

Regular Research Grants Awarded in FY 2015

Allen, Casey

Assistant Professor, Mechanical Engineering
RRG Award Amount: \$5,250

An Engine Test Stand for Rapid Fuel Blend Optimization

New internal combustion engine technologies are capable of achieving dramatic increases in efficiency relative to conventional engines (~20%), but the new modes of combustion employed by these technologies are inherently sensitive to fuel composition. Modest changes in fuel composition can change performance from being highly-efficient to being potentially-damaging to the engine. No robust, general approach currently exists to identify an optimum fuel composition for a broad range of engine conditions.

The PI is pursuing a new fuel optimization process that relies on two pieces of experimental equipment. The first is a rapid compression machine, which has recently been built in the PI's lab. The second piece of equipment is an engine test stand that can be operated to rapidly characterize the combustion phasing and heat release properties of candidate fuels. An engine test stand recently acquired by the PI can be used for this purpose, but it is not functional in its current state. The engine needs to be refurbished with new parts, modified for the intended application, and its performance must be characterized. RRG funding is requested in this proposal to support an undergraduate research assistant for the physical refurbishment and modification of the engine test stand. SFF funding is requested to support the PI during the development of data analysis codes for interpretation of the engine test data. Interpretation of the data will require a multi-zone model to estimate the time-varying in-cylinder conditions. Completion of this project will yield a fuel-characterization facility that is attractive to funding agencies.

Barnes, Sonia

Assistant Professor, Foreign Languages and Literatures
RRG Award Amount: \$4,075

An Acoustic Analysis of Asturian Vowel Metaphony

Vowel harmony is a process by which the presence of a certain feature in a vowel triggers the presence of that feature in other vowels in the same word. Vowel harmony occurs over a wide range of otherwise different languages. This study focuses on vowel metaphony, a type of vowel harmony that is currently observed in Asturian – an endangered language spoken in the region of Asturias. A very rare form of vowel harmony, Asturian vowel metaphony is characterized by a pattern of change in the vowels preceding a word-final unstressed vowel.

A challenge for our understanding of vowel metaphony is that all theoretical claims made to date have been based on impressionistic data collected using exclusively auditory judgment more than three decades ago. This study will provide new empirical data that will allow us to evaluate the controversial theoretical approaches to vowel metaphony and will serve as preliminary data for a large-scale sociolinguistic analysis of the phenomenon. Particularly, this project will determine how robust vowel metaphony is in Asturias, what its acoustic characterization is and whether variation exists in the speech of a single individual. Speakers from three rural and urban areas of Asturias will serve as participants for two experiments aimed at obtaining realizations of words that present the conditions for vowel metaphony to occur. The results of this work will constitute the first step towards understanding the social and phonological patterns of vowel metaphony.

Bekhet, Abir

Associate Professor, College of Nursing
RRG Award Amount: \$5,833

Online Positive Thinking Intervention in Caregivers of Persons with Autism Spectrum Disorders

This proposed pilot intervention study will test an adapted online intervention that teaches positive thinking skills to caregivers (CGs) of children with Autism Spectrum Disorders (ASD). The Positive Thinking Training (PTT) intervention has strong cognitive behavioral theoretical grounding. This study combines quantitative and qualitative methods in a pilot clinical trial with **66** CGs of ASD children. The online PTT intervention group (n=33) will be compared to a control group (n=33). We propose that the PTT online intervention format reinforced by homework will provide the CGs with essential skills for reducing their burden and improving their psychological well-being, which will, in turn, decrease their children's challenging behaviors. **Qualitative** data for capturing the **six intervention parameters namely; the necessity, acceptability, feasibility, fidelity, safety, and effectiveness** from the CGs' perspectives will be collected online from the PTT intervention group at one week post-intervention (T2) using open ended questions. **Quantitative** data measures of cognitions, burden, psychological well-being, and children's challenging behaviors will be collected at baseline (T1) and at 1 week (T2) post-intervention using standardized measures to measure the **effectiveness** parameter. Conclusions drawn from the critical examination of the **six intervention parameters** will inform further refinement and testing of PIT for autism CGs in a full scale randomized, controlled trial. Once established, such interventions will be useful in promoting healthy functioning among autism CGs so they can continue to provide adequate care for their children without sacrificing their own health which, in turn, will decrease their children's challenging behaviors.

Berry, Jeffrey

Associate Professor, Speech Pathology and Audiology

Johnson, Michael

Professor; Director of Graduate Studies, Electrical and Computer Engineering
RRG Award Amount: \$10,000

Speech Rehabilitation Using a Virtual Vocal Tract

The broad objective of this line of research is to further the development of a novel rehabilitation method for the treatment of *dysarthria*; a speech impairment resulting from brain injury characterized by disordered control over movement of the speech organs. This method will exploit the experimental phenomenon of auditory feedback-driven *speech-articulatory adaptation*, which has become a recent focus in the study of non-disordered speech, but has yet to be studied for rehabilitation. The work will utilize our novel method for eliciting speech adaptation using a "virtual vocal tract" that generates synthesized speech based on the movements of a patient's tongue, lips, and jaw in real time. The objectives of the proposed work are to: 1) improve how well our current virtual vocal tract system can imitate the unique acoustic characteristics of individual talkers; 2) develop a more complete understanding of how speech adaptations are elicited using our virtual vocal tract method differ from those elicited using existing acoustic-only approaches; and 3) complete further baseline studies that evaluate the rehabilitative potential of our novel approach for treating dysarthria. The results of the proposed work will facilitate key improvements for our NIH R15 proposal resubmission by addressing concerns expressed by reviewers and providing more pilot data to increase the chances of funding.

Choi, Yoon

Assistant Professor, Philosophy

RRG Award Amount: \$2,650

Inner Sense and Knowledge of One's Thoughts: A Kantian Account

Self-knowledge is unlike other kinds of knowledge in a way that make sit particularly puzzling. For instance, *how* do I know my own thoughts? I know that it's raining by seeing the rain, but do I know that I *believe* it's raining by seeing my belief? And why does self-knowledge seem less prone to error than other kinds of knowledge? I can easily be wrong about *whether* it's raining: I mistake the condensation on my windows for rain. But can I mistakenly think, *I believe it's raining?* Simple error does, I think remain a possibility (I think I'm angry when really, I'm scared); self-deception also remains a possibility (I convince myself I had good intentions, when I really didn't). But these kinds of mistakes seem both rarer and different in kind than the mistakes we make about the world around us.

Theories of introspection must address these puzzles, explaining *how* I know myself and *why* this knowledge has such unusual properties. In the summer of 2015, I will write an article, "Inner Sense and Knowledge of One's Thoughts: A Kantian Account," that sets out Kant's theory of inner sense as an alternative to recent accounts of introspection. I will then defend this theory by arguing that it offers a compelling answer to the question of how we know our thoughts. This project will develop my earlier interpretive work on Kant's theory of self-consciousness, and lay a foundation for my new project on the notion of unity in theories of consciousness.

Chubbuck, Sharon

Associate Professor and Director of Graduate Studies, Educational Policy and Leadership

RRG Award Amount: \$5,368

A Story of Detracking: One School's Systemic Reform Efforts

In 1986, Oakes' groundbreaking study revealed the inequities of tracking. Research continues to show that this practice, separating students by perceived ability/skill level and then tailoring curriculum and instruction to meet that perceived level, does not produce academic advancement among students in lower tracks and that those lower tracks are disproportionately filled with students of color and of poverty. The inequity is clear – tracking sets poor students of color on failing academic trajectories – yet the practice continues. In 2010, a large suburban high school proposed "detracking" two first year honors classes, enrolling all students reading at grade level, despite significant protest. Upon the proposal's approval, administrators developed system-wide initiatives to support its successes: school-wide diversity training, professional development for teachers, racially aligned parent-teacher organizations, and supportive student groups. Initial findings indicate improved academic performance among the students of color traditionally excluded from honors courses.

This case study will explore that school's reform efforts. Utilizing ethnographic techniques and framed in Oakes' (2005) theory of obstacles that impede successful detracking efforts – normative, political, and technical –, the study will examine stakeholders' experience and meaning-making in relation to those obstacles at three junctures: proposal approval, systemic-level support, and implementation/effects at classroom and school level. The purpose is to learn *how* this detracking process is occurring, with the goal of telling a nuanced, complex story of this process for the benefit of the larger educational community, a community becoming increasingly diverse and continuing to struggle to provide equitable quality education for all children.

Clark, Kathleen

Associate Professor, Educational Policy and Leadership

RRG Award Amount: \$1,725

Fostering Latino Children's Reading Gains: A Comparison of the Effectiveness of Instructional Approaches

Large numbers of Latino children and youth, who make up approximately 24% of the school population (National Center for Education Statistics, 2014) experience considerable difficulty learning to read. Eighty-percent of Latino fourth-graders scored either below (47%) or at (33%) *Basic* level on the National Assessment of Educational Progress (National Center for Education Statistics, 2013). While multiple factors contribute to Latino children's reading underachievement, among them poverty and English language learning challenges (Fallon, 2010), reading instruction that is better tailored to their language and literacy acquisition needs may accelerate their reading progress. The proposed research will compare the effectiveness of two forms of instruction – guided reading instruction and modified guided reading instruction – in increasing the reading achievement of Latino elementary school children who are below grade level readers. Guided reading is the dominant form of reading instruction in contemporary U.S. classrooms. It targets the development of children's cognitive reading processes, processes that transfer across texts and time and, hence, build children's reading independence. Modified guided reading instruction is a revision of guided reading that, while maintaining a focus on developing children's reading processes, incorporates elements that specifically target the English language and literacy needs of Latino children who are dual language learners. Although advanced as instruction that fosters reading gains among Latino dual language learners (Avalos, Plasencia, Chavez, & Rascón, 2007), modified guided reading has been insufficiently evaluated. This research will address this deficiency and, potentially, empirically validate the technique as an instructional practice that accelerates Latino children's reading achievement.

Cover, Michael

Assistant Professor, Theology

RRG Award Amount: \$1,240

Philo of Alexandria, On the Change of Names: A New Translation and Commentary

The current project, a new commentary on Philo of Alexandria's allegorical treatise, *On the Change of Names*, participates in the larger task of illuminating the varieties of Hellenistic Judaism at the time of the writing of the New Testament. There are to date no English commentaries on most of the allegorical treatises written by Philo, the first-century Jewish philosopher, theologian, and statesman: *On the Change of Names* is one of them. This lacuna in the scholarship is surprising, given that Philo has left behind one of the largest bodies of evidence by a single author bearing witness to Judaism in the Hellenistic and Roman eras. Philo's significance for understanding a number of New Testament writings, including the Pauline letters, John's Gospel, and the Epistle to the Hebrews, has also been long established. *On the Change of Names* is an important part of Philo's corpus due to its subject. Interpreting Genesis 17, Philo meditates on topics including the imperceptibility of God, the significance of Pentateuchal name-change, and the possibility that Abraham doubts – a question of central importance for Philo's contemporary, Paul the Apostle. The aim of this SFF project is to produce a new translation and commentary, most likely for publication with the Brill Philo of Alexandria Commentary Series. The commentary will be serviceable to students of Hellenistic Judaism, ancient philosophy, and early Christianity. RRG funds will support presentation of related research on Paul and mysticism at a major international conference.

Donaldson, William

Professor, Chemistry

RRG Award Amount: \$5,908

Development of Synthetic Methodology for the Preparation of a Potent and Selective Estrogen Receptor-beta Agonist

Clinical studies indicate that post-menopausal hormone replacement therapy (HRT) has both detrimental and beneficial effects. The beneficial effects of a decrease in dementia in postmenopausal women are offset by the increased incident of breast and endometrial cancer associated with HRT. These detrimental effects are mediated predominantly by the estrogen receptor-alpha ($ER\alpha$), the dominant isoform present in the mammary glands and uterus. On the other hand, chemical entities that bind to, and activate, the estrogen receptor-beta ($ER\beta$) may be a viable therapeutic intervention for treating cognitive deficits in post-menopausal women, since the $ER\beta$ lacks the risk factors associated with $ER\alpha$ agonists. Current $ER\beta$ agonists have only a modest 70-fold selectivity for the beta versus alpha isoform, and thus present some $ER\alpha$ -mediated cancer risk. Thus, there is a need for more potent and selective $ER\beta$ agonists. Recently, a compound prepared in the Donaldson laboratory was found to exhibit both potent $ER\beta$ agonist activity ($IC_{50} = 5.3$ nM) and greatly improved selectivity (1000-fold more selective for the $ER\beta$ over the $ER\alpha$ receptor). This entity thus serves as a lead compound for further optimization. With support from this COR award, we will prepare sufficient quantities of this lead compound for further biological testing with respect to ADME (absorption, distribution, metabolism, and excretion) properties. Additionally, analogs of the lead compound will be prepared and submitted for biological testing in order to optimize for both potency/selectivity and the desired ADME properties.

Donoghue, Michael

Associate Professor, History

RRG Award Amount: \$6,000* (*Funded by the Center for Transnational Justice)

Race, Identity, and Gender in U.S. Military-Cuban Relations 1941-1964

I plan to travel to Cuba next summer to investigate the local records of U.S. military-Cuban relations from 1941-1964 in Santiago, Guatánamo City, and Caimanera. The focus of my research is on the intersections of race, identity, and gender that occurred between U.S. military personnel and the Cuban people from World War II until the closing of the U.S. Guantánamo naval base from Cuban contact in 1964. The main focus of my research is how these interactions contributed to the anti-American atmosphere of the Cuban revolution. The U.S. presence resulted in numerous binational encounters. Some were negative that included brawls, crimes, the growth of a sex industry, and narcotics sales. Other had more positive impacts such as cultural and economic exchanges, service jobs, intermarriages, and joint interests in sports, religion, and spectacle. This study will examine the impact of these encounters in transforming what was once regarded as Washington's closest alliance in the Caribbean into one of intense hostility by 1960. My third trip to Cuba will be concentrate on finishing up my research in the archives of Santiago and Guantánamo City and also conducting more interviews with retired Cuban workers from the base and local service industries that catered to Americans. This project will make a significant contribution toward our understanding of the many strands and forces that helped shape the Cuban Revolution beyond, high status actors, larger events, and economic indices, as it focuses on the personal and social relations that drove so many revolutionary processes.

Gendron, Sarah

Associate Professor of French, Foreign Languages and Literatures

RRG Award Amount: \$9,400* (*Funded by the Center for Transnational Justice)

Professing Hate: The Strategic use of Academia for the Justification and Implementation of Genocide

I am writing a monograph on the relationship between culture and genocide. In particular, I explore the ways in which art, popular culture, education, and social media have been employed in order to cultivate hatred and to transcend the subsequent physical and psychic damage. Tentatively entitled *Genocide Culture*, this project focuses on genocides of the twentieth century (the Holocaust, Cambodia, the former Yugoslavia, and Rwanda). It also considers the genocidal conflicts currently unfolding in the Middle East (Syria, Palestine, Israel). Although these events differ greatly from one another with respect to geographical locations, victims, and duration, they are all linked by the significant role they allowed cultural activities to play in making killing acceptable and, in some cases, even palatable to the masses and in helping the survivors to bear witness to it after the fact.

In addition to serving as the primary material for *Genocide Culture*, the research that has been completed to date has resulted in six publications, one literary translation, and thirteen conference papers. I am requesting the assistance of SFF and RRG funding in order to conduct part of the research for the section of the monograph that addresses the ways in which the participants in and materials of academia – administrators, teachers, theories, and textbooks – were co-opted by genocidal regimes. The tenure of the SFF and RRG will be divided between research conducted on campus – examining the various manifestations of so-called “race science” and their philosophical justifications – and archival research in Germany and Rwanda.

Harris, Angelique

Associate Professor, Social and Cultural Sciences

RRG Award Amount: \$5,248

Sociocultural Factors Influencing Health Behaviors and Health Information Seeking Among African American Men in Milwaukee

African American (AA) men experience lower life expectancies, higher prevalence of chronic diseases, and lower quality of life than their White counterparts. To date few studies have successfully addressed these disparities and research rarely takes into account sociocultural factors associated with poor health within this population. My goal is 1) define key problems associated with health and wellbeing, 2) determine antecedents to these problems and assess community resources and 3) identify components of an intervention to address these problems by employing a community based participatory model (CBPM). Employing the CBPM will enfranchise the targeted community to become an active partner in defining these problems and developing an intervention with the ultimate goal of improving the health of AA men. Funding is sought to complete phase one of the project, which will involve conducting focus groups and in-depth interviews with AA men from the target community. The Lindsay Height neighborhood of Milwaukee. Data collected from these focus groups and interviews will define the prevailing chronic health problems confronting AA men in this community, identify ways to address these problems, and identify components of an intervention to address these problems. Once this data is collected, additional external funding will be sought to begin the second phase of the project – conduct a feasibility pilot study in which the intervention will be implemented among AA men in the target community.

Heck, Nicholas

Assistant Professor, Psychology

RRG Award Amount: \$4,350

Willingness to Adopt a Mental Health Promotion Program: A Study of Gay-Straight Alliance Advisors in Wisconsin

Lesbian, gay, bisexual, and transgender (LGBT) adolescents evidence increased risk for depression when compared to their heterosexual peers¹. Minority stress theory posits that this elevated risk is

the result of unique stressors that are experienced by LGBT adolescents². Key mechanisms underlying the minority stress-psychiatric distress relationship include deficits in coping skills, interpersonal isolation, and maladaptive cognitions³. Although evidence-based mental health promotion programs for adolescents exist⁴, they fail to address these unique stressors and mechanisms. In turn, this SFF/RRG application will contribute to the investigator's efforts to address mental health disparities and stress among LGBT youth. First, it will provide funding to support the analysis of pilot data. The data are from an online survey of gay-straight alliance (GSA) advisors in Wisconsin. The survey seeks to evaluate eight hypotheses, which if supported, will document: a) the need for mental health prevention programming that targets LGBT adolescents; b) the feasibility of integrating such programming into the school setting; and c) the potential barriers to the implementation of such programming. Second, it will allow the investigator to prepare the survey results for publication. Third, it will provide the investigator with support to complete a grant application (in progress) to the National Institute of Mental Health. Overall, this project will provide critical pilot data for a larger grant application, while also demonstrating the existence of a collaborative relationship between the investigator, GSA advisors, the parent organization that coordinates the 156 GSAs in Wisconsin, and a co-investigator.

Huang, Jier

Assistant Professor, Chemistry

RRG Award Amount: \$6,000

Spectroscopic and Structural Probes of the Mechanisms of Hybrid Artificial Photocatalysts

The development of photocatalysts for the efficient production of carbon neutral, sustainable fuel sources by solar energy conversion is an urgent societal need. The successful design of such catalysts is challenging, in that it requires a fundamental understanding of the mechanisms operative during the photoinduced catalytic reaction. The objective of the proposed research is to advance the understanding of the mechanism of hybrid photocatalysts, systems that are likely to play a major role towards the development of robust economically sustainable materials for efficient solar energy conversion. The newly designed hybrid photocatalysts of interest in this work link multifunctional semiconductor nanocrystals with emerging molecular catalysts made of earth-abundant elements for fuel generation. We propose to design, prepare and functionally characterize newly designed hybrid photocatalysts by identifying the multiple transient species that are relevant to crucial catalytic reactions; this is made possible by exploiting powerful methodology based on transient optical and X-ray absorption spectroscopy. Collectively, the proposed studies seek to correlate the structural dynamic properties of the photocatalysts with their catalytic function(s).

This research targets Department of Energy (DOE) and National Science Foundation (NSF) grand challenges of renewable energy, solar fuel, catalysis, chemical structure, dynamics and mechanism, and nanoscience, and will thus be the foundation of award applications to these agencies.

Kipp, Kristof

Assistant Professor, Physical Therapy

RRG Award Amount: \$4,360

Effects of Ankle Flexibility Training on ACL Injury Risk Factors

Anterior Cruciate Ligament (ACL) injuries occur in 100,000 individuals per year. Young women are 6-8 more times more like to sustain an injury in the ACL than young men. In 1995 the short-term cost of treating an ACL injury was estimated at \$17,000, a figure well exceeded in today's healthcare environment. Moreover, the greater incidence of osteoarthritis in people who sustained an ACL injury only compounds future costs. ACL injuries are precipitated through "risky" movement biomechanics. Although researchers have attempted to decrease ACL injury rates by training athletes to modify these biomechanics, the injury rates remain disproportionately high. We have recently demonstrated an association between movement biomechanics and the amount of ankle flexibility in a cross-sectional study. The goal of the proposed project is to test whether an acute

improvement in the ankle flexibility is associated with an improvement in movement biomechanics. We plan to use well-established clinical treatments (e.g., stretching, joint mobilization, and soft tissue massage) that are commonly used by athletic trainers and physical therapists to acutely increase ankle flexibility and will use a motion analysis lab to measure movement biomechanics before and after treatment. The knowledge gained from this project will guide the design of long-term interventions in an effort to develop evidence-based prevention protocols to decrease the rate of ACL injuries in female athletes.

Knox, Lezlie

Associate Professor, History

RRG Award Amount: \$4,550

Mariano of Florence: An Ordinary Friar in an Extraordinary Time

This biographical study of Fra Mariano of Florence (d. 1523) explores the lived experiences of a fairly ordinary Franciscan friar and his contemporaries during a period of religious turmoil both within his own religious order and in the Roman Church more generally in the decades prior to the Reformation. Mariano performed ordinary clerical duties throughout his life, but also found the time to research and write fifteen treatises on his order's history and noted members. My research uses these writings (some of which exist only in manuscript copy) to explore daily life in the friaries and convents of central Italy at the end of the Middle Ages. It also assesses how important debates over what it meant to be a Franciscan played out at a local level, a subject that is frequently overlooked in favor of conflict at the level of the Order's leadership. This proposal specifically seeks funding to travel to Florence, Italy in June-July 2015 in order to read Mariano's autograph manuscripts and research archival documents related to the communities in which he lived.

Medeiros, Henry

Assistant Professor, Electrical and Computer Engineering

RRG Award Amount: \$2,700

Distributed Multi-target Tracking Using Wireless Camera Networks

Video surveillance has become increasingly pervasive world-wide. In the future, wide area surveillance camera networks will allow the exact location of suspect individuals to be determined accurately and almost instantly. The most important requirement for large scale intelligent surveillance systems is the ability to keep track of individual targets as they move along areas observed by different cameras. The goal of this project is to present an effective and efficient solution to this problem. We will develop an algorithm that integrates spatial, temporal, and visual target features observed by multiple cameras using state-of-the-art statistical filtering mechanisms based on the concept of random finite sets. Since these methods allow for variable state dimensions, our algorithm will be able to track multiple targets simultaneously, even as they enter or leave the field of view of the network. This algorithm will be designed in a distributed manner so that target association constraints determined by the physical arrangement of the cameras as well as target mobility limitations will be accounted for as information is shared among neighboring cameras. We will deploy a network of cameras that will allow us to explore different target motion patterns and visual appearances and, as a consequence, generate a robust and generalizable method. Our experimental results will be validated using publicly available datasets so that they can be benchmarked against alternative methods. Ultimately, we expect that our method will provide a theoretically sound and practically useful framework for the design of the multi-sensor multi-target tracking systems of the future.

Moon, Dawne

Associate Professor, Social and Cultural Sciences
RRG Award Amount: \$6,405

The End of Culture Wars? Evangelicals, Gays, and Reconciliation: A Qualitative Study

This qualitative sociological study seeks to understand a move among some evangelical Protestants to end the so-called Culture Wars. It asks what theological shifts are occurring among conservative Protestants, allowing various efforts at reconciliation between the evangelical Church and lesbian, gay, bisexual, and transgender (LGBT) persons in the United States. It also examines the actual dialogues and processes of reconciliation. Such reconciliation is taking place in evangelical congregations that are becoming affirming of gay identities and marriages, in groups of Christians that organize to apologize publically to LGBT people on behalf of the Church and facilitate dialogue, in places where LGBT evangelicals are speaking out as a “gay Christians” to challenge the Church to be more “Christian” in how it treats them. Some of these evangelical Christians do not believe that homosexuality is sinful; others believe it is, but still think the Church has behaved in “unchristian” ways toward LGBT people.

The study explores what social conditions have made it possible for people to create this world beyond the “evangelicals vs. gays” divide. This study will consider historical, demographic, and biographical causes of these changes and focus particularly on the theological reasoning and meanings that animate this movement. As this study is predominantly about meaning-making, I will use the methods of participant-observation, qualitative interviews, and textual analysis of documents from within this movement. In the end, it will offer scholarly insight into how people who disagree over important issues can work together productively to reduce harm and increase understanding.

Ohlendorf, Jennifer

Assistant Professor, College of Nursing
RRG Award Amount: \$5,500

A Pilot Study of a Nurse-Delivered Activation-Based Coaching Intervention to Promote Healthy Weight Gain in Pregnancy

Excess weight gain during pregnancy increases risk of overweight and obesity over a woman’s lifespan. Pregnancy is an opportune time to promote healthy eating and physical activity behaviors to achieve a healthy weight gain during pregnancy. Patient activation refers to a person’s likelihood that they will actively manage their health; and coaching interventions tailored to a patient’s activation level have been shown to be effective in increasing adoption of healthy behaviors among adults with chronic health conditions. This proposed pilot study will test the feasibility of an activation-based coaching intervention aimed to increase healthy eating and physical activity during pregnancy, thus increasing likelihood that a woman’s pregnancy weight gain will be within parameters recommended by the IOM based on pre-pregnancy BMI. The data will allow calculation of effect size for a full-scale study to test this intervention in a larger, more diverse population.

A total of 82 women will be recruited from an obstetrical practice and randomly assigned to one of 2 groups. The intervention group will receive an activation-based, coaching intervention (Coaching for Activation©) once per trimester and the comparison group will receive usual care. Provider and participant feedback will describe intervention feasibility. Repeated measures ANOVA will be used to compare eating and physical activity behaviors between the two groups before and after the intervention, and Chi square analyses will compare the proportion of women whose pregnancy weight gain is within recommended parameters between the two groups.

Orlov, Andrei

Professor, Theology

RRG Award Amount: \$5,500

Mother of God as the Heavenly Temple: Priestly Mariology of the Slavonic Version of the Protevangelium of James

The current project aims to introduce the theological community to unique sacerdotal traditions found in the Slavonic version of the *Protevangelium of James*—an early Christian document crucial for shaping patristic and liturgical images of the Virgin Mary as the heavenly Temple. The *Protevangelium of James* (the *Proto-Gospel of James*), written in the second century AD, offers an account of the early life of the Virgin Mary, depicting her as the priestly child who spends her youth in the Jerusalem Temple. The *Protevangelium* enjoyed popularity in various Christian milieus and survived in many translations, including Greek, Latin, and Syriac, Georgian, Armenian, Arabic, Coptic, Ethiopic, and Slavonic. Despite the fact that the Slavonic version of the *Protevangelium of James* is the most textually represented among other versions, as it has survived in 169 Slavonic manuscripts, it remains largely unknown to Western scholars. Yet, it contains a number of important details absent in other versions—most pertinently, a more extensive narrative of the Presentation of the Virgin Mary in the Temple, which is a tradition crucial for shaping the Virgin Mary's image as the Heavenly Temple. The outcome of the project will provide scholars with full textual evidence, an English translation and a thorough examination of the priestly features of the Theotokos story found in the Slavonic manuscripts of the *Protevangelium of James*. This will ultimately shed new light on the early development of the image of the Mother of God as the heavenly Temple.

Pladek, Brittany

Assistant Professor, English

RRG Award Amount: \$2,724

The Poetics of Palliation (Introductory Chapter)

For this SFF project, I will conduct archival research into 18th –and 19th century medical ethics treatises held at the Wellcome Library and University of King's College Library in London. This research will enable me to complete 1) the introductory chapter to my manuscript, *The Poetics of Palliation*; and 2) a paper I plan to present at my field's major conference in 2015. *Poetics* is an interdisciplinary study that reads Romantic literary writers through the lens of 18th-and 19th century medical ethics in order to challenge the standard account of how Romantic writing, and literature more broadly, is said to "heal." The standard account understands literary therapy as the restoration of spiritual holism, curing the "wound of self." But Romantic writers approached literary therapy through a diversity of models reflecting their contemporary medical milieu. As British doctors in the 18th century sought grounds for their professional reputation that did not depend upon curing patients---a promise their limited therapeutics could not guarantee---so Romantic writers explored how literature could act therapeutically beyond the goal of "curing" individuals or society.

Because the standard curative account of Romantic literary therapy has been so influential, *Poetics* offers a corrective that expands the available models for literature's medial potential while demonstrating their historical relationship to medicine itself. In doing so, *Poetics* provides a historical resource for the health humanities, a contemporary interdisciplinary movement that combines scientific medicine with humanities fields like literature and history in order to promote human wellbeing.

Porcelli, Anthony

Assistant Professor, Psychology

RRG Award Amount: \$6,000

Stress and Prosocial Behavior: The Influence of Acute Stress on Trust

The propensity for individuals to cooperate with each other has long been of interest to psychologists, economists, and other social scientists. Though not exclusive to *homo sapiens*,

humans are one of the few animal species shown to engage in prosocial interpersonal interactions that can lead to cooperation and trust in other individuals, with positive outcomes at the individual and societal levels. That said, choosing to engage in prosocial behavior can have a dark side. When trust is poorly placed, the outcome can be highly negative for the individual decision-maker as well as society. While research has begun to examine the pattern of complex social interactions leading to the choice to trust (or not trust) another person, little is known about how external factors might influence that decision. Past research on trust has often ignored the critical influence of context. One such contextual factor largely unexamined to date is one that people are exposed to every day—stress. In a modern world where stress is pervasive and is in fact increasing in prevalence, it has never been more important to examine interactions between stress and our choices to trust or not to trust others. Drawing on research in the field of economics, the research proposed here will examine the relationship between stress and trust in financial decision-making with a strong emphasis on the psychophysiological correlates of both.

Schindler-Ivens, Sheila

Associate Professor, Physical Therapy

Schmit, Brian

Professor, Biomedical Engineering

RRG Award Amount: \$10,000

A Novel Pedaling Paradigm to Improve Lower Limb Rehabilitation Post-Stroke

Motor compensation after stroke is a behavior in which the non-paretic limb performs tasks that are normally accomplished by the paretic limb. For example, stroke survivors with right hemiparesis often bear weight exclusively on the left leg when rising from a chair. While compensation improves independence, it may be detrimental to recovery. We have compelling preliminary data suggesting that compensation reduces cortical activation, resulting in submaximal lower limb movement. Our data also suggest that, when compensation is prevented, cortical activation increases. These observations led us to hypothesize that rehabilitation suppressing compensation maximizes lower limb movement via improved cortical activation and functional connectivity. This grant describes a novel experimental approach—a pedaling paradigm—that allows us to test this hypothesis and begin to resolve the conceptual controversy over compensation in lower limb rehabilitation. Specifically, we aim to determine whether training that prohibits motor compensation, improves cortical activation and functional connectivity, resulting in better paretic lower limb motor output. Individuals with stroke will perform pedaling training with and without compensation from the non-paretic limb. We predict that training without compensation will increase use of the paretic limb, leading to enhanced cortical activation and functional connectivity; training with compensation will not. Enhanced cortical activation and connectivity will further enhance paretic limb use. Ultimately, this feedback loop will maximize paretic lower limb movement. Results will provide a scientific framework for rehabilitation that has important implications for walking in people with stroke and other conditions that cause hemiparesis.

Sebern, Margaret

Associate Professor, College of Nursing

RRG Award Amount: \$5,820

iPad-Enhanced Shared Care Partners Intervention (iSCPI), Optimization and Usability Test

This Summer Faculty Fellowship/Regular Research Grant (SFF/RRG) application includes work to optimize the iPad-enhanced Shared Care Partners Intervention (iSCPI), and submit extramural grants and manuscripts. The iSCPI is designed to improve heart failure (HF) patient and family caregivers' self-care, social support, and palliative care planning. HF patients experience poor symptom management, quality of life, and increased risk of mortality.¹ HF direct medical costs are \$20.9 billion, and hospitalization accounts for 80% of these costs.² Preventable causes of hospital readmissions are poor self-care³ and inadequate social support,⁴ and palliative care is underutilized.²

The iSCPI is designed to address these preventable causes of hospital readmissions. The iSCPI is a 7-session intervention supported by an iPad app. The iSCPI takes a family-centered approach to address preventable causes of hospital readmissions.⁵

Prior to seeking extramural funding, it is essential to optimize this intervention and the iPad with clinicians and patient-family caregivers (referred to as stakeholders). Thus, we propose to involve stakeholders in focus groups to optimize the iSCPI and research strategy, which will be used in future grant applications. Specific aims for the RRG are:

- Aim 1. Engage stakeholders in focus groups to optimize the iSCPI components.
- Aim 2. Engage stakeholders in a usability evaluation of the iSCPI's iPad app.
- Aim 3. Engage stakeholders in optimizing the research strategy for future grant applications.
- Aim 4. Validate optimized iSCPI and research strategy with stakeholders.

The aims for the SFF are:

- Aim 5. Prepare proposals for extramural funding.
- Aim 6. Prepare manuscripts for publication.

Silver-Thorn, Barbara

Associate Professor, Biomedical Engineering

RRG Award Amount: \$6,000

Biomechanical Function of the Acetabular Labrum of the Hip Joint

The labrum, a soft tissue structure lining the hip socket or acetabulum, plays an important role in the overall function and long term health of the hip joint. Biomechanically, the labrum has been shown to create a seal against fluid flow into and out of the hip joint, and contribute to hip joint stability and fluid pressurization of the joint. Labral tearing adversely affects these functions, resulting in damage to the articular cartilage and development of osteoarthritis.

The goal of this research is to use a human cadaver model to assess the changes in biomechanical properties following stimulated labral tear and labral reconstruction, as compared to the intact labral state. The study hypotheses are: 1) labral tears or lesions will increase joint motion and regional contact stresses relative to the native intact hip under stimulated physiological loading conditions, 2) labral lesions will reduce joint distraction forces and joint stability compared to the native hip, and 3) labral reconstruction will restore the joint stability, contact stress, and joint distraction strength to that of intact labrum.

Young patients with compromised or absent labrums are at risk for development of early arthritis of the hip. The ability to reconstruct the labrum and restore the mechanics of the hip joint may reduce risk of early hip osteoarthritis and/or retard its progression, facilitating greater activity and a healthier, pain-free life.

Vanderheyden, Jennifer

Assistant Professor, Foreign Languages and Literatures

RRG Award Amount: \$6,500

Lettres de Cachet in Diderot's *Religieuse*

I am currently writing a book (under contract with the Edwin Mellen Press) that conducts a critical analysis of the eighteenth century writer and philosopher Denis Diderot's text *La Religieuse* (*The Nun*). My title is *Stained Souls in Diderot's La Religieuse*. Most critical studies of Diderot's novel focus on his depiction of the plight of the cloistered nun Suzanne Simonin, who is forced against her will to take her vows and thus submit to various atrocities she endures under the realms of the three Mothers Superior. Rather than continue the traditional discourse surrounding this text that centers on Diderot's criticism of the Catholic Church, abuses in the convent, as well as forced professions, my

book seeks to explore Suzanne's implied yet unspoken psychological revolt against her mother's rejection, and secondly, to address the larger political and social implications of this revolt.

For this SFF project, I will write a chapter for my book in which I plan to demonstrate that the thread that links both aspects of this rebellion are two implied references to the infamous *lettres de cachet*.¹ A major theoretical basis for this chapter will be Michel Foucault's study of the *lettres de cachet: Le Désordre des familles*. The significance of this chapter is that this connection with the *lettres de cachet* has not previously been made; therefore it should advance the scholarship on Diderot's novel in addition to provoking future dialogue and discussion, especially given the political and social implications that I plan to propose.