



ACADEMIC EXCELLENCE CELEBRATION

STUDENT RESEARCH PRESENTATIONS

THURSDAY, APRIL 11, 2019

Session I: 2:00–4:00 PM • Session II: 5:00–7:00 PM



GEORGIAN COURT UNIVERSITY

THE MERCY UNIVERSITY OF NEW JERSEY

Program

SESSION I

2:00–4:00 PM

Poster Presentations

North Dining Room

Oral & Panel Presentations

Mercedes Hall, Room 103

Refreshments

North Dining Room

SESSION II

5:00–7:00 PM

Poster & Oral Presentations

Mercedes Hall, Room 103

Refreshments

Mercedes Hall, Room 102

This program has been arranged by the Academic Research Subcommittee
of the faculty at Georgian Court University.

Academic Research Subcommittee

Chair: Amitabh Mungalé, Ph.D.

Lei Cao, Ph.D.
Jean Parry, Ph.D.

Lindiwe Magaya, Ph.D.
Megan Sherman, Ph.D.

SESSION I

Poster Presentations • North Dining Room

Developing the Techniques to Use Remote Sensing for Monitoring Expansion of an Invasive Sedge in New Jersey's Coastal Dunes

Deane Heinzer & Meagan Perrotta

Mentor: Louise Wootton, Ph.D.

Maximizing the Efficacy of Natural Antimicrobials

Patricia Elcano & Vaidevi Patel

Mentor: Michelle Esposito, Ph.D.

Jahn-Teller and Other Structural Effects in Some First-Row Transition Metal Complexes: IR, Raman, NMR, EPR and DFT Investigations

Edward Countryman, Marissa Adamczyk, Kayla Hammond, Milos Djeri, Clement Rajakumar & Prasad Lakkaraju

Mentor: Prasad S. Lakkaraju, Ph.D.

Academic Excellence Day Visual Identity Program

Stephanie Napolitano & Emily Soucheck

Mentor: Jinsook Kim, Ph.D.

Social Media and Social Connectedness

Carolyn Stanton

Mentor: Gina Marcello, Ph.D.

Organ(ic) Movement

Krista Morton

Mentor: Silvana Cardell, M.F.A.

Agility T-test and Multistage Fitness Beep Test May Be Indicators of Maximal Oxygen Consumption Rate (VO_2 max) in Division II Collegiate Male Soccer Athletes

John Esposito

Mentor: Vincent C. W. Chen, Ph.D.

Modeling of Optical Interference Phenomena

Milos Djeri

Mentors: Beth Schaefer, Ph.D. & Sarita Nemani, Ph.D.

Understanding the Experience of Recovery in a Halfway Home

Christopher Nelson

Mentor: Megan Sherman, Ph.D.

SESSION I

Oral Presentations • Mercedes Hall, Room 103

Molly Bloom in the Flesh: An Analysis of Molly's Bodily World in James Joyce's *Ulysses*

Olivia Fritz

Mentor: Russell Craig McDonald, Ph.D.

"The Story of My Life Doesn't Exist": Manifestations of Silence in Daoud, Duras, and Müller

Brittany Scardigno

Mentor: Pamela J. Rader, Ph.D.

Vague Words!: The Expression of Emotion in Stevenson's *The Strange Case of Dr. Jekyll and Mr. Hyde* and Tennyson's "In Memoriam A.H.H."

Brian Guarino

Mentor: Russell Craig McDonald, Ph.D.

Archival Violence

Hannah Moran

Mentor: Norah Gharala, Ph.D.

Collective Memory and Historical Oppression: Women of Color Being Purposely Forgotten

Daniel Ginchereau

Mentor: Norah Gharala, Ph.D.

Panel Presentation • Mercedes Hall, Room 103

Broken Humanity: Respect, Justice, & Compassion as a Response to Racism and Genocide in Rwanda

Sister Kieu Nguyen

Mentor: Paul R. Cappucci, Ph.D.

It Takes a Village: Fighting Elephant Poaching Through Global Cooperation and Mercy

Brian Guarino

Mentor: Paul R. Cappucci, Ph.D.

A Plea for Justice to Stop Deforestation in Africa: A Choice of Life or Death

Sister Monica Nakawala, LSOSF

Mentor: Paul R. Cappucci, Ph.D.

SESSION II

Poster Presentations • Mercedes Hall, Room 103

Graphic Design and Multimedia Program Promotional Postcard

Stephanie Napolitano & Samantha Widmer

Mentor: Jinsook Kim, Ph.D.

Ethics, Burnout, and Behavior Analytic Practice in Schools

Kathryn Prozzo

Mentor: Theresa J. Brown, Ph.D., BCBA-D

School–Family–Community Partnering: Helping Parents Balance Life Roles

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Oral Presentations • Mercedes Hall, Room 103

The Ease of Ignorance in Muriel Spark's *The Prime of Miss Jean Brodie* and Kazuo Ishiguro's *Never Let Me Go*

Julia Millington

Mentor: Russell Craig McDonald, Ph.D.

An Autobiographical Approach to Treating Crohn's Disease the Natural Way:

Can Crohn's Disease Be Managed by Means of an Individual's Nutritional Approach?

Celina Semente

Mentor: Sachiko Komagata, PT, Ph.D.

Abstracts

Developing the Techniques to Use Remote Sensing for Monitoring Expansion of an Invasive Sedge in New Jersey's Coastal Dunes

Deane Heinzer & Meagan Perrotta

Mentor: Louise Wootton, Ph.D.

Department Chair, Professor of Biology & Director of Sustainability

Department of Biology

Carex kobomugi (Asiatic sand sedge) is an invasive species on the eastern coast of North America. It is out competing the native species *Ammophila breviligulata* (American beach grass) in New Jersey's coastal dune ecosystems. *Carex kobomugi* is not used as food by native species and is often not suited for their habitat use either, so its invasion threatens native coastal wildlife. The lower dunes it creates may also reduce protection of human coastal communities from flooding. Different pigment concentrations in different plants result in different reflectances of light from plant communities. Such differences can be used to recognize the presence of specific plant species in photographs taken with cameras capable of filtering out light of different wavelengths. In this project, we are working to develop the technology to take and process pictures of coastal dune plant communities using a DJI Phantom 4 drone mounted with its built-in Normalized Difference Vegetation Index (NDVI)-enabled camera as well as a Sentra single sensor. NDVI imagery differs from RGB (visible light imagery) as it relies on the reflection of red and Near-Infrared (NIR) light to distinguish different plant taxa. We are working to learn how to collect images, geotag them, and stitch them into mosaics. We will then apply post-processing filters to the images using various software and online services such as ARCMAP, Drone Deploy, and Maps Made Easy. The goal is to collect NIR- and NDVI-geotagged photos and use the pigment differences between *C. kobomugi* and *A. breviligulata* to track the spread of the invasive species. Once adequate data on the locations of *C. kobomugi* are documented, the data can be used to find ways to monitor the spread of the species and develop management strategies to control its spread, as well as potentially repair damaged areas.

Maximizing the Efficacy of Natural Antimicrobials

Patricia Elcano & Vaidevi Patel

Mentor: Michelle Esposito, Ph.D.

Assistant Professor of Biology

Department of Biology

Bacterial growth from pathogens are often targeted with antimicrobials containing harsh chemicals, such as bleach, alcohol, or Lysol, that can be potentially harmful or even toxic to individuals, as they kill normal flora and cause organic tissue damage. Natural antimicrobial alternatives are a valuable area to research in lieu of the common chemical-based antimicrobials. The efficiency of such alternatives, as well as how to maximize their performance, were tested by disk diffusion. The bacteria tested consisted of *Escherichia coli*, *Staphylococcus epidermis*, and *Staphylococcus aureus*. They were be cultured on nutrient agar plates, and in the center of each plate, a blank disk was saturated with potential natural antimicrobials, which included essential oils. The essential oils utilized were peppermint, lavender, honey, green tea, lemon juice, lemongrass, tea tree oil, and orange. There were explorations of synergistic/additive effects. Through mixture and individual disk saturation, the two most effective essential oils were tea tree oil and lemongrass, which exhibited the greatest zones of inhibition among the different strains of bacteria. Lemongrass and tea tree oil were then further combined with other natural products, such as lemon juice and honey. The tea tree and lemongrass dipped with honey disk displayed the largest zones of inhibition compared to the other dilutions/mixtures on the strains of bacteria tested. Lemongrass/orange and lemongrass/frankincense were two combinations created that revealed prominent zones of inhibition. The procedure carried out examined the ways to enhance the effectiveness of potential natural antimicrobials. The dilution and combination helped validate the potency of natural antimicrobials. The findings are hoped to encourage individuals to explore natural antimicrobials in place of harsh chemical products damaging to the skin.

Jahn-Teller and Other Structural Effects in Some First-Row Transition Metal Complexes: IR, Raman, NMR, EPR and DFT Investigations

Edward Countryman, Marissa Adamczyk, Kayla Hammond, Milos Djerić, Clement Rajakumar & Prasad Lakkaraju
Mentor: Prasad S. Lakkaraju, Ph.D.

Professor of Chemistry & Chair of Faculty Assembly
Department of Chemistry & Biochemistry

Complexes of ethylenediamine, 1,10-phenanthroline, and 2,2'-bipyridine with first-row transition metals such as Zn^{2+} , Cu^{2+} , Ni^{2+} , Mn^{2+} are synthesized and investigated for structural changes caused by the Jahn-Teller effect and variations in ionic sizes of the cation. Copper (II) complexes undergo Jahn-Teller distortions in octahedral ligand fields resulting in an elongation or compression of the bonds along an axis. Ethylenediamine complexes undergo tetragonal elongation whereas 1,10-phenanthroline complexes undergo tetragonal compression. These structural variations are clearly delineated in the EPR spectra. Considering the fact that all the atoms that are immediately bonded to the metal ion are nitrogen atoms of the ligands, the reasons for divergence in structural distortions are not very clear. We will be presenting Raman and infrared spectral features of metal-nitrogen stretching frequencies, EPR and NMR spectral details, and DFT results to provide better insights into these structural complexities wherein the end result might be a combination of metal-ligand interactions as well as dynamic lattice effects.

Academic Excellence Day Visual Identity Program

Stephanie Napolitano & Emily Soucheck

Mentor: Jinsook Kim, Ph.D.

Assistant Professor of Graphic Design & Multimedia & Director of the Graphic Design & Multimedia Program
Department of Communication, Graphic Design & Multimedia

The visual identity program of Academic Excellence Celebration, an academic event of Georgian Court University, was explored collaboratively with the Office of Marketing and Communication. Visual identity is a visual language that reflects the target's value and vision. All elements of visual components, such as slogans, typography, colors and other identity-related graphics, will work in synergy to build the clarity of information in relation to the target, and the imagery will catch the audience's attention, therefore, the audience or users will be engaged and remember the particular event because of it. A booklet, a digital invitation, a postcard, a PowerPoint template, and a social media template were designed; detail layouts, typography, images, words, and formats are all integrated in synergy to construct a clear information space while the whole items represent Georgian Court University's identity as clearly as possible.

Graphic Design and Multimedia Program Promotional Postcard

Stephanie Napolitano & Samantha Widmer

Mentor: Jinsook Kim, Ph.D.

Assistant Professor of Graphic Design & Multimedia & Director of the Graphic Design & Multimedia Program
Department of Communication, Graphic Design & Multimedia

Good design satisfies audience in meaningful and informative ways. We developed a postcard to advertise the graphic design and multimedia program at Georgian Court University. The goal was to inform about the program in the most inviting ways—simple, informing, and engaging. For creative ideas that are simple, informative, and engaging, substantial design process is necessary. Our design process was to define the problem, investigate necessary information, conceptualize core ideas, explore concepts, and evaluate the outcome. These processes were iterative. Core concepts were developed based on the definitions of the program. We established the concept “#1 Thinkers & Makers” to reflect the set of assets and achievements that the students would get throughout their studies in the graphic design and multimedia program at Georgian Court University. We investigated approaches and images to represent, conceptualized detailed expressions, and explored the visual and verbal content for the integrity of all components of form and function.

Social Media and Social Connectedness

Carolyn Stanton

Mentor: Gina Marcello, Ph.D.

Assistant Professor of Communications & Director of the Digital Communication Program
Department of Communication, Graphic Design & Multimedia

The use of smartphones has increased significantly over the last decade (Hawi & Samaha, 2017). As the number of users increase, so does the amount of time spent on social media platforms. The purpose of this study was to examine the relationship between social media usage and social connectedness. The participants included 10 college age students enrolled at a private liberal arts university in central New Jersey. All had the “Screen Time” application on their phone and were active on at least one social media platform. Survey results indicated there was a relationship between social media and social connectedness. As a group, the results supported that highly active social media users reported to be less socially connected.

Organ(ic) Movement

Krista Morton

Mentor: Silvana Cardell, M.F.A.

Associate Professor of Dance & Department Chair
Department of Dance

This project incorporates elements of Body-Mind Centering® work, as well as Laban movement analysis, and Bartenieff Fundamentals, in order to inform a movement improvisation that detoxifies and rebalances the organ systems. Within this work, cellular breathing, body mapping, and organ tonification techniques are used. The individuals who participated in this study had no previous experience in this movement style, which served to provide an authenticity to the body’s movement patterns, within the Body-Mind Centering, Laban, and Bartenieff Fundamentals works. The participants were briefly guided through a background of these movement philosophies, including the idea of hyper- and hypotrophic organ states, cellular breathing, and movement qualities to explore, which was previously researched and studied by the student creating the project. Afterward, the experience was reflected in a written assignment and documented on video for presentation and research purposes.

The Ease of Ignorance in Muriel Spark’s *The Prime of Miss Jean Brodie* and Kazuo Ishiguro’s *Never Let Me Go*

Julia Millington

Mentor: Russell Craig McDonald, Ph.D.

Associate Professor of English
Department of English

When reflecting on the horrors of World War II, it is easy to say that they could never happen again. It is also easy to believe, especially as a citizen of a former Allied power, that one would never stand idly by while a group of people were being persecuted and abused. However, what’s even more frightening than the events of the second great war is the reality that mankind is much more susceptible to ignoring or joining in harmful discrimination if it’s considered socially acceptable. It is much more frightening for individuals to stand up against something they think is wrong than it is to participate in the action themselves. Muriel Spark’s novel *The Prime of Miss Jean Brodie* (1961) and Kazuo Ishiguro’s novel *Never Let Me Go* (2005) explore different elements of this phenomenon. Spark gives readers an up-close look at the subtle brainwashing the “Brodie set” receives from their instructor, encouraging the girls to make a scapegoat out of one of their own, abusing others and themselves along the way. Ishiguro takes a step back from the experience of the morally confused majority and focuses on how the systemic abuse of a minority can easily happen when “normal” people’s lives are at stake. After World War II, people wanted to believe that they were incapable of mistreating others; however, both Spark and Ishiguro expose how easy, and sometimes comfortable, it is to fall in line with socially endorsed persecution.

Molly Bloom in the Flesh: An Analysis of Molly's Bodily World in James Joyce's *Ulysses*

Olivia Fritz

Mentor: Russell Craig McDonald, Ph.D.
Associate Professor of English
Department of English

Leopold and Molly Bloom, the protagonists of James Joyce's modernist masterpiece *Ulysses*, have been credited as worthy-of-a-read characters because of their depth, realness, and relatability. By creating characters in this way, Joyce does more than simply connect the story through a plot. Instead, he connects the plot through the characters' actions and thoughts. As a result of this writing style, the book becomes bottom heavy, in that it comes to an explosive end with Molly's final monologue, a monologue that weighs heavy on the rest of the book because it finally reveals Molly in the flesh, a character who lingers in the beginning 17 chapters but does not get a chance to speak in depth. Following the "Ithaca" chapter, when Bloom finally ends his journey home, it seems as though his story is over, and Molly's begins. Molly's deviation from the Victorian woman is apparent, and her monologue offers an uncensored insight into the mind of a woman in tune with her body and who has bodily connections with the world she inhabits. Molly exists in the world through physicality and, because of this, she symbolizes what it means to exist as an embodied entity, to be a fleshy and bodily being, and she takes pride in this corporeal existence, equally as a woman, a mother, and a human being. Beyond biological terms, her body serves as the primary center of emotional connectedness with her world and of her associations with memories and people.

"The Story of My Life Doesn't Exist": Manifestations of Silence in Daoud, Duras, and Müller

Brittany Scardigno

Mentor: Pamela J. Rader, Ph.D.
Professor of English
Department of English

This paper focuses on manifestations of silence portrayed in the three texts: Daoud's *The Meursault Investigation*, Duras's *The Lover*, and Müller's *The Appointment*. The concept of silence is explored through lenses pertaining to cultural norms and misjudgment, oppression, death, and self-recognition. Silence is depicted as an artificial voice in which the protagonists are permitted self-validation and secured safety. The nonverbal communication of their characters is what gains their freedom and permits them the ability to write their stories to obtain a sense of permanence in what is only temporary. Ultimately, the manifestations within these texts empower the silenced to finally be heard.

Vague Words!: The Expression of Emotion in Stevenson's *The Strange Case of Dr. Jekyll and Mr. Hyde* and Tennyson's "In Memoriam A.H.H."

Brian Guarino

Mentor: Russell Craig McDonald, Ph.D.
Associate Professor of English
Department of English

In 1871, Charles Darwin unleashed *The Descent of Man*, which questioned widely held orthodoxies about the natural world, causing controversy and altering the Victorian consciousness regarding humanity's place in the zoological order. Specifically, Darwin argued that "man is descended from some less highly organized form," positioning humans as greater mammals, as opposed to superior beings created in God's image. Moreover, Darwin's claims cut to the heart of an omnipresent Victorian anxiety: the fear that every man houses a suppressed animalistic and primitive nature. The ramifications of Darwin's findings manifested in the literature of the era, as writers grappled with the notion that human beings and animals have more similarities than differences. Alfred, Lord Tennyson, in his poem "In Memoriam A.H.H.," struggles to find meaning in death when faced with an uncaring natural world. Robert Louis Stevenson's *The Strange Case of Dr. Jekyll and Mr. Hyde* similarly comments on humanity's relationship with nature, depicting the esteemed, civilized

Dr. Jekyll as two-faced, concealing his internal beastly desires. While both authors acknowledge the impossibility of separating humans from their animal past, they differ in their characterization of this dichotomous relationship. Stevenson, through the conflicted Dr. Jekyll, equates the expression of raw emotion with lowly animal instinct, while acknowledging that such instinctual passions exist within every man and, thus, shouldn't be suppressed in favor of pure human reason. Tennyson, in contrast, perceives emotional expression, specifically sorrow and grief, as a defining characteristic of humanity and as a means of bettering oneself, both evolutionarily and spiritually.

Broken Humanity: Respect, Justice, and Compassion as a Response to Racism and Genocide in Rwanda

Sister Kieu Nguyen

Mentor: Paul R. Cappucci, Ph.D.

Professor of English & Director of the General Education Program
General Education Program

The reality of today's world is disharmony and instability—the results of broken human relationships caused by prejudice and racism. Racism creates chaos and destroys civilization itself; it is an assault on all of humankind. The Rwandan genocide clearly demonstrates the consequence of such social disruption. The conflict has its origin in Tutsis' racist assumption of superiority to Hutus because their features are like those of Europeans. Kenneth R. White's "Scourge of Racism," Bill Berkeley's "Road to a Genocide," and Benon Kabeera and Vishanthie Sepaul's "Genocide and Its Aftermath" help define racism, show the particular circumstances in Rwanda that lead to genocide, and examine the remedy by UNICEF and NGOs to rehabilitate the survivors. If the Mercy core values were practiced more completely, they might help remake social harmony: respect for all races, justice in law, compassion to heal. These lessons can be learned from a variety of writers. Confucius believed respect in familial relationships was a basis for harmony and social stability. Good children become good citizens. Henry David Thoreau's "Civil Disobedience" demonstrates justice as the moral responsibility of each citizen to contribute to the common good by resisting unjust laws. Louise Erdrich's "Holy Rage: Lessons from Standing Rock" describes compassion when strangers come to support the Sioux Reservation in protesting the destructive Sunoco pipeline. Such readings can help inform our practice of these key Mercy core values.

It Takes a Village: Fighting Elephant Poaching Through Global Cooperation and Mercy

Brian Guarino

Mentor: Paul R. Cappucci, Ph.D.

Professor of English & Director of the General Education Program
General Education Program

In April 2015, experienced hunter Ian Gibson was trampled to death by his intended prey, a baby African elephant, while surveying its ivory tusks for a potential client. By all accounts, Gibson's death was incredibly graphic, as the young elephant applied several hundred pounds of weight to the hunter's fragile skeleton. While the loss of any life is a tragedy, Gibson's demise raises difficult questions regarding the application of GCU's Mercy core values. In a Facebook memorial, Gibson is described as "a fine man, a great friend, and one of the most experienced professional hunters on the African continent," yet, across the Internet, activists rejoiced, as his death marked one less threat facing the noble African elephant. Clearly, people have trouble showing compassion and respect to a deceased hunter, who met his fate endangering an allegedly defenseless creature. Some would even argue that Gibson's death was just, and that the elephant was acting defensively. The breadth of perspectives, ranging from family man and friend to callous murder, reveal the need to recontextualize the Mercy core values to reflect the intricate relationship between humans and the animal kingdom. Moreover, the violent struggle between pachyderm and man symbolizes the larger critical concern of elephant poaching, an issue that desperately calls for practical solutions infused with compassion and integrity and enacted by international bodies proposing and enforcing anti-poaching regulations, local rangers equipped with modern tracking technology and inside information, and volunteers and activists working diligently to care for and protect the remaining elephants.

A Plea for Justice to Stop Deforestation in Africa: A Choice of Life or Death

Sister Monica Nakawala, LSOSF

Mentor: Paul R. Cappucci, Ph.D.

Professor of English & Director of the General Education Program

General Education Program

Deforestation is an indiscriminate cutting down of trees for economic and utility reasons, which poses a great threat to Mother Earth in most parts of Africa. Research states that “failure to conserve forests will culminate in the scarcity of natural resources such as clean water, forest cover, fresh air. These lands will no longer sufficiently sustain humanity. Moreover, continuous pollution of carbon emissions due to lack of forest cover will rupture the ozone layer and result in the extinction of some species” (Wangari, 94). Accordingly, “the danger of deforestation decreases canopy transpiration that affects the surface water, energy balances, cloud cover and constraints in the energy fluxes diminishes the greenhouse effect” (Maynard, 352–353, 356). Therefore, it is imperative that African nations prudently use forests and afforestation to sustain a habitable earth for present and future generations. Through the Mercy core values of justice and respect, we can encourage biodiversity that will preserve these important habitats. Through service, people also can disseminate information on the prudent use of forests and plant trees that will benefit life in the future. Humanity ought to learn that the urgency to act will help curb the impending threatening dangers, heal Mother Earth, and, in turn, heal ourselves.

Archival Violence

Hannah Moran

Mentor: Norah Gharala, Ph.D.

Assistant Professor of World History

Department of History & Politics

History in itself is a story, a potential fiction procured by human beings to tell the story of the past and the shaping of the current society. Human beings act as both the characters in and the writers of history as they live through the events and record the details as well. However, if history is indeed a story, there would be parts that would be left out, whether it be through human error or intentional actions. Where do the intentional actions of archival violence come from? Is it an influence of the societal thinking or something greater? This silencing of history is an act of archival violence. Archival violence influences the accepted history of humanity and influences society in its current time. This influence can bear consequences on society for years, even to their present time. This topic will help clarify where certain aspects of archival violence have been detrimental to society as well as provide justice for those whose voices were not fully heard in the accepted narrative.

Collective Memory and Historical Oppression: Women of Color Being Purposely Forgotten

Daniel Ginchereau

Mentor: Norah Gharala, Ph.D.

Assistant Professor of World History

Department of History & Politics

This paper explores why so many female rulers in Africa have been forgotten in history. While some figures tend to stay culturally relevant, the education system forbids educators from deviating from state standards, thereby excluding these African rulers. I will discuss the idea of white society and the education system's discomfort with militant people of color as a trend in global history, and that United States history consistently praises people of color who are peaceful and forgets those who were warriors who resisted the white Europeans. Gender studies is strongly intertwined in my paper, as the male perception of gender and gender roles plays a key element in how our collective historical memory either preserves or erases various historical figures. This paper will work on a case-by-case comparative basis while incorporating sociological and gender studies. Women in leadership positions often were either idolized or despised. Interestingly, African women leaders who are remembered are the ones who have been dominated culturally or physically by men, whereas those who have been forgotten or shrouded have resisted subjection to patriarchal oppression. This paper helps answer the question: How do gender and racial issues affect America's collective historical memory and the academic outcomes that result from this rather skewed memory?

Agility T-test and Multistage Fitness Beep Test May Be Indicators of Maximal Oxygen Consumption Rate (VO_2 max) in Division II Collegiate Male Soccer Athletes

John Esposito

Mentor: Vincent C. W. Chen, Ph.D.

Assistant Professor of Exercise Science

Department of Holistic Health & Exercise Science

Aerobic endurance capacity and agility are two of the important factors for success in the sport of soccer. Maximal oxygen consumption rate (VO_2 max), a measurement of the maximum amount of oxygen an individual may utilize during vigorous intensity exercise, is an indicator of aerobic capacity. The Multistage Fitness Beep Test (Beep Test) has been broadly used as an indirect measurement of VO_2 max in athletes. The Agility T-test, measured by the time to complete a set of forward, lateral, and backward movements (in a "T" shaped route), has not been examined to identify its relationship with VO_2 max. The purpose of this study is to examine the relationship between the aerobic endurance capacity and agility in soccer players. Twenty Division-II collegiate male soccer players (ages 18 to 22) from Georgian Court University men's soccer team were recruited to perform a Beep Test, an Agility T-test, and a Bruce Treadmill VO_2 max Test. The correlation between VO_2 max and the results of the Beep Test and Agility T-test were measured by regression analysis using IBM SPSS Statistics software. The results showed that VO_2 max is positively correlated with the Beep Test ($r = 0.766, p < 0.001$) and negatively correlated with the Agility T-test ($r = 0.676, p = 0.001$). Our results are consistent with previous studies showing a strong correlation between VO_2 max and the Beep Test. The negative correlation between VO_2 max and the Agility T-test may provide a potential, less-intense, indirect VO_2 max measurement for collegiate male soccer athletes.

An Autobiographical Approach to Treating Crohn's Disease the Natural Way: Can Crohn's Disease Be Managed by Means of an Individual's Nutritional Approach?

Celina Semente

Mentor: Sachiko Komagata, PT, Ph.D.

Chair of the Department of Holistic Health & Exercise Science & Associate Professor of Holistic Health
Department of Holistic Health & Exercise Science

Crohn's disease, both an autoimmune and inflammatory bowel disease (IBD), affects everyone differently. While some patients may have severe physical pain or fatigue, others may suffer emotionally from anxiety or stress. These are just a few of the many symptoms that can result from IBD, and further complications can occur. Conventional treatment options include medications, steroids, or even surgery, which may all have unpleasant or dangerous side effects. On the other hand, patients are rarely offered holistic healing methods as a form of treatment. This project highlights several research articles on nutrition in patients with IBD and also explores a personal experience of the journey between nutrition and Crohn's treatment. The autobiographical writing in this project consists of a three-and-a-half-year timeframe, wherein Crohn's disease is transformed from originally being a scary diagnosis treated with strong medications to being a medication-free and stable condition, which solely depends upon natural healing means.

Modeling of Optical Interference Phenomena

Milos Djerić

Mentors:

Beth Schaefer, Ph.D.
Professor of Physics

Sarita Nemani, Ph.D.
Associate Professor of Mathematics &
Department Chair

Department of Mathematics, Computer Science & Physics

Interference is a phenomenon in which two waves superpose to form a resultant wave of greater, lower, or the same amplitude. Constructive and destructive interference results from the interaction of waves that are correlated or coherent with each other. The interference can come from a single extended source or from an array of sources. Interference effects can be observed with all types of waves, for example: light, radio, acoustic, surface water waves, gravity waves, or matter waves. Young's experiment was fundamental in showing that light has wave properties. Thomas Young first demonstrated the double-slit experiment in 1801, well before the advent of Maxwell's equations, which gave, for the first time, a theoretical framework for electromagnetic radiation. Approximations are normally used to find the intensity of interference patterns. For this project, we are calculating exact values of the intensity for two or more point sources instead of slits. Mathematical equations for intensity as a function of wave length and frequency are used to model the three-dimensional intensity in space using the program Mathematica. Graphical images were used to visualize the results at both close- and long-range values and through different planes. We created these images for two or more sources using identical and non-identical frequencies. Some of the main practical applications of interference and optical interference are in the subject areas of optical interferometry, radio interferometry and acoustic interferometry. Interference patterns are observed in many places in nature. Comparison of these observed patterns with the simulated patterns produced through our simulations would help to identify the number, position, and frequencies of the sources.

Ethics, Burnout, and Behavior Analytic Practice in Schools

Kathryn Prozzo

Mentor: Theresa J. Brown, Ph.D., BCBA-D

Professor of Psychology

Department of Psychology & Counseling

In this study, the relationship of administrative pressure to act unethically to burnout was explored among individuals delivering behavior analytic services in schools. Participants ($N = 170$) delivering behavior analytic services in schools completed an Internet survey about administrative pressure to act unethically, strategies to cope with this pressure, burnout, and job attitudes. Results indicated that many participants experienced administrative pressure to act unethically. This pressure was most commonly in the form of being asked not to recommend services because of the cost to the school district. Other forms of pressure included being asked to recommend restrictive placements for students and to perform job duties outside of their scope of practice. Participants used a variety of strategies to manage pressure to act unethically including educating school administrators about behavior analysts' ethical and legal responsibilities. Participants also asked colleagues for advice about how to manage pressure to act unethically. Participants' level of burnout and job attitudes will be discussed. Suggestions for future research and implications for behavior analytic practice in schools will also be discussed.

School–Family–Community Partnering: Helping Parents Balance Life Roles

Kayanna Chandler

Mentor: Theresa J. Brown, Ph.D., BCBA-D

Professor of Psychology

Department of Psychology & Counseling

The framework provided by the bioecological model (BM), formerly known as ecological systems theory, was used to examine work–life balance among parents of children with and without disabilities. The focus of this research was on person and context variables of the BM. Person variables explored included resources and demands. Context variables explored included aspects of the microsystem and macrosystem. Participants ($N = 78$) were parents of children under the age of 18 years who are employees of a university located in the mid-Atlantic region of the United States. Institutional research review board approval was gained prior to data collection. Participants responded to a web survey that included measures of the study constructs. The results of hypotheses tests and additional relevant findings will be presented. The utility of the BM for research and practice in school psychology, study limitations, and directions for future research will be presented.

Understanding the Experience of Recovery in a Halfway Home

Christopher Nelson

Mentor: Megan Sherman, Ph.D.

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Substance use and addictions have long been a part of American society. Today, with the rise of opioid addictions and expansive dependency on pills, alcohol, and cocaine, the use of substances has impacted more individuals and families than ever before. What was once considered a socioeconomic issue within our inner cities has since spread to the most affluent neighborhoods and country side towns. The purpose of this phenomenological research study is to explore the lived experiences of men with addictions living in halfway homes. The goals of the study are to better understand the life events that have contributed to their current situation and to effectively describe the expectations they may have about life after treatment.

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