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Cover design: Emmett Aiello
Booklet design: Christelle Mehu & Sabine Dantus
The College of Arts & Sciences once again welcomes the entire Lynn community to join us in celebrating the work of Lynn University students at the annual Arts & Sciences Symposium. This year there are several changes that we hope will make the symposium even more inclusive and accessible to all Lynn students. First, the symposium will be held in a new, more open venue, the Wold Performing Arts Center. This will provide a more open space than we’ve had in the past allowing for even more student presentations and easier viewing by visitors. Also, students from all colleges, both undergraduate and graduate, were welcome to submit their work this year. The committee received 42 submissions from 51 students, 29 faculty, and 3 colleges, making this the most diverse group to present at the symposium yet. And finally, there is a new third category in which students can showcase their work. In addition to posters and talks, students may now also submit papers. Prizes will be awarded in all three categories, so thank you for coming to support your friends and colleagues, and to help us recognize the great work that students here at Lynn are engaged in every day.
2019 College of Arts and Sciences Symposium Committee

Cassandra Korte, Ph.D.
Assistant Professor, Biology and Dialogues of Scientific Literacy

Stephen Aiello, M.A.
Associate Professor, Humanities and Dialogues of Belief and Reason

Amy Filiatreau, MLIS, MBA
Director of the Library

Melissa Lehman, Ph.D.
Assistant Professor, Psychology
2019 College of Arts and Sciences Symposium Submission Readers

Amanda Wolcott, Ph.D.
Associate Professor, Management

April Watson, Ph.D.
Assistant Professor, Natural and Applied Sciences

Angie O’Gieblyn, Ph.D.
Lecturer, Clinical Mental Health Counseling
2019 College of Arts and Sciences
Student Symposium
hosted by
the College of Arts and Sciences

Timeline of Events

The Wold Performing Arts Center
Noon to 2 p.m.

1. Opening Remarks by Dr. Gary Villa, Dean, College of Arts and Sciences
2. Lunch and Poster Session
3. Paper Presentations
4. Research Award Presentation
5. Closing Remarks by College of Arts and Sciences Faculty
Timeline of Events

Opening Remarks by Dr. Gary Villa,
Dean, College of Arts and Sciences

Lunch and Poster Session

1. Gender Differences in AGU Journals
   Karen Gonzalez and Alanna Lecher, PhD

2. Exploring How Temperatures Impact Crime Rates in Virginia
   Anne Myers and Alanna Lecher, PhD

3. Are Promotional Packages Sent to Influencers Contributing to Increasing Levels of Packaging Waste?
   Lindsay Miller and Alanna Lecher, PhD

   Rocio Carreno, Esther Ushuhuda, and Khalique Ahmed, PhD

5. Analysis of Potential Recreational Water Contamination with Fecal Indicator Bacteria
   Esther Ushuhuda, Eric Merkel, Chloe Talbert, Anden Velez, Alanna Lecher, PhD
   and Cassandra S. Korte, PhD

6. Comparison of Planarian Regeneration Rates Between Heads and Tails
   Anden Velez, Eric Merkel, and Cassandra S. Korte, PhD

7. Nicotine and Sildenafil as a Model for Pesticide Resistance in Agriculture
   Raymond MacKoul, David Baldwin, Ken Dawson-Scully, PhD, and Kimberly Rowland, PhD

8. Color Testing for Steroids
   Alex Resto, Faith Moore, Juan Zhuang, and Erika Doctor, PhD

9. Personality Characteristics and Study Choices
   Maxwell Casper and Melissa Lehman, PhD

10. Assessing the Financial Practicality of LEED
    Paul Ristuccia and Alanna Lecher, PhD

11. How Grain Size Corresponds with Human Habitation
    Cheree’ Faulk, Sarah Hughes, April Watson, PhD, and Alanna Lecher, PhD
12. How Humans Have Affected the Charcoal Content of Sediment in a Barrier Island Environment in Boca Raton, Florida
   Sarah Hughes, Cheree’ Faulk, Alanna Lecher, PhD, and April Watson, PhD

13. Individual Differences in Color Perception
   Kristina Petkovic and Melissa Lehman, PhD

14. Exploring Online Communication Patterns: Examining the Relationship Between Empathy, Self-Compassion, Dehumanization, Aggression in Social Media Activity
   Ashley Kaufman and Angie O’Gieblyn, PhD

15. Predicting Guilt Ratings from Juror and Trial Characteristics
   Josh Noreiga and Rachel Pauletti, PhD

16. Personal Care Products: Where are the Phthalates?
   Tara Lunsford, Joshua Noreiga, Cassandra S. Korte, PhD, and Erika Doctor, PhD

17. Examining the Effects of Screen Size on Archaeological Data Collection
   John McDowell, Jack Meyers, Alanna Lecher, PhD, and April Watson, PhD

18. Factors Influencing Concentrations of Micro-Plastics on Florida Beaches
   Elizabeth Harris, Shelby McKeever, and Alanna Lecher, PhD

19. Immediate Effects on Therapeutic Group Drumming on Affective States in Inpatient Substance Abusers
   Abbigail Rinard, Mathew D’Urso, Adrienne Apple, Patrick Cooper, PhD, and Jon Sperry, PhD

20. Investigating Career Readiness: a Comparison of College Students’ Self-perceptions in Four Soft Skill Desired by Employers
   Claudia Milhano, Conrad Rhein, Kristina Ortiz, Chad Barr, DSM, and Kristen Migliano, PhD

Oral Presentations introduced by Dr. Cassandra Korte, Assistant Professor, Biology and Dialogues of Scientific Literacy

1. Sorting out Mood, Stress, and Social Interest One Rhythm at a Time
   Abbigail Rinard, Patrick Cooper, PhD, and Jon Sperry, PhD

2. Is Your Sunscreen Worth It?
   Tara Lunsford, Alanna Lecher, PhD, and Cassandra S. Korte, PhD
Timeline of Events Cont’d

3. Abundance of Microplastics Found in Commercial Sea Salt Purchased in the US
   Khyla Bodie, Alanna Lecher, PhD, Cassandra S. Korte, PhD, and Erika Doctor, PhD

4. Comparison of Proctored On-Ground Exams vs. Non-proctored Online Exams in
   Undergraduate Finance Courses
   Claudia Milhano, Robert Reich, DBA, and Dawn Valentine, PhD

Research Paper Award Winner introduced by Leecy Barnett,
Reference Librarian

   Depression Across Cultures
   Carlota Garcia; Debra Ainbinder, PhD

Closing Remarks and Awards
Participant Biographies

Adrienne Apple
Adrienne Apple is a first year in the Clinical Mental Health Counseling Program at Lynn University. Adrienne has experience working in neurofeedback and biofeedback therapy and has interest in expanding research in neurocognitive and human development. She has several research interests in trauma, attachment styles, play therapy, and child-rearing practices.

Khyla Bodie
Khyla Bodie is a senior in the 3.0 program graduating with a bachelor’s in biology. She is a natural born Floridian, who was born and raised in Miami. She has interested in the medical field from a young age; however, since her first J-term class doing beach clean-ups, she has also grown an interest in environmental health and sustainability. Ideally, she would love to find a career that combines both passions but for now, she has her eyes set on getting a Doctor of Osteopathic Medicine. Until she reaches her goal, she looks forward to continuing research, volunteering, and interning to gain as much valuable experience as she can.

Rocio Carreno
Rocio Carreno (‘19) is an international student from Bogota, Colombia, graduated from The Bolles School in Jacksonville, FL. At Lynn University, Carreno is a senior majoring in Biology with a concentration in Forensic Science and a minor in Psychology. She is part of the Honor Society. She is currently a peer leader as well as mentor for the Dare to Be a Girl program from the Women Center, a participant of the Mapping of the System competition and a Campus Ambassador for Gift of Life, a nonprofit bone marrow registry. She has mentored first-year class biology students, held fellowships in Madrid and Bogota, shadowing physicians from diverse fields. Carreno volunteered at the Boca Raton Habilitation Center and Habitat for Humanity. After graduation, Carreno plans to work and get work-field experience while applying to graduate programs in forensic science to later attend medical school.

Max Casper
Max Casper is a junior graduating this December with a Bachelor of Science degree in Psychology and minor in Criminal Justice. Throughout his time at Lynn, Max served as the President of Project Civitias, which aims to promote civic engagement among the Lynn community. He also served as an intern for the peer education program, going into classes and holding events to teach students about the issues of addiction. This program led to him receiving his peer education certificate last May. In Max’s spare time he is an avid movie-goer as well as a lover of the outdoors.

Matthew D’Urso
Matthew D’Urso is a second year student in the Clinical Mental Health Counseling program at Lynn University. He works and interns as a group facilitator and counselor at The Jerome Golden Center for Behavioral Health in West Palm Beach, Florida. Matthew has interests in Solution-Focused Brief Therapy as well as working with dual-diagnosis clients and drumming as an intervention.

Cheree’ Faulk
Cheree’ Faulk is a Freshman at Lynn this year. She is in the 3.0 Program and am a member of the Lynn Leadership Institute. She spends her spare time with my friends, going to the beach, and work off campus. Cheree’ is an Environmental Studies Major and would like to pursue a career as an Environmental Scientist.
Carlotta Garcia
Carlotta Garcia is a Senior at Lynn University double-majoring in Psychology and Film & TV. She is originally from Madrid, Spain.

Karen Gonzalez
Karen Gonzalez was born and raised in Argentina. She decided to come to the United States to pursue her educational goals. Currently, she is a 3.0 undergraduate sophomore student at Lynn University, majoring in Psychology. Her graduation date is May 2020. Karen’s short aspirations are to build her resume to apply for a graduate school at John Jay College in New York. She enjoys acquiring knowledge and learning something new every day. Karen’s long-term goals are to obtain a PhD in Clinical Psychology and to be part of a government agency. She would like to help on social issues related to crime, as well as issues at a personal level. Karen is part of Psi-Chi club at Lynn University, and currently involved in two Internships in Arts and Science concentrating on research.

Elizabeth Harris
As a Senior at Lynn University from Mansfield, TX, a 3.0 program student with a 3.88 GPA, Elizabeth Harris is a Biology major with interests in Environmental Science as well as conservation which may lead to a job with the Environmental Protection Agency (EPA). With these interests, Elizabeth hopes to delve into water quality and the anthropogenic impact that is present today. In what ways have humans impacted our ecosystems? Has this human footprint altered the overall ecological systems in a negative way? If so, how so? Additionally, how can we return the life and diversity back to the ecosystem? She hopes to be a part of the conservation efforts that could be utilized to ensure the survivability of all organisms that may have been unmeaningfully negatively affected. Regarding to her academic goals, Elizabeth hopes to maintain a 3.8 GPA throughout her entire time at Lynn and also strives to make connections and educationally grow as an individual. After graduation she hopes to continue in academia and find a perfect graduate school that can put her on the path to successfully reaching her goals. Finally, on campus, Elizabeth is a part of many organizations such as SRA (Student Research Association) and is a student-athlete. As well as organizations, she has internship hours with Dr. Lecher that skimmed the surface on plastic pollution and conservation efforts. Here at Lynn Elizabeth is thrilled to see where her connections, experiences and hard-work will take her.

Sarah Hughes
Sarah Hughes is an Environmental Studies major finishing her senior year at Lynn University. After life at Lynn, she endeavors to join the Royal Navy as an Officer specializing in Oceanography or Hydrography. Sarah is a nationally ranked swimmer and an active member of the SAAC (Student Athlete Advisory Committee) community who regularly partake in volunteering projects in an effort to fundraise for Make a Wish Foundation.

Ashley Kaufman
Ashley Kaufman is a second-year graduate student in the Clinical Mental Health Counseling Program. Ashley has her undergraduate degree in Advertising and public Relations and a minor in Sport Management. Ashley is pursuing her degree in clinical mental health to connect with the community at large, and become an advocate for others. Ashley’s interest in looking at the dehumanization and aggression online stems from her interest in better understanding the way which individuals communicate online and the decrease in social connection and empathy.
Tara Lunsford
Tara Lunsford grew up in West Michigan but currently resides in Sarasota, with a newfound appreciation for the constant warm weather. Tara is a third year Biology student at Lynn University. She is heavily involved within the Lynn community as a Resident Assistant and a biology peer mentor. She is now in her third year working alongside Drs. Korte and Doctor. She has greatly enjoyed her involvement within the science department and is grateful for the opportunities she has had throughout her time here. In her free-time she enjoys going to the beach and watching true crime documentaries.

Raymond MacKoul
Ray is a Senior at Lynn University who grew up in Reading, PA, and has been living in Florida for several years. Ray initially began his career in the restaurant industry after attending culinary school. After almost ten years of work in the food service industry, he decided to follow his passion for science and return to college with the intention of changing careers. His lingering interest in food production has led him to seek a career in the agricultural sciences after obtaining a degree in biology. His work as an undergrad has centered on modeling agricultural systems using fruit flies and insecticides.

John McDowell
John McDowell is a senior and in the final year of the 3.0 program here at Lynn University. He is an international student from the Bahamas majoring in Biology with a minor in Environmental sciences. His research looks at how screen size affects archaeological data collection here in Florida. The goal for the future is to test all samples a ¼ inch screen (the standard) and a 1/8 inch screen as well as trying to identify and potentially dating as many species as possible from the faunal bone samples. Past graduation he is taking roughly a year off to consolidate work and research experience and potentially volunteer before going on for a master’s degree.

Shelby McKeever
Shelby McKeever is a first year undergraduate biology major at Lynn University. She is from Melbourne Beach, Florida. Growing up near the Atlantic Ocean has enabled her to develop a love for the beach and other natural environments. Her love for the environment has also developed into an awareness for the affect humans have on the environment. She knew this lab experiment was a perfect opportunity to conduct research on the various amounts of micro-plastics that are present at beaches she grew up visiting. Shelby is also a member of the NCAA division II women’s swim team for the university. When she is not studying or swimming, you can usually find her at the beach surfing or spending time with friends and family.
Eric Merkel
Eric Merkel is a senior biology student at Lynn University. After graduating, he plans to attend a veterinary medicine program with the aspiration of one day opening his own practice. Over the past 2 years, Eric has worked in both the biology and chemistry labs at Lynn. His primary role is in lab preparation for the 100, 200, and 300 level science classes. His tasks have ranged from preparing culture media for microorganisms, constructing distillation apparatuses to purify mixtures, sustaining populations of Dugesia flatworms, and safely preparing volatile solutions. Eric has also been a part of multiple research projects here at Lynn. For Esther Ushuhuda’s Analysis of Potential Recreational Water Contamination with Fecal Indicator Bacteria project, Eric was responsible for preparing various liquid and solid culture media used to detect the presence of bacteria. In his spare time, Eric enjoys playing basketball and recently began training in Brazilian jiu-jitsu.

Jack Meyers
John (Jack) Meyers is a third year student at Lynn University. Since the first time going to the American Museum of Natural History, he has always been fascinated with science especially marine biology. He has been assisting Dr. Watson, Dr. Lecher, and John McDowell in their research about the difference between ¼ inch and 1/8 inch mesh screens have when collecting samples. His major is Biology but plans to go to Graduate school for a Masters in Marine Biology.

Claudia Milhano
Claudia Milhano is a Graduate Assistant and Research Assistant in the College of Business and Management at Lynn University. Claudia is an international MBA student hailing from Portugal.

Lindsay Miller
Lindsay Miller is a senior at Lynn University who is graduating with an undergraduate degree in Environmental Studies. She is a manager at Flywheel Sports, a full-time student, and an entrepreneur. She started her first business this year called Slides w Slogans, which is an e-commerce website where she sells custom shoes. She also has plans this year to release her own clothing line made from recycled plastics. After graduation, Miller would like to pursue a career in Sustainable Development as her passion is to work towards keeping our environment healthy for generations to come.

Faith Moore
Faith Moore is a junior at Lynn University, majoring in Biology with a concentration in Forensic Science. Faith decided to go to Lynn specifically for the Forensic Science program. Faith is originally from Allentown, Pennsylvania. After Faith graduates from Lynn she plans on attending graduate school for Forensic Science. Graduate schools she is interested in are Penn State University, Cedar Crest College, or Syracuse University.

Anne Myers
Anne Myers was born and raised in Bogota, Colombia until she was adopted at the age of ten years old and moved to Richmond, Virginia. She is fluent in both English and Spanish. Ms. Myers is a junior and a criminal justice major. After Lynn University Anne would like to work as a private investigator. Anne enjoys doing volunteer work and has worked with salvation army, habitat for humanity and A Broader View Volunteer Corp. Ms. Myers has received multiple awards for her volunteer service including the The President’s Volunteer Service Award.
Josh Noreiga
Josh Noreiga is a junior biology major in the 3-year degree program at Lynn. He is the vice-president of Lynn’s Student Research Association. Josh loves science, basketball, baseball, and video games. In his free time, he likes to learn new things, especially in the field of epidemiology. Josh hopes to pursue a career in epidemiology and plans to attend a doctoral or medical school program after graduation.

Kristina Petkovic
Kristina Petkovic is a senior at Lynn University majoring in psychology and minoring in criminal justice. She has always been passionate about research and has been involved in several research projects. Kristina has participated in the previous Lynn Symposium, received the Undergraduate Student Research Award and presented at the annual APS conference in Boston (May 2017). Her future career goals include obtaining a doctoral degree in clinical psychology and maintaining the balance between applied psychology and research involvement.

Alex Resto
Alex Resto is a junior at Lynn University, majoring in Biology with a concentration in Forensic Science. Alex is originally from Aibonito, Puerto Rico but moved around a lot from Virginia to Florida. After, Alex graduates they plan to attend Nursing school or continue to pursue Forensic Science. Graduate schools that Alex is interested in are VCU, FIU or Syracuse University.

Abbigail Rinard
Abbigail Rinard is a second year in the Clinical Mental Health Counseling program at Lynn University. Abbigail works as a Graduate Assistant for the College of Arts and Sciences as well as for the Journal of Individual Psychology. Abbigail has many research interests in trauma, social interest, drumming as an intervention and cortisol.

Paul Ristuccia
Paul Ristuccia is a senior at Lynn University studying Environmental Studies. He is passionate about nature and wants to help address current environmental concerns as part of his career path. Last summer, Paul interned with the U.S. Green Building Council in Washington, D.C. He would like to work as an urban planner after getting more work experience.

Chloe Talbert
Chloe Talbert was born in New Bedford, MA. She has lived in six states; she now lives 20 minutes from Key West. She is currently a first-year student studying Biology. She is also a part of the three-year accelerated bachelor’s degree program here at Lynn University. She helped work on the independent research project studying potential water contamination with fecal indicator bacteria. She does not know exactly what she wants to do after she graduates but knows she wants to go to graduate school in a science-related field.

Esther Ushuhuda
Esther Ushuhuda, an international student from Dakar, Senegal, graduated from The American Bilingual High School. She grew up in different countries and spent most of her life in France, Italy, South Korea and the United Kingdom; which is the reason why she is bilingual. Ushuhuda is a senior at Lynn University majoring in Psychology. She is currently a laboratory assistant and an admission’s student ambassador. In her lab work, Ushuhuda analyzed potential recreational water contamination with fecal indicator bacteria at Lynn University. She has volunteered in non-profit organizations such as the American Association of the Caregiving Youth. She received honors and awards such as the Estonian development corporation environmentalist and is a part of the golden key honor society, psi chi, and the president’s honor society. Ushuhuda plans to go to medical school after her graduation in May 2019, where she can study to be a cardio thoracic surgeon.
Anden Velez
Anden Velez is a second year student at Lynn University majoring in Biology. He has spent the past six months doing research in the bio lab on Planarian *Dugesia* flatworms regeneration time of heads and tails. Currently the experiment is in its final stages. He has spent the last two years at Lynn University to move closer to his goal of working in a lab. For a long time, Anden has been obsessed with biology. That is why when he went off to college, he wanted to learn about biology and how biological systems work. When he arrived at Lynn in his first year, he was dumbstruck with how much he could learn at Lynn University. After finishing his first year, Anden wanted to learn more and do more, so he moved on to do experiments. Dr. Korte, a biology professor at Lynn, gave Anden the opportunity to work in the lab over the course of half a year. Anden did not hesitate to say yes and has been doing experiments in the lab on Planarian *Dugesia* flatworms since.

Juan C. Zhuang
Juan C. Zhuang is a senior at Lynn University, majoring in Biology with a concentration in Forensic Science. He is from Guayaquil, Ecuador. After Juan graduates from Lynn, he plans on attending a graduate school for Forensic Science. Some of his choices include Marshall University, George Washington University, and The University of New Haven.
Gender Differences in AGU Journals
Karen Gonzalez and Alanna Lecher, PhD

Gender differences in the geoscience field have kept women away from equal opportunities and success. The current study addresses gender differences within journals published by the American Geophysical Union (AGU). This organization is the largest geology society comprising 60,000 members, but only 20% are women. This study replicates another study performed in astronomy. The astronomy study measured the gender differences in the number of citations that each work from female and male authors have obtained. The findings showed that the gender differences decreased over time, but overall women receive 10% fewer citations than men. The current research seeks to discover the gender differences in geophysical journals, specifically journals published by AGU. It is expected that men will receive more citations in their academic work than women in these journals. This study expects to have a similar outcome as the astronomy study. The current study gathered citation data for AGU journals that have published at least ten years of volumes. Currently, the study is working on fixing the citations and finding the first names of the authors to determine whether they are female or male. Preliminary data on publication statistics of the journals will be presented at the symposium.

Exploring How Temperatures Impact Crime Rates in Virginia
Anne Myers and Alanna Lecher, PhD

Since the 1800s researchers have been trying to connect possible relationships between temperature and crime rate. Multiple researchers have come up with different theories and explanations why crime increases in the summer versus the winter. This experiment is intended to see if local temperatures can impact crime rates. Crime rates in Virginia were used to test for a difference in crime rates in cold years and hot years. The coldest years (2015-2017) and the hottest years (2010-2012) were compared. In addition, another test was completed to test for a difference between summer and winter crime rates. The temperature data was collected from NOAA National Center for Environmental Information and the crime data was found from the Uniform Crime Reporting Section Department of State Police. The hypothesis for this experiment is that more crimes would be committed in higher temperatures. To test whether this hypothesis would be supported, a clustered column chart and a t-test were used to see if there was a difference between the crime rates at different temperatures. The hypothesis was not supported because there was no significant difference between crime rates in hotter years versus colder years. However, the difference in crime rates between summer and winter was significant, indicating temperature is what is causing a higher number of crime rates, the experiment did also show though that crime is higher in the summer than winter.
Predicting Guilt Ratings from Juror and Trial Characteristics
Josh Noreiga and Rachel Pauletti, PhD

This experimental study explored the role of trait skepticism, college major, and eyewitness testimony in predicting guilty ratings of a hypothetical defendant. The goal of this study was to examine the role of juror characteristics on guilty ratings. Participants answered an online survey about their skepticism and college major, and were shown one of three different eyewitness scenarios, which differed according to the amount and quality of eyewitness testimony. We hypothesized that testimony, skepticism, and college major would affect guilty ratings. There were 86 participants who were recruited and took online surveys assessing the variables. Skepticism and college major did not predict guilty ratings. However, the eyewitness condition significantly guilty ratings. Participants who were told that there was no eyewitness to the crime found the defendant to be most guilty, while those who were told of a discredited eyewitness were the least likely to convict the defendant. Future studies should aim to obtain more participants from each major. Results illustrate that juror characteristics may not be as important as features of the trial.

Are Promotional Packages Sent to Influencers Contributing to Increasing Levels of Packaging Waste?
Lindsay Miller and Alanna Lecher, PhD

Companies use the marketing strategy of sending out Press Release packages to Influencers on platforms such as YouTube and Instagram. Within these packages exist a specific brand’s new line or collection of products. For example, makeup companies send PR packages of their new range of foundation to select groups of beauty influencers in the online community. Boxes are typically packaged to be very appealing to the eye and inside include every shade of foundation in that new range. With the high rate of consumption, the ever-growing issue of packaging waste in the United States is increasing. The number of recycled materials that end up in landfills and in the oceans increases year by year. Within this study, I will collect and examine a specific Instagram influencer’s PR packaging and the waste that is associated. I hypothesize that PR packaging sent to Influencers is packaged with a combination of recyclable and nonrecyclable materials, which leads to higher amounts of waste. Within my study, I will be collecting the data on PR packaging received by Instagram Influencer Amber Webb, as well as observing unboxing videos on the platforms. I will examine what types of materials are used in the packaging, such as paperboard, plastic wrapping, or paper stuffing, and if it is recyclable or not. Three weeks of data collection will be presented at the symposium, it is expected to find that a majority of the packaging will end up in the landfill due to the combination of recyclable and nonrecyclable materials.

Is E-10 Gasoline Really E-10? An Investigation of Ethanol Blended Gasoline
Rocio Carreno, Esther Ushuhuda, and Khalique Ahmed, PhD

Recently, there has been a great interest in the blended fuels for the purpose of reducing carbon dioxide emissions. In this brief communication we report near infrared (NIR) spectra of several ethanol blended gasoline samples collected from the ten different gas stations in the Palm Beach County of the State of Florida (USA). The ethanol content of the gas samples was predicted from the previously established NIR calibration. To our surprise the maximum ethanol content of the studied samples was about 7% or less. Some comments are made to understand the rationale behind using less ethanol in gasoline by the gas suppliers.
Analysis of Potential Recreational Water Contamination with Fecal Indicator Bacteria  
Esther Ushuhuda, Eric Merkel, Chloe Talbert, Anden Velez, Alanna Lecher, PhD and Cassandra S. Korte, PhD

Coliform bacteria are commonly used bacterial indicators of sanitary quality of foods and water. In this study, they will be used as an indicator of the safety of large bodies of water for recreational purposes. The safety of these lakes will be determined by the presence or absence of fecal indicator bacteria (FIB). The study looked specifically at how the weather and other variables (dissolved oxygen, pH, turbidity, and conductivity) affect the degree of contamination. Before testing the water for FIB, the water’s dissolved oxygen, pH, turbidity, and conductivity were measured. Temperatures on collection were also recorded. FIB were then assessed using differential culture techniques. The samples were taken monthly, during different weather conditions. There are six water sources at Lynn University, and three out of those six were chosen based on the level of activity performed in each one. For all the three lakes, assessment of FIB were positive. However, the quantity of FIB in each lake was different based on the month in which the samples were collected, suggesting the effect that the weather might have on the lakes.

Comparison of Planarian Regeneration Rates Between Heads and Tails  
Anden Velez, Eric Merkel, and Cassandra S. Korte, PhD

Planarian *Dugesia* flatworms are efficient at regeneration. They have neoblast stem cells located throughout their body to regenerate small damaged tissue to more complex body structures. Planarian *Dugesia* flatworms can even regenerate a missing head or tail. Their anatomy is made up of several structures such as a pharynx, located in the middle on the ventral side of the body, that acts as both mouth and anus. Their head has two pairs of organs, ocelli and auricles, which are used for sensation. When it comes to the Planarian *Dugesia* flatworms, their most complex organs mostly reside in their heads, aside from pharynx and a portion of their nerve system. This raises the question whether heads and tails have different regeneration times. So an experiment tested to see if them was a difference in regeneration time. The results of the experiment showed that regeneration time for most the segments were nearly in sync, aside from two outliners. The amputated segments regrew the lost portions around the eighth day, but whether the limbs were fully functional varied. Tails were completely regrown and just needed to darken in pigment. On the other hand, a portion of the headless worms were not responding to light on the seventh day. By the tenth day all heads but one were completely functional.

Nicotine and Sildenafil as a Model for Pesticide Resistance in Agriculture  
Raymond MacKoul, David Baldwin, Ken Dawson-Scully, PhD, and Kimberly Rowland, PhD

Modern industrial agriculture relies on a host of chemicals to increase yields and keep costs low. These practices have allowed the western world to enjoy the greatest diversity of available foods that has likely ever been seen in history. To protect crops from environmental threats, herbicides and pesticides are routinely used. Neonicotinoids are a common class of pesticides in use today, and are considered to be analogs of nicotine, though much more potent. Use of fertilizer containing high levels of nitrogen is almost ubiquitous in conventional agriculture. Lab tests involving the use of fruit flies have already been shown to reproduce resistance to nicotine, indicating that resistance to more potent analogs is possible. Some cases of neonicotinoid resistance have already been documented. The presence of sildenafil has also been shown to have an effect on reproduction in the model organism, with some tests showing increased reproduction in flies with increased resistance to nicotine. Sildenafil increases the level of nitric oxide in cells when it is present, and it is possible that fertilizers may have a similar effect, making the use of nicotine and sildenafil in model systems analogous to the interplay of fertilizers and pesticides on the insects that come into contact with them in agricultural settings.
Color Testing for Steroids  
Alex Resto, Faith Moore, Juan Zhuang, and Erika Doctor, PhD

Steroids are synthetic or naturally occurring compounds that are helpful in the body in a variety of ways. Testosterone and estrogen, which are important endogenous reproductive hormones, can also be used illicitly to enhance performance, often in athletes. Corticosteroids such as cortisone are used to treat inflammations in the body. When used over an extended period of time, cortisone can lead to psychological distress and addiction. Steroids are commonly used illicitly and are often found in criminal or doping investigations where rapid, specific screening methods are valuable. For other illicit drugs, on site color testing is utilized as a rapid screening method. The purpose of this study is to modify and improve a previously reported color test for cortisone for rapid screening and concentration determination of steroids through the use of UV/Visible spectroscopy. The reagent is a solution of sulfuric acid (62% in water) and phenylhydrazine. Following the previously published method, the reagent was added into cortisone solutions prepared in methanol at concentrations ranging from 50 µg/ml to 3.125 µg/ml and heated for 20 minutes in a hot water bath producing a yellow color. The absorbance was measured with the UV/Visible spectrophotometer and a detection limit of 8.74 µg/mL was determined. In addition to replicating this study, reagent to sample volumes were examined to determine the lowest volume necessary to produce the color change and a time study for the stability of the reagent were performed. This improved color test will be applied to a variety of anabolic and cortico steroids to determine the specificity of the test.

Personality Characteristics and Study Choices  
Maxwell Casper and Melissa Lehman, PhD

Personality is a widely studied topic in the field of Psychology, and one important area of research examines how personality affects people’s everyday lives. Though there are many models for studying personality, the Big Five model (McCrae & John, 1992), which includes the components Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism, has been established as a reliable and valid measure. Previous research has shown that personality influences effort in class, but little research has been published on how personality influences the way students study. Similarly, although research has demonstrated that personality may be related to leadership choices, there is little research specifically examining group work in college students. We hypothesized that individuals who are more conscientious are more likely to be group leaders. We also hypothesized that individuals who score higher in neuroticism will be more likely to be group leaders. Finally, we hypothesized that extraverted individuals will be more likely to study in groups. Consistent with our hypothesis, results indicated that there was a positive correlation between conscientiousness and group leadership. However, contrary to our prediction, there was a negative association between neuroticism and group leadership. Additionally, individuals who score higher in extraversion were less likely to believe that it is studying in groups is effective. These results suggest that there may be other factors that predict group leadership and study choices in college-aged students.

Assessing the Financial Practicality of LEED  
Paul Ristuccia and Alanna Lecher, PhD

The impact of construction and maintaining existing buildings is a major contributor to climate change. A solution to mitigating these associated impacts is green building rating systems; one of the most widely used is Leader in Environmental and Energy Design (LEED). First introduced in 2009 by the U.S. Green Building Council (USGBC), LEED is routinely updated based on user feedback and evolving industry standards. One flaw of this rating system are the additional costs of integration with construction projects and the certification process. This flaw moves LEED certification out of reach of low-budget
projects; thus, this study’s goals include: 1) determining the costs and benefits of LEED certification; 2) assessing if the rating system is overpriced; and 3) investigating possible solutions to the expenses as a financial attraction to low-budget projects. As an observational study, 10 peer-reviewed sources covering a multitude of sustainability and related factors will be evaluated. Credentials specifically in the green building construction industry will be compared. Following that, the marketing strategy of each rating system will be compared, with demographic data as an additional indicator. Another form of comparison will involve analysis of cities in Florida, comparable by selected criteria from the U.S. Census Bureau. Lastly, a cost-benefit analysis will be conducted comparing each rating system to expected ROIs by project-type based on marketing strategy. Expected results will show that there is awareness of high expenses for the LEED credential, but a solution does not exist beyond USGBC professionals offering guidance for reducing expenses.

Immediate Effects on Therapeutic Group Drumming on Affective States in Inpatient Substance Abusers
Abigail Rinard, Mathew D’Urso, Adrienne Apple, Patrick Cooper, PhD, and Jon Sperry, PhD

Traditionally, substance abuse treatment centers operate from a structured multi-dimensional treatment approach that includes individual and group therapy with a possible combination of medication if warranted (NIDA, 2018). Forty to sixty percent of individuals that complete a substance abuse treatment program return to actively using again with a year (McLellan, Lewis, O’Brian, Kleber, 2000). In order to better reach clients and ensure full term treatment, centers are incorporating various alternative techniques such as yoga, animals, music and art therapy. The purpose of this study is to assess the effectiveness of a drum therapy protocol at substance-use clinics. Thirty-three participants from inpatient substance abuse facilities completed three questionnaires examining social interest, stage of change and affective mood. At the beginning of the study, participants completed a group therapy intervention. Next, participants were assigned into a control or experimental group. Those in the experimental group participated in a group drumming intervention, whereas the control group participated in a motivational interviewing. At the end of each stage of the stage, participants completed a quick mood scale. At the end of the study, all participants returned to complete a drum session together. We hypothesize that the drumming intervention will improve affective mood states that will be moderated as function by the participant’s social interest and their level of stage of change in treatment.
Keywords: group drumming, social interest, perceived, substance abuse, music therapy

How Grain Size Corresponds with Human Habitation
Cheree’ Faulk, Sarah Hughes, and Alanna Lecher, PhD

Humans have reacted to changes in their environment for millennia. Consequently, humans have modified their environment for just as long. This study sought to see if humans inhabited South Inlet Park in Boca Raton, FL because of improved environmental conditions, which would cause a natural change in grain size, or if the grain size shifted because humans inhabited the area. Two locations were picked at South Inlet Park for archaeological excavation. Sediment samples were collected during the excavation from different levels of the test units. Each individual sample was weighed when wet to measure the moisture concentration because this affects how the artifacts are preserved. Then, the samples were dried overnight and weighed again before sieving. Sieving separates the sediment by grain size, which allows for the weight to be categorized by the size of the sediment. The data was then recorded and analyzed to see if there was any correlation between human inhabitation and grain size. Preliminary data shows that grain size was smaller in the levels where human artifacts were found, indicating there was a shift in the grain size during times of human habitation.
How Humans Have Affected The Charcoal Content of Sediment in a Barrier Island Environment in Boca Raton, Florida
Sarah Hughes, Cheree’ Faulk, Alanna Lecher, PhD, and April Watson, PhD

Geoarchaeology is the collaboration of geology and archaeology to better understand archaeological sites and explain why or how processes are occurring. Geoarchaeology allows for scientific explanations into exploring what existed before, during and after human dwelling. One component of geoarchaeological testing is charcoal analysis. Learning about the fire history of an area is an important feature to investigating what life was like before the modern era. The goal for this study was to gain further data and knowledge on the human impacts to barrier island environments, with specific interest in South Florida. We hypothesized that humans moved into the barrier islands in Boca Raton because they became developed and stable enough for human habitation but in doing so, the sediment experienced an increase in carbon content, specifically charcoal concentrations. To test this hypothesis sediment samples were collected during an archaeological excavation of two sites at South Inlet Park. The samples were tested for microscopic charcoal concentrations. Preliminary results indicate that charcoal concentrations increased in layers where human habitation was identified by artifact collections. Nonetheless, over time, the environment returned to its natural state, before human interaction.

Individual Differences in Color Perception
Kristina Petkovic and Melissa Lehman, PhD

In 2015, an image of a dress on the internet, which some viewers perceived as blue and black and others perceived as white and gold, sparked a debate among psychologists about the factors contributing to individual differences in perception. Some early research suggested that demographics and circadian rhythm could account for some of the variability in perceptions of the dress. We hypothesized that individuals with high levels of artistic experience may have more finely-tuned color perception and thus may be more likely to accurately perceive the colors of the dress, potentially explanation additional variation in this phenomenon. We investigated correlations between demographics, circadian rhythm, artistic/photography experience, color competency, and accuracy of perceptions of the dress. We also examined whether manipulations of the color characteristics in the image would produce changes in perception of the dress colors. The result indicated no significant relationship between most of the demographic factors, circadian rhythm, artistic/photography experience, or color competency and dress perception. However, native English speakers were more likely to accurately perceive the dress (54%) in comparison to non-native English speakers (31%). Furthermore, manipulations of color and brightness of the image produced considerable changes in perception. Changes in the color balance and illumination of the original dress image produced the changes in dress perception, with 67% of participants reporting that at least one manipulation changed their perception of the dress.

Exploring Online Communication Patterns: Examining the Relationship Between Empathy, Self-Compassion, Dehumanization, Aggression in Social Media Activity
Ashley Kaufman and Angie O’Gieblyn, PhD

The goal of the current study was to examine how geographically diverse adult Americans communicate online and what factors influence the tone of their communication. The study explores online communication and connection through social media platforms. The literature reviewed in preparation for the project emphasized the rise of internet aggression and its dehumanizing impact (Twenge, 2013). As Xu, Xu, Li (2016) explain in their summary of internet aggression research, “Internet aggression is regarded as a serious problem in online communities, and it has caused negative consequences in cyber- space” (p.642). The aim of the current study was to further explore factors that contribute to aggressive behavior online. The current study found that individuals with lower levels of empathy are
more likely to have higher levels of dehumanizing beliefs and aggressive behavior online. Significant positive relationships were found between self-compassion and empathy, as well as self-compassion being significantly and negatively correlated to aggression. The findings of the current study may support Bandura’s social cognitive theory’s assertion that with a heightened sense of self-worth, individuals are able engage in self-censurer behavior (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996). The study also found that participants with higher levels of trait aggression and dehumanizing beliefs were more likely to be aggressive online. In total, the findings of the current study support the idea that how individuals treat each other online is directly related their perception of and ability to find empathy for others.

Personal Care Products: Where Are the Phthalates?
Tara Lunsford, Joshua Noreiga, Cassandra S. Korte, PhD, and Erika Doctor, PhD

Phthalates are plasticizing chemicals that are commonly used in personal care products to help prevent products from drying out. Phthalates have been shown to have potential negative impacts on reproductive organs, causing birth defects, affecting the endocrine system, as well as causing other ill effects. High performance liquid chromatography (HPLC) uses a pump to pass solvents through a column providing the separation, and with an ultraviolet (UV) detector, a measurement of substances found within that specific sample. Phthalates in urine can be separated, identified, and quantified using HPLC. To test the procedure and to calibrate the instrument, caffeine was used as an example compound. Four concentrations of caffeine were analyzed in triplicate and subjected to regression analysis. Retention time and peak area were obtained to see when caffeine elutes during the HPLC run. Caffeine is detected by the HPLC around 9 minutes in retention time. The peak area correlated with the concentrations, with the largest peak area being 1 g/mL caffeine. The R-squared value was 0.9887, showing the linearity of the relationship between peak area and concentration. This research will help contribute to the method validation of the HPLC when urine samples containing phthalate metabolites, are run. This research project is looking to test for the quantity of phthalate metabolites in the urine of college age females after exposure to personal care products, specifically nail polish. Upon completion of this research we hope to further understand the exposure to phthalates from personal care products have on college-age females.

Examining the Effects of Screen Size on Archaeological Data Collection
John McDowell, Jack Meyers, and April Watson, PhD

Archaeology is the study of past artifacts such as bones, shell, or pottery, in order to construct hypotheses of past behaviors. Sediment is collected from sites through varying techniques including shovel tests and square units. The sediment is then sieved through a 1/4 inch mesh screen in order to differentiate any potential artifacts. While the ¼ inch screen is the standard, it holds the potential for data loss, as smaller artifacts can be lost due to the relatively large size of the holes in the sieve. This is particularly true in areas such as Florida, where sites often have middens, or ancient dumping grounds for past cultures, which contain small, possibly broken artifacts. Smaller bones or shells that potentially show certain animals were used as food could be lost due to their size.

Here we utilized a 1/8 inch screen instead of the ¼ inch screen in the sieving process. We then sieved the artifacts through a ¼ inch screen to see the difference of artifacts retrieved between the two. What we expected is to have larger quantities of artifacts recovered by the finer mesh screen versus the use of the standard screens. The results supported our hypothesis showing that a large quantity of bone was being lost using the ¼ inch screen, indicating that a finer mesh screen such as the 1/8 inch or potentially a 1/16 inch would be more beneficial. By collecting the smaller artifacts potentially lost by the ¼ inch screen we can compile a better understanding of what prehistoric indigenous people consumed in Florida.
Factors Influencing Concentrations of Micro-Plastics on Florida Beaches
Elizabeth Harris, Shelby McKeever, and Alanna Lecher, PhD

To ocean ecosystems, micro-plastics and other pollutants have become significant contributors to the degradation of the overall life and biodiversity within ecosystems. Micro-plastics are large pieces of plastics which have deteriorated to a small size of 5 mm or less due to natural occurrences such as weathering from currents and sand that breakdown the plastics pieces. Once this size, notable effects within fish populations and ecosystems occur and negative outcomes ensue such as plastics ingested by fish and possible biodiversity loss. Furthermore, these micro-plastics and other miscellaneous articles of trash are carried by currents and have found their way into a large mass of trash, otherwise known as the Atlantic Garbage Patch, off of the east coast of Florida.

Questions stemming from this observation include: does this mass of plastic and trash significantly influence the quantifiable concentrations of micro-plastics found on Florida's beaches? Would human interaction on land accrue more micro-plastics on the beaches than the one large mass of trash and plastics out floating in the Atlantic would? The goal of this project is to determine if plastic concentrations in sand on the east coast of Florida were significantly higher than the west coast as a result of the Atlantic plastic patch. Within this experiment, sand samples will be collected from several locations on both coasts of Florida. The samples will be sifted, plastics categorized, and statistically analyzed to aid in determining whether our hypothesis that the plastics are primarily washing up from the Atlantic Garbage Patch is supported or rejected.

Investigating Career Readiness: A Comparison of College Students’ Self-Perceptions in Four Soft Skill Desired by Employers
Claudia Milhano, Conrad Rhein, Kristina Ortiz, Chad Barr, DSM, and Kristen Migliano, PhD

Research shows currently there is a disparity of skills that employers look for in new college graduates and the skills that college students possess. Employers indicate there are specific soft skills that make new hires more valuable. For the purpose of this study, a skills gap is identified in four attributes sought by organizations. These specific skills are creativity, communication, teamwork and problem solving.

The study investigates students’ self perception of preparedness for the workplace specific to these soft skills. The developed data collection instrument will be distributed to all student athletes at Lynn University and a sample of non-student athletes at the same university, Students will self report their perceived level of readiness in each of the identified four soft skills. The findings and the results will be compared to a nationwide report on the career readiness disconnect between college graduates and employers. The hypothesis will be analyzed to determine a conclusion.
Oral Presentation
Abstracts

Comparison of Proctored On-ground Exams vs. Non-proctored Online Exams in Undergraduate Finance Courses
Claudia Milhano, Robert Reich, DBA, Dawn Valentine, PhD

Student cheating has been deemed a pervasive problem in academia and in finance classes. This study is conducted comparing a series of multiple-choice homogeneous exams given to undergraduate business finance students in on-ground sections and online sections. We find that students who took exams online scored on average 15% higher than students who took the same exam on ground. There is a significant difference in the populations when using a T Test. The purpose of this paper is to compare proctored test results from an undergraduate Business Finance course taught on ground compared to unproctored online exams from the same course. The test consisted of 25 multiple choice questions that were computational, consisting of NPV, IRR, Payback, CAPM, and WACC. The questions were all original, not taken from a test bank. Both sections of the class were given 50 minutes to complete the exam. We find that grades in the on-ground section were significantly lower when compared to the online classes. This is despite the fact that students had face to face lectures and in-person access to the professor.

Sorting Out Mood, Stress and Social Interest One Rhythm at a Time
Abbigail Rinard, David Zajac, Patrick Cooper, PhD, and Jon Sperry, PhD

Ansbacher (1968, p. 148) describes social interest as an “interest in the interests of mankind”. This interest allows individuals to develop an understanding of others and how to interact empathically in social situations. Social interest promotes characteristics that encourages contribution to mankind as a whole, instead of seeking personal inferiorities (Crandall, 1975). One hundred college students completed three questionnaires examining social interest, perceived social stress and affective mood before and after participating in a group drumming activity. Preliminary results suggest that as social interest increased, perceived social stress decreased and mood improved after participating in group drumming. Implications of this study’s findings suggest using the drumming intervention on college campuses in order to promote social interest, improve mood and decrease stress.

Is Your Sunscreen Worth It?
Tara Lunsford, Alanna Lecher, PhD, and Cassandra S. Korte, PhD

Skin cancer, the most common type of cancer within humans, has approximately 3.5 million cases each year. It is widely known that the use of sunscreen can help to prevent different forms of skin cancers. There are a multitude of brands that make sunscreen, each claiming to be better than the next. The two main types of sunscreen are physical and chemical. Physical sunscreens deflect the ultraviolet (UV) rays of the sun and are normally made of zinc oxide or titanium dioxide, whereas chemical sunscreen absorb the sun’s UV rays and can be composed of many different ingredients. It was hypothesized that the physical sunscreens would do a better job at protecting against the sun’s rays than the chemical sunscreen brands. In this experiment *E. coli* growth was tested under UV light exposure with an application of five different brands of sunscreen. The control was exposed to UV with no sunscreen protection. After exposure to the UV light, the bacteria was set aside to grow and colonies were counted.
for survival. Statistical t-tests were used to look at the significance between each brand of sunscreen, physical and chemical. Through the statistical analysis it was found that there was no significant difference between each brand of sunscreen. However, there was a significant difference in *E. coli* counts between the each sunscreen application and the control. There was no statistical difference in *E. coli* counts between sunscreen types, indicating both types of sunscreen provide the same amount of protection from UV radiation.

**Abundance of Microplastics Found in Commercial Sea Salt Purchased in the US**

Khyla Bodie, Alanna Lecher, PhD, Cassandra S. Korte, PhD, Erika Doctor, PhD

Plastic pollution in the ocean has increased dramatically in recent years. Despite this increase, the effects microplastics have on environmental health, specifically relating to ingestion, are unknown. Two previous studies found that microplastics are present in commercial sea salt purchased in Southeast Asia and Spain. This study will examine the abundance of microplastic found in commercial sea salt obtained in the US. We hypothesize that, much like the previous studies, microplastics will also be present in sea salt purchased. We bought samples of sea salt with various places of origin such as Italy and Spain from local stores like the Dollar Store, Costco, Whole Foods and Trader Joe’s. Then, we separated microplastics and other contaminants from the salt by dissolution and filtration. Microplastics found on each filter were counted using microscopy. If the hypothesis is correct, microplastics will be present in sea salts from cheaper brands and from areas that have previously shown a presence of microplastics.
Depression Across Cultures

Carlota Garcia

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Depression Across Cultures

Introduction

Depression, or major depressive disorder, is one of the most commonly known disorders. It is fairly prevalent and it is a mood disorder (Shelton, 2018). It is characterized by “persistent feelings of sadness and hopelessness and (lost) interest in activities (they) once enjoyed” (Shelton, 2018, par. 1). The DSM-V provides the following criteria for diagnosing depression:

1. “Depressed mood most of the day, nearly every day,
2. Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day,
3. Significant weight loss when not dieting or weight gain, or decrease or increase in appetite nearly every day,
4. A slowing down of thought and a reduction of physical movement (observable by others, not merely subjective feelings of restlessness or being slowed down),
5. Fatigue or loss of energy nearly every day,
6. Feelings of worthlessness or excessive or inappropriate guilt nearly every day,
7. Diminished ability to think or concentrate, or indecisiveness, nearly every day,
8. Recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide.” (Shelton, 2018, par. 3)

The DSM-V specifies that in order to be diagnosed, the individual must feel five or more symptoms (at least one of them being 1 or 2) throughout a two week period. The criteria in the DSM-V is not the only assessment that exists to determine the presence of depression. There are numerous scales and inventories used in studies. The paper will begin by analyzing two of those scales, and how they are culturally limited. Following this, the paper will examine different aspects of depression across cultures, including the stigma associated with it, with the variance in symptoms that the stigma entails, as well as different cultural factors that affect the way individuals will experience and express depression across cultures.

“Neuroscientists commented on the pervasiveness of ethnic and cultural issues in the interpretation of most genetic studies, and their influence on vulnerability and resilience, coping styles, cognitive responses to stress, and the nature of social support” (Alarcón, 2009, par. 41).

An analysis of standard depression symptoms across cultures was done, in which the Hopkins symptom checklist 15-item Depression scale (HSCL-15) was compared in different settings (Haroz, Bolton, Gross, Chan, Michalopoulos, & Bass, 2016). The participants included adults from low and middle-income countries (LMIC) from Colombia, Indonesia, Kurdistan Iraq, Rwanda, Iraq, Thailand, and Uganda (Haroz, et al., 2016). The 15 items in the scale were compared in all these countries.

The study’s purpose was to determine whether the varied prevalence of depression across countries was due to cultural factors or to errors in the measurement of the disorder in different settings. The researchers used Item response theory (IRT), to establish the scale’s cross-cultural applicability (Haroz, et al., 2016). The research finding’s concluded that most of the items in the scale are un-biased and that therefore, they are able to perform well in
different settings (different countries and in different languages) (Haroz, et al., 2016). These items included: “feeling hopeless”, “feeling sad”, “feeling low on energy”, “problems with sleep”, “feeling trapped”, “worrying too much”, and “feeling worthless” (Haroz, et al., 2016). However, there were two items that did present discrepancies. The item “loss of sexual interest or pleasure” is an indicator in Western countries, since sex is widely talked about and discussed. In non-Western countries; however, topics related to sex can be considered a taboo. Individuals in these settings do not give honest answers, making this item an unreliable indicator for depression (Haroz, et al., 2016). The item “thoughts of killing oneself/suicide” was not found to be a good indicator for depression in Thailand (Haroz, et al., 2016). “Recent findings have shown that while depression is a risk factor for suicide ideation in high-income countries, impulse control disorders are more strongly associated with thoughts of death and suicide in many LMIC” (Haroz, et al., 2016, p. 989).

Another interesting finding of the study was how different items were indicative of different levels of severity for depression in different settings. For example, in Indonesia, the item “low energy or fatigue” is an indication of mild depression, while in a different setting, the item might be correlated with severe depression (Haroz, et al., 2016). The study’s results also were descriptive for people with higher levels of depression rather than average levels (Haroz, et al., 2016), which could pose some limitations.

A different study focusing on the applicability of a widely used depression scale was conducted with Asian samples (Oei, Sawang, Goh, & Mukhtar, 2013). The DASS-21 is an instrument used to measure depression, anxiety, and stress, and it has been used with Hispanic Americans, British, and Australian adults with high levels of reliability and validity (Oei, Sawang, Goh, & Mukhtar, 2013). “Cross-cultural research has shown that Asians tend to have higher levels of collectivistic values which prioritize group goals over individual goals. These cultural values can also impact on how individuals express their emotions […] the way an individual talks about distress and how it is perceived and defined will be a function of his or her culture” (Oei, Sawang, Goh, & Mukhtar, 2013, par. 7).

The original DASS has 21 items. For the purpose of this study, three of those items: “I found it difficult to relax,” “I found myself getting agitated,” and “I felt that I was using a lot of nervous energy” (Oei, Sawang, Goh, & Mukhtar, 2013, par. 36) were removed from the factor “Stress”. The resulting DASS-18 presented high internal reliability with Asian samples from six different countries: Indonesia, Malaysia, Singapore, Sri Lanka, Taiwan and Thailand (Oei, Sawang, Goh, & Mukhtar, 2013). The problems with generalization across cultures are not simply concerns about the language translation of the item questions, rather they extend to concerns regarding how participants from a culture might perceive those items (Oei, Sawang, Goh, & Mukhtar, 2013). For instance, the reason behind removing the item “I found it difficult to relax”, was that participants in certain Asian countries, such as Singapore or Thailand, might perceive relaxing as lazy behavior, which is not in agreement with their cultural values (Oei, Sawang, Goh, & Mukhtar, 2013). This connects with a certain bias that cross-cultural researchers are especially concerned with, the “desirability bias” (Alarcón, 2009). Responses from these cultures might be influenced by the stigmas that depression, and related disorders such as anxiety might carry. The participant’s desire to not disagree with his/her culture values might prevail over his/her sense of help needed.
Differences in Depression Factors

Adolescents’ beliefs and attitudes about depression can fundamentally influence the symptom’s severity, the treatment plan and the adherence to recommendations (Dardas, Silva, Scott, Gondwe, Smoski, Noonan, & Simmons, 2018). A study conducted on Arab adolescents found that the main three believed factors affecting depression, which can overlap, are stressful events (72%), social factors (65%), and weak will (56%) (Dardas, et al., 2018). The latter is an interesting reason to examine. The least believed factors Arab adolescents think affect depression are genetics (24%), chemical imbalance (30%), and punishment for wrong doings (35%) (Dardas, et al., 2018). The latter one once again is an interesting belief factor. Although it is one of the least believed factors, a third of the respondents marked it, which could have religious reasons, as well as “weak will” might. These beliefs also influence the type and severity of depression (Dardas, et al., 2018).

The differences in depression across cultures are also expressed in the kind of symptoms each culture experiences. It is known that guilt is more frequent in large areas of Africa and in Europe than it is in Eastern cultures (Stompe, Ortwein-Swoboda, Chaudhry, & Friedmann, 2001, p. 13). This is a consequence of the presence of Judeo-Christian societies in these areas of the world. There has been a decline in guilt over the last 100 years, which has been associated with the decline of religious presence in Western cultures. Islamic countries show frequent feelings of guilt as well (Stompe, Ortwein-Swoboda, Chaudhry, & Friedmann, 2001, p. 13). Guilt is overall more frequent in the Western world. In the Eastern and non-Christian cultures, depressed individuals deal more often with hypochondriac symptoms (Stompe, Ortwein-Swoboda, Chaudhry, & Friedmann, 2001, p. 13). A cross-cultural study conducted with participants from Austria and Pakistan exploring guilt found that depressed patients from Austria were more likely to present depressed mood, guilt, suicidal tendencies, problems with work and daily activities, and insomnia (Stompe, Ortwein-Swoboda, Chaudhry, & Friedmann, 2001). The patients of Pakistan, on the other hand, were more likely to present psychic and somatic anxiety, hypochondriasis, loss of appetite, fatigue, depersonalization and paranoid symptoms (Stompe, Ortwein-Swoboda, Chaudhry, & Friedmann, 2001).

In this study, guilt was subdivided into several components. “Both feelings and delusions of guilt stem from the non-fulfilment of ethical challenges and are subject to biological, socio-cultural and situational influences” (Stompe, Ortwein-Swoboda, Chaudhry, & Friedmann, 2001, p. 13). Guilt can also be called “ethical feeling” and it emerges from an individual’s personal or cultural values being challenged (Stompe, Ortwein-Swoboda, Chaudhry, & Friedmann, 2001). In this situation, one’s conscience is activated and personal responsibility is taken. “Ethical feelings” arise when no action takes place. Guilt and shame act as “censors of conduct” (Stompe, Ortwein-Swoboda, Chaudhry, & Friedmann, 2001). For instance, in Pakistan, the main values are honor, dignity, pride, virility and family ties (Stompe, Ortwein-Swoboda, Chaudhry, & Friedmann, 2001). Actions that go in a different direction of these values trigger feelings of shame. The concepts of shame and guilt are often used interchangeably, but they are quite different. Guilt is usually an internal process, caused by feelings of responsibility or remorse; while shame is more public, and arises from acting dishonorably or improper. Cultures in which free will is predominant over determinism will take responsibility for events, and as a consequence experience guilt (Stompe, Ortwein-Swoboda, Chaudhry, & Friedmann, 2001).

The study’s findings call for an adaptation in the 21-item HRDS, the Hamilton
Depression Rating Scale, a widely used instrument in transcultural studies (Stompe, Ortwein-Swoboda, Chaudhry, & Friedmann, 2001). The scale’s items only list “guilt” as an indicator for depression, but the previous study proves that “shame” can also be an indicator for depression in Eastern cultures.

Another factor that has been associated with depression is parenting processes and internalizing behaviors. A study focuses on parenting processes as a predictor for depressive and anxious systems across different cultural settings (Vazsonyi, & Belliston, 2006). “Studies have consistently documented that children and youth enjoy healthy development and positive adjustment when there exists sufficient closeness and warmth in the parent-child dyad together with sufficient parental autonomy granting” (Vazsonyi, & Belliston, 2006, p. 491). We know that too much parental control, conflict and inconsistent support is correlated with depressive symptoms. The study concluded that individual parenting and internalizing behaviors are highly similar across cultures (Vazsonyi, & Belliston, 2006). The two main predictors across cultures are parental support and conflict. There were two inconsistencies across cultures relating to different aspects of parenting processes. For American youth, parental approval seems to have a tight relationship with the developing of symptoms, as compared to Dutch youth (Vazsonyi, & Belliston, 2006). A possible explanation for this might be that American parents use mechanisms of control more frequently than Dutch parents. In America, maternal peer approval had also a larger effect on depression symptoms on youth, than it did for Dutch, Hungarian, and Swiss youth (Vazsonyi, & Belliston, 2006).

Gender

The differences in gender for depression are quite significant. Females usually present higher levels of depression, less help-seeking, and different symptoms. The overall DASS-21 score is higher for Chinese women than for men (Oei, Sawang, Goh, & Mukhtar, 2013). Research conducted in Nepal, Finland, Portugal, Germany, Poland and North America concluded that there is a 2-1 female-to-male ratio for depression, meaning there are twice as many women as there are men that experience depression across the globe, and the ratio is stable across cultures (Loers, 2010).

Girls have also been found to cope with stressful factors differently than boys, affecting their experience of depression. A study examining coping strategies across cultures and across genders, with Chinese and Canadian participants, found that girls are more likely to experience higher levels of depression, and that those gender differences might emerge from vulnerability difference levels. Girls are also more likely to react to stressors with a ruminative style, which means they repetitively think about the stressor, a style that perdures into adulthood.

There is a common theme of women “self-silencing” when it comes to health, particularly cancer, HIV, eating disorders, heart disease, premenstrual syndrome, post-partum depression and abusive relationships (Loers, 2010). Below is an account of one of the most unknown and unexplored disorders.

Post-Partum Depression

An extremely prevalent, yet overlooked type of depression, that affects somewhere between 10-20% of mothers worldwide is Post-Partum Depression (PPD) (Evagorou,
The disorder is characterized by similar symptoms of a depressive episode with the addition of irrational fears for their child and concerns about the child’s health, and suicide (Evagorou, Arvaniti, Samakouri, 2016). The disorder can show up between the first and 12th month of the postpartum period (Evagorou, Arvaniti, Samakouri, 2016). It is a severe disorder that 80% of the time goes undiagnosed and untreated, causing long-term negative effects for both the child and the mother, as well as the family’s harmony (Evagorou, Arvaniti, Samakouri, 2016). The depression puts the maternal duties in danger, and increases the risk for suicide and child neglecting.

The causes for this have not been pinpointed, but it is known that there are predisposing factors that increase the risk for its appearance. These include history of depression in the family, low-income, low social support, low self-esteem and unwanted or unplanned pregnancies (Evagorou, Arvaniti, Samakouri, 2016). The beliefs held in different societies influence the emotional experiences of the mother as well as the expression of her symptoms. The expression clearly differs between Western and non-Western countries (Evagorou, Arvaniti, Samakouri, 2016).

PPD in Asia.

The emotional disturbances women experience in these countries are usually expressed through physical symptoms. The postnatal practices in these countries focus on the mother, and on bringing her back to her pre-pregnancy “normal” stage. There are higher levels of symptoms experienced by Asian women than in Western countries. In China, women have reported experiencing fevers, muscle pain, chills, low energy, and exhaustion (Evagorou, Arvaniti, Samakouri, 2016). In Hong Kong, the symptoms include fatigue, confusion, loss of control, frustration, sadness, stress, panic, fear and feelings of hopelessness (Evagorou, Arvaniti, Samakouri, 2016). In Israel, the women experience depression through hypochondriac behaviors. In Iran, women manifest the symptoms through constant feelings of guilt (Evagorou, Arvaniti, Samakouri, 2016). The prevalence in these countries varies from 0.5-6.8% in Singapore to numbers as high as 33% in Vietnam and 32.4% in India (Evagorou, Arvaniti, Samakouri, 2016).

PPD in Africa.

“PPD is characterized primarily by physical symptoms, because of the fear of social stigmatization of women” (Evagorou, Arvaniti, Samakouri, 2016, p. 135). Some of the symptoms include nausea, headaches, increased irritability, and general body pain (Evagorou, Arvaniti, Samakouri, 2016). African cultures are etnikinship cultures, which share the physical symptoms of Asian cultures and have a focus on the mother during the post-natal period (Evagorou, Arvaniti, Samakouri, 2016). The following cultures in Europe, Australia and North America are technocentric, with a primary focus both on the mother and the baby (Evagorou, Arvaniti, Samakouri, 2016).

PPD in Europe.

Depression in European countries manifest with the typical depressive symptoms, and
their post-natal support comes from machines and health professionals, as opposed to family and community support experienced by ethnonkinship cultures, that include the countries discussed above (Evagorou, Arvaniti, Samakouri, 2016). For instance, in France and the U.K., women experience a strong sense of guilt, stress, anxiety, panic and fear, with no clear triggering causes for the symptoms. The prevalence in Europe ranges from 2.87-13% in Italy to 5-22% in the U.K (Evagorou, Arvaniti, Samakouri, 2016).

PPD in Australia.

The symptoms experienced in these settings again resemble those of a depressive episode. The symptoms here include: sadness, guiltiness, suicidal thoughts, loss of control, loss of interest in simple daily activities and feelings of loneliness and isolation (Evagorou, Arvaniti, Samakouri, 2016). “Women with PPD report significant frustration because of the gap between their expectations of motherhood and the reality due to their illness, with problems in adapting to (the) maternal role” (Evagorou, Arvaniti, Samakouri, 2016, p. 138).

PPD in North America.

Post-Partum Depression is manifested through psychological symptoms. Canada has one of the lowest prevalence rates, 4.5-8.68% (Evagorou, Arvaniti, Samakouri, 2016). This might be due to the post-natal support system that Canadian women are offered, through their hospital or through different mental institutions, or the stigma associated with this disorder. Mothers feel inadequate and guilty, and are embarrassed to admit to how they are feeling, so their natural response is to normalize their symptoms and to not seek out for help, out of fear of being called “bad mothers” (Evagorou, Arvaniti, Samakouri, 2016).

PPD in South America.

Literature on the topic reveals that the rates of PPD in South American countries are at its highest, with the highest prevalence rate recorded being 57% in Colombia, followed by 42.8% in Brazil, 57% in Guyana and 4.6-48% in Chile (Evagorou, Arvaniti, Samakouri, 2016). In Brazil, most women’s symptoms are identified through her family members, who observe a drastic change in the mother’s behavior (Evagorou, Arvaniti, Samakouri, 2016). This disorder can be extremely dangerous if not treated quickly and appropriately, since it can have lasting effects on both the mother and the child, who might never establish a bond. The mothers feel regret and refuse to take care of the baby, not accepting their new role as a mother.

PPD conclusion.

The study combines data obtained from 106 articles relating to PPD, and the findings concluded that all the different cultures presented the same risk factors for developing the disorder. These might be predisposing factors such as low income, unwanted or unplanned pregnancies, premature birth, poor conditions of living, unemployment, stressful life events, or poor family and marital relationships (Evagorou, Arvaniti, Samakouri, 2016). There are other cultural factors that affect the appearance of the disorder in new-mothers. Cultures in which there is an overt preference for males, and
in which there exists gender discrimination can influence the development of the disorder, especially if the baby born is a female (Evagorou, Arvaniti, Samakouri, 2016). Another factor is the cultural post-natal practices that are aimed to help women transition. It has been found that many times, these practices can have the contrary effect and contribute to the detrimental symptoms women experience. Countries such as Japan, Hong Kong, Taiwan, Nigeria and Uganda provide such practices (Evagorou, Arvaniti, Samakouri, 2016).

The study also observed that the prevalence rates in non-Western countries is usually more varied across countries, and higher in general (although not higher in reporting) (Evagorou, Arvaniti, Samakouri, 2016). The study also identified that the more non-Western a culture is, the more somatization occurs. The symptoms experienced by women in these countries are manifested mainly through physical symptoms, “because of the different perceptions of mental health, the negative attitude towards its disorders, and the high expectations of some cultures for motherhood” (Evagorou, Arvaniti, Samakouri, 2016, p. 144). Women must normalize the symptoms (e.g.: India), or repress them without complaint (e.g.: Jordan) (Evagorou, Arvaniti, Samakouri, 2016).

China vs North America

A cross-cultural study with Canadian and Chinese participants found that the use of maladaptive coping strategies is associated with higher levels of depression for both Chinese and Canadian adolescents (Auerbach, Abela, Zhu, & Yao, 2010). The differences between these two countries are the kind of stressors that the students felt. For Canadians, who are part of the Western culture, their main stressors were conflict at home with parents or with peers; while Chinese students described academic and cultural factors to be their source of stress (Auerbach, Abela, Zhu, & Yao, 2010). “Escalating social pressures are being placed on Chinese youth to excel in school, resulting in increased stress and decreased leisure time” (Auerbach, Abela, Zhu, & Yao, 2010, p. 559). Furthermore, the modernization and Westernization that China is currently undergoing has breached with the traditional values that once dictated the lifestyle in the country and its citizen’s expectations (Auerbach, Abela, Zhu, & Yao, 2010). The old and the new generations clash in their approach to their lifestyle, and that can be see with the kind of social support and coping strategies that Chinese individuals turn to. Historically, China has been a collectivist culture in which its members turn to the community for support and coping; nowadays, younger Chinese individuals are turning towards more individualistic strategies and values (Auerbach, Abela, Zhu, & Yao, 2010).

The stigma about mental illnesses is one of the main factors why depressive symptoms vary across cultures, and why depression goes untreated in many different settings. It prevents people suffering from it to be diagnosed and provided with treatment. It is well known that the stigma is even bigger in Asian countries as compared to Western countries, especially Canada and America. A study done with Chinese Americans and Caucasian Americans found that Chinese Americans had a higher rating for stigma of disorders, especially major depression and psychotic depression (Hsu, Wan, Chang, Summergrad, Tsang, & Chen, 2008). The stigma is believed to arise from fear, shame, social values and sanctions (Hsu, et al., 2008). It is also psychotic symptoms that are more stigmatized than physical symptoms (Hsu, et al., 2008), perhaps providing an insight into why Asian cultures manifest physical symptoms for depression more frequently than psychological symptoms. “The stigma of mental illness
causes mentally ill patients to be discriminated against and ostracized, leading to poor self-esteem, persistent depression, social isolation, unemployment, and low social status. This stigma acts as a major obstacle to the detection and treatment of mental disorders, and it is prevalent in all cultures” (Hsu, et al., 2008, par. 3).

Asian and Hispanic populations, compared to Caucasian individuals, believe that mentally ill individuals are more dangerous (Hsu, et al., 2008). The study also found that somatoform depression was less stigmatized than other kinds of depression, explaining why depressed Chinese American (and Chinese) patients present higher levels of somatic symptoms (Hsu, et al., 2008).

Conclusion

This research paper has provided with different accounts as to why cultural factors are an essential aspect of depression, whether these are attitudes and beliefs, stigmatization, or parenting styles. These aspects essentially affect how an individual from a certain culture will first experience depression (physical vs psychological symptoms), how they will express it (seeking out for help vs repressing it), and how this affects the estimated prevalence of depression across cultures. The prevalence provided for different countries has been gathered from multiple cross-cultural studies. The limitation of whether the assessments utilized are culturally appropriate and generalizable, and whether cultural values such as stigma act as obstacles to clearly establishing a percentage of individuals experiencing depression (as it is defined by the DSM-V), remain. The path to a more culturally sensitive and inclusive diagnosis, not just of depression, but of any clinical disorder, has been supported by extensive research and professionals in the field. There is no question that the way an individual perceives, feels, and expresses depression varies across cultures, as the research paper has sustained. Nevertheless, an update in the criterion for diagnosis needs to be made in order to be able to study depression in a valid and reliable manner.

There have been justifications and extensive research evidence that supports the inclusion of cultural factors in psychiatric diagnosis (Alarcón, 2009). The implementation of what has come to be known as “cultural psychiatry”, is not a specific approach or a psychiatry for minority groups (Alarcón, 2009). It is an essential perspective and group of factors that need to be taken into consideration within the first phase of any clinical evaluation. Cultural psychiatry applies to all psychiatric conditions (Alarcón, 2009), not just “culture-bound syndromes”, which are clinical diagnosis related to a specific area or culture. These syndromes were first included in the DSM-III (Alarcón, 2009). The description of the syndromes are often too similar or too vague to be categorized (Alarcón, 2009), which leads to some criticisms regarding the DSM-V, the latest update in the manual. The main criticism in terms of culture, is that the manual is ethnocentric (Alarcón, 2009) in that it is white-centered since it is an American manual and its content is based on research predominantly done in the U.S. and with people of the same ethnicity. The critics claim that fundamental factors such as age, culture and gender are most often ignored (Alarcón, 2009).

A step towards a cultural psychiatry is to learn to identify what is cultural in the clinical area, or what creates a specific “environment” (Alarcón, 2009). Some of the main aspects that need to be covered for a well-structured clinical interview include cultural variables, family data, and pathogenic and pathoplastic factors, amongst others. The cultural
variables include but are not limited to language, religion or spirituality (dictating values and attitudes held by individuals), gender and sexual orientation, tradition and belief (tightly linked to ethnicity and the patient's sense of individual and group identity), and finally migration history and level of acculturation (Alarcón, 2009). The family data (paternal processes and internalizing behavior) constitutes a culture, or “micro-culture/environment” in itself. The roles, the hierarchies, the kind of social interactions, activities which provide with values and roles, and perhaps most importantly the help-seeking patterns that the family in question fosters, all reveal crucial information about the participant’s narrative and his/her view of the world; and thus, how a disorder might be experienced and expressed to the outside world (Alarcón, 2009).

The pathogenic and pathoplastic factors encompass a “macro-environment”. Pathogenic factors recognize whether the source is benign and therefore preventable, or harmful (Alarcón, 2009). Some factors include family life, media, socio-political environment, schooling norms or church affiliation (Alarcón, 2009). Pathoplastic refers to the symptoms expression (physical vs psychological symptoms). “Environment shapes the form (not only the substance) of the symptoms […] The distinction between the appearance of the symptom, its verbal description, and the patient’s surrounding reality continues to be the key element of this part (initial phase) of the evaluation” (Alarcón, 2009, par. 34)
References


