields. The Foundation also provides assistance with career counseling, internship placement, graduate school admissions, and professional development. Scholars are invited to participate in a number of programs.

- Winthrop University Nominee: Lauren Caponigro
- Winthrop University Nominee: Katie Parenti

Udall Scholarship: The Morris K. Udall Foundation was established by Congress in 1992 to honor Morris K. Udall's years of service in the U.S. House of Representatives. The Foundation awards approximately 75 scholarships to outstanding students on the basis of merit to two groups of students: (1) college sophomores or juniors with outstanding potential who study the environment and related fields; (2) Native American and Alaska Native students who are college sophomores or juniors with outstanding potential who are in fields related to health care or tribal public policy. Each scholar receives up to \$5,000, or the cost of tuition, fees, books, and room and board, whichever is less, for their junior or senior year of undergraduate study.

- Winthrop University Nominee: Kyle McDaniel
- Winthrop University Nominee: Alaina Wynes

Winthrop University Recognizes ONCA Student Success Stories

Emily Hokett is a Psychology and Spanish double major, who plans to study mental disorders that commonly affect the elderly in a doctoral neuroscience program. Moreover, she wants to be able to communicate effectively with more individuals in her environment. She is a Close Scholar, LIFE Scholar, McNair Scholar, Ann Cato Corps Scholar, and Lois Rhame West Scholar. Because she will be studying Spanish in Costa Rica in the fall, she is currently applying for the Gilman Study Abroad Scholarship and Phi Kappa Phi Study Abroad Scholarship.

Simone Mayers is a psychology major and Spanish minor. She is a first generation college student, a LIFE Scholarship recipient and a member of the Psychology and Spanish Club. She plans to study abroad in Costa Rica at Veritas University in San Jose. She aspires to become bilingual and hopes that her complete immersion in the Spanish culture will allow her to become more proficient in the Spanish language. Returning with an increased language ability will serve as a marketable skill for her in the future. Simone applied for the Gilman award this year.

Kyle McDaniel is a sophomore biology and French major. He has applied for three nationally competitive awards this semester: the Gilman, Udall, and Goldwater scholarships. He plans to study abroad in Madagascar in fall 2014, during which he will develop field research skills that will complement his research being conducted at Winthrop on meiofaunal food webs. Upon graduating, Kyle plans to attend graduate school and get his Ph.D. in molecular ecology.

Alexander Muller will graduate in May with a B.A. in English, creative writing. Over the past few years, Alex has served as the editor-in-chief of the Winthrop literary and arts journal *The Anthology*, volunteered with the Arts in Medicine Club, and has been involved with the Winthrop chapters of Sigma Tau Delta, Omicron Delta Kappa, and Phi Kappa Phi honors societies. This past summer, Alex traveled to France with the help of the Geraldine Trammel Hurley Fellowship, where he spent time at the Bordeneuve Retreat for Artists and Writers and worked on writing and compiling his original poetry for an honors thesis collection. This year he applied for several nationally competitive awards including the Jack Kent Cooke Award, the Elie Wiesel Prize in Ethics, various Sigma Tau Delta Scholarships, and a Phi Kappa Phi Fellowship. He was recently recognized as the winner of the Sigma Tau Delta Senior Scholarship, and his essay on Shakespeare's King Lear won the Frederic Fadner Critical Essay Award for The Sigma Tau Delta Critical Review. Alex hopes to pursue a graduate degree after leaving Winthrop, and he has applied to both M.A. and M.F.A. programs. He has recently been accepted into Wake Forest with an offer for full funding, and he is still waiting to hear back from other programs before he makes his final decision.

Matthew Neal is a senior pursuing a B.S. in Mathematics. Matthew has been involved in research in the department since its first summer experience with several faculty in mathematics and biology. As a teaching fellow, Matthew planned to complete the undergraduate program in teacher education but worked with Ms. Okey to explore ways to allow our teaching fellows to pursue the MAT5 program. Matthew will graduate this May as a member of the Honors Program and start the MAT5 in June.

Amber Schilling is history major with a minor in anthropology. In Fall 2013, she applied for the Fulbright English Teaching Assistant Program to India. She previously studied abroad in India as a Benjamin A. Gilman International Scholarship recipient in Spring 2012. After her adventure on the subcontinent, she received a summer internship at the Smithsonian Institution in 2013. Upon graduating in spring 2014, she hopes to pursue a fulfilling career in women's advocacy or international education.

Jeanne Stroud is a senior English literature and language major from Charleston, S.C. As a cross country and track athlete, she has had great success in her sport and in the classroom; she has been named the Big South Female Scholar Athlete of the Year for her sport five times, and she also earned the honor of Female Outstanding Track Performer for her 2013 outdoor track season. Her years as an athlete led her to devote a lot of her time to the Student Athlete Advisory Committee and its community service efforts. She is also an active member of the Phi Kappa Phi and Omicron Delta Kappa honors societies. Through ONCA, Jeanne applied for the Rhodes Scholarship, the Marshall Scholarship, the Sigma Tau Delta Senior Scholarship, and the Phi Kappa Phi Fellowship. After she graduates in May 2014 she will attend the University of North Carolina at Chapel Hill to earn her master's degree in library science.

Hannah Swan is now a senior math major after transferring from an art program three years ago. In that time, she has been awarded the Rosalind Sallenger Richardson Senior Scholarship, Kate V. Wofford Scholarship, and Robert M. Ward scholarship. She applied for the National Science Foundation's Graduate Research Fellowship. In the fall, she plans to attend graduate school for applied mathematics and continue conducting interdisciplinary research in the future.

Sigourney Woodfork graduated from Winthrop in December of 2013 with a degree in integrated marketing communication that pertains to all things advertising, marketing, and public relations. In addition, she pursued a minor in French language, culture as well as international studies. She hopes to blend her marketing communications background and interest in foreign cultures to work with socially focused initiatives that help solve global issues. Since graduating she has begun working as a media coordinator at a boutique advertising agency in Charlotte, N.C. Currently, she is a finalist waiting to find out if she will receive the Fulbright scholarship that will allow her to spend a year in France researching the effectiveness of sexual health communications for minority groups in France.

Alaina Wynes is a psychology, conservation biology, and environmental science major, with a minor in geology. Her research on the endangered species of sunflower *Helianthus schweinitzii* won second place for the Janice C. Houk Prize and scholarship through the Biology department in April of 2013. During this same month, she also presented a poster on her research at the Association of Southeastern Biologists Conference. More recently, she was selected by the Environmental Program Coordinating Committee to attend the National Council for Science and the Environment Conference in January 2014 as a student representative. She was awarded the South Carolina Wildlife Federation Scholarship in January of 2014 and was nominated by Dr. Werts for the Udall Scholarship and applied in March 2014. Future plans include enrolling in a graduate degree program in geology and entering into the field of environmental consulting to promote sustainable development.

McNair Scholars

The Winthrop McNair Scholars Program prepares first generation, low-income, and underrepresented undergraduates to be successful in Ph.D. programs by a summer research experience, workshops, GRE and graduate school application preparation, and travel to present research and explore graduate programs.

Winthrop's program is funded by a five-year renewable TRiO grant from the U.S. Department of Education (PR/Award No.: P217A130111). \$220,000 in federal funding is provided each year for programming and materials that will help 30 eligible students prepare for graduate study. This represents approximately 72% of program costs. Winthrop contributes the remaining 28% of the budget with \$85,000 in cash and in-kind matches.

Each year, the twelve-member Winthrop McNair Advisory Board selects the next cohort of Scholars through a highly competitive application and interview process. All McNair Scholars complete an intensive summer research experience and several of Winthrop's Scholars have earned awards for their research. Being a McNair Scholar is a prestigious, nationally-recognized honor resulting in Scholars being actively recruited by graduate programs across the country. For more information, visit www.winthrop.edu/mcnair or e-mail mcnair@winthrop.edu.

Cheryl Fortner-Wood, Ph.D.

Director, McNair Scholars Program

2013–14 Winthrop McNair Advisory Board Members

Dr. Adolphus Belk - Associate Professor; Political Science

Symone Calhoun - Undergraduate; McNair Scholar, Psychology

Dr. Kareema Gray - Assistant Professor; Social Work

Ms. Rose Gray - Director; TRiO Student Support Services (SSS) Program

Dr. Wenonah Haire - DMD; Executive Director of the Catawba Cultural Preservation Project

Dr. Willis Lewis - Assistant Professor; Accounting, Finance and Economics

Dr. Karen Stock - Associate Professor; Fine Arts

Dr. Takita Sumter - Associate Professor; Chemistry, Physics, and Geology

Dr. Will Thacker - Associate Professor; Computer Science and Quantitative Methods

Dr. Kim Wilson - Instructor of Biology and Director of the Program for Research Incentives in Science and Mathematics (PRISM)

Dr. Brad Witzel - Associate Professor; Curriculum & Instruction

Dr. Cheryl Fortner-Wood (ex-Officio) - McNair Director and Associate Professor, Psychology

Dr. Gloria Jones (ex-Officio) - Dean, University College

The following Winthrop McNair Scholars presented their research at the S.C. TRiO McNair Research Symposium on June 28, 2013 at the University of South Carolina.

Brianna Barnette, Mentor: Lisa Harris, Ph.D.

Title: The Perceived Readiness of Educators to Teach AAE Speaking Students

Leah Brown, Mentor: Merry Sleigh, Ph.D.

Title: The Effects of Drawing, Listening, and Writing on Mood

Kendra Bufkin, Mentor: Takita Sumter, Ph.D.

Title: Replacement of a Conserved Arginine at Position 25 in High Mobility Group A1 Proteins Affects DNA Binding Affinity

Symone Calhoun, Mentor: Donna Nelson, Ph.D.

Title: The Impact of Time Pressure and Personality on Conformity

Keisha Carden, Mentor: Robin Lammi, Ph.D.

Title: Mechanistic insights into small-molecule inhibitors of amyloid- β aggregation in Alzheimer's disease

Amanda Cavin, Mentor: Carol Marchel, Ph.D.

Title: How do teachers define teacher quality?

Dwana David, Mentor: Matthew Hayes, Ph.D.

Title: Perceptions of Difficulty on Procrastination

Nicole Drown, Mentor: Jack DeRochi, Ph.D.

Title: Papiasts, Machiavels, and the Roman Standard: Webster's The White Devil as a Critique of Idealizing Britannia

Aaron Fountain, Mentor: Andrew Doyle, Ph.D.

Title: The War in the Schools: San Francisco Bay Area High Schools and the Antiwar Movement, 1965-1973

Chelsea Gilmore, Mentor: Donna Nelson, Ph.D.

Title: Attitudes about Online and Face to Face Relationships: The Role of Attachment Style and Accessible Memories

Kierra James, Mentor: Antigo Martin-Delaney, Ph.D.

Title: Children's Attitudes toward Reading

Chelsea Johnson, Mentor: Marguerite Doman, Ph.D.

Title: Undergraduate Experiences that Encourage Students to Pursue Advanced Degrees in Computing Disciplines

Stanley Kennedy, Mentor: Marleah Bouchard, Psy.D.

Title: How Different Definitions of Homelessness Affect Available Resources for K-12 Public School Children

Brittany Lawrence, Mentor: Kristi Westover, Ph.D.

Title: The effects of geography and disease incidence on mutation rates of Chinese HIV-1 vif genes

Johnakin Martin, Mentor: Zachary Abernathy, Ph.D.

Title: A Reaction-Diffusion Model on the Effect of Insulin in Colon Cancer

Justin Moore, Mentor: Clarence Coleman, Ph.D.

Title: Income Tax Expense vs. Cash Taxes Paid: An Empirical Analysis of Faithful Representation

Nikesha Nelson, Mentor: Stephanie Milling, Ph.D.

Title: Recreating Perception towards the Africanist Aesthetic: Opening Doors for Exploration

José Paramo, Mentor: Stephen Smith, Ph.D.

Title: Education and Its Effect on Military Discipline

Denise Peppers, Mentor: Nicholas Grosseohme, Ph.D.

Title: Purification and Characterization of the Nickel Uptake Regulator (NUR)

Brittany Prioleau, Mentor: Heather Evans-Anderson, Ph.D.

2013 Society of Developmental Biology CHOOSE Development Fellow

Title: Expression of FGF9/16/20 and Foxp1 in Juvenile and Adult *Ciona intestinalis*

Derion Reid, Mentor: Takita Sumter, Ph.D.

Title: Silencing Cellular Expression of the High Mobility Group A1 (HMGA1) to Enhance Sensitivity to Chemotherapy

Hannah Swan, Mentor: Joseph Rusinko, Ph.D.

Title: Machine Learning for Phylogenetic Invariants

Sarah Wicks, Mentor: James Hanna, Ph.D.

Title: Synthesis and evaluation of biphenyltetrols as amyloid- β aggregation inhibitors

WISE Scholars

The Winthrop Initiative for STEM Educators (WISE) program is supported by a \$1.2 million grant through the National Science Foundation Robert Noyce Scholarship Program. The primary focus of the WISE efforts is to recruit, support, and mentor science and mathematics majors choosing to pursue teaching as a career. The program currently has two primary outreach activities. The WISE Scholars are graduate and undergraduate students committed to teaching in high need schools and are provided scholarship funds, connections to state and national organizations for STEM teachers, opportunities for conference participation, additional mentoring, and access to STEM education resources on campus. The WISE Interns are first- and second-year Winthrop and York Technical School students pursuing STEM degrees. These students participate in a summer program that explores research in a disciplinary group, engages in local schools for service learning, and promotes the formulation of individual research questions for more extensive investigation through a variety of other avenues. The following WISE Interns and Scholars submitted abstracts for their scholarly work:

Tyler Brooks	2012 WISE Summer Intern and Current WISE Scholar
Lucas Boncorddo	2012 WISE Summer Intern
Kendra Bufkin2012	2012 Summer Intern
Gabrielle Epelle2012	2013 Summer Intern
Destinee Johnson 2012	2011 Summer Intern
Lynnique Johnson 2012	2013 WISE Summer Intern
Lauren Lay2012	2012 Summer Intern
Olivia Manley	2013 WISE Summer Intern
Kyle McDaniel	2014 WISE Summer Intern
Kristen McLaurin	2012 WISE Summer Intern
Amy Moore	2011 WISE Summer Intern and Current WISE Scholar
Denise Peppers	2012 WISE Summer Intern
Derion Reid	2011 WISE Summer Intern
Katherine Rigby	2011 WISE Summer Intern
Kirsten Stallings	2011 WISE Summer Intern
Whitney Taylor	2011 WISE Summer Intern and Current WISE Scholar

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