STUDENT SCHOLAR DAY 2017
Thursday, April 20
Student Scholar Day Goals

• Promote and encourage student contributions to scholarly activity across the campus.

• Recognize and reward outstanding student achievements and scholarly activity.

• Promote interdisciplinary academic interaction among students and faculty.

• Reinforce the breadth of learning that characterizes a quality formal education.

• Support the institution’s educational efforts regarding the importance of communication skills.

• Enhance community awareness of the high level of scholarship at Avila University.
Welcome to Avila University’s 17th Annual

Student Scholar Day

April 20, 2017

2017 Student Scholar Day Committee Members

Jessica Brunsman, MSN, RN, CPN
Leah Gensheimer, Ph.D.
Dorie Kurtz, MLIS, MA
Paige Libbert, MLS
Sue Ellen McCalley, Ph.D.
Ron McCleary, MS
Francis Origanti, Ph.D.
Benjamin Pascoe, M.F.A. (Chair)
Joseph Roberts, Ph.D.
Jordan Wagge, Ph.D.

Special Thanks to:
Maintenance Staff for room set-up and tear-down
Great Western Dining Services Staff
ITS for technical support
Avila Faculty for student mentorship and encouragement
Office of Marketing & Communications
Oral Presentations
Whitfield Conference Center
9 a.m. – 11:30 a.m.

9:00 Case Study: The Effects of Cupping Therapy on Acute Reoccurring Myofascial Female Golfer with Scoliosis
Alexus Clary

9:15 Veterans’ Voices Project and Media Kit
Hanae Ishikawa

9:30 Maternal Immune Activation Stimulates an Immune Response in the Developing Fetus and Development of Autism Spectrum Disorders in Offspring
Carli Joy Boen

9:45 A Symbol of Hope: Superman’s Never-Ending Quest for Truth and Justice
Kendall Burke

10:00 Short Documentary: Exercise and Parkinson’s Disease
Lauren Larson

10:15 A Queer Education: LGBTQ Students in the Modern Education
Katherine Kashka

10:30 The Final Frontier
Jade Callaway

10:45 Attention Deficit Hyperactivity Disorder
Patrick Henderson

11:00 Can Combined Field Measures of Stress Predict Heart Rate Variability?
Joseph M. Grindstaff

11:15 Dyslexia in the Classroom
Lindsey Jones

Spring Picnic
The Quad
11:30 – 12:30 p.m.
Performance Presentations

**Foyle Chapel**

**12:30 – 1:00 P.M.**

12:30  The Power of Partnership  
Ezekiel Bocklage

1:00  Musicality of Character: The Women of Don Giovanni  
Jessica Lewis

Oral Presentations

**Whitfield Conference Center**

**1:15 P.M. – 3:45 P.M.**

1:15  Comparative Mathematical Models for Infectious Diseases  
Joseph Gregory

1:30  Barriers to Counseling in Schools  
Jessica Hopkins

1:45  Arteriovenous Malformations  
Danielle Kaullen

2:00  The Biomechanics of a Volleyball Pass  
McKayla Wilbanks

2:15  The Effects of Mental Health Limitations on Labor Market Outcomes  
Kyler Tusay

2:30  Determination and Differentiation of Sugar Content in Gin  
Brian Murphy

2:45  The Impact of the Players’ Union on Major League Baseball  
Anthony James Oviedo

3:00  Increasing Resident Participation in Non-Mandatory Services  
Victoria Surdyke

3:15  “The Final Take Down” – A Study in Digital Ethnology  
Brianna Peralta

3:30  Hospital Revelations: The Role of Chaplaincy in the Healthcare Field  
Alyssa Parsells
Disciplines in higher education have different formats for presenting research and scholarship. You will notice that in the sciences (e.g., biology, kinesiology, psychology, education), scholars present research using a basic scientific approach: presentation of hypothesis, interventions or application, and results. Their research is usually presented with a power point and discussion. In disciplines such as history or English, scholars will present their research by reading a paper. Performance scholars will actually perform their presentation. All presentation styles and formats are valid and should be respected.

9:00
Case Study: The Effects of Cupping Therapy on Acute Reoccurring Myofascial in Female Golfer with Scoliosis
Alexus Clary (Pre-Health/Communication)
Faculty Mentor: Dr. Gerald Larson

Cupping has historically been used for treating acute and chronic illnesses. Many doctors in the field of pain management use it as part of their management of myofascial pain conditions. Scoliosis is defined as a lateral curvature of the spine. This chronic condition may cause length and strength imbalances in the posterior trunk myofascial. The resulting superficial soft-tissue and acute reoccurring pain is exacerbated by the golf swing. Traditional anti-inflammatory medications do not help because this type of pain is associated with tension, and not with inflammation. Purpose: The purpose of this Case Study was to evaluate Cupping for the management of acute reoccurring myofascial pain in a collegiate golfer with scoliosis. Methods:

- The subject completed a movement assessment, trunk muscle endurance tests, and the SF-12 to establish functional baselines. Her golf swing was assessed using the Trackman Pro, slow-motion video capture, and a K-Vest. The subject participated in Cupping sessions 2-4 times weekly, for six weeks. Cupping sessions followed established protocols for myofascial back pain and were administered by a qualified professional. Assessments were repeated after three and six weeks. Results/Discussion: Individualized Cupping for acute reoccurring myofascial back pain can be an effective non-medical strategy.

9:15
Veterans' Voices Project and Media Kit
Hanae Ishikawa (Communications AD/PR)
Faculty Mentor: Linda Streluff, M.L.A.

The Hospitalized Veterans' Writing Project started as an outreach for veterans returning from World War II. Today it serves all veterans with therapeutic writing programs, which address
unseen emotional wounds. Veterans write about personal experiences and innermost thoughts, which may or may not be related to experience in the military. The writing helps to manage the effects of PTSD and to reduce the risk of suicide.

Today with an influx of veterans from Iraq, Afghanistan, and other hot spots in the world, the need is greater than ever. The Hospitalized Veterans' Writing Project, now branded Veterans’ Voices, seeks to expand their outreach and visibility. My Practicum class partnered with them to address this issue. My plan proposes an initial program for universities, which focuses on verbal storytelling and provides an oral version of therapeutic expression. Veterans’ U is intended to strengthen the bond between veterans and their cohorts, Millennials. Veterans’ U emphasizes shared experience, as opposed to the different roads young people have traveled. Ultimately, it will promote understanding in the face of the diversity of experience and increase the visibility of the organization, Veterans’ Voice.

9:30
Maternal Immune Activation Stimulates an Immune Response in the Developing Fetus, Triggering the Development of Autism Spectrum Disorders in Offspring
Carli Joy Boen (Biology)
Faculty Mentor: Dr. Katherine Burgess

Autism is a complex, developmental disorder characterized by diminished social communication and repetitive behaviors. As of 2016, the CDC released an autism prevalence rate of 1 out of every 68 children. While the exact cause of autism is unknown, it is unanimous among researchers that both environmental and genetic factors play roles in the etiology of autism. Further, there is increasing evidence among researchers that supports an immunological link. The present scope of this research revolves around the etiology of autism and its correlation to the immune system. Mechanisms for how the immune system triggers this developmental response and future research for an effective treatment will also be discussed.

To elaborate, the immune system is seemingly a link between both environment and gene expression. For example, environmental factors, such as maternal infection, can cause immune activation in the mother. These activated immune factors can cross the placenta and trigger interactions in the developing fetus, presumably leading to altered brain development in the offspring, ultimately linking to autistic behaviors. This research is important from a scientific standpoint because the cause of autism is unknown, yet many individuals are affected by this on a daily basis.

9:45
A Symbol of Hope: Superman’s Never-Ending Quest for Truth and Justice
Kendall Burke (English – Literature)
Faculty Mentor: Dr. Amy Milakovic

This paper examines Superman as a continuing symbol of hope, focusing on his strong opposition to bigotry during World War II and a time of rising white supremacy, as well as his recent championing of humanity in a smaller, more connected world. I argue that Superman continues to be relevant 80 years after his creation, because he is able to transcend the limits of life’s dark realities while providing hope for the who live in it.

10:00
Short Documentary: Exercise and Parkinson’s Disease
Lauren Larson (Communication)
Faculty Mentor: Dr. Gerald Larson

Parkinson’s disease (PD) affects the nerve cells in the brain that produce dopamine. Clinicians have established five stages of PD. The first stage is characterized by mild tremors and diminishing postural control. Each progressive stage involves further impairments of motor control (i.e., muscle rigidity, gait) and cognitive function (e.g., confusion, memory, speech). In the last stage of PD, the person is unable to care for themselves; and may be unable to stand from a sitting position, or walk without losing their balance. Moving BIG Exercise exaggerates the bigness of movements to help people with
PD retrain their brains to move more normally. Purpose: The purpose of this project was to create a short documentary featuring the “human side” of a clinical exercise program for a 74 year-old male with PD. Methods: The subject and several family members agreed to participate in this project. Each signed the Informed Consent Form. The exercise program was administered by a degreed and certified clinical exercise physiologist. The filmmaker documented the process including exercise sessions, interactions with the subject, and interviews with the family members. Results: Exercise therapy may have its greatest benefit on the emotional and social well-being of the patient.

10:15
A Queer Education: LGBTQ Students in the Modern Education System
Katherine Kashka (Special Education)
Faculty Mentor: Dr. Nilufer Guler

This presentation explores the topic of lesbian, gay, bisexual, transgender, and queer (LGBTQ) youth in today’s school system. Twelve sources including research papers, personal accounts, and gay rights organizations were used. Experiences of the speaker will also be used. They, them and other gender neutral pronouns are utilized throughout the presentation not just as plurals, but also as replacement for he/she out of respect for those who do not conform to the gender binary system. Although it is impossible to know for sure, an estimated 10 percent of society is LGBTQ and an estimated 30 percent of all students will somehow be affected by LGBTQ issues while in school, whether through friends, parents, or being LGBTQ themselves (Savage & Harley, 2009). LGBTQ youth face a harsh and unforgiving world in which many will be rejected, abused, and tortured. School is no exception. Although Gay-Straight Alliances (GSA) are becoming more and more prevalent in public schools across the United States, the fact remains that society remains heterosexist and homophobic. In order for LGBTQ youth to feel safe in today’s schools, teachers must educate themselves on LGBTQ issues and actively teach tolerance in their classrooms.

10:30
The Final Frontier
Jade Callaway (Religious Studies and Philosophy)
Faculty Mentor: Dr. Leslie Smith

This presentation tackles the question of whether or not atheism is the last frontier left in American prejudice. Having made great strides in racism and gender equality, even if we are not there yet, atheists are still a group of people that face large amounts of social and political discrimination. How did America come to be known as a Christian nation? How has this Christian nation myth affected the lives of atheists politically and socially? The Final Frontier answers these questions and gives ideas on how to limit the prejudice that non-believers face in a country that boasts that it has separation of church and state.

10:45
Can Combined Field Measures of Stress Predict Heart Rate Variability?
Joseph M. Grindstaff (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

HRV is the beat-to-beat variance in resting heart rate, measured using an ECG as the R-R interval; and is considered to reflect the activity of the autonomic nervous system. High HRV and high vagal-related indexes have been related to high cardiovascular risks. HRV decreases when sympathetic nervous system activity is sustained for periods of time, and/or when vagal inhibition of the sinoatrial node is removed. Movement science professionals outside a clinical environment may not have access or opportunity to use the equipment and technology required to measure HRV. The purpose of this research project was to validate combined field measures of stress by comparing to the standard established using HRV. Methods: Participants were exposed to a speech preparation psychological stress trial, administered the Perceived Stress Scale Questionnaire and completed the YMCA Step Test. Stress and cardiovascular fitness related data were collected from each of these trials. During the trials each subject HR and HRV
were monitored using ECG technology. Results/Data: Results show a correlation between HRV and HR recovery in stressed individuals. When a cardiovascular fitness baseline has been established, it may be possible to use HR recovery as a field measure to predict overtraining.

11:00
Attention Deficit Hyperactive Disorder
Patrick Henderson (History and Secondary Education)
Faculty Mentor: Dr. Sue Ellen McCalley

This presentation will explore the characteristics of individual diagnosed with Attention Deficit Hyperactive Disorder (ADHD) according to the Diagnostic Statistical Manual definition. Most of the behaviors discussed will be universal to students diagnosed with ADHD and would not be isolated to either younger or older children. The primary characteristics associated with ADHD will be identified, with executive functioning deficit being the most relevant to performance in the educational setting. Key factors related to executive functioning will then be explored as well as strategies and practices that have shown efficacy in improving student engagement and performance. The presentation will include my own reactions, experiences, and conclusions regarding the information reviewed in the identified literature and research.

11:15
Dyslexia in the Classroom
Lindsey Jones (Special Education)
Faculty Mentor: Dr. Nilufer Guler

This presentation explains the role that dyslexia can and does play in students’ ability and understanding in the classroom. There is explanation of what causes dyslexia along with what the real meaning of having dyslexia is. Within this presentation there are non-fictional accounts of the effects of dyslexia from Don McCabe, studies conducted at Yale University on the brains of dyslexics, laws from the state of Missouri that cover students with dyslexia and countless accounts from foundations for dyslexia. This information not only includes strategies that teachers can use in their classroom, but also laws that both parents and teachers should be aware of, and be able to implement and take advantage of. Lastly, there are warning signs and behaviors to help diagnose dyslexia that could lead to quicker diagnoses and treatment.
“Art Songs” as we know it today is widely attributed to composer Franz Shubert, who sparked a revolution at the turn of the 19th century by composing more than 600 songs for voice and piano, and opened the door to a new genre that encompassed the Romantic spirit. Shubert’s genius relied not only on his unique talent of marrying music to poetry, but also on his ability to shape it naturally to the human voice. Part of his success in creating this relationship between music and expression came from his unique emphasis on partnership between piano and voice, revolutionizing the ways in which pianist and singer work together. He allowed each to play their own essential role in the story, helping to intertwine text, emotion, melody and performer. In doing so, Shubert created a new, living, musical language and pioneered the future of vocal composition.

This lecture recital on Shubert’s Die Schone Mullerin will explore the partnership between singer and pianist. It will demonstrate the two “characters” reliance on each other for the sake of the story and illustrate how his development of art song transformed the relationship between performers and independent entities to the artistic collaboration it is today.

Don Giovanni is among Mozart’s most well-known operas. A musical expansion on the classical legend of Don Juan, a cavalier whose womanizing reputation precedes him, it has served as a model for operas since its debut in 1787, Don Giovanni’s adventurous, complex libretto provides a captivating story, while Mozart’s encoded musical language adds layers of detailed interpretation and character development. Specifically, the music enhances the stories, personalities, and emotions to the opera’s three central female characters: Donna Anna, a young sheltered woman desperate to be in control of her life; Donna Elvira, an intelligent and commanding noblewoman turned hopeless romantic; and Zerlina, a youthful and flirtatious peasant girl who is by far more clever than she seems. In this lecture recital, I will perform musical examples and use them to demonstrate the ways in which Mozart used meter, rhythm, melody, and
harmony to create dynamic, compelling, and multidimensional women. I will also analyze the myriad ways in which Mozart used music to enable his audience’s understanding of these women’s journeys and to give them newly empowering stories to tell.

Oral Presentations
Whitfield Conference Center
1:15 p.m. – 3:45 p.m.

1:15
Comparative Mathematical Models for Infectious Diseases
Joseph Gregory (Pre-Health)
Faculty Mentor: Dr. Nicholas Haverhals

Gregor Mendel is well-known as the father of genetics, but he is also the father of mathematical biology because of his early work making predictive models about pea plant offspring. Having accurate predictive models removes guesswork and allows for more informed decision-making. This study aims to create effective models for predicting infectious diseases. This study will compare two separate models: Markov Chains and the S.I.R. model of differential equations. Markov Chains use the probability of remaining in the same condition (e.g., healthy) and the probability of changing conditions (e.g., becoming ill), to analyze how individuals within a population behave with respect to various conditions. The S.I.R. differential equation model tracks the ratio of the population that is Susceptible (to a disease), Infected (by the disease), or Recovered (from the disease) – over time. The results can be used by healthcare providers and public health agencies to make accurate predictions about the course of a disease.

1:30
Barriers to Counseling in Schools
Jessica Hopkins (Psychology)
Faculty Mentor: Dr. Dominick Scalise

Increased attention in the mental health of students has found that 13-20% of youth in schools can be diagnosed with a mental disorder. Counseling has shown to be an effective treatment for youth, and schools that offer mental health services have found an improvement in students’ personal and social lives and academic success. Yet, studies have found that there is a lack of counseling taking pace in schools and school counselors have reported facing multiple barriers reported to providing these services (Hanchon & Fernald, 2013). This project reviews the barriers reported, such as confusion of professional identify and lack of support and funding, as well as the direction offered by the professional literature to address this issue. Solutions to overcoming these barriers have focused on clarifying the identity and role of school counselors as both educational leaders and mental health professionals. Pragmatic steps and research directions will be addressed to focus on the application of these solutions in schools to determine their effectiveness.
1:45
Arteriovenous Malformations
Danielle Kaullen (Radiologic Science)
Faculty Mentor: Ashlyn Hull, M.S.Ed.

I will be discussing the nature of arteriovenous malformations and facts regarding this disease, such as where it occurs in most and where it is more likely to develop. I will be describing symptoms, for example weakness, dizziness, and extremity paralysis, that may come along with the condition and possible life-threatening risks, such as hemorrhaging, if this goes untreated. I will then discuss how arteriovenous malformations are diagnosed by doing an exam called MRI, also known as Magnetic Resonance Imaging, which is done in most radiology departments. There are a few options that the patient can undergo for this condition, such as surgical removal, or a treatment similar to radiation therapy. I will also be providing personal examples of this condition that have occurred with my brother.

2:00
The Biomechanics of a Volleyball Pass
McKayla Wilbanks (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

Volleyball is a very complex and fast paced sport that causes players to depend on their immediate reactions during most of the game. However, it is vital for a player to learn and apply the basic techniques. For both the volleyball player and the coach, understanding the biomechanics that take part in being able to pass the ball efficiently are important. Purpose: The purpose of this presentation was to view the differences between novice and expert passers and how novices can improve their form. Methods: The application, Hudl Technique: Slow Motion Video Analysis was used to gather freeze frames for the different phases of movement with the volleyball pass. Using the freeze frames, differences between novice and expert were easily found. This study was completed during the spring of 2016 in the KN 319 Biomechanics and Motor Control class. Results/Discussion: Factors such as weight distribution, hip flexion, and one’s center of mass have a great effect on how the player tended to pass a volleyball. With the visible distinctions between the novice and expert, coaches can implement certain practice strategies to improve their players’ skill set.

2:15
The Effects of Mental Health Limitations on Labor Market Outcomes
Kyler Tusay (Finance)
Faculty Mentor: Dr. Malcolm Gold

We examine the effects of physical disabilities, mental health problems, and other limitations on the labor market by analyzing individual level data from the National Health Interview Survey. We find that individuals with all three of these limitations experience lower annual earnings, a lower likelihood of employment, and work fewer hours per week on average than individuals with no limitations. Moreover, these labor market outcomes are experienced by some demographic groups but not all. We find individuals with physical disabilities on average earn approximately 25% less, individuals with mental health problems earn 24% less on average, and individuals with other limitations earn 37% less on average. Nearly two thirds of the annual pay differential are explained by differences in weekly hours worked and employment status for individuals with mental health problems and physical disabilities. Employment status and hours worked only explain thirty percent of the annual earnings difference for individuals with other limitations however. Reduced annual earnings and lower levels of weekly hours are primarily experienced by
Non-Hispanic males with physical disabilities. Employment is negatively affected for physical disabilities, mental health problems, and annual earnings across all demographic groups.

2:30

**Determination and Differentiation of Sugar Content in Gin**
Brian Murphy (Pre-Health and Biochemistry/Molecular Biology)
*Faculty Mentor: Dr. Joseph Roberts*

Gin is an alcoholic beverage whose flavor is mostly attributed to the extraction of juniper berries and other botanicals. Different designations of gin, like London Dry and Compound gin, are made differently and thus demonstrate different sugar profiles. High performance liquid chromatography (HPLC) was used to determine sugar profile of both professionally – and lab-crafted gins to determine the impact of the juniper berry infusion for ultraviolet detection. Thus far, Compound gins have demonstrated sugar profiles that are different than that of London Dry gins. Laboratory-synthesized compound gin has shown a similar profile to that of New Amsterdam, a professionally-made Compound gin, but not to professionally-made London Dry gin. The difference in sugar profiles suggest that synthesis schemes do affect the sugar profile of gin.

2:45

**The Impact of the Players' Union on Major League Baseball**
Anthony James Oviedo
*Faculty Mentor: Dr. Kelly Watson*

Based on the Supreme Court Case Flood v. Kuhn in 1972 and similar lower court cases, my research examines the unionization of Major League Baseball. Focusing on the Reserve Clause and the creation of Free Agency, this presentation will review the connection and the impact that the organized labor movement in the United States impacted the business of organized baseball.

3:00

**Increasing Resident Participation in Non-Mandatory Services**
Victoria Surdyke (Social Work)
*Faculty Mentor: Lindee Petersen Wilson, M.S.W.*

Residents at Safe Haven, a domestic violence shelter, could benefit from participating in case management and therapy, both of which are offered by the shelter. Research suggests residents may be unaware of the services, as well as the benefits of services. The dependent variable in this project was participation of residents in case management and/or therapy. The independent variable in this project was the level of knowledge residents have about the benefits that case management and/or therapy will have on their well-being. The researcher has posed the following question: “Does providing an infographic to residents about the benefits of case management and/or therapy increase the residents’ engagement with a case manager and/or therapist?” A correlation has been found between the amount of knowledge a resident knows about the benefits of case management and/or therapy and their likelihood to meet with a case manager and/or therapist. If residents are provided with an infographic about the benefits of case management and therapy, it is likely to increase the residential engagement with a manager and/or therapist. The researcher used snowball sampling to gather participants; each participant completed a pre-test and intervention test.
“The Final Take Down” – A Study in Digital Ethnology
Brianna Peralta (Communication – AD/PR)
Faulty Mentor: Dr. J. Anthony Snorgrass

We all know that Internet and social media posts are forever, right? That is why we are so careful about what we tweet, picky about photos we share on Instagram, and vigilant about our Facebook privacy settings. Yet, no matter how vigilant you are about your own profiles, sometimes a post, tweet, or tag gets away from our better selves and finds its way on-line. You might be surprised to find out how common it is for cyber bullies, abusers, bitter friends, or even hackers to take those unflattering and embarrassing photos and re-post them on-line. Not only is it humiliating to be embarrassed in front of millions on-line, but it can also cause huge problems in your relationships and employment.

The social media effects on language, relationships, communication, exchange parameters, and daily life have serious consequence including the loss of privacy, and the creation of our (curated) selves. Digital Ethnography describes the process and methodology of doing primary research in this digital space. The study investigates how people experience the frustration and regrets of “digital posting” in everyday life and offers fresh insight to the tactics required to survive in this constantly changing digital world.

Hospital Revelations: The Role of Chaplaincy in the Healthcare Field
Alyssa Parsells (Pre-Health and Biochemistry/Molecular Biology)
Faculty mentor: Dr. David Wissmann

Confusion, fear, and worry are just a few of the emotions experienced when a patient is hospitalized with a serious illness or has received a devastating diagnosis. The constant interruptions associated with healthcare treatment by nurses, physicians, therapists, and social workers often do not allow patients enough time to understand and cope with their illness. As a result, a spiritual wellness department becomes important in the healthcare setting by providing support to all patients – regardless of religious beliefs. As a member of the healthcare team, the role of a hospital chaplain is simply to listen to patients and offer encouragement. A chaplain is trained to actively listen and ask directed questions that help lead a patient to the root of their problem. This anecdotal presentation is a personal account of my experiences as a hospital chaplain at Saint Luke’s South Hospital in Overland Park, Kansas, and is supported by a focused literature review. The purpose of this presentation is to explain the importance of spirituality in the healthcare setting by providing real-life experiences that showcase the field of bioethics.
Mindfulness in the NBA
Eric Adams (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

Introduction: There are a number of variables that influence the individual perception of psychological stress, and associated impact on professional athletes. For example, elite players in professional basketball (e.g. NBA) are expected to score and make shots in pressure situations, especially during important games. These situations demand a level of focus and concentration that exceeds what is required from the “average” player. Purpose: The purpose of this project was to examine the mental approach and/or specific strategies used by elite basketball players to help them block out the many distractions of an NBA game. Methods: This project will review the literature including original research, case studies, and expert opinions. Results/Discussion: Several elite NBA players and Hall-of-Fame coaches have reported employing Mindfulness Training to help them achieve peak performance. There also seems to be a connection between teams that report using similar approaches and their winning percentage.

A Biochemical Comparison of Submaximal and Maximal Deadlift Efforts
Michael Adriano (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

Introduction: The sport of Powerlifting consists of the back squat, bench press, and deadlift exercises. To the uniformed, Powerlifting may appear as nothing more than brutes lifting heavy weights; with little consideration given to the science, strategic thought or skill required to achieve peak performance. Purpose: The purpose of this motion analysis project was to compare the biomechanics of submaximal vs. maximal effort deadlifts. Methods: The male subject was an advanced Powerlifter. He completed a single training session that included submaximal and maximal effort sumo deadlifts. The set and repetition scheme for both were 3 repetitions for 3 sets. The weights used were 143 kg for the submaximal lift, and 252 kg for the maximal lift. The IPhone 5s camera was used to video each lift. Iron Path data software was used to configure bar path, work, force production, displacement, velocity, and acceleration. Coaches Eye was used to configure the torso angle. Results/Discussion: The results for this research project included greater velocity (1.43 m/s vs. 0.99 m/s) and acceleration (10.83 m/s vs. 6.62 m/s) for the submaximal lift, and greater force production (2,776 N vs. 946 N) and work (4,554 J vs. 1,936 J) for the maximal lift.

Burnout and Over-Training Among Avila University Golfers
Tori Aziere (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

Introduction: Student-athletes, especially at private colleges and universities, often find themselves struggling to avoid overtraining and burnout. These individuals are typically recruited by a sport coach, and offered a scholarship to attend the University. Upon
accepting the scholarship the student-athlete also accepts the responsibility to prepare, compete, and in general represent the University to the world beyond their campus. Sometimes, these “contractual” duties conflict with their academic responsibilities. Recently, an informal poll of Kinesiology students indicated that approximately 40% of student-athletes also work a part-time job. These competing priorities may contribute to the student-athlete feeling overloaded, interfere with their ability to recover from physical training, and lead to burnout.

Purpose: The purpose of this research project is to evaluate overtraining and burnout among Avila golfers 2016-17. Methods: Subjects were 15 Avila golfers (7 female; 8 male). Questionnaires were administered to evaluate signs and symptoms associated with overtraining/burnout. Results/Discussion: Results varied by individual; with sex, age, and year in school seeming to make little difference. Golfers who rated the program lower in meeting their basic needs for trust, compassion, stability, and hope scored higher on the burnout scale.

Public Speaking Anxiety: The Fear of Showing Fear
Sheri Brown and Wendy Hamrick
(MS in Counseling Psychology)
Faculty Mentor: Dr. Marcia Pasqualini

Public speaking anxiety (PSA) is a subtype of social phobia (Bloete et al., 2007) characterized by fears of observation, interpersonal interactions, speaking before an audience, or a combination of these factors (Cox et al., 2007) and the fear of negative evaluation may be due specifically to exhibition of somatic symptoms such as blushing, trembling, or sweating (Bogels & Reith, 1998). We used surveys and the Personal Report of Public Speaking Anxiety (PRPSA; McCroskey, 1970) to determine if perceived physical reactions visible to an audience correlated with PSA in first year college students. One-fourth to one-third of respondents reported having little or no control over sweating, hand shaking, trembling voice, blushing, and forgetfulness during a speech. The highest correlations were a trembling voice and the belief that one appeared more nervous than others, \( r = .453, p < .01 \), and a trembling voice and total PRPSA score, \( r = .623, p < .01 \). In a step-wise linear regression, trembling voice, forgetting what one is going to say, blushing, and a dry mouth predicted how nervous a person feels he or she looks in comparison to others. Future research could further investigate individual differences in those with PSA.

An Integrated Approach to Shoulder Rehabilitation
Samantha Castoldi (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

Introduction: Shoulder injuries are very common among throwing athletes. Physical rehabilitation strategies and injury prevention are based on a working knowledge of shoulder anatomy including common pathomechanics of injury. It is also important that the movement science professional effectively prescribe rehabilitation exercises and educate their patients to support their recovery. This framework helps the patient continue a maintenance program on their own. Purpose: The purpose of this project is to provide an evidence-based summary of the most common clinical shoulder injuries, assessments, and corrective exercises. Methods: The evidence-based summary of the related literature will review original research articles, case studies, and expert opinions. Results/Discussion: An integrated approach to the rehabilitation
process is important for overcoming an injury. In order to get back into a normal routine it is important for the person to go through the different steps of rehabilitation, and to continue on their own with a maintenance program. By doing this it will help a person return to daily activities, and enjoy a healthy more active lifestyle.

Kinematic and Kinetic Analysis of the Triple Jump
Stesha Crosby (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

Introduction: The triple jump is a Track and Field event similar to the long jump; but with a running “hop” and “skip” before the jump. The complexity of the triple jump, compared to other standing and running jumps, requires the athlete to have a better understanding of the technical aspects of the movement skill. Purpose: The purpose of this motion analysis project was to quantify the kinematics and kinetics of track and field triple jump event. Methods: Slow motion video analysis was used to record a triple jump performed by a collegiate track and field athlete. The phases of the triple jump were identified. Kinematic variables including position, displacement, velocity, and acceleration were calculated and used to describe the motion. Kinetic variables including force, momentum, and impulse were calculated and used to explain the causes of motion. Results/Discussion: The triple jump integrates horizontal running velocity, net vertical forces, and the momentum-impulse relationship to achieve peak performance.

Biomechanical Characteristics of Defensive Linemen and Linebackers
Jimmy Fimbres (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

Introduction: On the defensive side of the ball in football, there are two groups of groups of different positions. The first group is the interior positions that include defensive linemen (interior and exterior) and linebackers. The second group is the exterior group that includes cornerbacks, safeties, and sometimes a free outside linebacker. Each position features different biomechanical characteristics (e.g. speed vs. force production vs. mass), which helps each respective player be successful at their assigned position. Purpose: The purpose of this research project was to compare physical abilities between defensive linemen and linebackers. Methods: Avila’s starting defensive linemen and linebackers participated in this study. They went through a football specific combine test, which was being recorded by a video camera. Video was used to further evaluate the defensive line and linebackers. Results/Discussion: There was a difference in speed, strength, and power between the defensive linemen, both exterior and interior, and linebackers. The linebackers were the fastest, then exterior defensive linemen and interior defensive linemen. The order in reverse was the order for strength and power was close between each athlete.

A Comparison of Co-ed and All-Female Cheer Teams Performing the Basket Toss
Joycelyn Jones (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

Introduction: Cheerleading has been traditionally associated with girls in short skirts and big bows in their hair, whose main goal was to inspire the crowd. However,
influenced by Title IX and Cheerleading Competitions, the sport has evolved. Modern day cheerleading has become increasingly athletic as well as Co-ed. This raises a question about fairness when Co-ed teams are compared to all-female teams. Does having a few big guys with more muscle mass give the Co-ed team an advantage when performing strength movements, such as, the basket toss where a “flyer” is thrown high into the air?

Purpose: The purpose of this research project was to compare a Co-ed team to an all-female team executing the basket toss. Methods: The researcher observed an individual practice session for the Co-ed and all-female teams. An IPhone 6 camera was used to record slow motion videos of three successful basket toss attempts for each group. Dartfish motion analysis software was used to analyze each team’s efforts. An Excel spreadsheet was used to organize the data and calculate basic statistics. Results/Discussion: All-female teams may compete with Co-ed teams without discrimination, because the basket toss is a skilled movement that only requires “so much” strength.

Suicide Awareness, Prevention and Loss Support Policy in the State of Kansas and Johnson County, Kansas
Jes Lane (Psychology)
Faculty Mentor: Christina King

I am a suicide loss survivor and a resident of Johnson County, Kansas. My oldest son, Oscar, died by suicide on September 11, 2015. He was 15 years old. Suicide is the #2 killer of kids between the ages of 15 and 24 in the state of Kansas. I did not know that statistic until after Oscar was dead. It seems obvious to me that we should be raising awareness of this health concern simply based on that statistic alone. Suicide awareness needs to be raised not just through mental health providers, but also through primary care providers, public health organizations and schools. This was a research project related to current Kansas policy and statistics surrounding suicide awareness, prevention and loss support. Public internet search was utilized to access government data and community programs focused on this issue.

Chronic Traumatic Encephalopathy: Your Brain on CTE
Tammy Mitchell-Smock (Radiologic Science)
Faculty Mentor: Ashlyn Hull, M.S.Ed.

Chronic Traumatic Encephalopathy (CTE) is a progressive degenerative disease of the brain found in those with a history of repetitive brain trauma. This includes symptomatic concussions as well as asymptomatic sub concussive hits to the head. It is not an area that had received much attention until Nigerian-American Forensic Pathologist Dr. Omalu began performing autopsies on retired NFL players who had lived somewhat disturbing lives. This exhibit will show the how the brain responds to repeated trauma. It will show how this diseases mimics dementia and Alzheimer and can be misdiagnosed as such. This disease has not been able to be detected until after the death and there is more research continuing.

Are the Fundamental Biomechanics of Throwing a Baseball Different by Position?
Erick Mojica (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

Introduction: Tom House, Ph.D., the father of modern pitching mechanics, said “Baseball is a game of failure, coached by negative people, in a misinformation environment.” Dr. House identified four key kinematic phases
associated with efficient pitching: Set-Up, Lift-Off, Stride and Momentum, and Release Point. After coaching major league pitchers for several years he began working with position players in baseball, as well as football quarterbacks. Dr. House's current work suggests that all throwing athletes incorporate the same fundamental sequence of rotary motion to throw with greater velocity and accuracy, regardless of position or sport.

Purpose: The purpose of this study was to compare the kinematics of throwing a baseball by player position. Methods: Collegiate players from the Avila Baseball team were videoed on a normal day of fielding practice, and throwing kinematics were analyzed using Dartfish Motion Analysis software. The data collected included sequential timing of their throwing motions; joint angles and relationships; and linear/angular kinematics of the pelvis, torso, and throwing arm. Results/Discussion: This study showed that despite differences in footwork and body positioning, throwing a baseball requires the same sequence of movements throughout the three main points.

**Motion Analysis of a Collegiate Defensive Back**

Alain Nguessan (Kinesiology)

*Faculty Mentor: Dr. Gerald Larson*

Introduction: According to Timothy Gay, a physics professor and author of The Physics of Football, a defensive back's body mass combined with his speed (averages a 4.5 sec 40-yd) can produce up to 1600 pounds of tackling force. Purpose: The purposes of this motion analysis project were to: 1) describe the motion (kinematics), and 2) explain the causes of motion (kinetics) of a football safety defending a deep pass, and running full speed to make a tackle across the field. Methods/Results: The subject was a 23 year old male (height = 175.26 cm; weight = 79.50 kg). Video was used to record the subject defending a deep pass, and making a tackle from his safety position. Dartfish software was used to analyze motion, and provide data needed to calculate player resultant displacement, velocity, acceleration, momentum, average net force, and impulse for both plays. Discussion: A basic understanding of physics can be applied to better understand the external forces acting on the body and the internal forces the body produces to resist. This understanding will help athletes, coaches, and parents make informed decisions.

**The Benefits of Electro-muscular Stimulation with Physical Therapy Aspects for Spinal Cord Injured Patients**

Alayna Oberto (Kinesiology)

*Faculty Mentor: Dr. Gerald Larson*

Introduction: Among individuals with serious spinal cord injuries (i.e. quadriplegic and paraplegic patients), nerve function is essential to regaining gross motor control. A rehabilitation program that includes small weights and arm bikes allows the patient to participate in a general physical therapy environment, in an effort to restore some degree of the neurological function that was lost due to injury. Purpose: The purpose of this clinical research experience was to work with patients that suffered injuries to the spinal cord, in an effort to help them regain gross muscle activation and motor control. Methods: Assisted exercise therapists with the implementation of individual exercise protocols, and electronic muscular stimulation (EMS) to promote improvements in muscle activation and motor control over time were used. Exercise therapy used weights, ropes, bands and a power plate. Results/Discussion: EMS benefited paralyzed patients by helping
motor units activate on their own. Exercise therapy improved strength and general function over time.

Isolation and Characterization of Mutants in Salmonella Enteritidis
Michelle Pace (Biology/Pre-Dental)
Faculty Mentor: Dr. Stephen Daggett

The bacterium Salmonella enteritidis is the cause of gastrointestinal disease globally. This bacterium has a gene, bapA that codes for a protein BapA, involved in the production of a protective matrix called biofilm. Biofilms are responsible for the virulence of Salmonella and act as protective coverings that allow several colonies of Salmonella enteritidis to grow and mature without being affected by the surrounding environment. Due to this type of protection, the Salmonella species are able to grow rapidly and infect hosts. This study involves isolating mutants of Salmonella enteritidis and observing the impact of mutagenesis on biofilm formation. Mutants were generated using ultraviolet (UV) radiation and were selected based on their impaired ability to catabolize sugar. Ten mutants were generated and characterized in terms of cell morphology, biochemical characteristics, biofilm-formation ability, and the presence of the bapA gene.

Training Quarterbacks by the Numbers
Jordan Radebaugh (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

Introduction: Overhead throwing athletes, quarterbacks in particular, have many different aspects that contribute to their overall arm strength. Throwing a football involves a series of movements that sequentially increase angular velocity of the pelvis, trunk, arm, and hand. During this process the relationship between the arm angle and torso is especially important. Throwing accuracy requires the quarter back to integrate and control these variables to hit receivers running full speed, in different directions, ranging from 5 to 50 yards away. Many football coaches are unaware of the basic biomechanics of throwing a football, and despite their best efforts are limited in their ability to help quarterbacks make the needed improvements. Purpose: The purpose of this project was to present coaches and overhead throwing athletes an evidence-based approach to developing an optimal throwing motion. Methods: This research project integrates original research, case studies, and expert opinions with practical motion analysis data collected by the researcher. Results/Discussion: Throwing velocity and trajectory varied depending on the receiver route, need for timing of the throw, and distance down field. Throwing accuracy and consistency were directly correlated to optimal throwing biomechanics.

Functional Evaluation of Collegiate Golfers Improves Training and Performance
James Richards (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

Introduction: Tiger Woods arrived on the professional golf circuit in 1996. His dynamic play increased the popularity of the game, and changed the way coaches prepared golfers for competition. To compete against Tiger required a more comprehensive approach. The biggest change was in the way golfers began to physically condition themselves. A quality physical training program begins with a golf specific movement assessment, swing characteristic analysis, and swing performance testing. This evaluation informs the coach/golfer about physical limitations (i.e. mobility and stability), and individual swing characteristics (e.g. “Loss of Posture”) that
might impair golf performance. Purpose: The purpose of this research project was to evaluate Avila University golfers, and recommend individualized corrective strategies. Methods: Thirteen Avila golfers (7 females; 6 males) were evaluated during the Fall 2016 semester. Each golfer completed the TPI Movement Assessment, TPI Swing Characteristics Analysis, and TrackMan Pro analysis of the golf swing and ball flight. Regression analysis was used to estimate relationships among variables. Results/Discussion: Limitations in mobility and stability were most related to compensations observed during motion analysis of the swing. Core stability was most related to consistency in overall swing performance. Corrective exercises and drills improved movement quality and swing performance.

The Effects of Proprioceptive Balance Training on Lower Extremity Injuries and Re-injuries

Daniel Roberts (Kinesiology)  
*Faculty Mentor: Dr. Gerald Larson*

Introduction: Sensory motor stimulation (SMS) emphasizes the unity between the afferent and efferent nervous system, without implicating any specific structure or function. This integrated approach to balance and coordination training is characterized by 1) a slow phase where new movement patterns are introduced and the nervous system works out the basic motor program; and 2) a fast phase in which SMS of the proprioceptive system promotes neuromuscular control of balance and posture. Whole body vibration (WBV) training has been purported to stimulate the proprioceptive system. Purpose: The purpose of this study was to investigate the acute effects of WBV training on dynamic balance using functional goniometry (i.e. Y-Balance Test). Methods: Volunteers were recruited from the SP17 Biomechanics class. Each participant performed the Y-Balance Test to establish a baseline for comparison. At a different time, subjects also completed a 3-minute WBV protocol before performing the Y-Balance Test. The two protocols were alternated among subjects to control for learning of the test. Results/Discussion: Participants who completed the WBV protocol scored higher on the Y-Balance Test. If athletes can incorporate dynamic balance training into their exercise program they will reduce the risk of lower extremity injury and increase spatial awareness.

The Relationship of Urbanization and Nutrient Impact on Algae Growth at Little Blue River of Kansas City, Missouri

Erin Sheehy (Biology)  
*Faculty Mentor: Tyrun Flaherty, M.S.; M.A.*

The purpose of this study is to characterize the relationship between urbanization and the amount of nutrients in the Little Blue River of Kansas City, Missouri. This information is crucial because 60% of world populations will live in urban areas by 2030. Therefore, understanding how the inputs of nitrogen and phosphorous affect stream health is important. I hypothesized that a higher concentration of nitrogen and phosphorous along with a current threshold of 0.4m/s would cause a larger amount of algae growth. Data were collected with two plot sections and six collection points in each section, which included the nitrogen levels, phosphorous levels, and water current. Periphyton and suspended algae were collected and then processed in the lab for dry weight and Chlorophyll concentration levels. The data were collected seven times from the fall of 2015 to present. Overall, the results show a relationship between water current, chemical levels and amount of periphyton. In conclusion, algae is dependent on both
chemical and physical variables and that variation in either variable can affect the amount of algae present in urban watersheds.

A Comparison of Baseball Swing Contact Points and Exit Velocity
Eric Shempert (Kinesiology)
Faculty Mentor: Dr. Gerald Larson

Introduction: Baseball is a game characterized by many traditions and superstitions. For example, there are two opposing coaching philosophies related to the baseball swing that instruct: “let the ball get deep,” and “hit the ball out front.” While the debate may continue among traditionalists; these coaching philosophies can be quantified by measuring the exit velocity of the ball. Greater exit velocity is associated with a better batting average and more extra base hits. Purpose: The purpose of this research project was to measure exit velocity of batted balls that were systematically struck at certain points in front of or behind the front of home plate. Methods: Five college baseball players at Avila University hit baseballs off a tee in the batting cage at three fixed points, each one differentiated by the distance out in front of home plate. Exit velocity was recorded with a radar gun. Results/Discussion: Exit velocities of each tee position were evaluated to determine if there is an optimal distance at which the hitter needs to hit the ball. Also, it is acknowledged that different body types of the players may play into strengths and weaknesses among contact points within the swing.

Analysis of Gene Expression after Inhibition of the Hedgehog Signaling Pathway with Cyclopamine in Planaria
Ashtyn Sills (Biology)
Faculty Mentor: Dr. Katherine Burgess

Hedgehog (Hh) signaling is important in developmental patterning and regeneration biology, and it is often abnormal in cancer cells. Anterior-posterior patterning in regenerating planaria requires functional Hh signaling. The Hh signaling pathway can be inhibited with the use of pharmacological agents, such as cyclopamine. Regenerating planaria treated with cyclopamine had eyes that were significantly closer together than controls and malformation of regenerated tails. To further understand the effects of cyclopamine treatment on regenerating planaria, gene expression was analyzed. For 7 days, a 25µM concentration of cyclopamine was applied to worms for pretreatment. The midsection of the worm was transected and cyclopamine treatment was continued for another 7 days during regeneration. RNA was extracted and reverse transcribed into cDNA. Gene expression analysis for GAPDH, Gli, and Ptc was conducted via semiquantitative PCR. I hypothesize a decrease in Gli and increase in Ptc mRNA following cyclopamine treatment. As planaria share more than half of their genes with humans and also have many similar physiological mechanisms, discoveries in these worms may be applied to regeneration of human cells.
Perioperative Nursing Care of a Total Hip Placement

Rachel Somodi (Nursing)

Faculty Mentor: Jessica Brunsman, MSN, RN, CPN

Total hip replacement (THA) surgery has become much more common over the last 35 years, making it one of the most widely practiced surgeries in developed countries today. Although THA surgery has increased in frequency, the best methods for preparing patients and rehabilitating them afterwards are still in question. Research for this project was found using PubMed Central and CINAHL databases and was reviewed for quality. This project investigates the

PICO question: In adult patients who have had a total hip arthroplasty, does an accelerated rehabilitation program including a perioperative nurse, as compared to no accelerated rehabilitation program, decrease their length of stay in the hospital and increase their satisfaction with the procedure? There are more positive outcomes for patients who are in organized rehabilitation settings for THA surgery. Supporting evidence is used to argue for a change in practice. As healthcare costs and patient expectations increase, it’s necessary for healthcare teams in the United States, and especially orthopedic and perioperative nurses, to recognize the shortcomings of current procedures and work to improve them over time.

Awards Ceremony
Whitfield Conference Center
4:45 P.M.

Dr. Sue King Wilcox, Vice President of Academic Affairs will present:

Oral/Performance Award Winner
Poster Presentation Award Winner
Alumni Award for Outstanding Presentation
Participants from Student Scholar Day 2016