

# Celebration of SCHOLARSHIP



THURSDAY, APRIL 19, 2018

## Oral Presentation Program

IWU'S ANNUAL UNDERGRADUATE RESEARCH CONFERENCE

SPONSORED BY THE JOHN WESLEY HONORS COLLEGE

# ORAL PRESENTATION SCHEDULE

Presentations begin every 20 minutes in Bedford and Leedy Banquet Rooms in the Barnes Student Center. There will be a break for the Celebration of Scholarship Luncheon\* from 12:00pm to 2:00pm.

\**RSVP required*

	<b>BEDFORD</b>	<b>LEEDY</b>
<b>8:00am</b>	Ryan Koehlinger	Zane Hayden, Michael Olson, Kennedy Jones, & Ally Thies
<b>8:20am</b>	Jordan Koehlinger	Victoria Haller, Annabell Kennell, Alexandra Seabeck, & Alexandrea Springer
<b>8:40am</b>	Brooke Eber	Caroline Moore, Corbin Coffman, Andrew Wick, & Elaine Shimmons
<b>9:00am</b>	Rachel Price	Josiah Planck, Douglas Oliveira, Christi Wolgemuth, & Whitney Yoder
<b>9:20am</b>	Jordan Maure	Ben Lex, Ashley Etherton, Karaline Hallett, & Jordan Stemple
<b>9:40am</b>	Phillip Quinn	David A Rodrigo
<b>10:00am</b>	Jessica Corbett	Jessica Dion & Karissa Uhlig
<b>10:20am</b>	Erin Linker	Adam D. Carroll
<b>10:40am</b>	Ray Mosley	Julie Webster & Jessie Dion
<b>11:00am</b>	Larisa Kuehn	
<b>11:20am</b>	Peter Troutner	
<b>11:40am</b>		

## LUNCH

<b>2:00pm</b>	Zechariah Pfaffenberger	Erica McKinley, Jessi Cox, & Kira Raquet
<b>2:20pm</b>	Hannah VanDusen	Erica Chapman, Mickey Huntington, Jani Barrera-Ramirez, & Blake Dennis
<b>2:40pm</b>	Jaylin Miller	Evan Forshey, Akeem Green, Bethany Hastings, & Brett Rider
<b>3:00pm</b>	Hannah Scheibel	Riley Blake, Madison Cook, Carly Norwood, & Mikalea White
<b>3:20pm</b>	Lauren Zaeske	Madison Gruber, Hannah Easdon, & Shaley Hartsburg
<b>3:40pm</b>	Kristin Moore	Miranda Barrett, Beth Riley, & Kate Regnier
<b>4:00pm</b>	Sydney Weghorst	Katura Rowe
<b>4:20pm</b>	Koby Buth	
<b>4:40pm</b>	Zephan Oelmann	
<b>5:00pm</b>	John Kristof	
<b>5:20pm</b>	Albert Gustafson	[GLOBE THEATRE] "Miranda Rights" Sitcom Premiere
<b>5:40pm</b>	Tessa VanderStel	
<b>6:00pm</b>	Madison Routledge	

# MORNING SESSIONS

8.00 AM

## The Relationship of Internal Culture and the Church

Ryan Koehlinger, *School of Theology and Ministry*

Throughout the past fifty years, there has been an emergence in the study of corporate culture within the majority of academic work centering around its mechanisms within the corporate context and its effects on the economic value of a company, the quality of its products, and the benefits culture provides for the company. As academic research continues to explore cultures within organizations and businesses, the concepts and findings should be tested against other forms of organizations and businesses to better inform the topic and provide insight and application into their different forms. Specifically, churches and religious organizations have seen little research or comparison of culture from the academic realm. Through qualitative interviews with a small sample of churches, this research intends to explore manifestations of culture within churches and religious organizations and better understand the similarities and differences between the cultures within churches and between church, corporate, and organizational culture. This research concludes that elements of corporate culture exist within church organizations, such as the impact of leadership on culture development and the propagation and importance of visual representations of goals. As a result, churches can benefit from a portion of corporation's practices and theories to better influence their own culture, filtering this information through a knowledge of the fundamental differences between churches and corporations.

BEDFORD

## Accuracy of fitness trackers in measuring caloric expenditure and heart rate

Zane Hayden, Michael Olson, Kennedy Jones, Ally Thies, *Health and Human Performance*

LEEDY

As people continue to try to be healthier, the popularity of fitness trackers increases. The purpose of this study was to test the reliability and accuracy of the heart rate and caloric expenditure of two of these wearable devices, the Fitbit Charge 2 and the Garmin VivoSmart. The articles researched for this review showed that the Fitbit Charge 2 can accurately measure heart rate at rest. This was also shown with the Garmin VivoSmart. For exercise, however, the Garmin VivoSmart would underestimate the heart rate. This was also true for the Fitbit Charge 2. For caloric expenditure, both devices were shown to be inaccurate, either measuring too high or measuring too low. However, each study used different ways to measure the accuracy of both of the variables. Therefore, the design of the study could be a significant factor in determining this accuracy. The study conducted, composed of 21 participants (age range 18-62), showed the Garmin VivoSmart to overestimate the heart rate while resting and the Fitbit Charge 2 to underestimate the heart rate at rest. Both devices underestimated heart rate while performing the study (i.e. while exercising). As far as caloric expenditure, the Garmin VivoSmart underestimated the calories burned; the Fitbit Charge 2 overestimated the number of calories burned. As reliance upon these technologies continue to rise, it is imperative that the companies strive to improve in the accuracy of these variables.

**The Musical Narrator: The Narrative Role of Film Music in The Godfather Part II**

Jordan Koehlinger, *Music*

The researcher examines the role that music plays in shaping the narrative of the film, *The Godfather Part II*. She demonstrates that the music of the *Godfather Part II* guides viewers' interpretations of the film by clarifying otherwise ambiguous elements of the plot, describing the internal states of characters, and highlighting implicit literary themes of the film. Without music, these respective elements of the film would remain unclear.

**Correlation Analysis of the Skulpt and BodPod**

Victoria Haller, Annabell Kennell, Alexandra Seabeck, Alexandrea Springer, *Health and Human Performance*

The BodPod is known as the golden standard for measuring body composition. A new body composition measurement tool called the Skulpt© was created recently. There is little to no research on the Skulpt©, because it is so new. For this reason, our study sought to determine the accuracy of the Skulpt© compared to the BodPod. This research is beneficial because if the Skulpt© is determined to be accurate, the low cost and convenience of the Skulpt© would make measuring body composition more accessible and available to the general population. This will increase the public's knowledge on the importance of a healthy body composition. The purpose of our study is to test how accurately the Skulpt© measures body fat percentage when compared to the BodPod. Participants completed an informed consent and demographics form prior to the study. The participant's body composition measurements were recorded, using the BodPod first then Skulpt©. Results were analyzed using the Spearman's R Correlation on SPSS software and concluded there was a statistical significance of 0.000 between the BodPod and Skulpt©. A 4.8582% difference was found between the measurements. There was a direct relationship correlation of 0.845 found between the BodPod and Skulpt©. The Skulpt© was statistically higher when measuring body composition in comparison to the BodPod. The primary recommendation is to avoid using the Skulpt© in research settings. The Skulpt© is acceptable to measure body composition in the general population if prior knowledge is given that it will provide a consistently higher measurement than the BodPod.

**Afternoon Tea and Ministry Innovation**

Brooke Eber, *School of Theology and Ministry*

How can we make ministry sustainable? Can nonprofits provide a beneficial service for the community that funds their main mission? What innovative initiatives will work in our context? For my research project I explored these questions of sustainability and innovation through participating in Duke's Foundations of Christian Leadership education program. With the support of a \$5,000 Innovation Grant from Duke Leadership, I started Afternoon High Tea fundraisers at The Brain Kitchen. My presentation will explore these questions and their answers as they relate to The Brain Kitchen and our Afternoon High Tea program.

## **Accuracy of Fitness Trackers in Predicting Caloric Expenditure during Stationary Biking**

Caroline Moore, Corbin Coffman, Andrew Wick, Elaine Shimmons, *Health and Human Performance*

LEEDY

With the increasing prevalence of wearable activity trackers, it is important to investigate how reliable they are. The measurement of caloric expenditure of three different fitness trackers was assessed during a stationary bike test through the use of a six minute biking protocol. Each reading on the fitness trackers were compared to the metabolic cart, the gold standard in assessing caloric expenditure. Forty college-aged individuals voluntarily agreed to participate in the study. Following the data collection process, two of the fitness trackers were found to have a positive correlation in relation to the metabolic cart. However, activity tracker 1 was found to overestimate caloric expenditure, and activity tracker 2 was found to underestimate caloric expenditure. The results of activity tracker 3 were unable to be statistically analyzed due to the variation and inaccuracy between measurements found during the study. Since both activity trackers were found to be inaccurate when compared to the metabolic cart, this could lead to individuals having misconceptions about the number of calories they burn during an exercise session. As a result, those who use activity tracker 1 will be led to believe that they burn more calories than they actually do, while those who use activity tracker 2 will have a perception that they are burning less calories for the same exercise program.

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9.00 AM

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## **Intervention for the Improvement of Mental Health Among Clergy in the NCCUMC**

Rachel Price, *School of Theology and Ministry*

BEDFORD

This research was aimed at evaluating symptoms of depression and anxiety among ordained elders and licensed local pastors within the North Carolina Conference of the United Methodist Church. Once identified, pilot intervention models were studied. Then, denominational officials and clergy were surveyed differently to understand the effects and perceptions of previous attempted interventions. There is a great need for intervention supported by denominational leadership that is financially feasible. These findings will go towards developing an effective and sustainable program that addresses needs identified in this study and former studies by the Duke Clergy Health Initiative.

LEEDY

## **The Accuracy of Activity Trackers Measuring Energy Expenditure Compared to the Metabolic Cart**

Josiah Planck, Douglas Oliveria, Christi Wogelmuth, Whitney Yoder, *Health and Human Performance*

Fitness trackers are becoming increasingly popular worldwide. There are several different brands that produce fitness trackers that come in a variety of colors with various functions and abilities. It is essential that consumers who purchase these watches be able to rely on the functions that are advertised, especially when cost, exercise, and life-style choices wane in the balance. The purpose of this study is to assess the accuracy of the energy expenditure function of three different fitness trackers: Garmin Vivosmart HR, Fitbit Charge 2, and the Huawei Band 2. There were a total of 35 participants whose ages ranged from 18-23. The participants were college and graduate students at Indiana Wesleyan University. Each participant wore all three devices and walked on a treadmill for 10 minute at 3.0 mph with no incline. The energy expenditure from each device was compared to

the results of indirect calorimetry, which is the gold standard. The average on the total energy expenditure was off by 37 calories on the Fitbit, 22 calories on the Garmin, and 4 calories on the Huawei when compared to the metabolic cart, which utilizes indirect calorimetry. The main finding was that all devices overestimated energy expenditure and they all had a moderate correlation to the metabolic cart. Consumers need to be aware of the product they are buying, its functions, and accuracy. Purchasing fitness trackers can be expensive so doing proper research on which one is the most accurate is essential.

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9.20 AM

## Morality and Reputation: Pressures Placed on India to Reform their Human Trafficking Laws

Jordan Maure, *International Relations*

Since the 1990s the issue of Human Trafficking has gained much traction on the global stage. However, in India anti-human trafficking groups have been working to end trafficking since the 1970S. Yet, for the most part, their legislation has not followed in suit until recently. What are some of the factors that have helped cause the transformation of Indian legislature to take a harder stance on trafficking and why now? This research is based in the constructivist narration of the International Relations field that states the world and nations works by sets of norms. One of the internationally accepted norms is that human trafficking is wrong. Though this has become accepted by most of humanity, human trafficking can be found in almost every nation in the world; including India. The question of this paper is what factors have been pushing India to begin reforming their trafficking laws? Has the nation and its citizens began to accept the human trafficking norm or have outside pressure from the United States, the UN, and other leading groups combating human trafficking causing them to want to keep a positive reputation in the international community?

## Effect of Preferred Music Genres on Exercise

Ben Lex, Ashley Etherton, Karaline Hallett, Jordan Stemple, *Health and Human Performance*

The aim of this study was to determine the impact of music on performance, rate of perceived exertion (RPE), and heart rate (HR) during moderate exercise. Running has been found to be a common mode of exercise during which students listen to music (Barney, Gust, & Liguori, 2012). Prior research suggests that listening to preferred music during physical activity affects HR, RPE, and performance. Thirty healthy male and female university students (18-24 years old) participated in this study. Participants completed the 12-minute Cooper Run Test on three separate occasions, listening to most preferred genre, least preferred genre, and no music. Distance traveled, HR, and RPE were recorded during each test. After performing a Repeated-Measures ANOVA, it was determined that HR and RPE responses did not display any statistically significant differences ( $p > 0.05$ ) among the three trials. While listening to most preferred genre, however, participants traveled a significantly greater distance than when they ran to their least preferred genre ( $p < 0.05$ ). Because there is a linear relationship between exercise intensity and HR, it would be expected that HR would increase significantly as distance traveled increased, however, this was not the case, suggesting there is a physiological effect of listening to preferred music genre. The findings from this study enhanced our knowledge of music's impact on physiological responses. These discoveries impact a large portion of the exercising population, due to the popularity of listening to music during physical activity and the effect on performance.

## **Communal Values, Personal Virtues: The Epistemic Critique of Eudaimonistic Virtue Ethics and Virtue as a Communal Endeavor**

Phillip Quinn, *Other*

In this thesis, I answer an important critique made against eudaimonistic virtue ethics (EVE): the "epistemic critique," which states that EVE cannot provide action guidance to all competent individuals and is therefore incomplete. Secondarily, I propose a communal virtue formation account and suggest some communal directions that EVE might take in the future.

I first outline what constitutes EVE and distinguish it from other ethical theories. Because the epistemic critique is raised against the ability of EVE to provide action guidance, I also discuss what constitutes action guidance and how virtue ethicists such as Rosalind Hursthouse attempt to give such an account for EVE. Second, I discuss the epistemic critique. Robert Louden argues that EVE cannot provide action guidance because it relies on novice in virtue to recognize the virtuous; the novice cannot accomplish this because it is impossible to ascertain who is virtuous by looking at actions or by attempting to perceive motivations. Third, I argue that this critique makes two problematic assumptions that mitigate its force. One does not have to assume a strong division between the knowledge that a novice and an expert in virtue would have with regard to virtue. Furthermore, it is unfair to expect EVE to give action guidance to the untrained in virtue because no individual is able to use moral reasoning without extensive prior training. Fourth, drawing on psychology for support, I outline an account of moral formation that shows how virtue ethics can account for the cultivation of virtue and how the ability to engage in moral reasoning is developed. This should show that, though it cannot provide clear action guidance for the completely untrained in virtue, EVE can guide actions with regard to helping such individual develop into virtue. Last, I draw out some implications of the above account, noting some directions that virtue ethics might take in the future and suggesting that it might benefit from a more love-centered and communal (rather than agent-centered and individually eudaimonic) account of virtue and virtue development..

## **Multicultural Worship in a Monolithic Context: Exploring the challenges and possibilities for praxis in transforming monocultural gathering of believers into multi-culturally conscious worshippers**

David A Rodrigo, *School of Theology and Ministry*

Multicultural worship is not solely reserved for an eschatological purpose. Instead, it is also an ecclesiological requirement of 21st century worshippers. This study examines how Christ had already paved the way for multicultural worship as he challenged Jewish purity codes that made worship a monochromatic affair. The pluriuniformity of worship practices in the early church has been neglected as unity was confused with uniformity. Colonialism has had adverse effects in fostering indigenous Christian roots throughout the world while global missions have made western practices to be gold standard of worship. These realisations have caused scholars and practitioners to look for ways to encourage indigenous worship by creating a global exchange of worship practices through ethnodoxology. Systems and structure that have its origins in colonial and cultural supremacist mindsets still govern church practices and are a hindrance to cultivating multicultural worship. There are well-meaning, yet problematic strategies for inclusion in worship. Ultimately, if decisions are not multiculturally influenced, a church remains multicoloured and thereby monocultural. Discipling multiculturally conscious worshippers requires intentionality, creativity, and learning.

## Barriers Faced by Burmese Refugee Youth in Educational Attainment and the Support They Need to Succeed

Jessica Corbett, *Modern Language and Literature*

Since 2001, the population of Burmese refugees has been the largest growing refugee group in the US (Quadros & Sarroub, 2016, p. 29). In the process of traveling to the US and resettling here, Burmese refugees face a plethora of challenges, and have to overcome many barriers especially in regards to education. The Burmese refugee youth that are coming to the US today have spent part, or most, of their lives in under-resourced refugee camps. In 1993, it was said that refugees spent on average 9 years in refugee camps, but in 2003 that number almost doubled to an average of 17 years (Lui, 2007, p. 185). Additionally, most refugees who settled in the US used to be clustered in large urban centers, but they are now found in almost every state and a great number of school systems around the US. Regrettably, most teachers lack the experience and training to support their new students both culturally and academically (Sadowski, 2004, p. 2).

There is a need for scholarly research to examine the educational attainment of Burmese refugees prior to resettlement in the US, how that impacts the schools in which they are placed, and their educational attainment going forward, and finally how educators can best support them in the classroom (Quadros & Sarroub, 2016, p. 29). For many years world news of conflict, poverty, and the refugee crisis in other regions of the world have overshadowed the human rights violations that have caused such an increase in Burmese refugees settling in the US (Lui, 2007, p. 186). These students have been overlooked for many years, and the few researchers who have considered their education can say that there are adverse effects due to this neglect (Lui, 2007, p.186). Students are not only unprepared for the continuation of their education and to adapt to American culture, but these refugee students are also struggling to find the support they need to thrive in school (Koh, 2013, p. 297).

In order to best support refugee students and their family's input is needed from a variety of educators and professionals who support them. This study will use interviews with refugee families and the professionals who support them in resettlement and in their educational attainment in order to reveal what barriers created by the refugee process affect their children's educational attainment, and what specifically needs to be done to support these students. This study is built upon the scarce research that has been done on Burmese refugees, and will hopefully enlighten the research community to an area that is under-represented and needs to be explored. This study seeks to answer the following specific research questions: RQ1: What factors are perceived by Burmese refugee families and the professionals who work with them as influencing the educational attainment of Burmese refugee youth? RQ2: What strategic support can be given to refugee students so they can achieve educational success?

## Mindfulness Matters: A Study of Self-Care and The Ink Well

Jessica Dion and Karissa Uhlig, *Modern Language and Literature*

This presentation will be a continuation of the research Karissa and Jessie presented at the East Central Writing Central Association conference in March. The study consists of three rounds of surveys and one to two rounds of interviews assessing the level of self-care of tutors in The Ink Well and their subsequent ability to be present in sessions, which affects their overall ability to tutor. Based on these findings, we will make concrete changes in The Ink Well to better support tutors and tutees.

**Want: Depicting Depression Through Literature**

Erin Linker, *Modern Language and Literature*

In a realistic fiction young adult novel I will address the topic of depression, specifically persisting depression (also called dysthymia). To present the abstract mental illness, I will personify and enflesh depression; I will give depression a face, a name, a personality, and, most importantly, a voice. In this novel, I will present the story of Jacklyn, a high school student with a common life and an uncommon friend, Clay. Taking the physical form of her depression, Clay, who is invisible to everyone else, follows Jacklyn and is in near-constant conversation with her. These conversations will reveal the destructive nature and logical fallacies of depression, as well as the difficulty of recognizing the need for change.

**Troubled Times: Working with Adolescent Males Diagnosed with Oppositional Defiant Disorder**

Adam D Carroll, *Graduate Counseling*

The focus of this research is on gaining a better understanding of Oppositional Defiant Disorder (ODD) in adolescent males ages 13-17. Additionally, this research seeks to identify effective modalities of therapy and comparing the effectiveness of group versus family therapy. The effects of ODD are felt not only by the young men themselves, but also their families and the communities in which they live. The purpose of this presentation is to give an update on the preliminary findings from the existing literature on the development and impact of ODD. Finally, this presentation will offer initial thoughts on potentially effective therapeutic interventions for the treatment of ODD.

**Biophilia: Understanding Humanity and Science Fiction**

Ray Moseley, *Modern Language and Literature*

This presentation will discuss my graphic novel, Biophilia, the process I followed to complete it, and what it means. I will discuss the ideals and themes that I wrote about in Biophilia, their connection to the JWHC and myself, and the importance of some of the ideas that I wrote about to myself and to others. The presentation will likely feature a powerpoint and at least one printed copy of the comic itself, and will also highlight my process work and plans for the future.

**Lament and Fiction: An Exploration of Beloved and Maus Through Film**

Julie Webster and Jessica Dion, *John Wesley Honors College*

Through the lens of Dr. Rah's Prophetic Lament, we analyze the historical and cultural practices of lament as seen in the timeless classics of Toni Morrison's Beloved and Art Spiegelman's Maus. We present our findings via a short film in which we compare the stories of Sethe, Baby Suggs, Denver, Art, and Vladek to Lamentations 5. A short discussion will follow the film. Our film shows that lament is a common language that carries across the divisions of culture, race, time, and gender.

**INFRASTRUCTURE NECESSARY FOR PROMOTION OF BEST BREASTFEEDING PRACTICES**

Larisa Kuehn, *Nursing*

The Baby Friendly Hospital Initiative (BFHI), which promotes best breastfeeding practices, was launched by the United Nation's Children's Fund and the World Health Organization to encourage and implement breastfeeding in hospitals and birthing centers. Hospitals who have adopted the BFHI ensure that they offer optimal care for the breastfeeding mother and child. This study determines whether the infrastructure at a small, rural hospital is conducive to the adoption of the BFHI. Surveys were administered to nurses working on a family birthing unit to determine data and their perspectives. Advantages and barriers found from analyzing the data will be presented to hospital in hopes of aiding them in best breastfeeding practices.

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**WITH OR WITHOUT THEM: THE ROLE OF DESIGN AND MEMORY IN THE RECONCILIATION OF DIVIDED SPACES AROUND PUBLIC MONUMENTS**

Peter Troutner, *Art*

Our stories matter. Our communities matter. Even our histories matter despite all the pain and hurt that is found within their pages. The goal of my project is to design a kit for communities to use containing tools used to create spaces for productive and peaceful conversations about the false memories, abrasive memories, or longed to be forgotten memories within our own communities. These memories are often tied to place and come to heads around the places of commemoration in our cities and towns. These commemorative monuments or absence of monuments create a context around which we live. Considering the national debate around memorials and monuments, how can we create conversations that lead to unity while still doing justice to history in the spaces and places in which we live? How do we as a community navigate a past we would rather forget?

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# AFTERNOON SESSIONS

2.00 PM

## SULT1C2 Modifies Mitochondria Respiration In Vitro

Zechariah Pfaffenberger, *Natural Sciences*

Regulating blood pressure and electrolyte levels, stimulating production of red blood cells, and removing nitrogen waste products from the blood, kidneys are one of the most important organs in the human body. According to a U.S. National Vital Statistics report, kidney ailments are the 9th leading cause of death in the U.S. Despite the importance of this organ and the prevalence of kidney ailments, there are only two treatment options: dialysis and transplant. One particularly troubling ailment is acute kidney injury or AKI, defined as a rapid loss of kidney's excretory function due to mismatch in energy supply and demand caused by blood loss, trauma, or toxic agents. AKI is often comorbid with other diseases and appears in 5-7% of all hospital patients. One potential method for helping with recovery from AKI is ischemic preconditioning in which a small non-lethal dose of ischemia is induced in a target organ that then protects against future injury. This study sought to determine biochemical changes that took place in ischemic preconditioned kidney tissue. It was previously found that mitochondria efficiency increased in ischemic preconditioned rat tissue versus control and that the enzyme sulfotransferase 1C2 was highly upregulated in ischemic preconditioned kidney tissue in a rat model. This enzyme is responsible for detoxification of xenobiotic compounds by adding a sulfate group; therefore, we hypothesized that SULT1C2 modified mitochondria function by adding a sulfate group onto some component of the membrane. Thin layer chromatography was used to analyze the lipids of the mitochondria membrane for sulfate groups and respirometry was used to determine if sulfated lipids on their own might increase mitochondria membrane potential. The results indicate that SULT1C2 does increase the amount of sulfated cholesterol in mitochondria membranes and that sulfated cholesterol increases the state 3 respiration of mitochondria in vitro.

## Too Tired to Care: A quantitative study on Shift Length for Workers at Residential Treatment Centers and how it relates to Compassion Fatigue and Compassion Satisfaction

Erica McKinley, Jessi Cox, Kira Raquet, *Behavioral Sciences*

Residential treatment centers house some of the most vulnerable children, the children society sometimes deems as unworthy. These facilities hire direct care workers, also called house parents, who are the people who invest heavily into the lives of the children and adolescents they are privileged to work with. Direct care workers have the most contact with these children as they are looking after the children during their day to day activities. The demands on workers require them to be emotionally stable while they teach the children how to regulate their own emotions (Freudenberger, 1977; Seti, 2007). Staff work long hours with few, if any breaks, which leads them little time to practice self-care, an important skill for any mental health professional. When staff do not practice self-care they can often develop compassion fatigue, a result of the combination of secondary trauma and burnout. This study will examine the level of compassion fatigue and compassion satisfaction direct care workers experience using the Professional Quality of Life scale. Direct care workers will be surveyed at two different Indiana residential treatment centers. One facility uses an 8 hour rotating shift schedule while the other uses a 16 hour rotating shift schedule. The

surveys will be compared to see if the protective factors put in place for staff who work 16 hour shifts result in the same level of compassion fatigue as the staff who work 8 hour shifts.

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2.20 PM

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**BEDFORD**

### **Analysis of biochemical requirements for Nef-dependent packaging of Hck into HIV virions**

Hannah VanDusen, *Natural Sciences*

Nef is an accessory protein of HIV which works in multiple ways to increase virus infectivity and contribute to pathogenesis. In addition to downmodulating MHC-1, CD4, and other glycoproteins, Nef activates the Src family tyrosine kinase Hck by binding with its SH3 domain, resulting in increased HIV infectivity. This complex, inhibited by a unique diphenylfuropyrimidine, is a promising target for anti-HIV therapies. However, very little is known about the mechanism by which the Nef-dependent Hck activation benefits HIV. It is known that Hck is packaged into the virion during virus production. To begin to investigate the biochemical requirements for Hck packaging, we have produced stable 293 cell lines which express several mutant Hck proteins. These are wild type Hck, Hck Y416F (structurally normal but kinase dead), Hck P2A Y527A (constitutively active), and Hck PP (closed inactive conformation). By expressing HIV in these cell lines and analyzing the virions produced, we will determine whether the protein-protein interaction of Hck and Nef, the kinase activity of Hck, or both are important in the packaging of Hck into virions.

LEEDY

### **Parental Divorce and Interpersonal Trust: A Quantitative Comparison Study**

Erica Chapman, Mickey Huntington, Jani Barrera-Ramirez, Blake Dennis,  
*Behavioral Science*

The stigma attached to divorce and family separation has changed dramatically within the United States. For many years, divorce was considered socially unacceptable. In recent years however, the social normality of divorce has become more tolerable. This acceptance led to overwhelming statistics regarding the effects of divorce throughout a family, an individual, and society as a whole. With the ever-growing normalization of divorce, one thing remains constant in psychology: the importance of trust (Covey, 2006). Divorce can be an experience that impedes or hinders an individual's ability to find a healthy level of interpersonal trust. Therefore, this study will compare the extent to which parental divorce negatively affects an individual's level of interpersonal trust. The General Trust Scale will be administered to adults ages 18 to 30 and grouped into those who have experienced parental divorce and those who have not. Results will allow insights for social workers in clinical practice and prevention programming.

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2.40 PM

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**BEDFORD**

### **Improving Bone Health Knowledge in Selected Age 9-12 Indiana Students**

Jaylin Miller, *Natural Sciences*

Studies by Winzenberg et al. regarding bone mass and osteoporosis indicated that a 10% increase in bone mass during childhood potentially delays the onset of osteoporosis by 13 years. Further, Golden et al. reported that between the ages of 9 and 12, peak bone mass lags behind peak height by 6-12 months, making children susceptible to bone fractures. Taking this data into consideration, our laboratory investigated bone health knowledge in students at Fairfield Community of Elkhart

county and Lakeview Christian of Grant county. The purpose of the study was to see if an educational presentation would help students understand how to build healthier bones. After institutional review board approval and informed consent from the students and their guardians, our laboratory tested 273 students ages 9-12 in 4th, 5th, and 6th grades. We gave each student a 12-question survey. The first questions identified variables in the students. The second tier of questions probed their knowledge of foods containing calcium and vitamin D, two important nutrients for healthy bones. Then students were asked if they could define osteoporosis. Lastly, students were asked if they knew why exercise was important. The 12-question survey results established their baseline understanding of bone health. Students had an awareness that consuming calcium and vitamin D was important (95.3%), but did not correctly identify which foods contain these nutrients (only 14.7%). Only 7% knew the definition of osteoporosis. The students were aware of the importance of exercise (97.4%) and participated in daily exercise (96.3%). The second part of the research involved a live presentation that gave students information about appropriate nutrition and exercise for good bone health. For the last part of the research, the same survey will be given to the students and results will be analyzed to assess the effectiveness of our educational efforts.

### Social Work Graduates Compassion-Fatigue Study

Evan Forshey, Akeem Green, Bethany Hastings, Brett Rider, *Behavioral Sciences*

LEEDY

Many studies focus on social problems, yet few studies examine the public servants dealing with these social problems and their levels of fatigue as a result of dealing with emotionally and physically traumatized individuals on a regular basis. This study examines the trends of these emotional demands in the social work profession and explores how they correlate to their levels of burnout. The participants consisted of graduates of a Bachelor's or Master's level social work program within the last 1-5 years and 10 plus years from a private, liberal arts college in rural Indiana. A survey in the form of a short questionnaire was sent out to them using the scholarly, psychologically recognized compassion fatigue scale. The data was then collected and results were discussed in terms of the implications for social workers and how this information can be used to advocate for more resources in assisting social workers from experiencing burnout that would negatively impact their ability to serve their disenfranchised clientele.

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3.00 PM

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### The Benefits of Human Cadavers in Undergraduate Nursing Education

Hannah Scheibel, *Nursing*

During the summer of 2016, I participated in the International Human Cadaver Prosecution Program at Indiana University Northwest. Throughout my experience, I worked extensively with three out of seven cadavers, through autopsy reports; x-ray, CT, MRI, and ultrasound imaging; and prosecution for the first-year medical students to use in their gross anatomy lab. This program greatly impacted the way I understood the human body. Indiana Wesleyan University has a brand-new cadaver lab, but does not integrate its use with the pre-nursing/nursing curriculum. From research and my personal testimony, it is my goal to incorporate the use of the human cadaver gross anatomy lab with the nursing curriculum, so that other nursing students would reap the benefits of this hands-on opportunity.

I will be exploring why many undergraduate nursing students do not have access to cadavers as an integral part of their nursing education. I will perform two surveys regarding the potential use of cadavers as an educational tool in nursing classes. I will distribute one survey to the undergraduate nursing faculty. This survey is geared toward those who are creating the nursing curriculum.

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Additionally, I will distribute a survey to a class of senior nursing students. This survey focuses on the student's perception of the benefits and drawbacks to incorporating cadavers into the classes they have taken.

The use of human cadavers in undergraduate nursing education is beneficial to students. Working with cadavers has many benefits, including increased human anatomy understanding, development of emotional maturity, and collaboration with other future healthcare professionals. I will also be addressing the place of digital and synthetic cadavers as a supplement, rather than a substition for human cadavers. I will also examine various reasons as to why cadavers are not widely utilized in undergraduate nursing education. I hypothesize that the benefits that the students will receive because of their exposure to human cadavers will far outweigh the costs required to maintain such programs.

### **Mental Health Among College Students**

Riley Blake, Madison Cook, Carly Norwood, Mikalea White, *Behavioral Sciences*

The topic of mental health has been on the forefront of individuals and organizations minds in recent years. This recent trend has spurred the exploration on whether it is unknown if students that attend a private, Christian university will score statistically differently on the revised mental health scale than students enrolled at a public, secular university in central Indiana. The purpose of this research study is to see to what extent there is a difference between the mental health of students enrolled at a public, secular university versus a private, Christian university in central Indiana. The researchers administered a survey questionnaire provided by the Hazelden Foundation that aims at addressing each area of mental health. This survey is a modified mini scale that provides a wide range of variability in responses of college students' (enrolled at public, secular and private, Christian universities) perceived mental health. This issue presented the need for a quantitative study due to the ambiguity of mental health status in students. In order to conclude the findings, it is necessary for the researchers to run a T-test of our findings into SPSS. The importance of gained knowledge from this study could potentially aid their institutions in future decision making in regards to mental health. The study allows readers to understand differences, if any, in health statuses among students that attend two types of institutions. The knowledge gained from this study will hope to instill changes in the way mental health is addressed on either campus.

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### **Prevalence of Cultural Competence in Doctor of Physical Therapy Programs in the Midwest**

Lauren Zaeske, *Modern Language and Literature*

This research project analyzes the degree to which Doctor of Physical Therapy (DPT) programs are implementing structures that regulate the cultural competence education of their students. Accrediting bodies APTA and CAPTE provide standards for DPT cultural competence education, and those standards served as the foundation for the survey created for this research. Eleven DPT programs in the Midwest, all of which are accredited institutions, participated in this study inquiring about the educational methods which provide cultural encounters for students and faculty to help grow in cultural competence.

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## Up in Smoke: A qualitative study on smoking cessation in Grant County

Madison Gruber, Hannah Easdon, Shaley Hartsburg, *Behavioral Sciences*

All it takes is the act of lighting and smoking that first cigarette to begin a detrimental journey. The addiction to cigarettes, that often starts young and negatively affects everyone that is exposed, holds more challenges than just attempting successful smoking cessation. Because this habit is a snare that traps people both physically and psychologically, it is difficult for the larger sum to successfully cut their ties with this dangerous companion (Siegel, 2014). A staggering number of 443,000 people are estimated to die each year in the United States caused by smoking related diseases (Sondhi, 2010). It is important to convey that those who attempt the great feat of ceasing smoking do not do so with ease, but rather face many challenges along the way. The 100% Smoke Free legislation passed in 2015 made it more difficult for users to smoke at every craving. Several states adopted the legislation in their restaurants, workplaces, and bars, but what how much are these acts legislation really helping? In order for people to win this ongoing battle and put an end to the destruction caused by smoking, the challenges faced by that population need to be identified and understood. This qualitative study of Grant County members who smoke reveals the most common challenges they face and gives possible solutions that Grant County health care professionals can provide aid.

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## The Theology of Animal-Assisted Therapy

Kristin Moore, *Behavioral Sciences*

The relationship between humans and animals has existed since the beginning of time when God created both creatures and man in the Garden of Eden. Made in God's image, mankind is responsible for stewarding creation, both biotic and abiotic elements. Humans have taken it upon themselves to domesticate animals, but the outcome has resulted in benefits for both the human and the animal and lead to a co-dependent relationship between the two beings. Within humans, human-animal relationships improve developmental growth, psychological well-being, and physical health. Noticing these beneficial results, the field of animal-assisted therapy has grown and been seen in a variety of settings accompanied by a diverse range of animal species. The way human-animal relationships are viewed through both theology and psychology influences the way animal-assisted therapy is approached and carried out, and the way it might be improved for more effective treatment in the future.

## Unheard Voices: A Qualitative Study on Individuals Involved in Circles of Grant County

Miranda Barrett, Beth Riley, Kate Regnier, *Behavioral Sciences*

In 2015, nearly 70,000 people were residents of Grant County, Indiana. In recent years this number has declined significantly. According to Indiana's national statistics, today the poverty rate is over 20% Grant County, and 29% of those individuals are under 18. These figures confirm the tradition of generational poverty, the impoverished community and the lack of knowledge. Unheard Voices: A Qualitative Study on Individuals Involved in Circles of Grant County is a study which gathered data from participants in the Circles poverty education course. This study looked specifically at current participants in Circles compared to past participants in Circles. The purpose of this study strives to capture changes in values systems and overall benefits from participating in Circles. Data collection within this study was through a demographic survey and a series of interview questions. It is the

hope that this study will provide adequate knowledge about poverty in Grant County and potentially alter future Circles programs positively.

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### **Method for Pancreatic Islet Isolation and Quantification of Secretagogue-Augmented Glucose-Stimulated Insulin Secretion**

Sydney Weghorst, *Natural Sciences*

Islets of Langerhans ( $100\mu\text{m}$ - $200\mu\text{m}$  in size) are located in the pancreas and are composed of 60-70% beta cells, 15-20% alpha cells, and 10-15% delta cells. The beta cells produce and store insulin. To maintain blood glucose levels, insulin is released in the presence of glucose, promoting its cellular uptake. Bay 55-98372, a VPAC2 selective agonist, is known to augment insulin release in response to glucose. During our exploration of the VPAC2R knockout (KO) mouse phenotype, *in vivo* results showed hyperglycemia and hyperinsulinemia in the VPAC2 KO mice. To determine if the hyperglycemia and the hyperinsulinemia were a direct result of islet dysfunction, we performed the following procedure. Islets isolated from C57Bl/6 (WT) and KO mice were exposed to various levels of glucose and Bay in a glucose stimulated insulin secretion assay. Normalization of insulin release data was accomplished using two methods. The normalized data indicates that islets isolated from VPAC2R-deficient mice have impaired insulin release during glucose challenge when compared to islets isolated from WT litter mates.

### **Investigating the Relationship Between Feminism and Perceived Pressure to Marry in Undergraduate College Students**

Katura Rowe, *Behavioral Sciences*

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The purpose of this study is to better understand the impact of feminist views on pressure that young (18-24 year-old) women feel to get married during or soon after their college years. A phenomenon that seems to be particularly strong in small Christian colleges is known as the “ring by spring” phenomenon. This can best be described as the goal or expectation to get engaged by the spring semester of senior year, or shortly thereafter. This concept appears to be less common in larger public universities where feminist views are more widespread.

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### **Microwave-Assisted Tissue Processing: A Tool to Assess Murine Tissue Morphology**

Koby Buth, *Natural Sciences*

In order to process tissue samples to visualize in light microscopy, the samples must first be dehydrated and infiltrated with paraffin wax. Conventional processing methods can take anywhere from 18-24 hours to complete this, so, in order to expedite and streamline the procedure, we developed a processing method that utilizes a domestic microwave. By microwaving the samples in methanol, isopropanol, and paraffin wax, we are able to prepare tissues for slicing on a microtome within one hour.

We developed this procedure to assist us in assessing the function of the vasoactive intestinal polypeptide receptor 2 (VPAC2R). Previous research shows that male VPAC2R knockout (KO) mice have increased testicular degeneration compared to wildtype (WT) mice, leading to premature infertility. Utilizing the microwave tissue processing, however, we saw no difference between age-

matched WT and KO testes morphology. 3 -HSD levels were tested through immunohistochemistry and found to be higher in WT than KO mice. We also noticed that KO livers are saved from steatosis that was seen in age-matched WT mice. Further research will need to be completed in order to elucidate the mechanism by which KO livers undergo less steatosis.

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## **Development of the Transfer and Detection of Telomeric DNA Using An Electrophoretic Mobility Shift Assay**

Zephan Oelmann, *Natural Sciences*

Chromosomes contain repeating DNA sequences at their ends called telomeres. The primary function of these structures is to protect chromosomes from damage during replication and repair. Specific telomere binding proteins are recruited by the repeating DNA sequence to facilitate these functions. Although a number of these telomere proteins have been identified in numerous organisms, many questions still remain regarding their organization and binding affinity. In order to study these interactions further, we are developing an assay to examine DNA protein interactions outside of the cell. This assay, called an electrophoretic mobility shift assay (EMSA), specifically examines changes in DNA mobility due to interaction with protein. Currently, in the development of this assay we are attempting to optimize the transfer and detection of the DNA. We are doing this by exploring the results of changing the transfer membrane composition, the size of the DNA, and the assembly of duplex DNA molecules. Once we have optimized DNA detection we will then pursue analysis of protein binding, which will measure the specific parameters of this interaction. Broader application of this binding interaction will better inform us of the role each of these telomere proteins plays in the function of a telomere. This is important because of the roles that telomeres are believed to play in our understanding of the onset of cancer due to telomere dysfunction..

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## **Factors of State Female Labor Force Participation Rates**

John Kristof, *Social Sciences*

Social scientists have used economic models to analyze women's labor for decades. Much of the literature rises from the question of how women choose to enter or leave the labor force. Most studies rely on time-series analyses for a national economy, attempting to identify domestic and external forces that tend induce higher labor force participation. Time offers just one form of variance; political geography is another. Economists have performed few cross-sectional analyses on female labor force participation (LFP). This study aims to add to the literature on women's labor by performing a cross-sectional analysis of female LFP among the fifty U.S. states and the District of Columbia via an ordinary least squares (OLS) regression analysis. Nine independent variables were analyzed, some being demographic and others institutional. Educational attainment was the most significant contributor to female LFP, while institutional factors like governmental partisanship and occupational sex segregation no significant effect. Results of this study indicate the most effective way to encourage women to work is to encourage investment into skills valuable in the market economy.

**Panel Presentation: *If We Build a Prison, Will They Come?***  
Hunter George, Silas Weghorst, Katie Key, Nick Alvarez, *Studio Production Class*

**"MIRANDA RIGHTS"**

will premiere immediately following the panel discussion in this extended hour-long session

Students in the Division of Communication & Theatre's Studio Production class spent the entire spring semester creating an original situation comedy - Miranda Rights - set in a women's prison - for presentation to a live audience and television. The 16 class members took the concept from nothing to finished program, working in 3 teams: Producers/Writers, Design, and Production. This presentation takes you behind the scenes as students learned the complexity of entertainment production and the creative satisfaction of working as a team to make an idea into a finished product.

Additional Class Members:

Rachel Berry	Marlee Mayo	Ray Ozmun
Logan Fulton	Mikayla Martinie	Tatum Rice
Carson King	Arielle McLaurin	Kayla Ruchti
Sarah Kirk	Daniel McMurray	Juwani Sisco

Faculty Members:

- Dr. Randall King  
Dr. Steve Wood

GLOBE THEATRE

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**Intergovernmental Grants and Federal Democracy: Complementary or Exclusive?**

Albert Gustafson, *Social Sciences*

The federal government funds about one third of all states' budgets. The last century witnessed major changes in the way federalism works in the United States. The quantitative research on this change comes mainly from economists, and the literature in political science relies on qualitative evidence. This research proposes a quantitative approach to the political ramifications of federal grants to states. Using economist Paul Farnham's median voter budget model to represent state voters' preferences, this project inserts an additional variable, intergovernmental revenue, to see if federal grants affect how much states spend. Indeed, the median voter budget model proved a rigorous tool for predicting state budgets ( $R^2 = .984$ ), and federal grants were more important in predicting a state's expenditure level than any single feature of the electorate ( $p < .001$ ). These findings indicate that federal grants change how states spend money, against voters' preferences. Using qualitative evidence as an interpretive framework for its quantitative findings, this research also concludes that federal grants wield influence in state policy beyond budget size. These findings reveal a tradeoff between the benefits of federal grants and the benefits of decentralized federalism, which should be central to any discussion of the merits of federalism and the nature of America's form of liberal democracy.

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## Physical Touch in the Elementary Classroom

Tessa VanderStel, *Teacher Education*

In the past few decades, elementary schools across America have begun enforcing “no touch” policies in order to not only keep their students safe from sexual abuse, but also to keep their staff safe from being accused of inappropriate touching. Although these rules seem justified, since safety of children in elementary schools is of utmost importance, early childhood professionals have begun to point out the detrimental effects that this lack of touch might be bringing to children. Physical touch has been proven to be necessary for physical, cognitive, and emotional growth in children. Teachers who are denied the use of physical touch are also being denied the ability to encourage, comfort, and relate to their students. In order to reverse the “no touch” policies, administrators, staff, and all those who work with children, must change their mindset on physical touch. By observing six elementary classrooms in Indiana, I have examined the ways that physical touch is being used in classrooms today. Because I saw a direct correlation between physical touch and positive student-teacher relationships, I believe that educators should begin to have a conversation about how positive physical touch might help their students. Although much more research still needs to be done about physical touch in the classroom, there is enough evidence to prove that “no touch” policies are simply not effective.

## Tracking the Trafficked: An examination of NGO's influence on U.S. TIP Tier Rankings using a case study of World Hope International in Sierra Leone

Madison Routledge, *John Wesley Honors College*

This paper investigates the influence of non-government organizations on the United States' Trafficking in Persons (TIP) Report's tier rankings through a case study of the relationship between Sierra Leone and the organization, World Hope International. Acting as Sierra Leone's sole anti-TIP partner with an aftercare facility, World Hope International has played a crucial role in the nation's current tier ranking as stated by the political officers of the United States Secretary of State. In addition, while the organization's anti-TIP department lacks long term planning and funding, their partnership is crucial to the Ministry of Social Welfare, Gender and Children's Affairs, Family Support Unit, and Transnational Crime Unit of Sierra Leone. Furthermore, without the organization's partnership, the U. S. would not have the proper information to evaluate Sierra Leone accurately on the Secretary of State TIP tier scale.